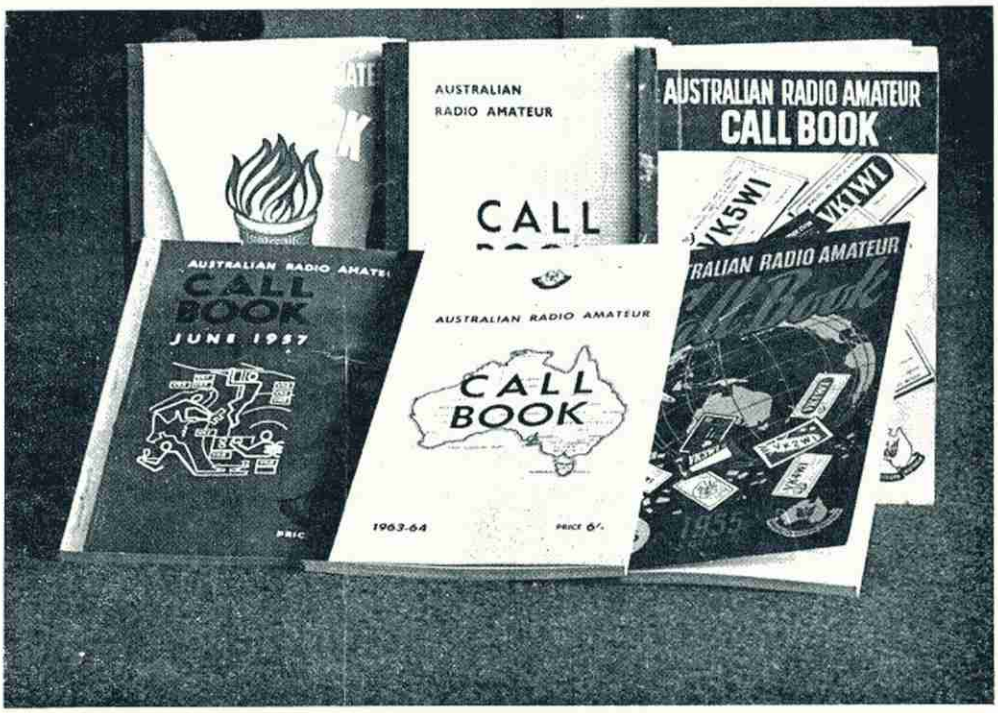
# AMATEUR RADIO

JANUARY, 1965




Vol. 33, No. 1

2/6

Registered at G.P.O., Melbourne, for transmission by post as a periodical

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## OUR COVER

Featured in this photograph are some past issues of the Australian Radio Amateur Call Book.

## FEDERAL COMMENT

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### THE SCOUT JAMBOREE

In October of this last year we had another very successful "Jamboree-on-the-Air". During December and early this month we will have the opportunity of allowing Scouts attending the Seventh Australian Jamboree at Rowville, near Dandenong, Victoria, the pleasure of talking to other Scouts and Amateurs throughout the world and locally in Australia.

Those members who took part in the previous Pan-Pacific Jamboree at Clifford Park, Victoria, will undoubtedly recall the great pleasure both they and the Scouts derived from these activities. We have no doubt whatever as to the success of the Jamboree currently being held and urge every Amateur who can organise some time to help at Dandenong, or by arranging to have boys who cannot attend the Jamboree talk to their friends in the camp.

It is with regret we pause to record the very able services of our previous night operator at Clifford Park will not be available again. We refer to Lance Frith, VK3ZA, whose key became silent in September of last year.

The questions in the minds of some may be—what does Amateur Radio gain from these activities, or why does the W.I.A. interest itself in the Scouting movement? Obviously the answers to these questions are closely related.

Firstly, the encouragement of any group of young people in the hobby of Amateur Radio is part of the aims and objects of the Wireless Institute. Secondly, Amateur Radio gains more devotees to its cause and in turn the community benefits by gaining better citizens with wider knowledge technically, geographically and of humanity on a non-political basis free of national and social barriers. Thirdly, the Institute can provide an additional interest to the boys in camp when their activities are not being concentrated on Scouting affairs.

The Federal Station of the W.I.A., VK3WIA, will be active from the camp over the Jamboree period and Amateurs should look out for this rather rare call, at the same time making their stations open where possible to local Scouts to chat with their more fortunate contemporaries at the Jamboree.

What better time for such extra-mural activities devoted to public service than over this Yuletide period when Peace and Goodwill are uppermost in our minds and thoughts. The Jamboree dates are 30th December to 8th January.

A VERY FRUITFUL AND PROSPEROUS NEW YEAR TO AMATEURS EVERYWHERE.

FEDERAL EXECUTIVE, W.I.A.

## CONTENTS

# MODIFYING THE PYE REPORTER MK. II. FOR H.F. NET OPERATION

*E. C. MANIFOLD,* VK3EM*

FIRSTLY, the purpose of the modification is to have mobile equipment capable of working on the 1825 kc. W.I.C.E.N. net frequency in VK3.

Having received a Pye Reporter Mk. II., and also having thoughts of 160 metre operation, the possibility seemed too good to pass by without further thought.

When the tube line-up in the receiver and transmitter is considered with the requirements for simple mobile or portable 160 metre gear, there appears to be a good reason to try it out and see if it is worth while.

It may be argued that the 2.9 Mc. i.f. strip would be too broad for this type of service and that interference from the Loran transmissions would be troublesome. This could be so, if the receiver was to be used near a Loran installation. However, since the answers were not available, the only thing to do was to "give it a go".

The receiver was not made tunable, although this is no problem to do. It was not necessary for our purpose, so a crystal was obtained to lock the receiver to the net frequency.

It is probable that the Reporter will be wired for 6v. operation, and if this voltage is required, no alteration to the terminal strip is necessary. But for 12 volt operation the terminal strip inside the front panel under the chassis will have to be altered.

With the bottom up and facing the front panel, remove the heavy wire bridges on the terminal strip and re-bridge lugs No. 123 from the right hand end of the lug strip, add 20 ohm 3 watt resistor between lugs 3-6. Lug No. 4 is earthed, No. 5 is the relay d.c. supply and No. 7 is 6.3v. transmitter supply. The above assumes that the unit as received here was as orginal wiring. (See Fig. 1).

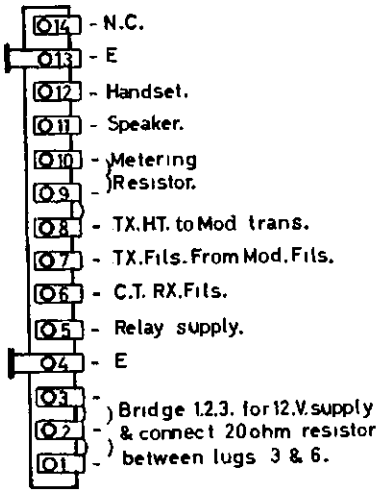



Fig. 1. Terminal strip connections.

As there are valves which will not be required and will be removed, the remaining valve filaments should be wired as shown, and balanced as close as possible to provide 6.3v. at each valve. (See Fig. 2).

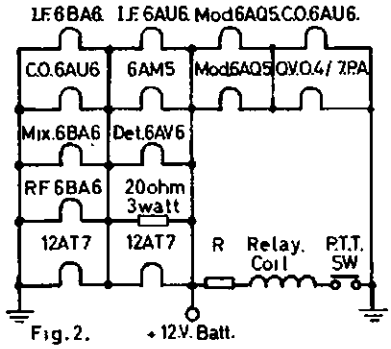



Fig. 2. Filament connections for 12V battery operation.

Remove V2, V3, V13, L2, L3, L4, T1 and associated circuits.

The existing crystal oscillator V4 is retained and is provided with a 4725 kc. crystal, used as the oscillator frequency to provide injection to the mixer (V5) for an i.f. of 2.9 Mc., which is normally the second i.f. channel.

The r.f. stage VI is now a 6BA6 and was substituted for the original 6AK5, as it was thought that at this frequency with fairly strong b.c. harmonics, cross modulation may be experienced with a.v.c. on the sharp cut-off pentode. It was also thought that the 6AK5 could be more usefully employed in other gear at v.h.f.

The original antenna coil is rewound with 70 turns of 38 s.w.g. enamel as the grid coil. On the earthy end of the coil, wind 10 turns over the grid coil, in the same direction, with 2 mil. insulation between coils.

Insert an iron slug ½" long inside the former at the centre of the coil and cement in position, dope the windings and re-install in the original position.

In addition to the original tuning condenser, a parallel condenser of 50 pF. is connected across the grid coil to provide an improved C/L ratio at 1825 kc.

Replace the original bypass condensers on V1 with 0.01 μF. mica (or ceramic) condensers as the existing bypasses (680 pF.) are too small at this frequency.

The screen dropping resistor should be changed to 68K for the 6BA6.

As an alternative to rewinding the original antenna coil, suitable pi-wound coils which are slug tuned on a 7 mm. former are available from Ham Radio Supplies which, when tuned with 50 pF. parallel capacitance, will cover the 1825 kc. net frequency.

Turns would probably require to be removed from the smaller coil, for the antenna coil, but could be used "as is" for the r.f. coil.

However, since a number of chaps may not be able to procure these coils, details for rewinding a coil similar to the antenna coil are included.

Use a coil former of ⅜" diameter, preferably slug tuned, and wind coil to the following details: Wind 70 turns of 38 s.w.g. enamel as the grid coil and over the earthy end, insulate with 2 mil. insulation, and wind 25 turns of the same wire in the same direction, for the plate coil.

Tune this coil with a parallel condenser of 100 pF. If slug tuned coil, or if you want to use the original tuning 33 pF. variable, add another fixed condenser of 80 pF. in parallel. In any case, a slug similar to the antenna coil should be cemented inside the coil former if condenser tuning is used.

Rewire the front end of the receiver to the circuit shown in Fig. 3, but as there is no alteration to the 2.9 Mc. i.f. or the audio, this section of the circuit is not included.

It seems to be that almost all of these units would require to have the diodes in the noise limiter and squelch circuits replaced and this unit was no exception.

The replacements were OA85s and OA79s, each giving similar results when tried. Care must be taken to replace them in the correct polarity in each circuit in lieu of the existing diodes.

It was found that the audio gain control did not cut the audio off at minimum rotation on local signals. By-passing the earthy end of the audio gain control to chassis (with a 0.1 μF. condenser) provided better control of signal level.

**TRANSMITTER**

The original line-up was a 6AU6 c.o., 6AQ5 mult. and QV04/7 p.a., modulated with a pair of 6AQ5s p.p., driven by a single or double button microphone.

Quite a few ideas could be advanced to improve the audio side, but as the unit was to be simple, but effective, the original circuit was retained as it is quite satisfactory providing that the operator "talks up" to the microphone or copiability will be quickly lost.

The original 6AU6 c.o. is retained and slightly altered to suit the lower frequency of operation (see Fig. 4).

The 6AU6 plate coil is rewound with 38 s.w.g. enamel wire to the full space between the former connecting lugs, and an extra 100 pF. condenser is placed across the coil to tune it to the 1825 kc. frequency with the iron coil tuning slug.

The c.o. is capacitively coupled to the QV04/7 p.a.—the 6AQ5 (V13) being removed.

The plate circuit of the p.a. must, unfortunately, be made fully tunable, and a pi coupler has been provided to

* 267 Jasper Rd., McKinnon, S.E.14, Vic.

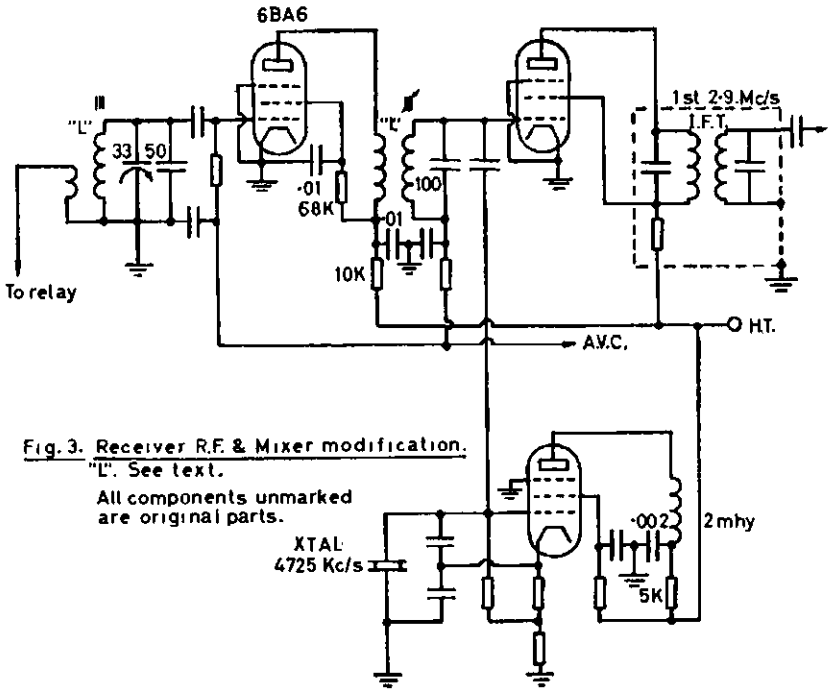



Fig. 3. Receiver R.F. & Mixer modification.
"L". See text.
All components unmarked are original parts.

cope with the various antenna lengths and positions which will be used at different locations.

This allows the p.a. to be loaded and matched to a range of low-to-medium impedance aerial feed points and was considered to provide the most flexible arrangement in the confined space available in the cabinet and chassis.

The physical layout dictated the use of miniature tuning p.a. condenser and loading condensers, which were located under the chassis, beside the p.a. valve socket, while the p.a. coil was located above the chassis, mounted from the side of the cabinet close to the p.a. valve.

This coil was wound on a ¾" diam. polystryene former, which originally was purchased full of pepper (hot stuff!) and was wound with 26 s.w.g. enamel wire to a length of 1¼", approximately 65 turns.

Transmitter tuning consists of plugging a 0-1 mA. meter into the metering plug on the side of the chassis, pins No. 4 (negative) and No. 6 (positive) and tuning for maximum grid current (approximately half scale).

Then attach the antenna (see recent notes in "A.R." for suggested antennae) and tune the p.a. to resonance, indicated by an 0-100 mA. meter plugged into the metering socket, pin No. 5 (negative) and No. 7 (positive), which should indicate approximately 28-30 mA., depending on the h.t. voltage available, and will be in the range of 250-280 volts.

Power input to the p.a. is approximately 7 watts and has been fed into a 40-metre dipole at this location for want of a better aerial, with the two feeder wires tied together and loaded against earth.

Reports received from all local stations have been between S7/9 with S5/7 from the few country stations worked to date, and although not used a great deal, has been very gratifying.

Receiver alignment is equally simple since the i.f. strip will be aligned, and the insertion of the receiver crystal with the unit powered will only require that the r.f. and mixer coils be tuned for maximum noise or, better still, to use a signal generator, Bendix frequency meter, or of course a station on the net frequency.

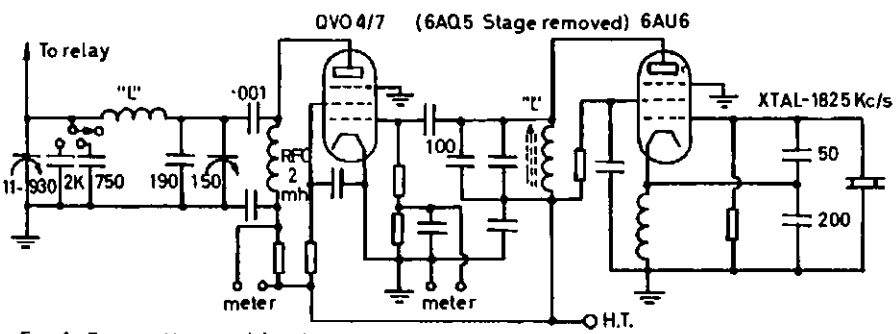



Fig. 4. Transmitter modification.
"L" See text.
Unmarked components are original parts.

It would be advisable to finally tune all circuits, i.f's. included, to a station on the net frequency.

To get indications of correct tuning for the receiver, connect a 0-10 voltmeter between the junction of the two noise limiter diodes and earth. This will give a sensitive reading for all receiver adjustments.

As mentioned at the commencement of this article, Loran signals are audible at this location, only when there are no stations working on the net frequency and the squelch circuit inoperative.

Loran signals are not strong enough to operate the squelch circuit, which will operate on signals which are S3/4 and over.

Signals from the VK2 net, which is 5 kc. removed from the VK3 net, are copiable on the receiver, but are not particularly strong and have not yet operated the squelch circuit to date.

No actual selectivity or sensitivity tests have been made on the unit, but listening tests have indicated that the unit modification is satisfactory for the purpose.

There appears to be no reason why this gear should not be modified to operate on the 27 and 28 Mc. bands as mobile and fixed portable equipment, to make use of a frequency allocation which has been almost neglected, and which for some considerable time will not be useful as a DX band.

Aerials for these bands are comparable with the centre loaded whip aerials of the lower frequencies for length, but do not need the loading coil to make them resonant at these frequencies.

And finally, considering the number of tubes and parts in one of these chassis one could not get on the net frequency any cheaper, the crystals being relatively the dearest parts.

Attention is drawn to several interesting articles in "A.R." in recent issues, to which reference has been made, in modifying this equipment for the 160 metre band. ●

☆

## 1965 FRENCH CONTEST

**Dates:** C.w. from January 30, 1400 G.M.T., to January 31, 2100 G.M.T. **Telephony** from February 27, 1400 G.M.T., to February 28, 2100 G.M.T. V.h.f. from May 1, 1800 G.M.T., to May 2, 1800 G.M.T.

**Code:** RST/RS and number of QSO.

**Multiplier:** Each French station gives his number of department after their call. For each band, one point per each different department or each different D.U.F. country other than F or FC.

**Scores:** 3 points per each QSO and multiply this total by the total of all multipliers.

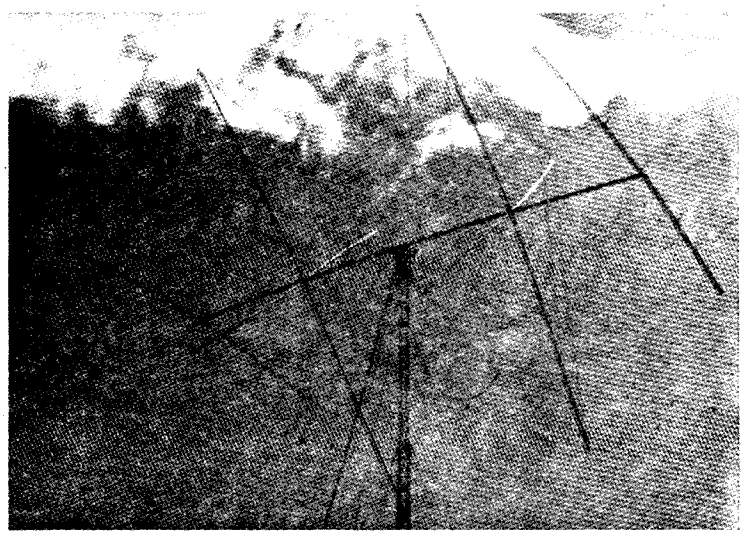
For this R.E.F. anniversary, all stations who send a log for more than 1,000 points, receives a special certificate.

**R.E.F. Award:** Reference to any log sent is available for any French Award application: D.P.F., D.D.F.M., D.U.F., D.T.A., during two years, total or, partly with QSL of other QSO in complement.

**Send log** to R.E.F., B.P. 42-01, Paris R.P., France.

# A CUBICAL QUAD CUM YAGI*

*RALPH TURNER,† VK5TR*



● **This 20 metre antenna combines the features of the Quad and Yagi antennae for simple construction and improved performance. The information given is also valid for the conventional two-element Quad and can help to improve performance of these antennae.**

THE two element cubical quad is, in the writer's opinion, the best all round antenna yet devised. When assessed on a forward gain, angle of radiation, front to back ratio, and low initial cost, as compared to any other type of antenna, for similar performance, it excels.

I have had so much success with the two element quad that, after listening to G3VNA, it was decided to try his approach to quads. G3VNA uses a quad with two conventional elements plus a Yagi type reflector and director. As a result, G3VNA puts the best and most consistent signal into VK5 land.

I have talked to many Hams all over the world who have built quads and have come to the conclusion that only about 50% of them have been satisfied that their quads are really working at their peak performance. Most think their quad is working but they are not confident enough to say that they **know** that it is working 100%.

The reason for the failure to get a quad working properly is, in my opinion, due to four main points which are as follows:

1. The exceptionally high Q of the reflector.
2. The fact that it appears to be impossible to accurately "grid dip" a quad radiator.
3. The disastrous effects that metal spreaders have on the operation of a quad.
4. The interaction between the radiator and reflector elements.

## HIGH Q

The two elements of a quad could be viewed as the two tuned circuits of a very high Q i.f. transformer, where tuning one coil detunes the other. Those readers who have tried to band pass a series of tight coupled i.f. transformers will appreciate that trying to tune these circuits is like a dog chasing its tail.

The Q of a quad reflector is so high that it is practically impossible to tune it except by remote means, the proximity of a hand being sufficient to move the resonant frequency many kilocycles. If this effect is clearly understood you are on the way to success with your quad.

Obviously the design of the reflector should be such that any alterations that have to be made to the length of this element can be made without too much pain or strain.

We found that using a loading coil in place of a tuning stub broadened out the characteristics of the reflector and was a whole lot easier to adjust than a stub.

## GRID DIPPING QUAD RADIATORS

For some reason unknown to the writer, a quad radiator cannot be grid dipped in the same manner as a yagi element. This peculiar effect has resulted in all sorts of varying lengths of radiator elements being published. We suggest that the lengths specified, 17 ft. 2 in. on all sides, be strictly adhered to until final adjustments are made. The only method of determining the resonant frequency of a quad is by means of an s.w.r. meter. The frequency indicating the lowest s.w.r. is the resonant frequency of the quad.

## METAL SPREADERS

The writer has not been able to make a quad work efficiently when metal spreaders were used. The reason for this effect is not known.

## INTERACTION BETWEEN ELEMENTS

The quad is basically two high L, low C tuned circuits with a high degree of coupling between the elements, and, as with any such circuit, the tuning of one circuit detunes the other. Hence, the advice that the lengths of the radiator must be left alone until the correct length of the reflector is determined by means of adjusting the loading coil.

## DESIGN

Well now so much for the why; now for the how. For mechanical balance it is necessary to have four elements on a quad. It is impractical to have three elements, as the quad radiator would be hard up against the tower, or alternatively the weight of the elements on the boom would not be evenly distributed. The yagi elements were thought to be easier to construct than additional quad elements, but no claim is made for performance as compared to a four element quad.

**Boom:** As we had a light telescopic mast made of three 15 ft. sections, a portion of this was used as a boom. The 15 ft. length of 2" o.d. was used as the main boom, with the 15 ft. of 1¾" o.d. section cut in half and used as extensions to mount the yagi reflector and director. This procedure allows the spacing between the yagi and quad elements to be adjusted to some extent.

The ends of the main boom are cut every ¼" for a length of 2" and a radiator hose clamp is used to tighten the end of the main boom on to the extension boom. When optimum spacing is selected, the two booms should be drilled and locked up with self-tapping screws.

**Yagi Director and Reflector Mountings.**—In order to mount the directors and reflectors on the extension booms, a 3" length of 1" o.d. x 16 gauge steel tube is welded at right angles to the boom. The boom end is filed out to fit and slightly flattened on two sides to meet the diameter of the smaller tube.

A 15" length of ⅞" wood dowel, well varnished, is passed through the 3" length of tube so that six inches projects on each side of the mounting. The yagi elements slip over the wood dowel to a length of 5". This is shown in Fig. 1.

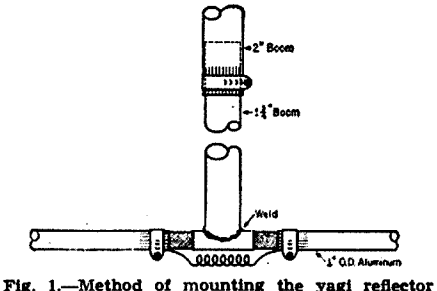



Fig. 1.—Method of mounting the yagi reflector and director to the boom enda is shown above. The details are given in the text.

* Reprinted from "CQ," August, 1964.

† 25 Austral Avenue, Linden Park, South Aust.

**Yagi Elements.**—The yagi elements consist of four 12 ft. lengths of 1" o.d. x 16 gauge aluminium tube, two for the reflector and two for the director. This length was chosen at random and has no special significance. The inboard end of each element is cut in four places with a hack saw to a length of 1½" for clamping purposes. The tube is pushed over the piece of ⅞" dowel, leaving a space of 1" between the end of the tube and the steel mount.

The elements are clamped to the wood dowel by means of two 1" diameter hose clamps. These clamps also serve to mount the loading coils.

**Yagi Element Support.**—In order to prevent the sag in the 1" aluminium tubing, five 5" t.v. type stand-off insulators are mounted along each element as shown in Fig. 2. Two ⅛" diameter holes are drilled approximately ¼" in from the end of the elements and a No. 16 wire loop tied through each hole. Two lengths of 100 lb. nylon fishing line are tied to one end, then passed through the stand offs and tied to the other end of the element. If the nylon is tied when the element has an upward curve, the entire element should become straight when mounted on the boom.


Fig. 2.—The director and reflector would sag without the support shown above. Nylon fish line, 100 lb. weight, is stretched through five 5" t.v. stand-off insulators.

**Quad Spider.**—The quad spider is designed to rotate on the boom; this enables the elements to be strung by rotating the spreaders like a windmill and also allows the distance between the quad elements to be varied easily.

The spider mount consists of a 12" length of 2¼" 18 gauge steel tube. Four pieces of 1" i.d. 16 gauge steel tube, 15" long, are welded to the mount in the form of a square, as shown in Fig. 3. One end of each of the four pieces of tube are filed to fit perfectly before welding. It is highly desirable to use a jig for setting up, as the tube will move during welding and will not finish up square.

When the spider is welded, four 3/16" holes should be drilled adjacent to each weld to allow for drain out of any water that seeps into the spider.

Two ⅜" steel nuts are welded to the spider mount to provide fixing to the boom. These nuts are easily held in position for welding if the tube is drilled and tapped first and a stud screwed through the nut and the tapped hole.

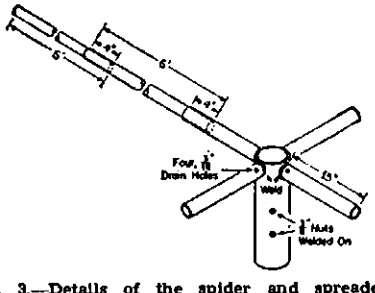



Fig. 3.—Details of the spider and spreaders. If bamboo spreaders are used, commercial spiders would be suitable.

★

Fig. 5.—Overall view and dimensions of the yagi-quad. The quarter wave matching stub is described in the text. The quad elements measure 17 ft. 2 in. on all sides. The co-ax. feed-line is supported by a nylon line, to the boom, to prevent sag.

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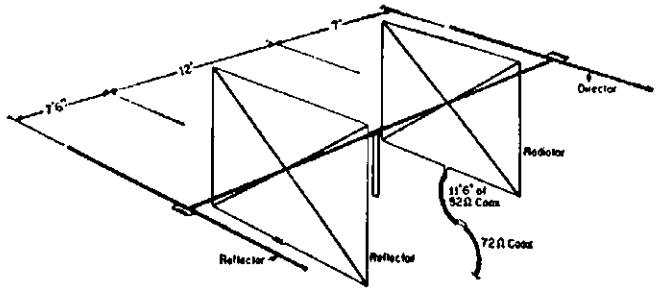


## SPREADERS

In the interests of economy and for reasons previously stated, the spreaders are half of aluminium tubing and half of wood dowel. Bamboo canes, where available, are ideal but are not readily available in this neck of the woods.

The aluminium spreaders are six feet of 1" o.d. 16 gauge tube. The wood spreaders are six feet of ⅞" wood dowel which should be varnished with three coats before assembly. The aluminium spreader is pushed into the spider for a distance of 4" and held in position by means of two ⅛" x ⅛" self-tapping screws.

The wooden spreader is pushed into the end of the aluminium spreader for a distance of four inches and is held by means of two ⅛" x ⅛" self-tapping screws. Drain holes should be drilled in the aluminium spreader adjacent to the end of the wooden dowel on the two bottom spreaders.

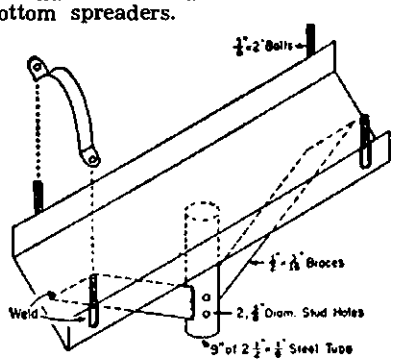


Fig. 4.—The boom mount is made of a 2 ft. length of 2" x 3/16" channel with four 3/8" x 2" bolts welded as shown. The clamps are 2" x 3/16". The support pipe is braced diagonally by ½" x 3/16" stock.

## STRINGING QUAD ELEMENTS

The quad elements consists of 68 ft. 8 in. of No. 14 bare copper wire. Other wire of similar size will do but stranded wire is preferred because of its greater flexibility. Two lengths of wire should be run out and pre-stretched and marked at 17 ft. 2 in. with plastic insulation tape. Marking should start from the middle of the 69 ft. to allow for the half lengths of wire from the bottom spreaders to the feed and coil points. When the wire is marked at the centre point, two points 8 ft. 7 in. each side of the centre should be marked. Now remove the centre marking and measure the other points.

In selecting the spreaders which are to be at the top of the quad, remember that you have to tighten up the ⅜" set screws on the spider after the wire is fastened. These screws are more easily tightened when they are projecting downwards.

Fasten the wire to the top spreader by means of an insulated staple. The staple is not hammered home but allows the wire to pass freely through it. This allows the spreaders to be adjusted so that they are all in line and straight. The spreaders are now rotated like a windmill and the wire is fastened to each spreader.

It is wise to connect the plastic terminal block to the two ends of the wire in order that the bottom side of the wire may be set square. Once the wire has been fixed at all four points the array can be checked for "squareness" and the staples driven home.

Both the quad elements are identical in length of wire and method of fixing. The two quad elements should now be spaced 6 ft. each side of the centre of the boom and the set screws locked up. A boom mount is shown in Fig. 4. The final position of the elements is shown in Fig. 5.

## SQUARE OR DIAMOND

The square type set up is used in preference to the diamond owing to the difficulty experienced with entanglement with guy wires when a diamond shape was used. It has been stated that the diamond set-up gives 1 db. more gain but our tower and guys did not allow a true comparative test.

## YAGI LOADING COILS

As the yagi elements are shorter than the required electrical length, loading coils are necessary. The director coil is 11 turns of 14 gauge copper, wound 1" in diameter over a 2" length. The yagi reflector coil is 22 turns of 14 gauge wire, wound 1" in diameter over 4". The ends of the coils project for approx. 2" and are hammered flat and slipped under the 1" diameter hose clamp.

The yagi elements should be pretuned to the approx. frequency by means of a grid dip meter before fixing to the boom. Remember that in mounting the yagi elements on the boom the coupling to the other elements will lower the inductance of the loading coil and consequently more turns on the loading coil will be required. We tuned our elements to the desired frequency before mounting on the boom, with the coil wide spaced and then squeezed the coil together to hit the correct frequency when the elements were mounted on the boom.

If a portable grid dip meter is not available a two-turn link each end of a two-conductor flexible cable can be used to couple the yagi loading coils to a grid dipper for accurate tuning.

The yagi reflector and director must be tuned to between 5% and 6% lower and higher respectively in frequency

than the desired resonant frequency of the quad radiator. For example, if the desired resonant frequency of the antenna is 14,250 kc., the director will be tuned to 13.537 kc. and the reflector to 14.962 kc. The antenna will not work 100% unless these elements are correctly tuned **on the boom.**

### QUAD RADIATOR MATCHING

With the dimensions given it was found that the feed impedance of the quad radiator was approx. 38 ohms. Our method of feed was to use a 70 ohm co-ax. cable with a quarter wave matching section of 50 ohm co-ax. at the antenna end. The impedance transformation is thus:

$$Z_m = \sqrt[2]{Z_L \ Z_A}$$

where $Z_m$ = Impedance of required $\lambda/4$ section.
$Z_L$ = Impedance of feed line.
$Z_A$ = Impedance of antenna feed point.

$$Z_m = \sqrt[2]{72.38} \simeq 52.5 \text{ ohms.}$$

The quarter wave section is 11 ft. 6 in. long and should be well spliced and soldered to the 70 ohm co-ax. and waterproofed with plastic tape.

### TERMINAL BLOCK

A plastic cable connector is used to connect both the feed points on the quad radiator and the coil on the quad reflector. This connector is a handy device and it simplified the replacement of the co-ax. feed as the cable usually breaks, due to flexing by the wind, at the feed point.

Photographs illustrating the use of plastic terminal blocks for connecting to the quad reflector and driven element.

### QUAD REFLECTOR LOADING COIL

In order to obtain the correct electrical length of the quad reflector it is considered that a coil is easier to handle and adjust than a stub as it does not flap around in the wind.

The coil is 7½ turns of 14 gauge copper wire 1¼" in diameter, air wound, and is adjusted by means of squeezing the turns together.

Remember the previous warning; the Q of the quad reflector is so high that the proximity of a hand is sufficient to detune it many kilocycles. This element should be roughly tuned for the maximum front to back ratio by turning the antenna back on to a fixed signal. Adjust the coil for minimum received signal. Raise the quad to its full height and check the F/B ratio; it should be in the order of 40 db. It will probably be found that it is necessary to increase the inductance of the coil slightly as the extra height above ground will lower the effective inductance.

A simple method of checking the accuracy of the setting of all coils is to tape a 6" length of ferrite rod and brass rod about 3" apart on the end of a long pole. This enables the coils to be checked at a much greater height than can be done otherwise. Inserting the ferrite rod will increase the inductance and the brass rod will decrease the inductance and thereby indicate which way the coils should be moved. Both the ferrite and the brass rods should be covered with insulating material to prevent shorting the turns of the coils.

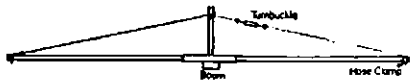


Fig. 6.—To prevent boom sag a 2 ft. length of ½" steel tubing was welded to the side of the boom mount. A 3" ¼" diameter is welded to the top of the rod as a hook to support the 1/8" stranded steel cable. The tension is adjusted with the turnbuckle.

### RESONANT FREQUENCY AND S.W.R.

As no way has been found by the writer to grid dip a quad the method of checking the resonant frequency is by means of an s.w.r. meter. With home-brew meters make sure the meter will zero on a 70 ohm dummy load before starting to test the antenna. Our s.w.r. meter zeroed perfectly on low power, 20 watts, but would not zero on full power.

Starting at 14,000 kc., take readings of the s.w.r. at 50 kc. points up to 14,350 kc. and plot the s.w.r. against the frequency. It should be found that the s.w.r. is lowest on 14,250 kc. and should be not more than 1 to 1.07 at this frequency. The s.w.r. will rise rapidly each side of the resonant frequency. If the indicated frequency is other than desired, the quad radiator can be shortened by bridging out one corner or lengthened by adding a piece of wire in the bottom section.

Differing ground, mast, guys and proximity to other buildings can all cause changes in the resonant frequency of the system.

Checking the front to back ratio on transmission should be carried out with a station at least 1,000 miles away as local checks are very apt to be erroneous due to radiation from other antennae and buildings. One local Ham 7 miles away measured our F/B ratio 12 db.; two others, one in Hawaii and the other in California both said the F/B ratio was in excess of 40 db.

### PAINTING

The spider and booms should be galvanised, but if such treatment is not possible all steel should be treated with a rust inhibitor and painted with two coats of zinc base primer and two coats of silver finish. Careful preparation of all steel work prior to painting will be well repaid by the long rust-free life of the work.

### BRACING

Due to the light material used in the "boom," a 3/16" stranded steel cable brace was fitted as shown in Fig. 6. The cable can be fastened at each end of the boom with hose clamps. A 2 ft. long vertical post was fastened to the centre of the boom or mast. A light turnbuckle provides for adjusting the tension of the cable. Nylon fishing line of 100 lb. weight is used to brace the quad spreaders. The line is fastened to the ends of the boom and tied to each spreader at about 9 ft. above the spider. This bracing really stiffens the spreaders. ●

# The Historical Development of Radio Communication

## PART TWO—THE EARLY PIONEERS

J. R. COX,* VK6NJ

### CHAPTER 1

### 1. THE ERA OF EXPERIMENTATION

The technique of radio communication is a modern art originating early in the 20th century. Its basic technology, however, is not as recent, for it began to gather in the 19th century. For it was in that era that the germ of the idea of communication by wireless began its development. Also, stretching farther back in time, there lies man's innate urge to communicate with his fellows and the need to convey information from one point to another in space.

From the earliest times history is studded with incidents which depict the necessity and value of communication. This necessity prompted inventiveness towards speeding up the existing means of communication. It is recorded that in 500 B.C. two hundred miles were covered in forty-eight hours by mounted messengers for Darius and Xerxes of Persia. As a speedier means of transmission in the same period, important announcements were shouted and relayed across from one point to another by watchmen. Surely a very public system of "**wireless**" communication, using as a medium of transmission not electricity, but sound waves. This method conveyed messages thirty times faster than by using horsemen.

As well as acoustic arrangements, visual transmission was employed. Both the Greeks and Persians employed lighted torches to represent letters of the alphabet and thus, by various combinations, conveyed messages. The Romans and Carthaginians under Hannibal used similar schemes, and we are well acquainted with the Englishman Drake's warning system of a relay of bonfires to signal the approach of the Spanish Armada. American Red Indians, as well as other races, used a code of smoke puffs to form intelligible signals transmitted over wide distances.

### 2. THE ERA OF COLLATION

Just two centuries after the defeat of the Armada, about the time of the French Revolution, great efficiency and speed were achieved with a visual telegraph system invented by a twenty-nine-year-old priest named Claude Chappe. His optical system involved the arrangement of small bars suspended from a chain of high towers at conspicuous points. Using a code devised by the inventor, the repeating towers accomplished amazing rapidity of transmission. From Paris to Toulon is a little over four hundred miles, yet it was possible to send a message between the two points in twenty minutes.[10] Man's employment of all these visual methods illustrates his use of the medium of light waves, very much faster than sound, for quick transmission of messages. Unfortunately the medium also was public and so there arose a desire for an **invisible** medium to ensure privacy of the message. Impressed with the value of Chappe's system, Napoleon Bonaparte later commissioned a scientist, Doctor Von Sommering, President of the Bavarian Academy of Science, to improve on the method.[11]

Von Sommering was interested in electricity, then known as galvanic current, and little understood. He decided that improvement might lie in utilising galvanic current as a medium of transmission. Knowing that electric current possessed the property of decomposing water into hydrogen and oxygen, he set about to devise the first **electric** telegraph. In so doing he was attempting what had not been tried before; the substitution of the obvious media of sound or light waves by the use of a **possible** new medium, **electric** current. Von Sommering's crucial decision must be regarded as a basic step towards wireless communication because it initiated the idea, the possibility of amalgamation between transmission of messages and electric current. Notable enough for its speed, Claude Chappe's system is historically important also for another reason. His success was instrumental in bringing about the introduction of Von Sommering with his scientific thought, for, from this point on, theory and research on electricity and magnetism were linked with the concept of electrical transmission of messages.

Drawing upon the facts established experimentally by Stephen Gray, who, about 1729, discovered electrical conductivity,[12] the idea of using continuous transmission wires arose. Von Sommering's telegraph proved impractical because of the thirty-five wires it involved, but it aroused interest and assisted development.

One of those intrigued by Von Sommering's "bubble telegraph' was his colleague, Karl Friederick Gauss, then Director of Gottingen Observatory.[13] Gauss was aware of another discovery made by a Dane named Hans Christian Oersted. This man had found that a compass needle was deflected when placed near a wire through which was passing an electric current, and, when the current near the needle was at zero, the needle returned to its original at rest position. This finding was to prove of cardinal importance, because it displayed the connection between electricity and magnetism. Thus provided, Gauss realised the proper sequence of ideas: electric current: wire conductor: magnetic needle: telegraph. Gauss was friendly with a Professor Weber and together, in 1832, they worked to produce the first **successful** two-wire electric telegraph.[14]

Six years later, Carl August Steinheil, acting on a suggestion made by Gauss, demonstrated that the earth could perform the function of a return path for a telegraphic circuit.[15] Steinheil was not the first to employ the use of the earth as a return half of a circuit, but he was the first to realise its importance and to apply it to practical telegraphy. What Steinheil did do was provide a system with **one wire less.**

This innovation was an important step towards the advent of wireless communication because it facilitated progress in two ways. In the first place it afforded a mental stimulus towards the feasibility of one day having telegraphic communication without the necessity of a continuous metallic link. The fact of one wire being proved redundant stirred thought towards the removal of the one remaining strand. From then on scientific workers were intrigued by the possibility of a wireless communication system. The second point about Steinheil's adaptation was one of finance. Using only one wire instead of two reduced installation cost considerably and thus made the introduction of more schemes economically possible. This factor in turn speeded up the rate of expansion, and its success excited attention elsewhere, and a demand for similar telegraphic systems in other lands.[16]

Within the next few decades wire telegraphy had assumed gigantic proportions. The widespread use on land led to the concept of inter-continental links and in 1850 England and France were connected, to be followed, on 4th August, 1858, by the cable connection of Europe and America. Towards the end of the century there were 318 links with a total of 250,000 miles of cable.[17]

Over this era of telegraphic expansion there was a call for continual improvement which resulted in the development of appliances and managerial skill of a high order. Thus telegraphic engineers of this period unknowingly aided the foundation of wireless communication. The pioneers of the latter were fortunate in being able to adapt some of the material and technique from an already proven system for the furtherance of radio communication.

One of those to thus assist was the son of an American clergyman and an artist. At the age of forty-one, Samuel F. B. Morse was returning to the United States in 1832 from Europe where he had heard about the Englishman Faraday's electro-magnetic experiments.[18] He had also heard of the European electrical transmission of information and was convinced that a way could be found to transmit messages electrically over a long distance. He turned his powerful creative talent from art to science and set to on fashioning apparatus involving the principles of

* Government School, Yornup, W.A.

[10] Gartmann: op. cit., p.128.

[11] Ibid., p.129.

[12] Lemon and Ference: "Analytical and Experimental Physics", University of Chicago Press, U.S.A., 1942, p.240.

[13] Gartmann: op. cit., p.129.

[14] Ibid., p.129.

[15] Ibid.

[16] Some branch-line telephone systems in the W.A.G.R. employ the Steinheil earth return system even now.

[17] Gartmann: op. cit., p.134.

[18] United States Information Service Booklet, "Twelve Inventions That Changed the World," 1960, p.10.

an electric current producing magnetism. Using a key to stop and start the flow of electricity in the circuit he employed an electro-magnet to press a pen against a uniformly unrolling tape. A short press on the key created an electrical impulse which flowed along the wire conductor. This electrical current activated the electro-magnet which in turn marked the tape for the duration of the current flow. A short impulse produced a dot and a long press on the key a longer impulse and hence a longer mark (—) called a dash. By a combination of dots and dashes, Morse, like Chappe before him, created a code. This, named the Morse Code and patented in 1840, was an innovation which, together with the Morse Key, proved to be of great worth when wireless telegraphy eventually was realised. This may be regarded as the end of the period of collation.

Later another American inventor discovered that Morse messages could be read by **sound** alone.[19]

With the means of "writing" and receiving messages by sound, a desire, a dream, of speaking at a long distance materialised. Like telegraphy, the pursuit of this goal was to materially aid the later advent of radio communication in the form of wireless telephony. Orthodox electrical engineers scoffed at the idea of transmitting speech over wire using electric current. It was left to a Scottish elocution teacher, who emigrated to America, to prove the experts wrong. Alexander Graham Bell began as a novice electrical inventor. He was no novice with regard to the study of the human voice, however, being a Professor of Speech Physiology.

Bell had heard of experiments being carried out by a German physics teacher named Philipp Reis who had conceived the idea of a telephone before Bell. His device transmitted audible sounds, but it was not a "speaking" telephone.[20] A. G. Bell's belief in the possibility of speech transmission was held to ridicule by orthodox electrical engineers. They contended that transmission of speech by a continuous electric current was impossible because of the many overtones involved. Professor Bell well realised the truth about the speech part but his **lack of electrical knowledge** meant that he could not see the impossibility of combining the two. Because of his persistence, Bell was held to personal ridicule, spent all of his capital and suffered ill health, but he pressed on to achieve one of the world's great technological advances.

Analysis of the problem caused Bell to decide that the air vibrations of speech would have to be changed into an identically varying, continuous electric current for sending speech, and then converted back to sound, or air vibrations, so that the human ear could hear at the receiving end. Together with his colleague, Thomas A. Watson, Bell commenced his experiments in 1874 and successfully transmitted speech during 1875. Thus the telephone was born.[21]

With the telephone[22] came into existence two essential appliances necessary for successful radio telephony; namely, the microphone and earpiece. The basic principles underlying Bell's instrument are used today in wireless communication. Especially is this so in portable equipment where, for communication, microphones depend upon sound waves impinging on a diaphragm and compressing carbon granules, while the headsets rely upon similar diaphragms to reverberate the air in accordance with the fluctuation of electric current received.

Thus, by 1875, there existed two means of using electric current to transmit speech and telegraphy over distance. Both depended upon wires connecting receiving and sending apparatus. The need now was for the harnessing of some invisible connector to substitute for the metallic conductors and so bring about the advent of wireless communication. This concept was near-fantastic to most, yet further research was just about to open the way to new lines of investigation which ultimately were to lead to the achievement of communication without wires.

As long ago as 1820 it had been known that a magnetic field is always associated with an electric current.[23] Eleven years afterwards Michael Faraday, the self-taught son of a smith, observed that oscillations set up in one circuit could promote secondary oscillations in another circuit set up at a distance from the primary one. Michael Faraday reasoned that there had to be some conductive link between the primary and secondary circuits. He stipulated that transfer of electrical charge from one circuit to another could not occur unless there was some medium for conduction. His ideas were not in accord with traditional viewpoint and were ignored. It was at this juncture that a friend and colleague mathematically explained and confirmed Faraday's contentions. James Clerk Maxwell was the originator of the resultant profound stipulations which formed a paper titled "A Dynamical Theory of the Electro-Magnetic Field". This paper was read to the Royal Society on 8th December, 1864, and subsequently printed the next year.[24]

Maxwell's hypothesis was important because he suggested that light waves were electro-magnetic in character and that it should be possible to produce waves of longer wave length than light by causing "an electric displacement through a dielectric".[25] Maxwell did not stipulate how this electric displacement could be done, but a later experimenter did. Maxwell's work was a forecast of electro-magnetic wave radiation upon which wireless transmission depends. The abstractness of Maxwell's theories,[26] plus the fact that they were a radical departure from orthodox opinion of the period, precluded ready acceptance and this denial outlasted his life.

The importance of Maxwell's contribution to the later development of wireless communication is absolute. It was not only that he verified Faraday's ideas but, more significantly, that his translation of the facts of Faraday's experiments into the language of mathematics gave science a new means of regarding electrical phenomena. It was to be nine years after Maxwell's death in 1879 before a brilliant experimenter established, experimentally, the veracity of his propositions beyond doubt.

This man was a young German intellectual, Professor Heinrich Rudolf Hertz. By direct experiments he provided the evidence necessary to substantiate Maxwell's theories. The acceptance and proof of Maxwell's stipulations depended upon the fashioning of a device to bring about the electric displacement through a dielectric and thus generate electro-magnetic waves sufficiently strong to be measurable at a distance. Measurement at a distance was able to demonstrate that an electric current **was produced** by the charge of electric displacement and that the current **was conveyed** through space.

Designing an appliance called an oscillator, Hertz used air as a dielectric which broke down as an insulator, and became a conductor, when a critical value was reached by an accumulating electro-motive force. Conduction was shown to be intermittent, evidenced by a rasping spark, and the energy aroused unleashed the propagation of electro-magnetic waves in the surrounding space. By mounting a galvanometer away from the oscillator, Hertz showed how the instrument's needle was deflected each instant the spark flashed. The deflection was indeed detection of the electro-magnetic waves by measurement of their current value.

Another method of detecting the electro-waves, to be later styled Hertzian waves, was demonstrated also by Hertz when he fashioned a "resonator". This appliance, when in the path of Hertzian waves propagated from the spark-gap transmitter, evidenced their presence by producing a small spark between its points. By a series of experiments Hertz demonstrated how the waves passed through some materials, were deflected by others, and absorbed by yet others.

The research by Hertz had important repercussions on the development of radio communication, although Hertz, himself, considered his gear of little practical value.[27]

Elsewhere, however, Professor Hertz's findings triggered off speculations on the possible use of electro-magnetic waves in transmitting messages. Thus a new field of experimental research was laid open and resourceful minds probed

[19] Discovered by Alfred Vail who at one stage assisted Morse financially. United States Information Service: op. cit., p.10.

[20] Gartmann: op. cit., p.135.

[21] United States Information Service: op. cit., p.12.

[22] The term telephone was known before Bell's invention. It had been coined by a Britisher, Charles Wheatstone, to describe his non-electrical sound transmitter.

[23] This had been discovered and experimentally displayed by the Danish physicist, Hans Christian Oersted. Lemon and Ference: op. cit., p.244.

[24] Fleming, J. A.: "The Principles of Electric Wave Telegraphy and Telephony," Longmans Green and Company, London, 1910, 2nd edition, p.340.

[25] Ibid., p.363.

[26] Mr. Oliver Heaviside, by his writings, later gave a fuller appreciation and simplification of Maxwellian theory. Lee, Sir George: "Oliver Heaviside"; Longmans Green and Company, London, 1947; p.13.

[27] His oscillator was distinctly adaptable to the practice of radio communication as was later proved, but he did not concern himself with the issue.

towards the possibility of somehow utilising the properties of Hertzian waves for wireless telegraphy. Some discerned its imminent usage. Sir William Crookes,[28] when speaking of electro-magnetic waves in 1892, said, "Here is unfolded to us a new and astonishing world; one which it is hard to conceive should contain no possibility of transmitting and receiving intelligence. Here is revealed the bewildering possibility of telegraphy without wires, posts, cables, or any of our present costly appliances."[29]

Meanwhile, since Hertz's use of his resonator, methods of detecting electro-magnetic waves had improved. The main contributor to this advancement was a Parisian, Professor E. Branly. In 1890 Branly published an account of his experiments dealing with his observations on the change of conductivity of loosely compressed metallic filings under the influence of electro-motive forces. Similar observations had been documented as early as 1835 by Munk, of Rosenchoeld, so that Branly was not a lone pioneer in this field. Munk described the permanent increase in conductivity of a mixture of tin filings resulting from the passage through it of an electrical discharge. In 1866 two brothers, C. and S. A. Varley, also noted that "powdered conducting matter offers great resistance to a current of moderate tension, but offers little resistance to a current of high tension."[30] Later Professor E. D. Hughes, of England, and T. Calzecchi Onesti conducted experiments on the changes of electric conductivity of loosely packed metallic powders under various electro-magnetic forces, but they did not progress beyond the findings of the Varley brothers and the observations attracted little attention at the time.

The important thing about Branly's work was that it produced the discovery that loosely congregated conductors were changed in conductivity by an electric spark at a distance.

Thus a new device for the detection of electro-magnetic waves was given to science by Professor Branly in the form of a tube or box containing a metallic filling rather loosely packed between metal plugs. Like his predecessors, Branly used a Leyden jar to produce the spark and like his predecessors, too, his annotations did not receive undue notice. They were to receive full attention, however, when repeated two years later by a Dr. Dawson Turner in Edinburgh. A Leyden jar was being used by Dr. Turner to produce a spark, and in the discussion which followed his discourse the important query arose: "Would Branly's device break down its resistance if acted upon by Hertzian waves?"

This question indicates the indecision surrounding Branly's observations. Conjecture persisted as to whether the cause of lessened resistance in a Branly tube was due to the electro-magnetic waves created by the spark of the Leyden jar or the light waves produced by the spark's flash. An Italian, G. W. Minchin, closed the debate when he gave evidence that the action discovered by Branly had its origin in electric waves sent out from the spark.

In 1894 the name "coherer" was bestowed upon Branly's tube and other similarly arranged devices. These coherers were to form "the eye" to discern the invisible link of wireless waves when radio arrived.[31]

Even as late as 1894 attention, in the main, was not directed towards using electro-magnetic waves for wireless telegraphy. Research until then was mostly concerned with studying the similarity between electro-magnetic and light waves, not to the practical application of these electro-magnetic waves.

There was an incident in 1894, however, which directed more scientific thought towards wireless telegraphy. This was Sir Oliver Lodge's lecture delivered on the work of Hertz.[32] Many of the experiments were repeated and a notable scientific audience once again witnessed the Hertzian oscillator cause an electric spark which had the power to deflect a galvanometer needle at a distance. Undoubtedly the quandary of how to use this property, to send and receive telegraphic messages, was pondered over.[33]

One attracted to the subject by Sir Oliver Lodge's address was Alexander A. S. Popov, of the Imperial Torpedo School, Cronstadt, Russia. Popov repeated the experiments, for lecturing purposes, and utilised the equipment for registering electrical perturbations taking place in the atmosphere. He employed a Branly-type coherer involving his own modification; two platinum leaves down opposite sides of the glass tube with loosely packed iron filings between. Popov collected the atmospherical electrical discharges by a lightning rod, detected them by the coherer and recorded their incidence by coupling a Richard Recording Cylinder to this circuit. His equipment was set up at the Meteorological Observatory of the Forest Institution of St. Petersburg in July 1895 and between then and 1897 it successfully operated as a lightning indicator and recorder. Popov was in effect using what is now termed an "antenna" for receiving "wireless" waves.

Around Popov's name controversy exists. The Russians claim that he gave a public demonstration of the world's first radio set in 1895—before Marconi to whom the Western world credits the discovery.[34]

It should be emphasised that the prime object of Popov's work was the study of atmospherical electrical phenomena and for this purpose he fashioned his circuits.

Published in 1896, the description of Popov's investigations concluded with these remarks: "In conclusion, I may express the hope that my apparatus, with further improvements, may be adapted to the transmission of signals at a distance."[35] This certainly indicates, at least, that he had entertained the idea of wireless communication. He continued by saying, "as soon as a means for producing quick electric vibrations possessing sufficient energy is found." From this it seems logical to accept, and believe, that he had not overcome the practical difficulty of generating or radiating sufficiently strong electro-magnetic waves to carry over a distance by early 1896. It is possible that he may have experimented with his set-up of recording instruments in conjunction with a Hertzian oscillator to note the effect of Hertzian waves. The remarks made in 1910 by Professor J. A. Fleming, M.A., D.Sc., at the University of London, seem conclusive enough to end speculation. It is noteworthy to add that Fleming was of neutral nationality and that the opinion came long before the present antagonism between East and West.

"Although the notion of using Hertzian waves for telegraphy had been suggested, no one had overcome the practical difficulties, or actually given any exhibition in public of the transmission of intelligence by this means. The appliances in certain elementary form existed, and the advantages and possibilities of electric wave telegraphy had been pointed out, but no one had yet conquered the real practical difficulties and exhibited the process in actual operation."[36]

The day was soon to dawn, however, when the world would awaken to the introduction and reality of wireless communication through the agency of a brilliant Italian—Guglielmo Marconi.

(To be continued)

[28] Sir William Crookes produced the instrument which subsequently produced Rontgen rays. Fleming: op. cit., p.513.

[29] Fleming: op. cit., p.514.

[30] Ibid., p.420.

[31] The name "coherer" was bestowed by Sir Oliver Lodge in 1894. Fleming: op. cit., p.514.

[32] Delivered in the Royal Institution, London.

[33] J. A. Fleming quotes three eminent men who gave the matter much consideration, among them a captain in the Royal Navy—Admiral Sir H. B. Jackson—who later pioneered the use of wireless in the British Navy and did much to lay the foundation for the study of electro-magnetic wave propagation.

[34] Radio Day—7th May—is celebrated in Russia in commemoration of the day in 1895 that Popov was said to have given his demonstration. Levine, Irving R.: "The Real Russia"; Allen and Company, London, 1959.

[35] Fleming: op. cit., p.517.

[36] Ibid., p.518.


"The box kite certainly gets the antenna up in the air."

# AUSTRALIAN DX CENTURY CLUB AWARD

**OBJECTS**

1.1 This Award was created in order to stimulate interest in working DX in Australia and to give successful applicants some tangible recognition of their achievements.

1.2 This Award, to be known as the "DX Century Club" Award, will be issued to any Australian Amateur who satisfies the following conditions.

1.3 A certificate of the Award will be issued to the applicants who show proof of having contacted one hundred countries, and will be endorsed as necessary, for contacts made using only one type of emission.

**REQUIREMENTS**

2.1 Verifications are required from one hundred different countries as shown in the Official Countries List.

2.2 The Official Countries List will be published annually in "Amateur Radio" and will be amended from time to time as required. Should a country be deleted from the Countries List at any time, members and intending members will be credited with such country if the date of contact was before such deletion.

2.3 The commencing date for the Award is 1st January 1946. All contacts made on or after this date may be included.

**OPERATION**

3.1 Contacts must be made in the H.F. Band (Band 7) which extends from 3 to 30 Mc., but such contacts must only be made in the authorised Amateur Bands in Band 7.

3.2 All contacts must be two-way contacts on the same band. Cross band contacts will not be allowed.

3.3 Contacts may be made using any authorised type of emission for the band concerned.

3.4 Credit may only be claimed for contacts with stations using regularly-assigned Government call signs for the country concerned.

3.5 Contacts made with ship or aircraft stations will not be allowed, but land-mobile stations may be claimed provided their specific location at the time of contact is clearly shown on the vertification.

3.6 All stations must be contacted from the same call area by the applicant, although if the call sign is subsequently changed, contacts will be allowed under the new call sign providing the applicant is still in the same call area.

3.7 All contacts must be made when operating in accordance with the Regulations laid down in the "Handbook for the Guidance of Operators of Amateur Wireless Stations" or its successor.

**VERIFICATIONS**

4.1 It will be necessary for the applicant to produce verifications in the form of QSL cards or other written evidence showing that two-way contacts have taken place.

4.2 Each verification submitted must be exactly as received from the station contacted, and altered or forged verifications will be grounds for disqualification of the applicant.

4.3 Each verification submitted must show the date and time of contact, type of emission and frequency band used, the report and the location or address of the station at the time of contact.

4.4 A check list must accompany every application setting out the details for each claimed station in accordance with the details required in Rule 4.3.

**APPLICATIONS**

5.1 Applications for membership shall be addressed to the Awards Officer, Box 2611W, G.P.O., Melbourne, Vic., accompanied by the verifications and the check list with sufficient postage enclosed for their return to the applicant, registration being included if desired.

5.2 A nominal charge of 2/6, which shall also be forwarded with the application, will be made for the issue of the certificate to successful applicants who are non-members of the Wireless Institute of Australia.

5.3 Successful applicants will be listed periodically in "Amateur Radio". Members of the D.X.C.C. wishing to have their verified country totals, over and above the one hundred necessary for membership, listed will notify these totals to the Awards Officer.

5.4 In all cases of dispute, the decision of the Awards Officer and two members of the Federal Executive of the W.I.A. in the interpretation and application of these Rules shall be final and binding.

5.5 Notwithstanding anything to the contrary in these Rules, the Federal Council of the W.I.A. reserves the right to amend them when necessary.

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# AUSTRALIAN V.H.F. CENTURY CLUB AWARD

**OBJECTS**

1.1 This Award has been created in order to stimulate interest in the V.H.F. bands in Australia, and to give successful applicants some tangible recognition of their achievements.

1.2 This Award, to be known as the "V.H.F. Century Club" Award, will be issued to any Australian Amateur who satisfies the following conditions.

1.3 Certificates of the Award will be issued to the applicants who show proof of having made one hundred contacts on the V.H.F. bands, and will be endorsed as necessary, for contacts made using only one type of emission.

**REQUIREMENTS**

2.1 Contacts must be made in the V.H.F. Band (Band 8) which extends from 30 to 300 Mc., but such contacts must only be made in the authorised Amateur Bands in Band 8.

2.2 In the case of the authorised bands between 30 and 100 Mc., verifications are required from one hundred different stations at least seventy of which must be Australian. The Amateur Bands 50 to 54 Mc. and 56 to 60 Mc. will be counted as one band for the purposes of the Award.

2.3 In the case of the authorised Amateur Band between 100 to 200 Mc. and any authorised band between 200 to 300 Mc., verifications from one hundred different stations for each band is required.

2.4 It is possible under these rules for one applicant to receive three certificates, one for each of the authorised Amateur Bands nominated in Rules 2.2 and 2.3.

2.5 The commencing date for the Award is 1st June, 1948. All contacts made on or after this date may be included.

**OPERATION**

3.1 All contacts must be two-way contacts on the same band, and cross band contacts will not be allowed.

3.2 Contacts may be made using any authorised type of emission for the band concerned.

3.3 Fixed stations may contact portable/mobile stations and vice versa, but portable/mobile station applicants must make their contacts from within the same call area.

3.4 Applicants, when operating either portable/mobile or fixed, may contact the same station licensee, but may not include both contacts for the same type of endorsement.

3.5 Applicants may only count one contact for a station worked as a limited licensee with a Z call sign who is subsequently contacted as a full A.O.C.P. holder.

3.6 All stations must be contacted from the same call area by the applicant, although if the applicant's call sign is subsequently changed, contacts will be allowed under the new call sign providing the applicant is still in the same call area.

3.7 All contacts must be made when operating in accordance with the Regulations laid down in the "Handbook for the Guidance of Operators of Amateur Wireless Stations" or its successor.

**VERIFICATIONS**

4.1 It will be necessary for the applicant to produce verifications in the form of QSL cards or other written evidence showing that two-way contacts have taken place.

4.2 Each verification submitted must be exactly as received from the station contacted, and altered or forged verifications will be grounds for disqualification of the applicant.

4.3 Each verification submitted must show the date and time of contact, type of emission and frequency band used, the report and the location or address of the station at the time of contact.

4.4 A check list must accompany every application setting out the following details:—

4.4.1 Applicant's name and call sign, and whether a member of the W.I.A. or not.

4.4.2 Band for which application is made, and whether special endorsement is involved.

4.4.3 Where applicable, the date of change of call sign and previous call sign.

4.4.4 Details of each contact as required by Rule 4.3.

4.4.5 The applicant's location at the time of each contact if portable/mobile operation is involved.

4.4.6 Any relevant details of any contact about which some doubt might exist.

**APPLICATIONS**

5.1 Applications for membership shall be addressed to the Awards Officer, Box 2611W, G.P.O., Melbourne, Vic., accompanied by the verifications and the check list with sufficient postage enclosed for their return to the applicant, registration being included if desired.

5.2 A nominal charge of 2/6, which shall also be forwarded with the application, will be made for the issue of the certificate to successful applicants who are non-members of the Wireless Institute of Australia.

5.3 Successful applicants will be listed periodically in "Amateur Radio". Members of the V.H.F.C.C. wishing to have their verified totals, over and above the one hundred necessary for membership, listed will notify these totals to the Awards Officer.

5.4 In all cases of dispute, the decision of the Awards Officer and two members of the Federal Executive of the W.I.A. in the interpretation and application of these Rules shall be final and binding.

5.5 Notwithstanding anything to the contrary in these Rules, the Federal Council of the W.I.A. reserves the right to amend them when necessary.

# AUSTRALIAN D.X.C.C. COUNTRIES LIST

| | Phone | C.W. |
|---|---|---|
| AC3 Sikkim | | |
| AC4 Tibet | | |
| AC5 Bhutan | | |
| AP East Pakistan | | |
| AP West Pakistan | | |
| BV (C3) Formosa | | |
| BY (C) China | | |
| C9 (prior 1/1/64) Manchuria | | |
| CE Chile | | |
| CE9, KC4, LU-Z, VK0, VP8, ZL5 etc., Antarctica | | |
| CE0A Easter I. | | |
| CE0Z J. Fernandez Arch. | | |
| CM, CO Cuba | | |
| CN2 (prior 1/7/60) Tangier | | |
| CN2, 8, 9 Morocco | | |
| CP Bolivia | | |
| CR4 Cape Verde Is. | | |
| CR5 Portuguese Guinea | | |
| CR5 Principe, Sao Thome | | |
| CR6 Angola | | |
| CR7 Mozambique | | |
| CR8 (prior 1/1/62) Goa | | |
| CR8 Port. Timor | | |
| CR9 Macao | | |
| CT1 Portugal | | |
| CT2 Azores | | |
| CT3 Madeira Is. | | |
| CX Uruguay | | |
| DJ, DL, DM Germany | | |
| DU Philippine Is. | | |
| EA Spain | | |
| EA6 Balearic Is. | | |
| EA8 Canary Is. | | |
| EA9 Ifni | | |
| EA9 Rio de Oro | | |
| EA9 Spanish Morocco | | |
| EA0 Spanish Guinea | | |
| EI Rep. of Ireland | | |
| EL Liberia | | |
| EP, EQ Iran | | |
| ET2 (prior 14/11/62) Eritrea | | |
| ET2, 3 Ethiopia | | |
| F France | | |
| FB8 A'dam & St. Paul Is. | | |
| FB8 Crozet Is. | | |
| FB8 Kerguelen Is. | | |
| FC Corsica | | |
| *FF8 French West Africa | | |
| TU2 (fr. 7/8/60) Ivory Coast R. | | |
| TY2 (fr. 1/8/60) Dahomey Rep. | | |
| TZ2 (from 20/6/60) Mali Rep. | | |
| XT2 (from 5/8/60) Voltaic Rep. | | |
| 5U7 (from 3/8/60) Niger Rep. | | |
| 5T5 (from 20/6/60) Mauritania | | |
| 6W8 (fr. 20/6/60) Senegal Rep. | | |
| FG7 Guadeloupe | | |
| FH8 Comoro Is. | | |
| | | |

| | Phone | C.W. |
|---|---|---|
| FI8 (pr'r 20/7/55) Fr. Indo China | | |
| FK8 New Caledonia | | |
| FL8 Fr. Somaliland | | |
| FM7 Martinique | | |
| FN (prior 1/11/54) French India | | |
| FO8 Clipperton I. | | |
| FO8 Fr. Oceania | | |
| FP8 St. Pierre & Miq. Is. | | |
| *FQ8 Fr. Equatorial Africa | | |
| TL8 (fr. 13/8/60) Cen. Afric. R. | | |
| TN8 (from 15/8/60) Congo Rep. | | |
| TR8 (from 17/8/60) Gabon Rep. | | |
| TT8 (from 11/8/60) Chad Rep. | | |
| FR7 (from 25/6/60) Glorioso I. | | |
| FR7 (from 25/6/60) Juan de Nova and Europa Is. | | |
| FR7 Reunion I. | | |
| FR7 Tromelin Is. | | |
| FS7 Saint Martin | | |
| FU8, YJ1 New Hebrides | | |
| FW8 Wallis & Futuna Is. | | |
| FY7 Fr. Guiana & Inini | | |
| G England | | |
| GC Guernsey and Deps. | | |
| GC Jersey I. | | |
| GD Isle of Man | | |
| GI Northern Ireland | | |
| GM Scotland | | |
| GW Wales | | |
| HA Hungary | | |
| HB Switzerland | | |
| HC Ecuador | | |
| HC8 Galapagos Is. | | |
| HB0 (HE) Liechtenstein | | |
| HH Haiti | | |
| HI Dominican Rep. | | |
| HK Colombia | | |
| HK0 Arch. of San Andres and Providencia | | |
| HK0 Bajo Nuevo | | |
| HK0 Malpelo Is. | | |
| HL, HM, 6N5 Korea | | |
| HP Panama | | |
| HR Honduras | | |
| HS Thailand | | |
| HV Vatican | | |
| HZ (see 7Z) | | |
| I1, IT1 Italy | | |
| I1 (prior 1/4/57) Trieste | | |
| I5 (prior 1/7/60) It. Somaliland | | |
| IS1 Sardinia | | |
| JA, KA Japan | | |
| JT1 Mongolia | | |
| JY Jordan | | |
| JZ0 (pr'r 1/5/63) W. New Guinea | | |
| K, W U.S.A. | | |
| KA0, KG6I Bonin & Volcano Is. | | |
| | | |
| | | |

* Fr. West Africa and Fr. Equatorial Africa: Only contacts dated prior to when the particular area obtained separate listing (as shown) will count.

| | Phone | C.W. |
|---|---|---|
| KB6 Baker, Howland and Am. Phoenix I. (inc. Canton I.) | | |
| KC4 Navassa I. | | |
| KC6 Eastern Caroline Is. | | |
| KC6 Western Caroline Is. | | |
| KG4 Guantanamo Bay | | |
| KG6 Guam | | |
| KG6 Marcus I. | | |
| KG6 (Rota, Tinian, Saipan, etc.) Mariana Is. | | |
| KH6 Hawaiian Is. | | |
| KH6 Kure I. | | |
| KJ6 Johnston I. | | |
| KL7 Alaska | | |
| KM6 Midway Is. | | |
| KP4 Puerto Rico | | |
| KP6 Palmyra Group, Jarvis I. | | |
| KR6 Ryukyu Is. | | |
| KS4B Ser'na Bank & Roncad Cay | | |
| KS4 Swan Is. | | |
| KS6 American Samoa | | |
| KV4 Virgin Is. | | |
| KW6 Wake I. | | |
| KX6 Marshall Is. | | |
| KZ5 Canal Zone | | |
| LA Bouvet I. | | |
| LA Jan Mayen | | |
| LA Norway | | |
| LA Svalbard | | |
| LU Argentina | | |
| LX Luxembourg | | |
| LZ Bulgaria | | |
| MP4 Bahrein | | |
| MP4 Qatar | | |
| MP4 Trucial Oman | | |
| OA Peru | | |
| OD5 Lebanon | | |
| OE Austria | | |
| OH Finland | | |
| OH0 Aland Is. | | |
| OK Czechoslovakia | | |
| ON4 Belgium | | |
| OX, KG1 Greenland | | |
| OY Faeroes | | |
| OZ Denmark | | |
| PA0, PI1 Netherlands | | |
| PJ Neth. West Indies | | |
| PJ2M Sint Maarten | | |
| PK (from 1/5/63) Indonesia | | |
| PK1, 2, 3 (prior 1/5/63) Java | | |
| PK4 (prior 1/5/63) Sumatra | | |
| PK5 (prior 1/5/63) Borneo | | |
| PK6 (prior 1/5/63) Celebes and Molucca Is. | | |
| PX Andorra | | |
| PY Brazil | | |
| PY0 Fernando de Noronha | | |
| PY0 Trindade & Martin Vaz Is. | | |
| PZ1 Netherlands Guiana | | |
| SL, SM Sweden | | |
| SP Poland | | |
| | | |

| | Phone | C.W. |
|---|---|---|
| ST2 Sudan | | |
| SU Egypt | | |
| SV Crete | | |
| SV Dodecanese | | |
| SV Greece | | |
| TA Turkey | | |
| TF Iceland | | |
| TG Guatemala | | |
| TI Costa Rica | | |
| TI9 Cocos I. | | |
| TJ (FE8) Cameroon Rep. | | |
| TL, TN, TR, TT (see after FQ8) | | |
| TS (3V8) Tunisia | | |
| TU, TY, TZ (see after FF8) | | |
| UA1-6, UNI Eur. R.S.F.S.R. | | |
| UA1 Franz Josef Land | | |
| UA2 Kaliningrad Region | | |
| UA9, 0 Asiatic R.S.F.S.R. | | |
| UA0 (prior 1/9/60) Wrangel I. | | |
| UB5 Ukraine | | |
| UC2 White Russian S.S.R. | | |
| UD6 Azerbaijan | | |
| UF6 Georgia | | |
| UG6 Armenia | | |
| UH8 Turkoman | | |
| UI8 Uzbek | | |
| UJ8 Tadzhik | | |
| UL7 Kazakh | | |
| UM8 Kirghiz | | |
| UNI (prior 1/7/60) Kar-Fin.Rep. | | |
| UO5 Moldavia | | |
| UP2 Lithuania | | |
| UQ2 Latvia | | |
| UR2 Estonia | | |
| VE, VO Canada | | |
| VK Australia | | |
| VK2 Lord Howe Is. | | |
| VK4 Willis Is. | | |
| VK9 Christmas I. | | |
| VK9 Cocos Is. | | |
| VK9 Nauru I. | | |
| VK9 Norfolk I. | | |
| VK9 Papua Terr. | | |
| VK9 Terr. of New Guinea | | |
| VK0 Heard I. | | |
| VK0 Macquarie I. | | |
| VO (prior 1/4/49) Newf./Lab. | | |
| VP1 British Honduras | | |
| ‡VP2 (prior 1/6/58) Leeward Is. | | |
| VP2 Anguilla | | |
| VP2 Antigua, Barbuda | | |
| VP2 Br. Virgin Is. | | |
| VP2 Montserrat | | |
| VP2 St. Kitts, Nevis | | |
| ‡VP2 (prior 1/6/58) Windw'd Is. | | |
| VP2 Dominica | | |
| VP2 Grenada & Deps. | | |
| VP2 St. Lucia | | |
| VP2 St. Vincent & Deps. | | |
| VP3 British Guiana | | |
| VP4 Trinidad & Tobago | | |
| | | |

‡ One contact with each group formerly known as "Leeward Is." and "Windward Is." dated prior to 1/6/58 may be credited, in which case no further credit as a separate listing, as from 1/6/58, will be given those particular islands.

| | Phone | C.W. |
|---|---|---|
| VP5 .... .... .... .... .... Cayman Is. | | |
| VP5 .... .... .... Turks & Caicos Is. | | |
| VP6 .... .... .... .... .... .... Barbados | | |
| VP7 .... .... .... .... .... .. Bahama Is. | | |
| VP8 .... .... .... .... .... Falkland Is. | | |
| VP8, LU-Z .... .... South Georgia | | |
| VP8, LU-Z .... South Orkney Is. | | |
| VP8, LU-Z .. South Sandwich Is. | | |
| VP8, LU-Z, CE9 .... Sth. Shet. Is. | | |
| VP9 .... .... .... .... .... Bermuda Is. | | |
| VQ6 (prior 1/7/60) Br. Somalil'd | | |
| VQ8 .... .. Cargados Carajos Shs. | | |
| VQ8 .... .... .... .... .... .... Chagos Is. | | |
| VQ8 .... .... .... .... .... .... Mauritius | | |
| VQ8 .... .... .... .... .... Rodriguez I. | | |
| VQ9 .... .... .... .... .... Aldabra Is. | | |
| VQ9 .... .... .... .... .... .. Seychelles | | |
| VR1 (includ. Canton Is.) British Phoenix Is. | | |
| VR1 Gilbert & Ellice Is., Ocean Is. | | |
| VR2 .... .... .... .... .... .... Fiji Is. | | |
| VR3 .... Fanning & Christmas Is. | | |
| VR4 .... .... .... .... .... Solomon Is. | | |
| VR5 .... .... .... .... .... .... Tonga Is. | | |
| VR6 .... .... .... .... .... .... Pitcairn I. | | |
| VS1 (prior 16/9/63) .. Singapore | | |
| VS4, ZC5 (from 16/9/63) East Malaysia | | |
| VS4 (prior 16/9/63) .... Sarawak | | |
| VS5 .... .... .... .... .... .... .... Brunei | | |
| VS6 .... .... .... .... .... Hong Kong | | |
| VS9 .... .... .... .... Aden & Socotra | | |
| VS9 .... .... .... .... .... Kamaran Is. | | |
| VS9 .... .... .... .... .... Kuria Muria | | |
| VS9 .... .... .... .... .... .. Maldive Is. | | |
| VS9 .... .... .... Sultanate of Oman | | |
| VU2 .... .... .... .... .... .... .... India | | |
| VU.... .... .... .... .... Laccadive Is. | | |
| VU .... .... Andaman & Nicobar Is. | | |
| XE, XF .... .... .... .... .... .. Mexico | | |
| XE4 .... .... .... .... .. Revilla Gigedo | | |
| XT2 (see after FF8) | | |
| XU .... .... .... .... .... .... Cambodia | | |
| XW8 .... .... .... .... .... .... .... .... Laos | | |
| XZ2 .... .... .... .... .... .... .... Burma | | |
| YA .... .... .... .... .... .. Afghanistan | | |
| YI .... .... .... .... .... .... .... .... Iraq | | |
| YK .... .... .... .... .... .... .... .. Syria | | |
| YN, YN0 .... .... .... .... Nicaragua | | |
| YO .... .... .... .... .... .... Roumania | | |
| YS .... .... .... .... .... .. .... Salvador | | |
| YU .... .... .... .... .... .... Yugoslavia | | |
| YV .... .... .... .... .... .... .. Venezuela | | |
| YV0 .... .... .... .... .... .... .... Aves I. | | |
| ZA .... .... .... .... .... .... .... Albania | | |
| ZB1 .... .... .... .... .... .... .... Malta | | |
| ZB2 .... .... .... .... .... .... Gibraltar | | |
| ZC5 (pr. 16/9/63) Br. Nth. Borneo | | |
| ZC6 .... .... .... .... .... .... Palestine | | |
| ZD3 .... .... .... .... .... .... .. Gambia | | |
| ZD4 (pr. 5/3/57) Gold Coast, Togo. | | |
| ZD7 .... .... .... .... .... .... St. Helena | | |
| ZD8 .... .... .... .... .... Ascension Is. | | |
| ZD9 T. da Cunha and Gough Is. | | |
| ZE .... .... .... .. Southern Rhodesia | | |
| ZK1 .... .... .... .... .... .... Cook Is. | | |
| ZK1 .... .... .... .... .... Manihiki Is. | | |
| ZK2 .... .... .... .... .... .... .... Niue | | |
| ZL .... .... .... .... .... .... Chatham Is. | | |
| ZL .... .... .... .... .... .. New Zealand | | |
| ZL1 .... .... .... .... .... Kermadec Is. | | |
| ZL4 .. Auckland and Campbell Is. | | |
| ZM7 .... .... .... .... .... .... Tokelaus | | |
| ZP .... .... .... .... .... .... .. Paraguay | | |
| ZS1, 2, 4, 5, 6 .... Rep. of S. Africa | | |
| ZS2 .... Prince Ed. and Marion I. | | |
| ZS3 .... .... .... South-West Africa | | |
| ZS7 .... .... .... .... .... .... Swaziland | | |
| ZS8 .... .... .... .... .... .... Basutoland | | |
| ZS9 .... .... .... .... .... Bechuanaland | | |
| 3A .... .... .... .... .... .... .... Monaco | | |
| 3W8, XV5 .... .... .... .... .. Vietnam | | |
| 4S7 .... .... .... .... .... .... .... Ceylon | | |
| 4U1 .... .... .... .... .... I.T.U. Geneva | | |
| 4W1 .... .... .... .... .... .... .... Yemen | | |
| 4X4 (from 14/5/48) .... .... Israel | | |
| 5A .... .... .... .... .... .... .... .. Libya | | |
| 5B4 .... .... .... .... .... .... .... Cyprus | | |
| 5H1 (VQ1) .... .... .... .... Zanzibar | | |
| 5H3 .... .... .... .... .... Tanganyika | | |
| 5N2 .... .... .... .... .... .... .. Nigeria | | |
| 5R8 .... (Madagascar) Malagasy | | |
| 5T5, 5U7 (see after FF8) | | |
| 5V .... .... .... .... .... Togolese Rep. | | |
| 5W1 (ZM6) .... .... .... .... Samoa | | |
| 5X5 (VQ5) .... .... .... .... Uganda | | |
| 5Z4 (VQ4) .... .... .... .... .... Kenya | | |
| 6N5 (see HL) | | |
| 6O1, 6O2 (fm. 1/7/60) Somalia R. | | |
| 6W8 (see after FF8) | | |
| 6Y (VP5) .... .... .... .... Jamaica | | |
| 7G1 (from 1/10/58) Rp. of Guinea | | |
| 7Q7 (ZD6, Nyasaland) .... Malawi | | |
| 7X2 (FA) .... .... .... .... .... Algeria | | |
| 7Z (HZ) .... .... .... .. Saudi Arabia | | |
| 8Z4 .... .. Saudi Arabia-Iraq N.Z. | | |
| 8Z5 (9K3) Saudi Ar.-Kuwait N.Z. | | |
| 9A (MI) .... .... .... .. San Marino | | |
| 9G1 (from 5/3/57) .... .... Ghana | | |
| 9J (VQ2, N. Rhod.) .... .... Zambia | | |
| 9K2 .... .... .... .... .... .... .... Kuwait | | |
| 9K3 .. Kuwait-Saudi Arabia N.Z. | | |
| 9L1 (ZD1) .... .... .... Sierra Leone | | |
| 9M2, 9M4 (VS1) (from 16/9/63) West Malaysia | | |
| 9N1 .... .... .... .... .... .... .... .. Nepal | | |
| 9Q5 (pr. OQ5-0) R. of The Congo | | |
| 9S4 (prior 1/4/57) .... .... .... Saar | | |
| 9U5 (from 1/7/60 to 30/6/62) Ruanda-Urundi | | |
| 9U5 (from 1/7/62) .... Burundi | | |
| 9X5 (from 1/7/62) .. Rwanda Rep. | | |
| — .... .... .... .... .... .... .... Cambodia | | |

# LASERS*

BY STANLEY LEINWOLL†

## Part 1—Introduction to the Communications Mode of the Future: Lasers.

THROUGHOUT the history of radio communication, amateur and professional scientists alike have been striving to broaden the spectrum of usable frequencies. In the early days of radio, control of the spectrum was limited to the kilocycle range. Then gradually this control extended first to the megacycle region, then to kilomegacycle ranges.

The object of this expansion has not only been to apply communications engineering techniques to as much of the electromagnetic spectrum as possible. It was also intended to reap the rewards of increased bandwidth, since the number of users has been increasing more rapidly than the amount of usable spectrum space.

Over the past generation, electron tubes, klystrons, magnetrons, transistors, and other semi-conductor devices have been developed and refined to the point where generation of carrier waves in the vicinity of 1 millimetre, or a frequency of 300,000 megacycles, was possible. At millimetre wavelengths, however, it became painfully apparent that the practical upper limit of frequencies that could be generated and used by using conventional methods had been reached. The construction of miniature resonant cavities as well as extremely small waveguides made the production of higher frequencies by known techniques an impossibility.

Then, in 1960, a scientist named Theodore Maiman, working for Hughes Aircraft Corp., succeeded in producing a beam of pure red light, at a single frequency. What made Maiman's discovery so remarkable was that the light produced was coherent—it was in phase, and the beam was nearly parallel. Maiman's device, which was called a laser, or optical maser, was different from other conventional generators of light. Light sources such as tungsten lamps, fluorescent bulbs, and even so-called monochromatic sources like sodium vapor lamps, produced a wide band of frequencies which were, in addition, out of phase, of different amplitudes, and of different polarisation. Such light is called incoherent.

In radio terms, the laser was comparable to an oscillator or frequency generator, while conventional light sources were the equivalent of noise generators. While it was impossible to modulate the latter, there was a definite possibility of modulating a coherent light beam.

Until the development of this remarkable device, it had not been possible to generate frequencies above about 300 kilomegacycles. Then suddenly, in one step, more potential spectrum space was made available than in all other bands combined. Fig. 1 shows the electromagnetic spectrum.

From this figure it can be seen that wavelengths in the visible and infrared range run from 4,000 to 7,000 angstrom units, where one angstrom unit is equal to $10^{-8}$ centimetres (0.00000001 cm.). Since the velocity of light is equal to frequency times wavelength, we can solve for the frequency by substituting the speed of light, 300,000 metres/second. On solving for frequencies in this part of the spectrum we find a range varying from 430 to 750 **million megacycles per second.**

When we consider that at present the total available spectrum is under 200,000 megacycles, the implications stagger the imagination! For example, if only one per cent. of the spectrum could be used for Amateur communications, there would be made available 3 million megacycles of spectrum space. This is fifteen times the total now available in all parts of the spectrum. Assuming about 300,000 Amateurs in the world, it would mean enough space to assign every Amateur his own personal 10 Kc. channel!

At the present time laser devices can produce coherent radiation in a portion of the visible spectrum as well as at a number of wavelengths in the infra-red region of the spectrum. The number of frequencies at which optical masers have been producing coherent radiation has been increasing rapidly, however, and there is every reason to believe that the range will continue to increase.

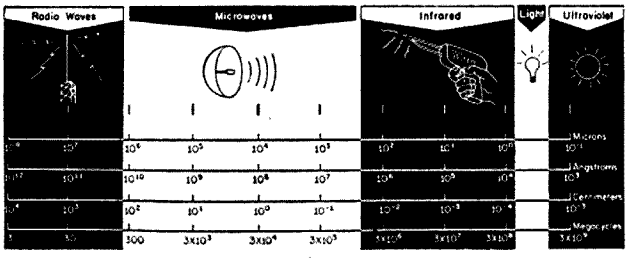


Fig. 1.

The electromagnetic spectrum. The laser produces coherent radiation in the microwave and visible portions of the spectrum.

### COMMUNICATION APPLICATIONS

In the four years since the announcement of the first working laser more than 500 laboratories in this country alone have joined in laser research. Toward the end of last year a television picture was transmitted using a beam of laser light as the carrier. Other laser beams have been used successfully in short range experimental communications systems, and several months ago I.B.M. was awarded a contract by N.A.S.A. to build and test a laser space communications system.

This remarkable device has also seen applications in the fields of medicine, in industry, in science, and by the military establishment. The most revolutionary possibilities, however, are in the field of communications. From this point of view alone the optical maser is one of the most exciting inventions of the century. It has been compared in its potential impact on communications with the vacuum tube and the transistor. It could turn out to be even more important than both!

Many Amateurs have been asking for more information about lasers. What are they? How do they work? What do they mean to the Amateur community at present and what will they mean in the future? This article will attempt to answer these questions.

### ATOMS AND ENERGY

The production of laser light involves an entirely new concept in electromagnetic radiation. Whereas electronics had previously limited itself to the control and use of the energy of free electrons that moved about from one atom to another, the laser utilises energy states **within** atoms themselves to produce electromagnetic waves.

In order to understand how electromagnetic radiation can be generated as well as amplified sub-atomically, it is desirable to describe briefly the modern picture of radiation from within atoms and molecules.

### ENERGY LEVELS

Every atomic system, whether it is an individual atom, a molecule, a crystal, or some other configuration, has associated with it certain characteristic energy levels.

Ordinarily, the systems are at rest, at their lowest, or ground state energy level. They can, however, absorb energy which raises them to an excited state. It should be mentioned that the excited state is not the natural state of any atomic system, and that it will tend to return to ground level, doing so in the easiest possible manner. Every atomic system can absorb specific, discrete amounts of energy which are unique to that system.

These discrete energy units are most often referred to as **photons**. They can be thought of as minute bundles or packets of energy which exhibit both the characteristics of matter as well as of electromagnetic radiation travelling with the speed of light.

This model of atomic systems is part of a fundamental theory of matter—The Quantum Theory. It has been successful in explaining atomic phenomena which had not been understood previously. According to this theory, the energy level to which an excited atomic system is raised is proportional to the frequency of the photon that is absorbed by the system.

* Reprinted from "CQ," August, 1964.

† Radio Frequency and Propagation Manager, Radio Free Europe.

Figs. 2A to 2C show what happens when an atom, initially in the ground state, absorbs a photon. The atom, initially at its lowest energy level, Fig. 2A, is excited by an incoming photon of the right frequency, Fig. 2B. One of the electrons, which orbit the nucleus the way the planets in our solar system orbit the sun, jumps to a higher energy level.

Once the electron has been excited, a number of things can happen to restore it to its original level. The most common way for the atom to return to ground level is for it to emit a photon of the same frequency at which a photon was absorbed, as shown in Fig. 2C. This occurs spontaneously, and can take less than a microsecond from the time the photon was first absorbed. It is also possible for the atom to drop to an intermediate energy level by losing some of its energy in the material by collision. From this intermediate level often referred to as the metastable state it can emit a photon of a lower frequency. This is so because the energy to which an atom is raised is proportional to the frequency of the emitted photon.

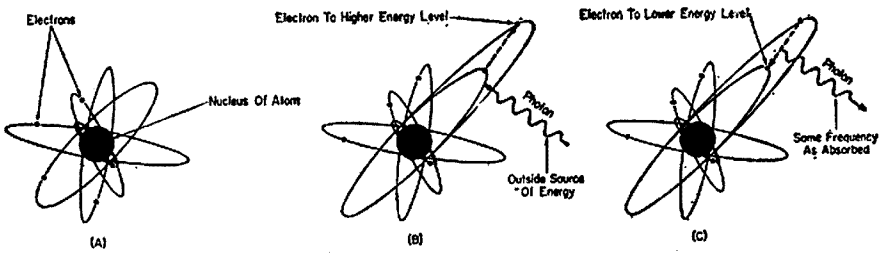


Fig. 2.—The series above show how an orbiting electron may be excited by an outside source of energy, the photon. In (B) electrons are in higher energy level by the absorption of the photon. To return to a lower energy level the electron emits a photon of the same frequency as absorbed.

In general, the time it takes for spontaneous photon emission to occur depends on the frequency of the incident wave, and there on the energy level to which the excited atom has been raised.

At values of frequency which correspond to the portion of the spectrum in the infra-red and visible ranges, spontaneous emission is extremely rapid. As the frequency decreases, excited energy states also decreases, and the time spent in the higher energy level increases.

There is another way for the excited atoms to be returned to ground level states. If, while the atom is in the excited state a photon of the proper frequenoy strikes the atom, it will emit a photon and return to its normal energy level. This is of fundamental importance, since it leads to a completely revolutionary method of amplifying electromagnetic radiation. A photon of the proper frequency striking an excited atom gives rise to the release of a second photon. This second photon is exactly in phase with the first photon, and travels in the same direction. One photon entered the system and two emerged. Microwave amplification has been accomplished!

In 1958, a historic scientific paper by A. L. Schawlow and C. H. Townes proposed a method of constructing a device that would produce coherent radiation at optical wavelengths by using a resonant cavity whose dimensions were millions of times the wavelength of light.

Schawlow and Townes proposed a device made of some fluorescing material with two small mirrors on either side of it facing each other. They theorised that a photon travelling within the mirrored device would interact with other energised atoms to emit other photons. In cases where the photons travelled perpendicular to the plane of the mirrors the wave would strike the mirror and be reflected back into the system, toward the other mirror.

With each succeeding passage of the wave it would grow in intensity until it were strong enough to burst through one of the mirrors as a flash of coherent light (see Fig. 3). In the Schawlow-Townes model it was proposed that one of the mirrors be made semi-transparent to facilitate the maser output. Laboratories throughout the country immediately began intensive research aimed at developing an optical maser.

In July 1960 the first announcement of success was made by T. H. Maiman, of the Hughes Aircraft Co., and before the end of the year five materials had been successfully tested in different laboratories. All used the principle of reflecting end mirrors proposed by Townes and Schawlow.

## THE RUBY LASER

Maiman's laser used a ruby crystal. The amount of chromium in the aluminium oxide determines the color of the ruby. In Maiman's laser the ruby was "doped" with about 0.05 per cent. of chromium which gave the crystal a light pink hue.

The pumping source for Maiman's ruby was an electronic flash lamp. Chromium atoms are particularly responsive to light having a wavelength of 5,600 angstrom units in the blue-green part of the spectrum. Most flash-

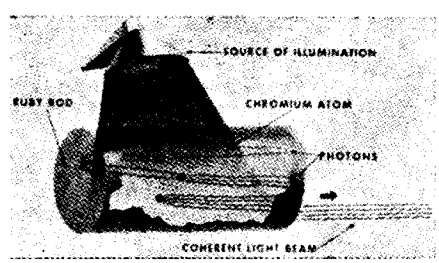


Fig. 3.—This drawing illustrates the build up in intensity as the photons travel between the mirrored surfaces until the beam is strong enough to burst through one of the ends as a coherent light beam.

lamps are able to supply energy in this range.

Once chromium atoms have been excited to an upper energy level, they require two steps to return to their ground state. This is shown in Fig. 4.

There is first an initial drop in energy, as shown. This is a relatively small step and results primarily in heating the crystal lattice. The atom is then at an energy level at which it can remain for several milliseconds, a relatively long time as energy levels go. For this reason, this state, $E_1$ in the diagram, is called the metastable state. Unless the excited atom is stimulated to do so sooner, it will return to its ground state by emitting a photon at a wavelength of 6,943 angstrom units at room temperature. This is in the red region of the electromagnetic spectrum and accounts for the red fluorescent glow of ruby as well as the characteristic color of ruby laser light. This phenomenon is also indicated in the figure.

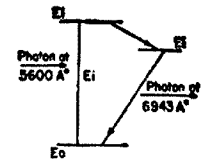


Fig. 4.—Energy level diagram for chromium. A photon at 5,600 angstrom units rises the level from Eo to Ei. The photons give up some energy to the crystal lattice by dropping to El, a metastable state where they remain several milliseconds. Decay to Eo, the ground level, from El, results in the emission of a photon in the red portion of the spectrum either spontaneously or by interaction with another photon.

## POPULATION INVERSION

When the flash lamp first begins to pump light most of the chromium atoms are in the ground state, $E_o$. Continued optical pumping raises most of the chromium atoms to their upper energy levels at $E_1$, from which they immediately begin to drop spontaneously to the metastable state.

From the metastable state the atoms begin to emit photons at random and the ruby rod begins to glow red. The flash lamp continues to fire, feeding chromium atoms into the upper energy level. Then, at a particular point, the picture suddenly changes. It is the point at which the population of excited chromium atoms has been inverted and there are more chromium atoms at level $E_1$ than there are at $E_o$. At this point, photons begin to interact with chromium atoms at level 1 to a significant extent. This results in stimulated emission of other identical photons and a cascade begins. Photons travelling parallel to the long axis of the crystal, which is several centimetres long and about ½ centimetre in diameter, will continue in the same direction until they strike the end of the crystal, where they are reflected back into the crystal.

Photons travelling in any direction other than this will pass out of the ruby. In the meantime, photons moving back and forth inside the crystal will continue to build until the intensity of the radiation is great enough, at which time some of it bursts through the end of

that face that is slightly transparent in a coherent pulse of light. This is shown in Fig. 3.

### COHERENCE

Because a photon emitted by stimulation of another photon is in phase with the first, because the frequency of both is the same, and because both travel in the same direction, the beam emitted has space, time, and directional coherence. Coherence can be shown by repeating an experiment used in the early nineteenth century by Thomas Young to illustrate that light consisted of electromagnetic waves.

In this famous experiment light passes through a flat surface in which two small parallel slits have been cut. If light from one slit reaches a point on a screen behind it in phase with light from the second slit, there will be a brightening on the screen. If the light is not in phase, one source will cancel the other and there will be a dark area on the screen.

By placing two parallel slits directly against the surface of the ruby from which the light emerges, an interference pattern will appear. It has been found that this interference pattern is in very close agreement with what has been theoretically calculated assuming a plane wave that is perfectly coherent emerging from the two slits.

### CONTINUOUS OPERATION

Xenon flash tubes are most frequently used to pump ruby lasers. These emit intense pulses of light which last about one half to two milliseconds. Laser output at room temperature is of somewhat shorter duration than this, running from about one to two milliseconds.

Because of heating effects, it is not possible to operate a ruby laser continuously at room temperature without damaging the crystal. In 1962 Bell Laboratories announced the development of a ruby laser that would operate continuously. This was made possible by using a new method of pumping, and by operating the laser at liquid nitrogen temperatures (about 200° below 0°C.).

### OTHER LASER MATERIALS

Since Maiman's first ruby laser in 1960, other materials have been used successfully to obtain laser action. Among these have been calcium fluoride, calcium tungstate, and even glass, as host materials. In addition to chromium, dopants used have included neodymium, dysprosium, and uranium.

The only solid-state laser to operate continuously at room temperatures was announced several years ago by Bell Laboratories. It is a calcium tungstate-neodymium doped crystal. Output power is very low.

Ruby is still the most widely used material, and most laboratories currently doing solid state optically pumped laser research use the ruby crystal.

(To be continued)

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AMATEUR FREQUENCIES:
USE THEM OR LOSE THEM!

## ENQUIRIES INTO PORT PIRIE T.V. RECEPTION

### Hams Say They Are In The Clear

Following are extracts taken from Port Pirie's (South Australia) "The Recorder."

"Because of complaints of Ham Radio broadcasts allegedly interfering with t.v. reception in Port Pirie, members of the Pirie Amateur Radio Club conducted secret tests in an endeavour to locate unauthorised operators.

"Each licensed operator voluntarily had his set sealed during the period of the investigation which lasted a full week. According to the club, the test proved that licensed Amateur operators were not responsible for excessive t.v. reception interference.

"All transmitters were sealed by the deputy town clerk, Mr. R. M. C. Mudge.

"The interference was of sufficient strength to cause many viewers to complain bitterly and to consult t.v. mechanics.

"Most complaints were levelled at Amateur operators and because of this it was decided to institute enquiries to find the cause of the interference.

"It was pointed out by a spokesman for Ham operators that their equipment was regularly inspected by officers from the Postmaster-General's Department.

"At Port Pirie an inspector from the Department addressed the club. The inspector told members that the P.M.G. could not undertake to remedy interference troubles experienced in this area which was not serviced by a particular t.v. station.

"The service area under the control of the P.M.G. extends from only 70-80 miles from the t.v. station."

The paper then goes on to give a lengthy explanation of t.v. and t.v.i. problems for the benefit of viewers in that district.

## W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

### PHONE

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK5MS | 24 | 306 | VK2JZ | 61 | 218 |
| VK6RU | 2 | 303 | VK6KW | 4 | 211 |
| VK5AB | 45 | 301 | VK3WL | 14 | 211 |
| VK6MK | 43 | 293 | VK3ATN | 26 | 204 |
| VK3AHO | 51 | 290 | VK4HR | 12 | 192 |
| VK4FJ | 21 | 280 | VK4RW | 23 | 186 |

### C.W.

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK3KB | 10 | 326 | VK6RU | 18 | 260 |
| VK3CX | 26 | 304 | VK3AHQ | 79 | 248 |
| VK2QL | 5 | 301 | VK3ARX | 68 | 242 |
| VK4FJ | 20 | 296 | VK3XB | 75 | 238 |
| VK3NC | 19 | 286 | VK3YL | 39 | 237 |
| VK2AGH | 71 | 287 | VK2EO | 2 | 234 |

New Member:
VK5KO 80 102

### OPEN

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK6RU | 8 | 309 | VK3NC | 77 | 287 |
| VK4FJ | 32 | 305 | VK3HG | 3 | 274 |
| VK2ACX | 6 | 300 | VK3JA | 43 | 252 |
| VK2AGH | 83 | 300 | VK7LZ | 23 | 242 |
| VK6MK | 74 | 295 | VK2VN | 18 | 235 |
| VK3AHO | 76 | 295 | VK4HR | 7 | 233 |

## HAM RADIO "DOWN UNDER"

(Reprinted from R.S.G.B. Bulletin, Aug. 1964)

The first thing that strikes a UK immigrant or visitor to Australia who applies for a transmitting licence is the low annual fee of £1 Australian (equals 16/- sterling!). No extra charge is made for mobile operation, but prior permission must be sought for /P operation, whether from a temporary portable or alternative address.

For those already the holders of a current UK licence, or who held one until say six or seven weeks prior to arrival in Australia, issue of a new VK licence is a friendly formality.

If not yet in possession of a UK licence then the new arrival must sit a Radio Theory and Morse (15 w.p.m.) examination similar to the UK one. Without the Morse examination, however, permission may be obtained to work on the v.h.f. bands, telephony only, for which a special series of "Z" calls is allocated, e.g. VK3ZAA.

#### Operating

What a pleasure operating in Australia is. One is immediately made to feel at home among the thousands of VKs who hold licences.

The Australian operates in almost empty bands compared with the overcrowded conditions to be heard on any receiver in the Northern Hemisphere.

Furthermore, 150 watts is the maximum permitted power on all Amateur bands from 160 to 2 metres. Add to this the use of 6 mx (52 to 54 Mc.), plus a neighbourly tolerance of large aerial towers (many t.v. receivers in country areas have 57 ft. monsters); good sunny weather for eight months of each year, and the feeling of being a sought-after call sign if you work 14 and 21 Mc. DX. I can see some pre-war as well as post-war Gs booking on the next boat "down under" already!

#### Equipment Available

Most equipment is very dear by UK standards; for example, an Eddystone 888A would sell new for more than £200 and a good condition HRO for £80.

Luckily the Wireless Institute of Australia (equivalent to R.S.G.B.), through some of its State Divisional bodies, has been able to arrange trade price facilities with selected local distributors. Membership in the VK5 Division also entitles one to the first class disposal equipment arranged by the W.I.A. disposals sub-committee in South Australia at give-away prices.

Thus the usual tendency is towards "home brew" rigs or converted government surplus.

To visitors and intending immigrants alike, the Australian Department of Customs extends a very helpful hand. So, if you are bound for the land of the Southern Cross, take all you can afford so that you can sit back one balmy Australian evening and work those few Gs who are early risers.

In conclusion, the XYL and I would like to say 73 to all those VK5 Hams and their XYLs who made our three-year stay in their sunny land such a memorable one; maybe we will be amongst you again one day.

—A. G. Blackmore, G3FKO (ex-VK5II).

[VK5 Amateurs may now take a bow. Pansy excepted!—Editor "A.R."]

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### ERRATUM

In the article "An S.s.b. Transceiver for 52 Mc.," "A.R.," November 1964, some component values were omitted. Please refer to Fig. 21, Power Converter, on page 7.

D—OA210 or equivalent.
L—100 mH.
C1—8 μF., 600v.
C2—8 μF., 150v.

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The W.I.A. has nearly 3,000 members. Wear the badge which proclaims **your** membership. You can buy it from your Divisional Secretary.

# ANOTHER LOOK AT THE I.T.U. FUND

The following is an extract from "Info," the journal of the Elizabeth Amateur Radio Club. The editorial is written around the I.T.U. Fund. This is well put together, sensible, and a both-sided approach to the question; a little unusual in that so far all writings on the subject in our magazine and Divisional journals assume that there is not two sides to the subject.

"In the most recent issue of our South Australian W.I.A. journal, Hams were urged to contribute to the fund to finance a trip for a W.I.A. representative/observer to the forthcoming I.T.U. Conference in Switzerland. It was suggested that unless the Australian Hams were represented, then there was a strong possibility that we may lose more of our Amateur frequencies. It was inferred that unless we donated to the fund we probably would have no Ham Radio at all! The obvious lack of interest of members in giving to the fund indicates that some doubt exists as to whether this trip is really necessary.

"There appear to be three alternatives:—

1. It is advisable, as inferred, that a W.I.A. representative be present at Geneva to swing the balance of opinion of other representatives, and so preserve our frequencies,
2. The presence of our representative will have no effect on proceedings, or
3. It would be better not to send a representative.

"The first alternative has been well presented by more able pens—so successfully in fact that it may tend to be considered that there is no doubt that the trip is almost vital to our interests.

"On the second alternative, it must be asked why the W.I.A. is the only minor Amateur organisation to consider sending a representative. There are many organisations in countries with a much higher Ham population than ours who did not send a representative to the last Conference and, as far as is known, do not intend sending one to this one. Nor, apparently, has any suggestion been received from sister societies to share the cost of a common emissary.

"If, as reported, the main threat to Amateur frequencies is to come from newly independent countries interested in broadcast bands, is it seriously considered that the delegates from these countries will be influenced away from what they consider their needful rights by a representative from a country whose racial and political structure is so different from theirs, and which is already so powerfully active in short-wave propaganda broadcasting, particularly as our representative is to have no official standing? Surely any negotiations to be effective in this regard would need to be most delicately performed at a higher level.

"In fact, is not the third alternative a real one?

"It is probable that the real support for the Amateur cause at the Conference will come from three directions:—

(a) From the delegates of other communications interests who are themselves Amateurs.
(b) From the governments of those countries interested in Hams as potential defence operators.
(c) Indirectly, from those companies manufacturing Amateur equipment. (The setting up of 4U1ITU would seem to be a good one!)

"To return to the article in The Journal; perhaps it is not much good buying a new tube only to have to use it in the family radiogram. We should, however, consider other aspects of this representation before sending our money the same way as the last lot went."

Do you think this is food for thought? Write to "A.R." and let us know your views.

☆

## AMENDMENT TO NATIONAL FIELD DAY CONTEST RULES

Readers are asked to note the following alteration to the Rules of the John Moyle Memorial National Field Day Contest, 1965.

Delete Rule 8 as published in Dec. 1964 "A.R.," and substitute:—

"8. The following shall constitute Call Areas: VK1, VK2, VK3, VK4, VK5, VK6, VK7, VK8, VK9, and VK0."

# D X

## VP4, OA4, BV, ZM7, 7GI, FP, AC5, MP4, ZC6, TY2

Sub-Editor: H. A. BEHENNA, VK5BB,
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ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Another year has slipped quietly by, possibly not a good year for radio communication as Amateurs are concerned. However, things are never as bad as they seem and most of the very keen boys are still jubilant at their results achieved on the Amateur frequencies. To those fellows who have kept plugging away under these slightly adverse conditions (as compared to those of some years back), might I say congrats. for the results attained. To those fellows who will not go on the air unless they can destroy the other fellow's speaker cone, how about pressing the switch a little more often? Now is the ideal time to make that resolution. Remember that things could be a lot worse, let's try to tolerate these weaker conditions and make the most of our excellent hobby Amateur Radio.

**160 Metres:** A little more activity on this band of late. A report from Chas. VR1B says that he has been hearing VKs 3BM and 3ATN with very good copy on s.s.b.

**80 Metres:** Most of the activity on 80 is from around 1000z when South America through Central to North America can be worked, depending on the QRM and QRN.

**40 Metres:** I have not listened in the early a.m. hours local time on this band, but it appears to be gaining in popularity, since the influx of s.s.b., later in the day it appears to be still following the habits of the previous few months and is, I think, on the improve.

**20 Metres:** Has gone a little erratic, especially during the early p.m. hours local time. However, when most of the Amateurs are able to go on in the evenings, the long path early in the evenings to Europe, etc., and a little later on the short path is generally open for a while and gives good signals. The number of a.m. stations on seems to indicate an improvement in these conditions also.

**15 Metres:** Activity is on the improve here for those who enjoy the contact with perhaps less QRM and quieter conditions. Unfortunately with this band, a lot of listening has to be done. Not two days in a row it is the same, and you can only go on 15 when it permits one to do so. There has been an occasional break-through to Europe in the evenings. The commercials on the high end are still a good pointer, but not always reliable. A possible falling off in activity here is that 40 metres, etc., can be worked with a dipole. T.v.i., etc., and some are adverse to erecting a beam when they can do it on the other bands much easier without the worry of the beam.

**10 Metres:** This has been open on odd occasions to the North, especially on week-ends, to JA and KR6 at excellent strength. Let's hope that it decides to open a little more often. If you are a fan of this band, stick at it, thereby creating activity on same, as activity is the only thing that will keep it open.

### WHOM TO LOOK FOB AND WHERE

VP7BC is active from the Bahamas on 15 and 20 mx. He is American W4CNS and hopes to use this call sign for about six months.

WA4AYX likes working South Americans on phone, but finds the language barrier troublesome. He has learnt Spanish. He now gets plenty of contacts and the QSL returns are nothing short of excellent.

HB9EB is located on Utila Island, off the coast of Honduras. He is a Methodist missionary and with a power plant recently installed, he has added strength to his signal, to say nothing of the pile-ups.

XE2ZZZ is the call of Delia, 19-year-old daughter of XE2UB, and hails from Obregon in Mexico. She likes c.w. and favours 40 mx.

JA4AKI, operator Kiroshi from Japan, has a nice signal from his low power tx. He runs 16 watts to a 6146, thence to a ground plane antenna.

VP2KM active on 14 Mc. s.s.b. about 1300z. QTH is Basseterre on St. Kitts.

ZS2QK is not in South Africa as the call suggests, but is at Queen Maudsland, Antarctica, and is using c.w.

CE0AG, Easter Island, will be the DX-ers' Christmas present, thanks to George VE3DGX, now operating as VE0NM, aboard the H.M.C.S. Cape Scott, which left Halifax on Nov. 16. The ship is due at Easter Island on Dec. 12 where it will remain until Feb. 14, 1965. Ashore on the island, George will use the call CE0AG. Operation will be 60 per cent. s.s.b. and 40 per cent. c.w., using Hallicrafters-furnished equipment which includes two SR-150 transceivers. The antenna is a 14AVQ vertical supplied by Hy-Gain. QSL to George Hrischenko, VE-3DGX, 3156 Bruce Ave., South Windsor, Ontario, Canada.

KX6AJ has left Kwajalein and returned to U.S. where he can be contacted at W6GRZ. Whilst at Kwaj., he contacted over 3,000 Amateurs.

KG6SB is reported active on Sundays and Mondays (local) about 0800z.

BV1USA at Taiwan is operated by both military and civilian personnel. Spot freq. are 14050 kc. for c.w., 14307 for s.s.b. There are no individual licences available at Taiwan.

CE1DD, from Chile, is a YL operator by the name of Ursula, has been working some of the VKs on s.s.b. on 14 Mc. She can be heard most evenings.

FY7YF is on daily s.s.b. from French Guinea, S.A., on a freq. of 14105 kc., time approx. 1200z.

Some of the best Brazilian stations to look for at about 0600z would be PY2BGL, PY2BKO and PY1BTX.

KH6OY/KM6, Wake Island, reports that KW6ED disappeared on a Pacific flight last March. As he had his log book with him, none of his contacts can be verified.

VQ8BY, with a nice signal, is the call of Ralph Bird, located on Vacoas, Mauritus; runs 40 watts to a half wave dipole.

MP4BEQ says he is in the Shaikdom of Bahrein, Arabian Gulf. Operator is Steve Gibbs, known for his former call signs of 5A3CJ, GM3MBS; he is currently running 400 watts input.

UB5UN and UB5AR Tek are on the air quite regularly for those who desire a contact to this area. Both have good signals and are popular contacts.

KG6APJ also reports that he is listening on 6 mx for those interested. He transmits on a frequency of 50110.

A very informative letter from Chas. Hawker, VR1B, re the spurious frequencies from an essential service on 14355. These unwanted frequencies, which were falling in the Amateur band, have been cleaned up. Our thanks to those concerned. It makes for better listening. Chas' QTH is the Gilbert Islands in Western Pacific, where he says that 20 mx is the only reliable band and is his favourite. He works c.w. and s.s.b. Chas also says that he has been working a little MM as from VR1B/A and VR3H. (Thanks for the letter Chas.)

VR1B: C/o. Wireless Department, Betio, Tarawa, Gilbert Islands, West. Pacific.

From Comps VK5EF comes the information that at the time of writing there are approx. 530 Amateurs active on s.s.b. in VK. Comps is keeping a log of all these operators, so if you are going into s.s.b., make sure that your call sign is given to him at Gawler with the necessary details of the type of gear, etc.

Had a contact with Ross WB6DEX, ex-VK5AJ. David VK1ATR was visiting Ross and was leaving by air the next day for N.Y. He had an excellent trip over to the States and was thoroughly enjoying it all.

Les 3A2CP is workable on s.s.b. around 1400z, 14240 kc.

IT1TAI is also very active with a good signal from 141-14250 kc. s.s.b., 1230z.

VU2PP, one of the a.m. diehards, always puts in a very good signal on 14 Mc. in the a.m. portion.

Peter Drew, WIA-L8021, reports: Conditions here have improved greatly over the past month and I am hearing loads of DX on 20 and a little on 15. I have not listened to 160, 80 or 40 mx lately except for about 10 minutes on 40 at 1700 G.M.T. when I heard one weak G on c.w. 20 mx seems to be excellent almost round the clock, the worst period being in the middle of the day. The afternoons consist mainly of Far East and Pacific stations and then after about 1130 the Europeans, Middle East and Asia in general pour in with an occasional African. The Europeans usually last until about 17/1800 G.M.T. and then until about 2200 the band is usually excellent towards U.S.A. on the long path with a few West and South Africans still getting through. Of course the time is not very convenient for us, but it's worth losing a night's sleep to hear such good reception from U.S.A.

15 mx has been opening to Europe reasonably well most evenings up to about 1300 G.M.T., starting around 08-0900. Other than that, there is very little else on 15 except odd Africans around 09-1100 G.M.T., but they are not as regular as the Europeans.

10 mx: An odd JA during the middle of the day and KR6BF regularly, especially Sundays after 0300 G.M.T.

### COUNTRIES AND ZONES WORKED

Another ever welcome letter from George VK5GG reveals the following stations worked on 14 Mc. s.s.b.: On short path, OK1ADP, G6DA, UA6FG, DL3WM, 4X4IX, OE8KI, IT-1ATI, UA6XG, YV1LH, UH8BO, DJ8RI, UJ-8KAA, G3FPQ, UR2AR, DU7SV, CE3CZ, DU1AN, I1TMG, OA1U, YV5BQ, VP4TI, G2FSP, LU9AM, CE0ZI/MM, LU6ES-MR, LU9DAH, EA1GH, EA1IO, I1FP, UB5ARTEK, OA4K, LU3AEF, LU4BAD, CX2CO, UW4HZ, UA4IF, I1ORS, OZ5BW, 5A1TW, VS5MH, UR2DW, 9N1MM, VK0GS, GD3GMH, 9K2AU. On long path, DL1SDC, PA0FX, UB5KAA, UB5UN, SM3BIZ, EA1GH, DJ4PR, SM4SB, DL2PO. George further reports that he now has DXCC on phone, c.w. and mixed, all zones are now confirmed for W.A.Z. May I be the first to extend the hand, George. Thanks for the letter and congrats. from all.

My thanks to John VK5LV also for the passing on of notes for this column, and note with interest that you will soon be adding to the s.b. QRM on 80, 40, 20 and 15.

Pete and myself have worked the following stations: W9NDA, WA6ZZK, W1PSK, ON5ZO, EP2BQ, LX1KPW, 9M4LQ, W8RSQ, WB6GVV, K4IEP, W7OMN, KH6FJL, DJ9EG, DJ9HQ/P, UA1WU, KR6KS, F2ZE, PA0DV, UB5KIX, UF6FN, K6EXO, W6JY, W6BHM, MP4TBJ, W4DPI, UJ8AA, and several more Ws all on s.s.b. on 14 Mc. On 15 mx Fete has worked many JAs on c.w.

### QTHs OF INTEREST

4W1E—Via HB9ZN.
7Z3AA—Via MP4BDM.
7Z3AB—Box 2486, Dhahran, Saudi A.

And so at the close of 1964 may I take the opportunity of wishing one and all, all the best of good things. May 1965 be nothing short of a cracker year for everyone, hi! May we thank those mentioned hereunder for notes, etc., sent in during the year, all for the betterance of our magazine. The VK stations: 3TL, 3QV, 5RX, 5GG, 5FM, 3AKN, 4SS, 5WO, 5LV, 5ZK, 5ZC, 3BM, 5LD, Peter Drew, Hallicrafter Co. (U.S.A.) and many others who have had their names mentioned in this column. A very prosperous new year to you all. Lastly to the poor old printer—all the best for tolerating my crook typing. Bert, VK5BB.

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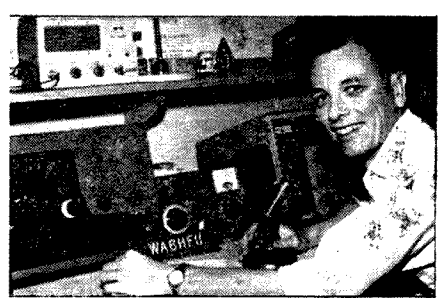
## RICHARD M. WHITE, WA6HFU




Pictured above is Richard M. White, WA6HFU, who is located at 333 Lotus, Redlands, California. A keen user of the 21 Mc. band in the old days, every contact whether signals were S5 or S9, Dick was a good listener and first-class operator of his station.

Dick now has probably turned to the modern method of s.s.b. transmission. When on a.m. he uses the Valiant at 200 watts input, the receiver is NC300 and the antenna is a four element G4ZU beam. Another contact which has made Amateur Radio just that little bit more interesting.—Bert VK5BB.

# V H F

## 52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
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ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

The introduction of Channel 0 in the Melbourne area and the news that 5A is a future allocation has forced our attention to the somewhat precarious position we are placed in operating so close to the t.v. channels.

Since Channel 0 commenced operating, numerous Amateurs have had unpleasant surprises to find themselves at loggerheads with their viewing neighbours and at times with the authorities. Due to the viewers' ignorance of the technical problems involved and their annoyance at having their programmes ruined by the "crank and his wireless," the average Amateur is somewhat overcome by the circumstances of his predicament and the result is often not becoming of either parties.

With this thought in mind, and the possibilities of being forced out of business, as it might imply, the VK3 V.h.f. Group Management Committee and V.h.f. Group have given considerable thought to how the whole business of t.v.i. can be tackled. At the November meeting of the Group it was decided to form a committee of responsible persons to give both technical and "diplomatic" service to the Amateur in trouble with t.v.i.

The plan is roughly as follows: The committee would consist of two Amateurs of professional standing with a more than average knowledge of both Amateur and television techniques, to assist in the diagnosis of the problem and the possible remedy; representatives of the t.v. service, preferably active Amateurs, who would know both sides of the problem; representatives of the Radio Inspection Branch, once again of Amateur group, who would assist in the other side of the negtiations and have the knowledge of both sides of the case.

Whilst this is only the beginning, further discussions will take place enabling a suitable programme to be made up and give the committee something concrete to build their foundations on. With a working committee then all the sides of the problem can be tackled. Both the Amateur and the viewer should receive the benefit of their work. This, we hope, will enable both parties to reach amicable agreements, taking into account all the factors likely to be involved, with the probable result that the viewer will receive interference-free reception and the Amateur can continue in business and preserve the usual domestic relationship in his neighbourhood.

With the summer months ahead and the usual bushfire danger becoming greater, many Amateurs through W.I.C.E.N. will be called upon to assist the various authorities in their task. To these Amateurs we offer our congratulations and trust that further service will be rendered to the community by their unselfish efforts. We ask other Amateurs who cannot, for various reasons, participate to ensure that the frequencies in use be kept clear for these emergency operations.

The question of net frequencies in the v.h.f. bands are very much alive at the moment. In particular, the 6 mx frequencies are under review in a number of Divisions and we trust that without any prejudice that other Divisions will follow and settle for a main calling net frequency of 53.032 Mc. QSOs between stations operating on this frequency in VK3 and VK4 have proved quite helpful in finding the openings on this band—apart from Channel 0 appearing. The use of ex-taxi two-way radios have produced some 50 odd call signs appearing on the net in VK3. If all Divisions accepted the freq., then Amateurs who are mobile away from home have a first class opportunity of reaching others in each capital city and we hope later in all main cities. With the aid of repeater stations, located at vantage points, it could be possible to communicate over long distances. This is quite the case in the U.S.

The VK3 Division has found a commercial source of crystals suitable for the net frequencies and of course the greater the use, that is the greater the number obtained from this source, the cheaper the price. These are first class crystals for the job. Any enquiries on this matter to Leo VK3ZGF, whose address will be found in the Call Book. If at least one freq. a.m. and f.m. in both the 6 and 2 mx bands are used Australia-wide, then we will have a universal calling frequency and in-built beacon for all to use.

The DX season has started on 6 and by the time you read this the Ross Hull Contest will be more than half way through. No matter how small your log, enter it into the contest and remember to be guided by the suggestion from the Contest Committee to comment on the suggestion that while the contest continues for the month that a log be entered for a period of say 7 or 9 consecutive days, thus allowing each to devote that period best suited to themselves to hop in and really have a go rather than chasing marathon efforts which discourages more and more each year.

73, best of DX for 1965, 3ZGP.

### QUEENSLAND

In November the annual 6 mx DX season got off to a flying start with the band opening to VK5 on the first day of the month. Since then the band has been open to some State about half of the total number of days. On Tuesday, 24th Nov., the bands were open to all States at various times. Around 1400 the VK6s came in and about six of them were worked from VK4. It seems that "Channel Doughnut" is at last making itself useful. Whenever it is being heard up here strongly, then the VK3s in Melbourne may be heard. Many of the boys in VK4 are now tuning 53.032 Mc. looking for contacts.

George 4ZLG, who has been touring VK2, 3 and 7, has been worked while in VK3 and VK7. One VK4 station, calling on the VK3 net freq., found that George was the only station on the net at the time of the morning that the call was made. With the advent of TVQ0 here in Brisbane, it may be wise for the VK4s to get together and decide if a net frequency should be established. I did note a move in VK7 to have a net frequency, the same as VK3 have, namely 53.032. Should we also use the same frequency? TVQ0 has begun site preparations and the foundations for the mast are already in place. Late January is the expected date for the first test transmission from the station. Regular programmes should begin in June—just in time to blot out any winter DX!

A few have been heard on 6 mx who have been fairly silent for a few months. Alan 4ZAW and David 4ZDF are two who come to mind. Les 4ZZ has been working the stations on his 10 mx dipole.

Two metre activity here has not been very startling lately. Apart from the few regular QSOs, it is hard to get a contact on this band at the moment. Jack 4JE and Kev. 4ZR are using f.m. rigs on 53.187 Mc., but it is very hard for an a.m. station to break in on them. Have heard them talking television so we may hear them up even higher (or rather see them).

73, Peter 4ZPL.

### WESTERN AUSTRALIA

The Vintage Car Club of W.A. had a rally on 15th and 16th Nov. Amateur Radio relayed check point times on the route to the overnight stop-over. We also got a mention in the "West Australian". Frequency used was 51.90 Mc. by special permission of the P.M.G. Tx's were netted over the previous fortnight. There were seven check points along the 60-milo route and about seven thousand cameras. An emergency occurred near Byford when a passing motor cyclist had a blowout and skated on his face for 20 yards. However, the 600-ohm proved sufficient to get the Armadale Ambulance.

The fox hunt the following week-end was a failure, only one hound turned up to find a fox with the news that he didn't want a run unless he had to. Since no reinforcements turned up, he didn't have to. The next fox hunt is at Narrogin on 5th Dec.

At the meeting on 23rd Nov., an exhaustive analysis was made of the training gear at D.C.A. There was a brief-case sized Collins s.s.b. tx and Cedric 6CD was heard muttering "where is it all?" I think Cedric's s.s.b. sounds just as good as any old Collins rig anyhow. After the inspection some strong coffee was downed. 73, 6ZAG.

## New Kind of Convention

The New South Wales V.h.f. and T.v. Group will hold their first Three-Day V.h.f. Convention on **5th, 6th** and **7th March, 1965.** The programme will commence at 8 p.m. on Friday 5th at WI Centre, Crow's Nest. Bookings for accommodation can be arranged if desired. Programme and venue will follow in future issues.

# S W L

Sub-Editor: Chas. Aberneathy, WIA-L2211
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Well chaps, we start yet another year, and I trust that it shall be a happy and prosperous one for all. With all the exams. over and the holiday break over the festive season, I should be hearing from many members of their listening over that period.

**VALVES**

**Diodes:** The simplest combination of elements constituting an electron tube is the diode (di-ode means two electrodes). It consists of a cathode, which serves as an emitter of electrons, and a plate or anode surrounding the cathode, which acts as a collector of electrons. Both electrodes are enclosed in a highly evacuated envelope of glass or metal.

**Triodes:** In 1907 Lee De Forest added a third element—the control grid—between the cathode and the plate of a diode and so provided the resulting triode tube with the ability to amplify tiny radio signals. This led to the sensational development of radio communication, broadcasting and electronics in general. The control grid in this tube is a circular spiral of a number of turns of fine wire that completely surround the cathode.

**Multi-electrode Tubes** are tubes having more than one grid, which permits attaining many desirable characteristics not possible in a triode. Among the most common multi-electrode tubes are the Tetrodes, which have four electrodes (two grids) and the pentodes (which have five electrodes and three grids).

**Tetrodes:** The development of the Tetrode is a direct outcome of the undesirable grid-to-plate capacitance in Triodes. This capacitance leads to coupling effects and instability in r.f. amplifiers. The most effective answer to the feedback problem was to insert an additional shielding electrode, called a screened grid, between the control grid and the plate of a Triode. This additional grid almost completely encloses the plate and thus acts as an effective electrostatic shield between plate and control grid.

**Pentodes:** The insertion of an additional grid, called the suppressor grid, between the plate and the screened grid of a Tetrode overcomes the effect of second emission, and the resulting negative resistance at low plate voltage. By adding this electrode the tube becomes a five-electrode unit, or Pentode.

**Beam Power:** A beam power tube is a hybrid between a Tetrode and a Pentode. It has two grids like a Pentode, but it also has a special beam confining electrode, capable of overcoming the effects of second emission as does a Pentode.

**Variable-Mu** (remote cut off tube): This tube is a Pentode that has a gradual plate current cut off when the negative bias is increased. This is achieved by non-uniform spacing of the control grid wires, resulting in the amplification factor that is low at the centre and high at the ends of the grid structure. Thus the amplification of the tube may be changed by varying the grid bias.

**NEW SOUTH WALES**

During the past twelve months there has been a noticeable increase in activity amongst our members. The monthly meetings during that period were well attended and we were fortunate that on our meeting nights, that the VK2 Council were holding theirs. This gave us the opportunity to get rulings and decisions on various matters, which we thought should be finalised that way. Council members gave talks on our hobby, and were always ready to answer questions put to them by our members present. This was much appreciated and our thanks go to them for their assistance. We are hoping that 1965 will show even greater activity, give us your support, and try to come along to the meetings, held on the third Friday in the month.

Bruce L2283 lives at Kingswood and is a newcomer to the page. He uses an AMR300 rx with a half wave dipole on 20 and 40 metres for his antennae. Pleased to hear from you OM. Keep me posted on your doings.

Arnold L2291, on his s.w./b.c. rx, has logged ZE, OA4, CR7, HK4, VS9, ZP5 and PY3. This is really good considering the type of rx.

Bay L2287, using a 3.5 Command rx, a Q5'er, and a xtal converter logged OX3, HL, CR9, UI8, UH8, CR7, VP7, XW8, 4X4, 5A1, 9M4, CX, OH and PA0. Quite a nice variety OM.

Alan, of Dubbo, is awaiting his L number. Thanks for the letter OM, and I trust that you shall let me know of your doings in the near future.

Russell L2262: OK re those cards for 2AOH, shall do. Hope that you have an enjoyable holiday and pass those exams.

Mac L2075 has his 8 mx gear in operation and hopes the season is a good one; that makes two of us OM as I hope so as well. Those S.w.l's not on that band are missing a treat.

Sid L2258: I trust that you are feeling better now OM and that your holiday did you good. Many thanks for that article, which I shall use in the near future.

**VICTORIA**

The visit to GTV9 studios was well attended by the group who studied all the technical equipment necessary to produce the t.v. picture. Also during December we held our popular Christmas Party where food and drink vanished very quickly. The December radio construction night produced a flood of 52 Mc. converters for adjusting, we hope they will all produce a high score in the Ross Hull Contest. The first of the group's functions for 1965 will be the general meeting at 8 p.m. on 29th January.—Ian L3008

Greg L3138: Congrats. on being appointed to the committee of the Moorabbin Radio Club. Thanks for the Budapest Award rules. I shall use them at a later date. OK on your first on 52 Mc., we have had a few openings here also. QSLs received: 9M2, WA5, UA9, GI3 and UW3.

Eric L3042: To date this year (1964) Eric has sent 1,000 reports. Really, I do not know how he does it. During November, QSLs received were 26, stations heard: 160 mx 5, 80 mx 6, 40 mx 11, and 20 mx 27. Sorry for the abbreviations OM, but the space is limited and I know that you will understand.

Peter L3221: I see that you have the number at last. Could any member help Peter with a circuit of a transistorised receiver, as at his QTH a.c. is not available as yet. QTH: Peter Curran, P.O. Box 49, Piangil, Vic.

Noel L3101: Many thanks for your kind offer OM and we are looking forward to meeting Gwen and yourself during our visit to VK3 in January.

**QUEENSLAND**

What has gone wrong with our members in VK4? Has everyone got writer's cramp? No mail for two months; it's a poor show chaps. Still, it is up to you, as all I can do is complain.

**SOUTH AUSTRALIA**

It is my pleasure to report that we have yet another contributor from VK5-land. It is very gratifying to see members starting to co-operate in this way, as assistance is essential.

Tony L5073: Although using a modest type rx, Tony has heard some 60 countries, with 25 confirmations, which is not too bad for a start. Welcome to the page OM and I trust that you shall keep me posted on your doings.

Brenton L5069: I did not misplace your letter this month OM, hi. Pleased to hear that you are chairman for the new radio club at the Adelaide Teachers' College. Yes, the 6 mx band is interesting, you should have some good listening now that the v.h.f. season is on.

Alan L5065: I was wondering if you heard from the printer about those QSL cards? I asked him to forward particulars. QSLs received: VK1, IT, ZL and XE. Countries heard: GI, DL9, JA, TG9, FO8, VU, PJ, VQ, PY, XE, PA0 and K2.

Tim L5067: By the sound of things you are having a quiet time so far as listening is concerned. Still, I think we all get that way now and then. Latest log shows: VR2, VK0, I1, YV5, DU1, ZE7, ZLs and Ws. Sorry that I do not have a photo of myself or the shack. The R.D. results usually come out in the Dec. "A.R."

**WESTERN AUSTRALIA**

This month Peter is not alone as we now have four contributors in the W.A. section, and a welcome is extended to these newcomers and we trust that they shall continue to stay there.

Alan L6029: Using a Murphy 160 rx with a long wire antenna, he has logged some 70 countries with a return of 10 confirmations. Nice to hear from you Alan.

Geoffrey L6030: This lad is Alan L6029's brother, so naturally they share the same rx, and between them they have logged this month: KL7, WA0, VS9, ZS5, UW3, UA1, CR7, VQ8, G4 and VU2. Pleased to hear from you both, so keep writing.

Bryan L6028: Loggings for the month show: 15 mx, MP4, YO4, EP2, OH5, F9; 20 mx, XE1, LU8, PJ3, TG8, CT1 and VR4. I shall be glad to add you to the DX Ladder including the one W State.

Peter L6021: It must be a DX paradise over in W.A. by the tone of your letters OM, as you can always supply plenty. Best for the month are 25 real beauties, whilst the 15 QSLs received are equally as good. I trust that you eventually got those 100 reports away, hi. All the best in the "CQ" Contest.

**SAFETY RULES**

It is a basic principle of both electrical and general safety rules that all mains and apparatus must be regarded as being alive until proved dead.

The message which most of us are reluctant to accept is that by the time we are 30 years of age our reactions are slowing down. You can't put old heads on young shoulders they say, and maybe that is why nature has provided young people with quick reflexes. It is equally true that you can't put young reflexes into older people, and let's face it, by the time we are 30 years of age we are no longer young. The over 30's must, therefore, use the old heads that they should have acquired by that age. A message to the under 30's: Don't rely too much on your quick reflexes or you may never reach 30!

**S.W.L. DX LADDER**

| | Countries Conf. | Countries Hrd. | Zones Conf. | W States |
|---|---|---|---|---|
| E. Trebilcock .... | 285 | 293 | 40 | 50 |
| P. Drew .... .... | 148 | 252 | 34 | 31 |
| D. Grantley .... | 124 | 281 | 38 | 35 |
| A. Westcott .. .... | 97 | 159 | 31 | 11 |
| M. Hilliard .. .... | 91 | 241 | 33 | 14 |
| G. Earl .. .... .... | 78 | 151 | 32 | 10 |
| R. Kearney .. .... | 70 | 146 | 32 | — |
| C.Aberneathy .. | 64 | 104 | 33 | 14 |
| N. Harrison .... | 56 | 178 | 31 | 37 |
| L. James .... .... | 51 | 144 | 24 | 10 |
| A. Raftery .. .... | 29 | 132 | 15 | 8 |
| R. Beckley .. .... | 27 | 50 | 19 | — |
| R. Oats .... .... .... | 17 | 40 | 13 | — |
| B. Prosser .. .... | 10 | 136 | 6 | 1 |

# YOUTH RADIO CLUBS

These notes will be brief (your scribe has had a dose of hospital) and the last for 1964. First priority is to wish all club leaders the best for the season and congratulate them, both for achievement (whether large or small) and for their spirit. I wish there were more like you.

We're happy in Canberra to have another 16-year-old who passed full A.O.C.P. His name is David Davies and he is in fourth year at Canberra Grammar. Lyneham could only give him a little help because he lived in the neighbourhood of some of our boys, so David has done a remarkable job. We'll have more details of his rig, etc., after the holidays.

News is scarce when you are away from communications, so I have only a letter from my regular helpful, Dave 3ZMX, and the VK4 Division Bulletin, which always includes Y.R.S. notes. (Sorry to inform you, 5PS, my old pal, that nobody in Adelaide honours me with even a line.) Dave sends me some very good VK3 items except for one sad one—Bill Allen, of Gowrie Park Y.R.C., is in hospital and very sick. You probably won't see this, Bill, but I've been in, and I'm out, so you join me as soon as you can. May be a photo in this issue of the boys at Korumburra, who earned the first Junior Certificates in VK3, said photo having been in the local paper. Wonthaggi Tech. have had a great burst of success with six Elementary and four Junior Certificates. Christian Brothers at Bundoora have applied for a licence and hope to be on the air in February. Have seen the P.M.G. publication, Applied Electricity I., mentioned in VK3 Newsletter, and it certainly is a good little course, from Electron Theory through Ohm's Law, Cells, Electromagnetism, Measurements, Capacitance, simple A.C. Theory, to the elements of Valve Theory.

VK4 continues to sail along with a helpful Council and a live-wire 4UC. Each VK4 Divisional Bulletin has a foolscap page of Y.R.S. notes showing a great lot of activity. New clubs at Yeronga High, Mt. Isa High, Redcliffe High, and Pomona Rural, and perhaps Christian Brothers at Gympie. News from Brian 9BJ of a move for a Y.R.C. at Rabaul when they finish their new shack. New club at Yeronga has 70 members and hopes to rope in Howard 4WO. Lots of interest in a display by Downlands College at the Industry and Hobby Fair. Gladstone Sea Scouts are keen to start a club and hope to be mobile marine, but can find no help as yet. Proserpine Scouts still stranded without help. Gympie Y.R.C. about to try some Junior Certificates and hope to be first in VK4. Some talk of Bundaberg having a Y.R.C. if help can be found.

A radio-happy New Year to you all. 73, Ken 1KM.

# Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

**PREPARING AN ANTENNA FOR JAMBOREE**

Editor "A.R.," Dear Sir,

One night in September, I opened the front door to find the front porch and half the driveway full of Boy Scouts in uniform. They had come to take delivery of a 40 ft. mast I had promised them for use during the Jamboree-on-the-Air.

Their Scoutmaster told me afterwards how they managed to carry this thing 1½ miles to their hall. Half the Troop carried while the other half acted as advance or rear-guard, holding up the traffic at intersections and cheering the workers on at appropriate intervals. The duties were rotated.

The mast was duly delivered to the site and a working party erected it in the rain during the next week-end.

The following week-end it was lowered and re-erected because someone had forgotten to thread the halyard through.

The next week-end, under the proper supervision of a qualified Ham, a tri-band dipole was installed. This is the contraption written up in "A.R." some time ago using 80, 40 and 20 metre dipoles with a common 50-ohm co-ax. feeder, the feed point pulled to the top of the mast with the ends tied down at any old angle to various convenient points on the 10th Caulfield Scout Hall roof. It did not load too well at first, but with the encouragement of many well-wishers and the very real help of Dick VK3ADR and a few roof-climbing 10th Caulfield Scouters, we very smartly pruned the 80 and 40 metre dipoles to give us s.w.r's. close to unity. The 20 metre job needed lengthening but that presented no problems, even though no Ham antenna wire has ever before been subjected to such beautiful Scout knots.

With a reasonable match on all bands, the next thing to do was try it out. Well, try it out we did, our first contact with a W6 or so, quickly followed by a break-in from VK3DT portable at 10th Sandringham Scout Hall, who was doing the same as us. This worked out nicely because we were able to make a quick all-band check for each other, and then pack up content that the Jamboree-on-the-Air would be successful, for at least two Scout Troops.

Well it was a success for very many Scouts —and what a pleasure it was for me to work many VK stations operating portable at Scout Halls and to hear their antenna stories.

—Bob Slutzkin, VK3SK.

**MOBILE SOCIETY**

Editor "A.R.," Dear Sir,

I wonder whether your members know of the Amateur Radio Mobile Society, located in Great Britain. It is a fine organisation, and has done much to promote high operating standards and good fellowship among mobile (and other!) operators all over the world. Its monthly "News" is a remarkable publication, including everything from excellent technical construction articles to fascinating Letters to the Editor—some of which can be as controversial as those of "73" magazine.

I should very much like to recommend the Society to your members, mobile and otherwise. Subscriptions to the "News" are about A£1 per year, and I'm certain that they would send a free introductory copy if requested. The QTH is 95 Collinwood Gardens, Ilford, Essex, England.

—R. L. Gunther, W6THN/VK7.

**N.C.D.X.C. AWARD RECEIVED**

Editor "A.R.," Dear Sir,

Recently you published an article on the occasion of my obtaining the D.X.C.C. Award for 40 metre c.w.

As stated in my previous letter, I have concentrated mainly on 7 Mc. and one of the objects was to secure the N.C.D.X.C. Award (the Northern Californian Club) for this band.

The Award was for contacting 20 members of the Club and, in addition, 200 other W6 district stations. I have much pleasure in stating that this object has been attained and the Certificate is to hand.

As a boost to the 7 Mc. band, I am forwarding to you the Certificate and its accompanying letter, and trust you can find space to give them publicity. By now I had hoped to have had a photograph of the 220 QSL cards but was unable to do this as I have been on my back for the past month—as a matter of fact my pal Jim 5FO is writing this letter for me. I will do my best to have a photo in time for your publishing date but I would not rely on this. After you have made suitable blocks would you please return this "treasured possession."

—Ted Cawthron, OT26, VK5JE.

[Unfortunately publication dates prohibited printing a photo of the Certificate.—Ed.]

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# Publications Committee Reports That . . .

Some readers overlooked the fact that this issue of "A.R." required all copy to be at Box 36 by the 1st December, and as the deadline was the 7th, all inwards mail received up to that date has been published or acknowledged in this issue. All mail received after the 7th December, 1964, will be held and not published unless requested by the sender.

Inwards mail was received from VKs 5JE, 5JT, R. W. Humphreys, R. L. Gunther, D. Parker, Ken Ashton and R. L. Erwin, and a technical article from VK5BI.

The cover price of "A.R." has been increased to 2/6 in an endeavour to combat rising costs. This will mean that the news-stand readers will now have to pay more for the copy of "A.R.," but members of the W.I.A. will not have to bear any increased charges. These will be met by the Division. Many facts could be put forward to explain why the increase was required, but no doubt readers are fully aware that their purchasing power is steadily being reduced overall, hence little we could say would in any way influence their attitude nor overcome the fact that "A.R." is now increased in price.

The "Ross Hull" V.h.f. Contest rules again appear to have drawn their share of attention and many vocal persons can be heard voicing their disapproval of the current rules. If you are dissatisfied then you should put your views to your Division or write to "A.R." Once other Amateurs have heard of or read your ideas on the new rules you suggest, the consensus can be forwarded to the Contest Committee for action. The time to protest is now. Little point is to be gained by commenting upon what the rules should be, when the Contest is on. Your committee is prepared to open correspondence upon this matter and to forward the final results to the Contest Committee, or you may act direct. The important thing is to have the rules ready for submission well in advance of the next contest.

The new "Call Book" is ready, but there could be some delays in the Interstate deliveries due to the holiday period slowing down normal mail. You can purchase your copy from the W.I.A. or Booksellers, as soon as they have received supplies.

Please remember that the February issue of "A.R." will not include any notes. This is caused by annual holidays at the Printers, and the standard format will again appear in March, 1965, "A.R.," copy for which is due by the 8th February at P.O. Box 36, East Melbourne, C.2, Vic.

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# NEW CALL SIGNS

**SEPTEMBER, 1964**

VK2ANS—J. J. Lilley, C/o. O.T.C., Bringelly.
VK2ASK—C. Harte, 144 Carlton Pde., Allawah.
VK2AYE—G. E. McPhee, 19 Borambil Place, Oyster Bay.
VK2BHA—1st North Strathfield Boy Scouts, N.S.W. Assoc., Central Park, Welbank St., North Strathfield.
VK2BJH—J. E. Hillman, 770 King Georges Rd., Penshurst.
VK2BKS—Kyogle Scout Radio Club, Station: Scouts Hall, Wiangaree St., Kyogle; Postal: C/o. R. Wilson, Borabee St., Kyogle.
VK2BRF—O. R. French, 78 Hercules St., Dulwich Hill.
VK2BRR—R. J. Richards, 49 Ourimbah Rd., Mosman.
VK2BWS—M. W. J. Sheldon, 40 Highlands Ave., East Gordon.
VK2ZDI—D. W. Rickard (Portable), C/o. Flat 340/3P, Dewrang Ave., Woomera.
VK2ZGO—G. K. Oates, 12 Smith Ave., North Manly.
VK2ZSJ—J. S. Michell, 18 McEvoy St., Padstow.
VK2ZWK—W. E. Kelly, 34 Sailors Bay Rd., Northbridge.
VK3CJ—C. J. Manning, 8 Monaco Cres., Beaumaris.
VK3DP—F. C. Duffin, 23 Shelbourne Court, Mornington.
VK3KI—T. P. Kirby, 17 Edinburgh Rd., Blackburn South.
VK3ADA—A. D. Proudfoot, 5 Andrew St., Horsham.
VK3AFW—R. R. Cook, Flat 5, 3 Gordon Gr., South Yarra.
VK3AIG—Gordon Radio Society, Fenwick St., Geelong.
VK3ATO—L. Grimshaw, 70 Emma St., Carrum.
VK3ZDG—K. C. Trevarthen, 28 Malcolm St., Blackburn.
VK3ZGQ—D. K. W. Bradbury, 7 Tarata Drive, Doveton.
VK3ZRP—R. A. Philp, 12 Lodden St., Box Hill.
VK4PE—Padua College Radio Club, Turner Rd., Kedron.
VK4PZ—P. E. Wilkins, 90 Brisbane Corso, Fairfield.
VK4YB—G. Bahre, 633 Oxley Ave., Scarborough.
VK4ZRA—H. J. Crosthwaite, 61 Phillips St., Deagon.
VK5CP—A. R. Jarman, 35 White St., Henley Beach.
VK6BC—P. I. Buzzard, 56 Moulden Ave., Yokine.
VK6GP—R. G. Price, 144 Robert St., Como.
VK6XW—K. Henning, 4 Butler St., Narrogin.
VK6ZES—S. J. Sands, Port Hotel, Carnarvon.
VK7BH—B. N. Hall, 49 Bastick St., Rosny.
VK7CR—C. Russell-Green, 99 Marlyn St., South Hobart.
VK7TA—B. L. Jones, 2 Richmond Pde., Sandy Bay.
VK7ZGP—G. P. Power, 10 Belle Vue Ave., Launceston.
VK7ZNS—N. Stutterd, 24 Moore St., Wynyard.

# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL

### I.T.U. FUND

As agreed at the last two Federal Conventions, Divisions were given target figures to meet towards financing representation at forthcoming I.T.U. Conferences. To date, the percentage of the target figures met are shown by States:—

| | |
|---|---|
| VK2 | — |
| VK3 | 25% |
| VK4 | 47% |
| VK5 | 32% |
| VK6 | 75% |
| VK7 | 50% |

The above figures represent monies received by Federal Executive and not necessarily monies still held by Divisions.

### MEMBERSHIP RETURNS

All Divisional Secretaries or Membership Secretaries are reminded that membership returns on Federal Form A are to be forwarded to Executive as at the first of each month. It is essential that Executive obtains figures from ALL Divisions. It is especially necessary at this time of the year as per capita payments for the Convention and other expenses are based on them. Your co-operation would be appreciated.

### AMENDMENT TO NATIONAL FIELD DAY CONTEST

Delete Rule 8 and substitute the following:— "8. The following shall constitute Call Areas: VK1, VK2, VK3, VK4, VK5, VK6, VK7, VK8, VK9 and VK0."

### FEDERAL CONSTITUTION ALTERATIONS

The proposal to make amendments to the Federal Constitution 1947, as notified in the January and February issues (1964) are still under discussion as several comments have been received. Advice of any changes will be notified in this column as soon as these are resolved.

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## FEDERAL QSL BUREAU

DL4IO writes: "Since leaving Africa one year ago, and ending our long operations of EL4A and EL4YL, we have had no way to receive the many late QSL cards sent us since we left. Present QTH is Mr. and Mrs. Ken Bale, DL4IO, 7100 Heilbronn/Bockingen, Haagstr 18, Federal Republic of Germany."

The K.A.R.L. advise that the present number of HM stations is HM1 37, HM2 6, HM3 2, HM5 6, HM8 6, HM9 2, and HM0 1. Total of 60 stations.

Details of the 8th OK DX Contest, scheduled for Dec. 6, 1964, again arrived too late for prior publication. Details re logs may be had from this Bureau.

Norm Koch, K6ZDL, 17204 Eastwood Ave., Torrance, Calif., U.S.A., advises he is now QSL Manager for HM1AP/HM9AP. Norm states that the old QSL Manager was injured in a cycling accident and broke her back! S.a.s.e. is required for QSLs.

—Ray Jones, VK3RJ, Manager.

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## FEDERAL AWARDS

The following Awards have been issued during 1964:—

W.A.V.K.C.A. (Nos. 252 to 265): UA4IF, VR1G, UA0EH, W0AUB, JA2AB, DL1IA, K6CT, VE4OX, W5UX, W6KG, K4TWK, KR6OF, W6PHF, W9UZS.

W.A.S. 50 Mc. as follows:—

| Call | Cert. No. | Addt. Cntr. | Call | Cert. No. | Addt. Cntr. |
|---|---|---|---|---|---|
| VK4ZAA | 45 | - | VK4ZAL | 58 | 3 |
| VK2ABR | 46 | 4 | VK8ZCX | 59 | - |
| VK6ZAA | 47 | - | VK6ZDS | 60 | 1 |
| VK2ZCF | 48 | 2 | VK5KK | 61 | 3 |
| VK4ZLG | 49 | 2 | VK6ZAS | 62 | - |
| VK2ASZ | 50 | 2 | VK5ZGF | 63 | 3 |
| VK3ZGP | 51 | 1 | VK5WV | 64 | 1 |
| VK5ZSG | 52 | - | VK6BE | 65 | 4 |
| VK6ZCM | 53 | - | VK7ZAP | 66 | 2 |
| VK3ZIG | 54 | 1 | VK5ZEJ | 67 | 2 |
| VK4ZK | 55 | 3 | VK3WK | 68 | 2 |
| VK4ZEK | 56 | 1 | VK6ZCX | 69 | 1 |
| VK1VP | 57 | 2 | VK4ZGL | 70 | 4 |

V.H.F.C.C. as follows:

| Call | Cert. No. | Confirmed 144 Mc. | Confirmed 50 Mc. |
|---|---|---|---|
| VK5KK | 28 | — | 143 |
| VK1VP | 29 | — | 100 |
| VK4ZAL | 30 | — | 100 |
| VK2ASZ | 31 | — | 100 |
| VK4ZLG | 32 | — | 100 |
| VK6ZDS | 33 | — | 108 |

D.X.C.C. New Members:

| | Cert. No. | Call | Countries |
|---|---|---|---|
| Phone | 64 | VK2APK | 128 |
| C.w. | 79 | VK3AHQ | 248 |
| C.w. | 80 | VK5KO | 102 |
| Open | 94 | VK3ACD | 104 |

—Alf Kissick, VK3KB, Awards Officer.

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## NEW SOUTH WALES

### HUNTER BRANCH

With the holiday season upon us, many of the local members are using their surplus spare time to prepare the gear for the VK2 Convention to be held in Sydney over the January long week-end. Perhaps this year we may even see some activity on mobile in the neglected bands of 160 and 10 metres. The top-band finds great favour with the boys in G land for local mobile working and 10 metres is used for this type of working in U.S.A. Both these bands seem to offer something to those who have mediocre results on 40 metres. And if you are not contemplating mobile operation, then why not join the growing ranks of the home station boys who are using top-band with outstanding results for cross-town contacts. It seems very important to "use the bands or lose them" as the war cry of the I.T.U. representatives has been and the only way to fulfil this worthy aim is to get on the air as often as possible and use ALL the bands. Those ethical sounding remarks made by some delegates at the recent Asian Broadcasting Union Conference were interpreted by some to mean even greater piracy by commercial stations on exclusive Amateur bands, especially 40 metres. Just listen any afternoon, or any part of the day for that matter, and you will realise the impossible situation which is developing too rapidly for comfort.

Mac 2ZMO is in the market for some very special high melting point lubricant since the bearings on the 6 mx beam became overheated while feverishly working the excellent DX heard of late on this band. Bill 2XT, fresh from his oriental perambulations, has found the same happy position prevails enabling him to keep in contact with many of his JA friends. After a break of two weeks or so to look through his coin collection for rare items, Gordon 2ZSG is now putting the finishing touches to the newly elevated shack amid the ecclesiastical surroundings of Marine View. On the other side of the town is the sloping wire belonging to Stan 2AYL who now gets remarkable results on Top Band with the "Topsy" tx. Two metres was never like this —according to Stan.

A local radio retailer just happened to have a hundred or so old steam radios for disposal so who should appear but Joe 2ANL. Armed with a sturdy vehicle, they were all taken to the school and the boys, their urge for demolition satisfied, given the job of stripping and classifying. As a result, Piux X radio club now has a truly remarkable array of most useful items for use in projects. The novelty of the new Morse Trainer at Westlakes Radio Club has now passed and the boys are using the unit to good effect. So confident are they, following its use, that three at least intend taking the examiners on at the January quiz for Amateur Operators. It is to be hoped that the paper does not contain too many of the professional type questions which have been all too frequent in recent months. Could it be that an attempt is being made to discourage rather than encourage? That long hoped for technician class licence is long overdue. Club leaders will support me, I am sure, when I say that experience on equipment works wonders with understanding theory.

Three more local boys have been accepted as Associate members of the Division. They are Les Field, Norm Sweetman and John Richards. There are terrible things happening in the coaly city of Cessnock. Peter 2AIY rose very early the other morning and decided to indulge in an unsupervised round of golf before breakfast. Carefully taking in tow the golf buggy, he crept stealthily out of the house leaving the sleeping occupants within. His delight turned to anguish however when he looked around just as he was leaving the gate to find that it was not the golf buggy at all, but the lawnmower! That shows he should have stuck to Amateur Radio and left that evil Scottish game alone. In the same vicinity lives Sherwood who, when asked what his call was, had to consult the Call Book—it's just so long since he's been on the air! The rest of the Cessnock boys are keeping the metropolis on the map with activity from the Radio Club. Being next to the baths, it is easy to get a good reflecting earth for the aerial farm.

Jan 2BJO has been notified of his appointment to Singleton and, as luck would have it, is domiciled only 200 yards from Geoff 2VU. Does the man on the air first have the right of way? Bill 2ZL is secretly preparing for operation on Top Band. He has been heard asking for crystals on the very frequencies most popularly in use. When the winter returns he will stoke up the fire and get the Phenyle Bay Railway in service once more. Paddy's fame has spread as far as VK3 anyway and to prove it, 3BA visited Toronto a few weeks back just to inspect the 2AXU venetian blind dipole. Al still wonders why it works. If you listen round the bands after you read this, you will no doubt hear some of those who from their labours, of the past year, deservedly rest. Varley 2SF, Jim 2AHT, Harold 2AHA and Stuart 2AYF have all promised increased activity when the holidays come, so look out for them.

I hope members will not forget that there is no meeting during January. The next meeting, which probably will be in the same location as last year's, will be held on Friday, 5th February. More details will be given in broadcasts from 2AWX in the coming weeks. The committee has lined up some quite outstanding lectures for this year and it is hoped that attendances at meetings will be better than ever. Remember, it's good to be alive in 1965! See you then, 73, 2AKX.

### BLUE MOUNTAINS SECTION FIELD DAY

The Blue Mountains Section Annual Field Day, held at the new venue, Glenbrook Park, on 15th Nov., was well attended. Present were the usual gang from the Bathurst Radio Club, Major 2RU and Les 2RJ, complete with XYLs from Gosford and Newcastle respectively, plus a good roll up from Sydney and surrounds. The weather as usual was excellent and families enjoyed the outing.

The first field event was a mobile scramble on the way to the Park. Dave 2AWZ and Bob 2ASZ tied with 19 contacts for first place in the v.h.f. section, while Major 2RU was a clear winner in the h.f. section.

The "snifter" hunt created considerable interest, the tx was located within the Park. For quite a period competitors wandered around more or less aimlessly until some clues indicated that the tx was not on any fixed object and was close to the ground. It was one of the more adventuresome types—Harold 2AAH—who selected a lady from the crowd and proceeded to investigate. Bob 2ASZ's mother-in-law, complete with dipole across the shoulders and tx in a handbag, provided the missing signal. Dick 2ZCF was close at hand for second place.

## SILENT KEY

It is with deep regret that we record the passing of:—

VK3KR—Ken Rankin.

In the afternoon session the ladies and children left by bus for a tour of Warragamba Dam, while the OMs searched for a hidden 144 Mc. tx. Dave 2AWZ and John 2ANF were the only team to pick the right ridge and find the unit hidden by Bob 2ASZ.

The final events were the v.h.f. and h.f. scrambles run simultaneously. Nev 2DR won the v.h.f. section and Dave 2AWZ the 7 Mc. event.

There were the usual lucky numbers for XYLs and OMs and the prize presentation was in the capable hands of State President, Vic 2VL, and Section Chairman, 2ASZ.

Thanks are extended to Ducon Condensers Pty. Ltd. and to the Miniwatt Division of Philips Industries for the donation of prizes and technical data, and to the A. W. Valve Co. for data folders.

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# VICTORIA

### WESTERN ZONE

With seasonal work being what it is in a predominantly rural zone, shearing and harvest for some and a different "harvest" for such as Bert 3EF, Merve 3AFO away having a look at t.v. from the tx and your scribe's lack of activity due to trouble with that strange beast "the donk," newsgathering becomes something of a hit and miss affair.

Ray 3ATN's proposed antenna system for the Moonbounce project created a lot of interest and will be a real showpiece in an already impressive antenna farm. Herb 3NN's activity on 432 Mc. indicates the future of v.h.f. in the far wet assured. Neil 3AQD's recently purchased 30 ft. tower delivered, but apparently felled while still growing because when approached with tape to determine vital statistics was found to be over 40 ft. Also in the picture concerning towers is Harry 3ZX who "inherited" one from Mac 3AZM who is moving to a new QTH. A very nice a.m. signal from Mac's little emergency service rig. Why bother rejoining the sideband brigade now that you have discovered the ultimate medium Mac?

With the approach of the fire season, Smoke Net operators are chasing the spiders out of emergency equipment, replacing borrowed components and generally gearing for the anxious months ahead. A possible exception is Alan 3HL who states that his gear must work, it was OK last summer. It was last summer that this rig refused to load the wrong aerial.

Bill 3AKW and Trev. 3ATR would seem to be riding the airwaves more than they are disturbing them, an interest which has captured quite a few Hams of late.

Barry 5YB and Rodger 5NY were heard on the hook-up battling severe QRN. Keep it up boys, conditions must improve. The "donk" just stopped, the thing only keeps active with repeated "kicks in the ribs"—a most tiring business, but we will soon have it soft, easy and comfortable. Happy new year to all. 73 David 3ADS.

### OBITUARY

**K. R. RANKIN VK3KR**

The VK3 Division of the Wireless Institute of Australia announces with sincere regret the sudden passing of Ken Rankin, VK3KR, on 8th November last.

Ken received his licence and commenced operation in August 1926. His first contact was with Chas. Baker, VK3VP, on 13th August, 1926, using the 180 metre band. Ken joined the R.A.A.F. Wireless Reserve and was one of the first to enlist at the outbreak of war. He rose to the rank of Warrant Officer, serving in the Pacific and other theatres of war from 1939 to 1945.

After discharge he moved to Benalla with his wife and family and became manager of the Regal Theatre and later the Drive-In Theatre.

Ken played a major role in setting up the radio communications network of the Benalla and District Rural Fire Brigades' Group 12 years ago. His work in the initial stages created great interest among neighbouring bush fire brigades and set the pattern in some areas outside Benalla district for an efficient radio communications system.

Although in ill health for some months, Ken appeared to be well on the way to complete recovery and maintained his Amateur Radio activity. In fact his final QSO was only about an hour before he passed away.

To his sorrowing wife, daughter and son we extend our heartful sympathy in their sudden and sad loss.

### SOUTH WESTERN ZONE

Firstly I would like to wish all members a Happy and Prosperous 1965 and plenty of DX.

Don 3AKN has been very active on the v.h.f. bands, having contacted the following stations: Eric 3ZL, of Ballarat, who has a nice s.s.b. rig going well; Thorb 3APS, at Casterton, who has taken up farming as an extra hobby; Ron 3ZER, of Ballarat; 3ZDM, 3ZJD, 3NM, 3ZKW, 3ZNJ, 3ZOO, 3ZOR, 3ZCE, 3ZDM, and Dave 3ZJU, of Hamilton, who is quite active. Don also attended the annual dinner last year and congratulates all who had anything to do with its organising.

Pat 3ADN, of Lismore, is very busily engaged in Fire Net work as he is the President of the R.F.B.A.; congrats. Pat on the good work. Peter 3FX has moved to a new QTH and hopes to be back on the air soon. I believe Wal 3QI passed through our city recently. Hope he will call again some time and make his presence known. We always like to meet any of the radio fraternity.

3WB was doing a fine job with the Scouts Jamboree-on-the-Air as he had a lot of Scouts with him working portable at Mt. Napier. 3TW was also on for the Jamboree. Bob 3IC, of Geelong, was out with the Geelong Radio Club station 3ATL, complete with Scouts; congrats. Bob for this great job. 3AAW, Y.M.C.A. Radio Club, Warrnambool, also took part with Second Warrnambool Scouts with Peter Kearney, Patrol Leader of Platypus Patrol, as their spokesman.

We have another new Amateur to welcome to the Zone. Neville 3AAQ is associated with the National t.v. station at Ararat. He is also a mate of Neil 3AQD. Let's hope that tx loaded up all right chaps. Alan 3BA, at Beaufort, hasn't been heard on the air for some time; can't you find the switch Alan or has the horror box got you in its grip? Don 3AKN also reported that Neil 3HG has been heard on the air again after a long illness. This is very nice to hear as Neil was always very active on Sunday mornings, along with Jack 3JA. These boys always had a regular sked, so hope to hear more of you chaps. James 3MC was included in this sked quite regularly.

Reg 3APR has come on now and again, keep it up Reg as we must get some regular activity into the Zone. John 3ARJ comes on each Thursday night for the Zone hook-ups, along with Harry 3AXI, but over the last few months not much support has been given to the hook-up each Thursday night, so what about it chaps.

Bill 3XE is flying and hopes to have his wings shortly. Believe he is rather good at following railway lines, but after a while they disappear. Bill 3WK is also flying, so it looks as though we will have plenty of flying Amateurs in the Zone. Don 3AKN's XYL has had her wings for some time, congrats. Peg. Norm 3EQ is on 21 regularly and has a few JA QSOs and also comes on 80 quite often. Ted 3PS has retired from work after 50 years in business in Warrnambool as a jeweller. He should have plenty of time now to get back on the air. The next Zone Convention is to be held in Ballarat, I believe. If the boys up there can't manage it, it looks like coming back to Warrnambool. 73, Bill Wines.

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# SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division for November took the form of the Xmas Social, and a very representative gathering was present. Strangely enough, early in the evening the attendance figures did not look too hopeful, but just before starting time all the seating accommodation was filled and standing room only was the order for the rest of the night.

Usually for this annual event, the entertainment for the night takes the form of a film evening, but this year an extravaganza to end all extravaganzas was presented, to wit, a demonstration of multiple tape recording, with Dave 5DS acting as recording engineer, musician, compere, comedian and when he was not

### TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

busy, he shoved a broom up his jumper and rushed around the room sweeping up the floor! To say that the demonstration by Dave was an eye-opener would be to make the understatement of the year, and I think it can be safely said that both from a technical and an entertainment point of view, he laid them in the aisles. The members lapped up the technical side of the entertainment, and their XYLs lapped up the entertainment side of the technical points. Suffice to say that Dave is now the hero of the Division, and the pin-up boy of the XYLs, to say nothing of the boost he has received to his technical prestige.

The vote of thanks to Dave for his efforts was ably proposed by my favourite banker, Keith 5KH, and the applause in support from those present should have boosted Dave's ego no end. All jokes aside, it was a splendid effort on his part and only goes to show just how much ability lies dormant within the Division and only occasionally sees the light of day. Nice work, Dave, you sure rocked them.

There was a goodly sprinkling of the ladies present, which is all to the good, and they seemed to spend a very congenial evening mixing, eating and talking after Dave had finished. The evening concluded at the witching hour of 11 p.m., with everybody having thoroughly enjoyed themselves to the full.

Bill 5HR, who has been little heard of in recent times, was among those present, as was Joe 5JO and Mrs. Joe, to say nothing of many other celebrities, the names of whom escaped the memory of my espionage agent planted in the audience. Yes, you have guessed it, I missed the night, the first time for far more years than I care to remember, but duty called and after all I must eat. What's that? Why must I eat? Well, you have got something there!

The truth is out. Leith 5LG has been holidaying, as has Buck 5DA, hence the silence from Leith. It was not the aftermath of the chewed up cable after all.

Bob 5DO is due to move to Christies Beach in the new year, or so he was heard telling Joe 5JO at the station of the Brompton Boys' Club (5BA) the other night.

Len 5ZF is apparently a serious contender for the next Field Day honours. He has nine antennae erected and hopes to work all bands, although whether this means multi-operator effort, or that he has an octopus in training, I am at the moment not too sure. Anyway, he means business. That nine aerials sounds more like the "Umbrella Man," Jim 5JK of old, does it not?

The VK5 W.I.C.E.N. group had a very successful simulated exercise this month in conjunction with the Emergency Fire Service and the St. John Ambulance Brigade at the Mount Barker Oval. Although starting off on the wrong leg with the 53 Mc. base and mobile becoming temperamental, the gang soon became re-organised and from then on everything went with a swing. The Co-ordinator, John 5JC, was more than happy with the whole show, and the reaction from the outside was good. As is usual with the local press, no mention was made of W.I.C.E.N. in the write-up next day, but as long as those responsible were appreciative, then I suppose that is as much as we can expect from the outside world. More of this type of exercise for the W.I.C.E.N. group should prove a shot in the arm to all concerned, to say nothing of the experience gained.

Brian 5BI heard on 7 Mc. portable from Cowell in QSO with Keith 5TJ from Clare. Both signals coming in down here at great strength, and both sides appeared to be enjoying themselves.

Clem 5WG was another one to be heard on 7 Mc. with an outstanding signal. He was talking about going bush next day, but I did not stay long enough with his contact to find out just what that statement meant.

Heard the usual network hard at it on 7 Mc. the other evening. Reg 3MZ, Carl 5SS and Frank 5MZ. Going on the conversation, it would appear that Carl was the only one in any condition of health. Frank and Reg both on sick leave—Reg with a nasty sounding finger injury, Frank with symptoms unknown. Anyway, their injuries or complaints did not seem to have any effect on their usual good humour and leg pulling, but I did think that Frank seemed a little subdued. All OK now chaps?

Our worthy President, Phil 5NN, is having quite a lot to say on the habits of our local motor car drivers these days. He was on his way to work the other morning when a car in front of him stopped at the scene of an accident. Phil, did likewise, when without any warning shout of "give way"—"make way" —or even "Tom Way"—the car behind him gave him a gentle nudge—so gentle that Phil gave the car in front a gentle nudge as well. With Phil as the meat in the sandwich—and what a vocal piece of meat—things were quite hectic for a short while, and with damage to the tune of 70 fiddely dids or so, Phil wended his merry way down the Belair hill. Perhaps the word merry is a little out of place, but then we must keep up the image of our President—who would want to know that he spent all of his time on the way to work talking to himself!

Tom 5TL sent me a couple of letters last month and I had the audacity to tell him that I had not received them after a couple of days had passed by. Have you ever told a tea drinker that his Department has not delivered a letter? Well take my advice and don't!! When I finally broke down and confessed that I had not been out to my letter box for a couple of days and therefore had not picked the letters up, I got the impression that he was about to have a couple of inverse convulsions in series-para-phrased module. I think he accepted my apologies, although the noise he made in reply could have meant anything. However, he did say goodnight to me.

Talking of the Department—although why anyone would want to talk of the Department —another tea drinker in Arch 5XK came up for air recently and gave me a ring (on the telephone of course), but I was absent at the time. This of course did not deter Arch, who apparently spent the next hour or so talking to my XYL who gave a ready ear to all the untruths and coarse remarks that he was only too willing to tell her about me. However, he did extend an invitation to us both to drop in for a cup of the proverbial tea should we be passing, and I am somewhat tempted to avail myself of the offer. After all, there must be something in this tea racket!

Received a copy of the Port Pirie Recorder the other day with Amateur Radio being given the pride and place on the front page. It appears that local t.v. reception had been on the blink (no pun intended!) at Port Pirie and of course the Amateur copped the lot. The headlines stated—and I quote: "Secret enquiries into Local T.v. Reception. Hams say they are in the clear . . . Because of complaints of Ham Radio broadcasts allegedly interfering with t.v. reception in Port Pirie, members of the Port Pirie Amateur Radio Club conducted secret tests last week in an endeavour to locate unauthorised operators. Each licensed operator had his set sealed voluntarily during the period of the investigation which lasted a full week . . . According to the club the test proved that licensed Amateur operators were not responsible for excessive t.v. reception interference . . . All transmitters were sealed by the Deputy Town Clerk, Mr. R. Mudge." The front page of the "Recorder" was taken up by this and a lot more of what Ye Ed is fond of calling padding when applied to me, but all in all it would appear that the local club members had stood up on their hind legs and barked with good effect. Good work, but only time will tell if the scoffers and doubters are convinced. Thank you to the anonymous poster of the paper, perhaps not as anonymous as they would wish, and I will send the front page on to the magazine who perhaps will see that F.E. eventually receive it. By the way, I tried to get some reference to the matter in the local paper here, but as we don't live in a fringe area for t.v., the matter did not register.

Jim 5JK called in the other day to see me but again I was absent in the line of duty. My XYL tells me that his daughter is to be married in the New Year, and that Jim is a busy little bee. She did not say what sort of a "B". He is another one who has been on the sick list, but is now on the mend again.

I have been listening on 7 Mc. each afternoon lately in the chance that I might pick up some news of the doings of the locals, but all to no effect. I could always count on this band for a little gossip, distorted or otherwise, but even the regulars seem to have given the game away. I do seem to be able to hear plenty of VK3s and VK2s, but they never seem to gossip!

With news on the home front again scarce this month, I am up to my tricks of last month and brazenly pinching news from the latest issue of "Info," that well-put-together and welcome journal of the Elizabeth Amateur Radio Club, for which I humbly apologise and hasten to express my heartfelt thanks. Any actions, court or otherwise, to be addressed to the W.I.A., G.P.O. Box 1234K.

Les 5AX has temporarily abandoned v.h.f. to exploit his recently acquired transceiver on the square bands. Incidentally, the Gawler Scout Group has started a youth radio group and has taken out a licence 5BP. I assume under the guidance of Les, and is appealing for the necessary to start a junk box. What about it, chaps?

Brian 5ZBR is busy these days scaring the daylights out of Elizabeth gentry with transmitters by taping all and sundry with his new tape recorder. One must be careful just what one says on the air these days, must not one?

Don 5TM has bobbed up on 6 metres once again for his annual quota of DX.

Keith 5ZMK has been conspicuous by his absence, due possibly to the fact of the arrival of a new harmonic—a bonny bouncing boy. Congrats. go to Rosie and Keith, with particular emphasis on the brave front exhibited by the father. There is no doubt about it chaps, we fathers have a lot to battle for, it always amazes me how we ever pluck up courage to have the second youngster!!

Rumour has it that Brian 5ZNK and Bill 5WV are contemplating operation on 52 Mc. this Xmas. Father Xmas have anything to do with this?

From the DX column in this same journal I glean the snippet that Bill (ex 5BS) is now stationed at Singapore and operating with the call sign of GM4GZ until he gets his own call.

Still talking of "Info," I strongly recommend the Editorial of the latest issue on the I.T.U. Fund. This is well put together, sensible, and a both-sided approach to the question; a little unusual in that so far all writings on the subject in the magazine and Divisional journals assume that there are not two sides to the subject. I think the closing paragraph sums up the subject very well, and I quote: "Perhaps it is not much good buying a new tube only to have to use it in the family radiogram. We should, however, consider other aspects of this representation before sending our money the same way as the last lot went." The editorial refers in the main of course to the latest issue of the VK5 Journal.

Frank 5FA, of Oodnadatta—that Frank is a shot in the dark, but if I am not right, plenty will let me know—who has not been on the air since pre-war, has been bitten by the bug again and is more than interested. He previously held the calls of 5FB and then 4DZ.

My spies tell me that Arch 5XK has been receiving one or two letters from DX-land asking him if he is going to have another DX-pedition this year. These enquiries are because about this time for the past couple of years he has DX-peditated to Norfolk Island, much to the satisfaction of the Ws and other interested key thumpers. My theory is that the flesh is willing but the pocket is weak—am I right Arch?

My gentle admonition to Mr. Wilson (4RW) —we are still not on christian names standing— regarding his trying to put himself in for a "cuppa" with the girls from VK2, certainly brought in its wake a lot of flattering remarks as to my chance of ever getting invited to join the girls in a tea drinking session. One character was even heard to remark that if I cared to drop in at his QTH any time, my dainty hands would surely be holding a cup, but the cup would not be holding tea! Nice of him, was it not? Anyway, when I summed up the total of flattering remarks I began to wonder if I had allowed my natural modesty and reserve, to say nothing of my old-world gallantry, to get somewhat out of hand, and that I had over-estimated my fatal attraction for the opposite sex. Just as my confidence had reached rock bottom, who should I spy galloping over the moat toward my drawbridge, none other than a telegram boy. With thoughts that Mr. Adams of VK3 fame had at last decided to recognise my humble efforts toward keeping his empire going, I rushed to the door to take delivery and found to my surprise and gratification that it was even something better. I quote: "Your dainty hand will surely hold the cup"—signed Verle 2MR. I shall be at home to greet the queue of scoffers and unbelievers who will surely be along to humbly apologise for their lack of appreciation. My sincere thanks Verle, for your kind invitation, but not a word to Bessie! Incidentally, my XYL is living in hopes that some gentle reader will send her a telegram or letter expressing sympathy for her in her being tied for life to a conceited windbag. Flattery—flattery—that is all I seem to get. Fat chance she has got of ever receiving a communication along such misleading lines! Oh, by the way, the telegram was addressed to Pansy Parsons, a fact which seemed to cause the telegram boy considerable amusement.

Have heard a lot about street lamps that replay B.B.C. music, of electric toasters that give out Morse signals, and even of gas stoves that at times play excerpts from the A.B.C., but it was only this month that I heard of a water tank that tapped and thumped in rhythm to a commercial broadcasting station musical efforts. The discoverer of this mystery was none other than Bob 5BG, and after intense research and a little bad language, a large goanna was found half way in the down-pipe of the tank at his work, merrily threshing his tail, more often than not in tune to the music from the monitor speaker. Science fiction at its best, eh Bob?

Some are born to fame, some have fame thrust upon them, others are just famous. It must be marvellous to be famous and so well

known that when a fellow Ham rings up and asks for Mr. Ovaltine, the said fellow Ham is automatically connected to Mr. Haseldine (5JC). True as true!

The V.h.f. Picnic, held this month at "Walnut Paddock," in National Park, was the social event of the month and resulted in the roll-up of a keen and happy group of Radio Amateurs and their families, all of whom thoroughly enjoyed themselves. The weather on the morning of the Picnic did not give any encouragement to those intending to venture into the hills, but by the afternoon it had turned out quite a fair day, and aside from the high wind, conditions were ideal. There were three well contested competitions, more than a fair share of goodies, ice cream, soft drinks, etc., quite a number of harmonics falling in and out of the creek (much to their enjoyment and their parents' annoyance), to say nothing of a chance of enjoying a real good old chinwag on matters Radio, and last but by no means least, a chance to relax in congenial company with common interests. Although it was named a V.h.f. Picnic, members of the square bands turned up in force, Council being particularly well represented—the President (Phil 5NN) and the Vice-President (Ross 5KF) being among those present—and all in all, the day was more than a success and something of an indication to Council that an annual picnic is good public relations for members. To those responsible for the arrangements, a hearty pat on the back, your efforts were well rewarded, keep up the good work.

I note with dismay, and a feeling of hurt, that in one of the contests at the Picnic—the one in which names of important people in Amateur Radio were included for solution—the name of Pansy was not included, although it was said that the picture of the elephant gave several people ideas!!

Well, this is the end of another year, and I feel the end of a very successful year for the VK5 Division. May I extend to my one reader of these notes the compliment of wishing him, or perhaps it is a her, anyway, whoever it may be, all the best for the New Year. Do your little bit for our grand old hobby, no matter how small. And always remember, you only get back from a hobby just as much as you put into it! 73, 5PS—PanSy to you—especially to you Verle 2MR!!!!

— . . . —

## WESTERN AUSTRALIA

The meeting for October was very well attended and during the night some lively discussions took place. One of our members had a grievance and brought it along and aired his feelings. This is as it should be as then your Council has a chance of doing something about it. If you don't let them know your feelings, they cannot help you. So what about it?

After some discussion on a motion to increase the subs. by 5/- per year, it was put to the vote and was carried unanimously. This means that as from the beginning of the financial year you will have to pay an additional 5/-. If you stop and look at this rise you will realise that it is only small and the first rise which has taken place for a large number of years.

From around the country we have been able to gather some items of interest. Katanning, Herb 6XO has obtained a new sideband tx and you can certainly tell the difference when you hear him on the air. From Katanning also we hear that George 6XG has something new but alas, it is not radio wise but in fact something which may keep him off the air. How about drilling some holes in it to mount some mobile gear, George. I am sure that no one would object to this! Still from the country, we hear about an active Amateur from Donnybrook who has purchased himself a fishing rod. Jack, I understand that you intend using this for its original application and not to repair your Quad. Good fishing, Jack, but take along some portable gear for when the fish are not biting.

Moving along to Bunbury we hear that Ted 6JG is going to the Eastern States and is going to bring back some commercial sideband equipment. Good going, Ted, and you certainly deserve it. Swinging back to Narrogin, Pat 6PH seems to be very much alive and more active since his stay in hospital, what was that theme song they played for you Pat?

Then we move up to the metro. area and we find that 6DP was very occupied on the night of the Council meeting. Of course we should not have held the meeting on People's Day of the Royal Show, Tom, but what was she really like? Our President Vic 6VK is at present expanding his knowledge and we wish him well with his studies. Rolo 6BO has been away up north with his caravan and although he has taken gear with him, I have not heard him on. Probably he has been on and I have not been around.

The results of the 80 mx scramble were: 6WL won the fixed station section and 6KN won the portable section.

The W.I.C.E.N. f.m. units have all been placed now and you can hear a lot of chaps using this gear if you care to switch on. I am not sure of the exact number of units, but it is somewhere around 20.

This Division's quota for the I.T.U. Fund was £225 and although you may have seen printed that we have only paid a small percentage of this the figure published is not correct. In fact we have sent to Federal Treasurer an amount of £219/19/0, so you can see that we are well up on our figure.

This seems to be all for now, so don't forget that I want information to publish and your Council wants to hear your complaints as well as your suggestions. 73, Roy 6RY.











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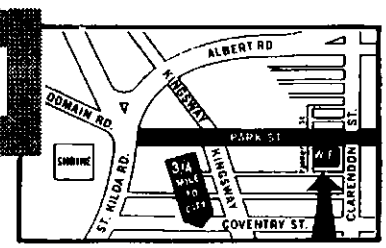


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W.F.9

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FEBRUARY 1965


5PS! See story on page 22.

Vol. 33, No. 2

2/6

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# "AMATEUR RADIO"

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## OUR COVER

Notes contributor, Warwick Parsons, VK5PS. See story on page 22.

## FEDERAL COMMENT

★

### V.H.F./U.H.F. GEAR

Over the last few years, groups of enthusiastic Amateurs have been breaking new ground in the v.h.f. and particularly u.h.f. frequencies in Australia. New distance records have been set on the 288, 576, 1215 and 3300 Mc. bands, but it is almost certain that these achievements have passed unnoticed by all but those few who have been involved. Although v.h.f. and u.h.f. records are periodically published in this journal, few Amateurs would have paid much attention to them.

A quick survey of technical articles by Australian Amateurs in this journal in the last three years has revealed that only two full length articles and one short one have been published dealing with equipment in the u.h.f. frequencies. This appears to represent a lack of interest by those concerned in u.h.f. experimental work, in recording their exploits and thus stimulating interest by others in their work.

The nature of equipment in these frequencies is such that, by present standards it must be home-built and tried, and involves considerable ingenuity in its construction. Surely the publication of articles on the gear used in these records would be of widespread interest and at the same time would record, for posterity, the equipment used.

### FIELD DAY CONTEST

This month once again introduces the John Moyle Memorial National Field Day Contest on the 6th and 7th. Whilst this Contest has not always in the past enjoyed the popularity it rightfully deserves, there are always many of the same old entrants in the field, each vieing with the other for personal honors. Of more recent years, the rules have been extended to include multi-operator stations and mobile stations.

These changes to the rules has encouraged several club stations and other stations to participate, but there is still room for many more portables "to get out and go". In this age of transistors and more compact but still efficient aerial systems, one would image there would be greater interest in this annual event to perpetuate the name of a great "mobiler" himself—the late John Moyle.

The popularity of this Contest can really only be measured in the number of stations who go portable or mobile and not by the number of fixed or home stations who may provide contacts when there are insufficient field stations to make the event worthwhile. You can promote the Contest these days without an expensive rig as the power limit is 25 watts. Maybe you won't work much DX these days with that power, but on 80 or 40 metres you will get more than your share of participating stations if you can spare the time to get away from the shack for the week-end. What about a try, fellows?

FEDERAL EXECUTIVE, W.I.A.

## CONTENTS

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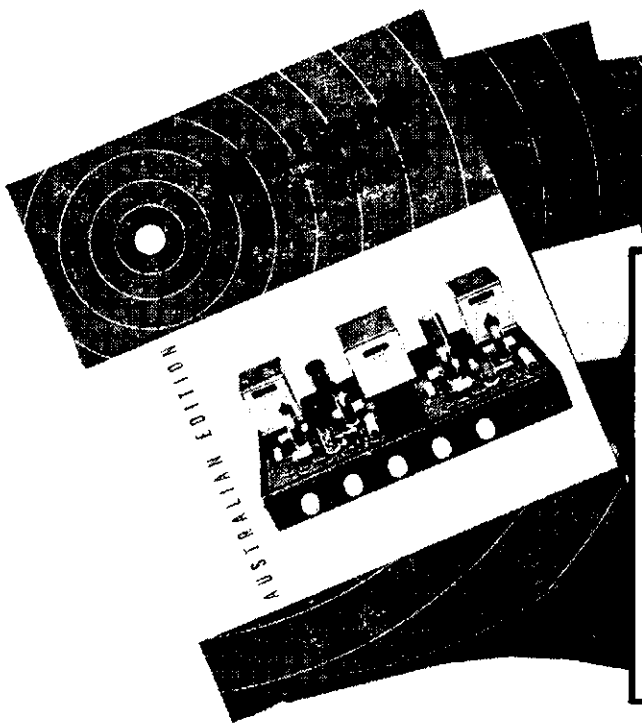


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# Further Modifications to the 522 for F.M. Operation

E. C. MANIFOLD,* VK3EM

WHEN the 522 was modified and first installed there were no other channels in use except channel A, and therefore no means of checking interchannel interference under working conditions.

A suggestion that interference may be experienced was given when the unit was checked with a signal generator, as there appeared to be a spurious response at one position.

**RECEIVER**

However, time has proved that the use of two crystal oscillators in the receiver for each mixer has given serious interference with interchannel A, B and C operation, mainly due to the selected second mixer crystal frequency of 7320 kc.

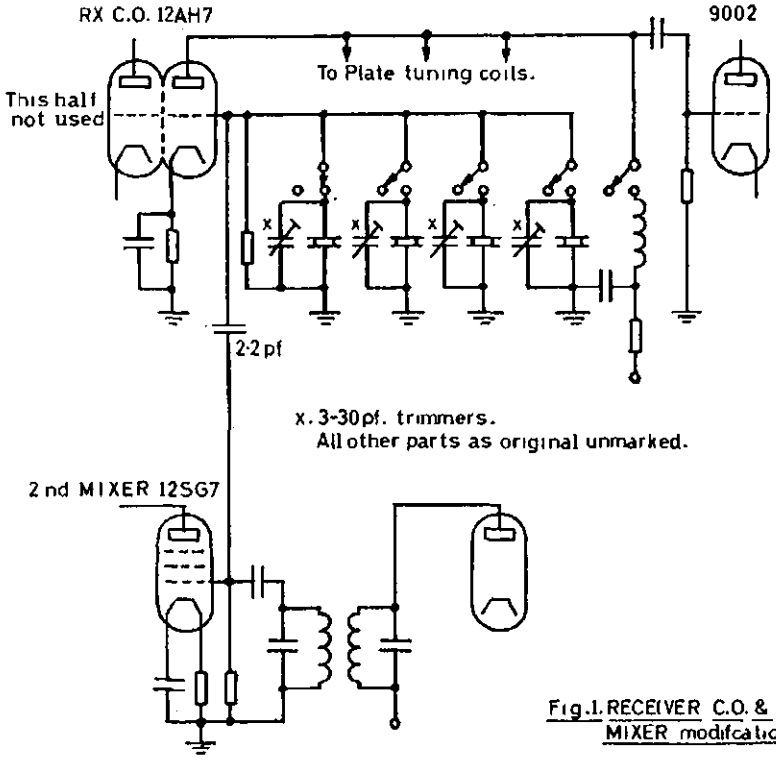



Fig.1. RECEIVER C.O. & MIXER modifcation.

To eliminate the problem, the 7320 kc. crystal has been removed and the 7450 kc. crystal has been used for both mixer injections, v.h.f. and h.f., for channel A, and the i.f. frequencies changed to suit this arrangement.

This was mentioned in the original article as a possible method of achieving mixing for both conversions from the one crystal, and has proved to be necessary.

The receiver crystals now in use are: Channel A, as originally, 7450 kc.; channel B, now 7458.11 kc.; channel C, 7466.33 kc., and, although not yet in use or tried, channel D, 7475.33 kc. Each crystal is paralleled with a 3-30 pF. trimmer to allow adjustment to correct net frequency.

The first i.f. is slightly changed to 11.754 kc. and the second i.f. channel is now 4.3 Mc., which can easily be covered by the tuning slug adjustment in the i.f. coils.

Initial alignment should be done as suggested in the original article (Oct. and Nov. 1963 "A.R.") on channel A and after the i.f. alignment has been made with the ratio detector adjusted to centre frequency, change to channel B, C and D in turn and adjust each crystal trimmer to give a centre zero reading on the ratio detector when netted on the net frequency **to a standard transmission**.

Modify the original circuit to show a 3-30 pF. trimmer across each receiver crystal and second mixer injection as shown in the circuit of Fig. 1.

It is suggested that adjustment of oscillator injection should be experimented with, to give a limiter current of 60 to 80 μA. on noise alone.

It is possible to provide injection voltages at each mixer to give quite high limiter grid current. This is misleading, as it appears that the receiver is at a more sensitive condition. In actual fact, the receiver may not unmute except on very strong signals, which will mean that the weaker signals will be missed.

The explanation for this is not simple or straightforward. Broadly speaking, the muting amplifier amplifies an audio component present in the plate circuit of the limiter, and if too much oscillator voltage is injected at each mixer it appears that on marginal signals a fairly high mixer noise is generated, which is amplified by the i.f. strip to the limiter, and further amplified by the muting amplifier to produce greater rectified d.c. voltages as muting bias to the audio amplifier, which will bias the audio tube well past cut-off.

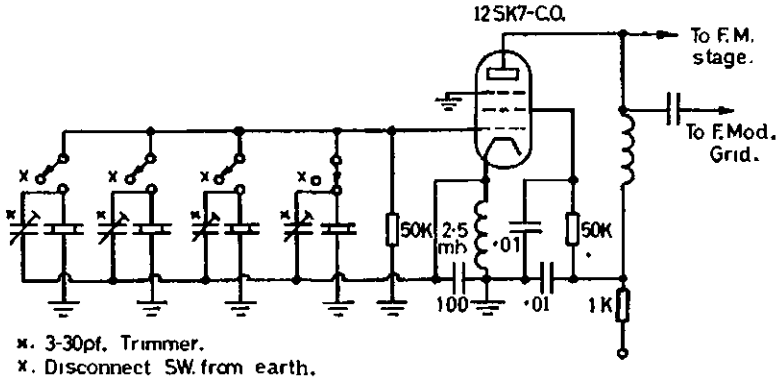
The indications seen on the limiter grid meter will be a rise in limiter grid current for a received signal, but the set will not unmute until the signal reaches a fairly strong value.

Incidentally, if you want to listen to an a.m. signal with the f.m. receiver, an audio voltage can be picked off the limiter grid and fed to the audio amplifier, as the limiter is, among other things, a grid leak detector.

**TRANSMITTER**

Again as mentioned, only single channel operation was in use at the time of the 522 modification, and adjustment to the crystal oscillator frequency by addition of parallel crystal capacitance proved to be difficult with the circuit shown, as adding C across the crystal only succeeded in reducing the feedback voltage across the grid cathode circuit, with the resultant unstable crystal operation, and increasing the C beyond 10 pF. put the circuit out of oscillation.

(Continued on Page 23)




*. 3-30pf. Trimmer.
x. Disconnect SW. from earth.

Fig. 2. TRANSMITTER C.O. Modified formulti-channel operation.

* 267 Jasper Rd., McKinnon, S.E.14, Vic.

# NO-SPACE AERIAL SYSTEM FOR SIX BANDS*

## GETTING THE MOST FROM THE MINIMUM SITE AREA

*L. H. THOMAS, M.B.E. (G6QB)*

WHERE aerial systems are concerned nearly all Amateurs work under difficulties—that is to say that they are seldom in a position to put up the aerial that is theoretically best suited to their requirements, or even anything remotely resembling it.

The main reason why we, as Amateurs, are achieving results which no commercial communications system designer would look upon as possible, is that we have the gift, or the knack, of improvisation, forced upon us by circumstances. And the chief of these is lack of space.

The few fortunate owners of "aerial farm" facilities can choose and decide upon direction, length and height, and put up exactly what they want for each band. But for every one of these exceptional cases, there are a thousand Amateurs who say "I only work Twenty, because my garden is only 35 feet long," or "No good trying Top Band, because I can't get out with a 67-foot wire" . . . and so on.

It is chiefly the man who would like to work all bands who suffers from lack of space; if you are content with good DX on Twenty, you can probably put up a small beam and call it a day. Or if Forty is your favourite, a groundplane or loaded vertical will see you through. But to work all bands, Ten to One-Sixty, with reasonable efficiency, you need either a lot of space or plenty of patience, time and ingenuity. And even then you mustn't expect to beat the top DX'ers at their own game!

### NO SPACE AT ALL!

To show what can be done by almost any Amateur transmitter, without heavy expense or even any purchase of commercial gear, it was decided to start from the premise that no space at all was available in the way of a garden. The house or bungalow itself would have to form the boundaries of the aerial system, with no masts or erections of any kind permitted in the backyard, or whatever space might in reality be available. This was taken to be about the most difficult case with a definite object in view (although it is realised that some people in flats or terraced houses could be even worse off).

The basis of the aerial system was a mast of the usual t.v. variety, fixed (by the local t.v. dealer) to the chimney-stack at the centre of a smallish bungalow. A 20-ft. length of dural was used, but allowed to overlap the chimney by four feet or more, to give a really firm support. A continuous halyard of tough nylon line (435 lb. breaking-strain!) was run through an insulator which was securely fixed to the top of the mast instead of a pulley.

* Reprinted from "The Short Wave Magazine," April, 1964.

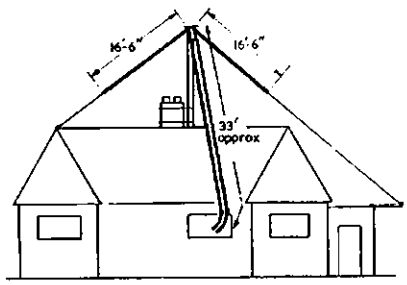



Fig. 1.—General layout arrangement of the inverted-Vee system discussed by G6QB in his article. In suitable locations, the arm-lengths could be doubled and a higher roof-mast used. The feeder-terminating configurations for six-band working are shown in Fig. 2.

Since the band of greatest interest was to be Twenty, a dipole for that band was chosen, and in view of the fact that sloping dipoles (mis-named "Inverted Vees," which are something quite different) are so efficient, this type was decided upon. Indeed, it was mandatory, since one cannot put up a horizontal dipole without **two** supports!

It was found that the two legs, cut to 16 ft. 6 in. each, sloped down at about 40° from the horizontal when they were pulled out to the extremities of the building (again using nylon cord for the purpose). With some shapes and sizes of building the angle of droop will be steeper, but this does not appear to be critical, and since tuned feeders are used, any deviation of the centre impedance from 72 ohms is of no consequence.

A length of open-wire line was made up, and fortuitiously turned out to be roughly 33 feet from dipole centre to lead-in insulators, allowing for a slight pull-out to avoid guttering and so on. The feeders were made of ordinary plasti-covered lighting flex, 33 feet of the "flat twin" variety being pulled apart into two single wires. Polythene curtain-rail was the material chosen for the spreaders. The curtain rail, in this instance, was cut into three-inch lengths and drilled to give a slight clearance for the flex. One spacer every eighteen inches was used, and each one was sealed to the plastic insulation of the wire by a dab with the soldering iron.

### SUPPORTING THE AERIAL

The centre should obviously be hauled up to the very highest possible point, with both legs and the open-wire feeder drooping down the roof. Even this simple arrangement gives scope for some vicious tangles and catchings-up on obstructions, under tiles and at the eaves—but keep a clear head and you will end up with the feeder coming down centrally, and the two legs of the dipole, extended to any convenient length with nylon or polythene cord, dropping on either side. From this point everything depends upon the shape and size of the house or bungalow.

In this particular case it was a long-ish shape, with garage at one end, and the anchorage points for the cords were pretty obvious. At one end a slight extension was made by means of a horizontal pole attached to the garage roof, and a similar dodge could have been used at the other end had it been necessary. Small egg insulators were used between the dipole ends and the nylon cord, but the insulation of the latter is so good that they are hardly necessary. The general configuration is shown in Fig. 1.

Erection completed, and the feeder connected to two lead-in insulators, all that remained was to make sure that the thing worked! There was obviously going to be no doubt about this on Twenty, so that band was taken first, and then the scheme for each of the other bands tried out.

### SIX-BAND SUITABILITY

The configurations are shown in Fig. 2, from which it will be seen that the aerial is used as a loaded vertical on One-Sixty and Eighty; as a tuned vertical on Forty; as a straight doublet on Twenty; and simply as a centre-fed wire tuned to resonance on Fifteen and Ten. On Ten, actually, it can be regarded as two dipoles in phase, whereas on Fifteen it is a kind of elongated dipole, part of the feed-line having been separated out, so to speak, and allowed to radiate along with the aerial.

On Twenty, if the feeder is roughly 33 feet long, it will give a good match into 72 ohm line and no a.t.u. will be necessary. This is because the half-wave of feeder will show the same impedance at the bottom end as it is confronted with at the top, and will therefore be very near 72 ohms. If the 33 ft. line is not practicable, no matter—use the a.t.u. to produce a match into whatever impedance the bottom of the feeder looks like.

If a choice of direction is possible (after all, most houses have four corners!) a little thought about this will be worth while. The natural run for the actual aerial described was roughly NE-SW, which meant that it was extremely good for the U.S.A. (check up on your DX Zone Map!), but very poor for New Zealand and South America. Unfortunately, being good for the U.S.A. meant that it was also good (much too good) for South-East Europe, whence so many strange noises originate. Eventually, by means of some juggling, a run was fixed upon which was almost East-West . . . but you will have to make your own individual decision according to local circumstances.

Excellent reports were received with 150 watts into this aerial on Twenty—comparable with, or even better than, those from a long-wire which had previously been in use. Countries worked included KH6, KL7, ZL, JA, W, VE,

ZS, CE, VP8, FB8, VS9, VU, VS1 and many others.

And so to Forty! On this band the aerial is a vertical quarter-wave which has been made somewhat too long by the arms of the dipole—the feeder alone would make the quarter-wave. By means of the usual type of a.t.u. a good match was obtained, and it was very heartening to note that it did exhibit the characteristics expected from a ground-plane. European stations were one or two S-points lower compared with the long-wire (which had been left up for comparisons, but was later taken down), and this led to the belief that the efficiency was not going to be high. However, after darkness had come, the heartening discovery was made that W and VE stations were two S-points better on the vertical than on the long wire! Switching over quickly from one to the other, using two a.t.u's, confirmed that the ratio of DX to European QRM was very much better on the vertical.

A really good earth connection is obviously a necessity here, and since the "no-space" claim had been made, it was felt that the use of radials or a counterpoise would be cheating. So the mains earth was carefully bonded to three different water-pipes within the house, and a long earth-spike (six feet of it) was knocked in the ground just outside the window. Results spoke for themselves, reception being excellent, and transmission on 40 metres (with 150 watts of c.w.) fetched in 579 and 589 reports from W1, 2, 3 and 8 as early as 2130 G.M.T.

## THE L.F. BANDS

There has been little compromise so far; on Twenty, fed as a doublet, the aerial did what was expected, and on Forty, with the feeders strapped, it definitely exceeded expectations. So to Eighty, with some trepidation, where the feeders remained strapped, but the aerial was a pretty short vertical for the band. Serious loading was used, as in Fig. 2(a), and the normal run of s.s.b. and c.w. contacts around Europe were made. The pleasant surprise came when 5A3CJ appeared on 3785 kc. s.s.b., quite early one evening (around 1900) and was at least one S-point better on this small vertical than on the long wire. At the time of testing, Eighty was going through a bad patch for DX, and the early morning ZLs had gone, so, regrettably, it was not possible to test the aerial on them. But on reception it seemed excellent on any stray DX that did come up; and on the transmitting side good reports were received from all the normal run of 80-metre contacts. After all, some of the keen DX types achieve outstanding results with 60-foot verticals on this band, and the total length of this one, from the bottom of the strapped feeders to the dipole tips, is 50 feet or thereabouts, so it is not too much of a compromise.

On One-Sixty, though, it really is! It is definitely not the aerial for attempting DX on Top Band. But for local and semi-local work, and even for occasional GDX, it is more than adequate. After all, it is a pretty good aerial compared with some of the mobile whips that achieve excellent GDX results. The same series-tuned loading coil was used both for Eighty

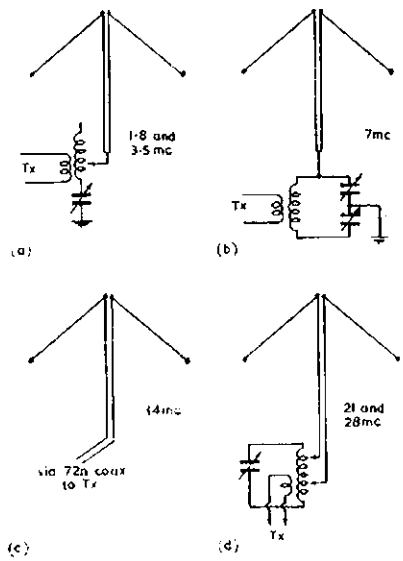



Fig. 2.—In (a) it is shown that by strapping the feeders and series-tuning the whole system against ground, operation on both l.f. bands can be obtained. The other sketches show the transmitter-end arrangements for working the h.f. bands. The only requirement at the station end is a versatile a.t.u.

and Top Band; it was the same size as a normal Top-Band tank coil, and provided with numerous taps. The best combination of coil size and tuning condenser setting was found simply by playing with both until the maximum aerial current was obtained at the lead-in point, where the feeders were strapped together.

The best contacts on One-Sixty were with DL, OK and HB9, all with pretty weak reports—but at least the ten watts did get there. Those who fight shy of the 160-metre band because they think they can't put up a good enough aerial might at least try this arrangement, and would probably be surprised.

## TEN AND FIFTEEN

It has been difficult to assess results on these bands, which have not often been open at the times available for testing. But the performance on Fifteen seems at least equal to that on Twenty. An a.t.u. is necessary, of course, and it can be either of the kind shown for Forty (Fig. 2b) or just a simple tuned coil with tappings (Fig. 2d). You can, of course, strap the feeders and try it as a vertical on these h.f. bands, but the t.v.i. situation is likely to be worsened if this is done. As a "long dipole" on Fifteen, and two dipoles in phase on Ten, no t.v.i. was encountered and the reception characteristics were extremely good.

On Fifteen, in fact, some amazing reports were received from Ws on one of the rare days when the band was wide open. C.w. produced several 599 reports, and s.s.b. brought in some 8s and 9s and even a 9-plus or two; the direction of the aerial was favourable for U.S.A. at this time.

Contacts on Ten were confined to locals and the odd European when conditions permitted, but it is pretty obvious that the aerial would perform excellently in the preferred directions when that band is once more open for consistent DX.

## SUMMARY

There may even be reasons why people who have plenty of space might like to try this simple aerial system, which is so compact that it can often be installed without interfering with any other wire or beams that may already be up.

Its advantages are: Simplicity of erection (one pole only); no need for space apart from the actual house plot; versatility (six bands); and certainty of excellent results now on at least three bands (Fifteen, Twenty and Forty).

Among the disadvantages should, in fairness, be mentioned the need for a really good earth system for the bands on which it is used as a vertical; also the fact that there will still be some readers who cannot make use of their roof or chimney-stack in this way owing to the prior claim of t.v. aerials; and its possible unsuitability for terraced houses, flats or council houses in which roof masts are not allowed.

However, it may possibly prove helpful to quite a number of short-garden owners to whom it has not previously occurred that one good high mast can be put to just as great a variety of uses as a variety of small ones, fences, trees and so on.

Try other lengths of radiator, by all means, if you have the space available; two sloping lengths of 33 feet each, if they can be accommodated, will give you two dipoles in phase on Twenty, and a rough equivalent of a vertical half-wave on Forty. They would probably be more interesting on Eighty and Top-Band, too. But the basic idea of starting with a Twenty-metre doublet is simple and effective. ●

☆

# B.E.R.U. CONTEST

Radio Amateurs throughout the British Commonwealth are invited to take part in the 28th B.E.R.U. Contest to be held on February 20-21, 1965.

**Sections:** The Contest is divided into two sections: (a) High power—maximum licensed power; (b) Low power—maximum input 25w.

**Duration:** The Contest (both sections) will start at 0001 G.M.T. on Saturday, February 20, and end at 2359 G.M.T. on Sunday, February 21, 1965.

**Entries:** Entries must be postmarked not later than March 15, 1965, and must be addressed to the Contests Committee, Radio Society of Great Britain, 28 Little Russell St., London, W.C.1, England.

**Bands:** Operation is restricted to the following bands: 3.5, 7, 14, 21, and 28 Mc. Transmission must be of type A1 (pure c.w.) only, and frequent tone reports of T8 or less may result in disqualification.

**Contacts:** Contacts may be made with any station using a British Commonwealth call sign except within the entrant's own call area. Only one contact on each band with a specific station will count for points.

**Scoring:** Each completed contact will score five points. In addition a bonus of 20 may be claimed for the first contact with each new Commonwealth call area on each band. All British Isles Stations (G, GB, GC, GD, GI, GM and GW) count as only one call area.

The contest number of six figures shall be made up of the RST report and three figures starting with 001 for the first contact and increasing by one for each successive contact, e.g. 559001 for the first and 439002 for the second contact, and so on.

**Logs:** These must be set out as follows: Date, Time (G.M.T.), Call sign of station worked, No. Sent, No. Received, Band (Mc.), Bonus Points, Points Claimed. Total points equal Points Claimed plus Bonus Points.

**S.w.l. Section:** There is an s.w.l. section and the rules are as for the transmitting section.

# SEMICONDUCTOR POWER SUPPLY FOR TRANSCEIVERS

THE following features apply to this semiconductor power supply:—

1. Uses t.v. type power transformer (e.g. H.M.V. part 9040251/2).
2. Gives voltages of 12v. a.c., +300v., +600v., —150v., and +15v. d.c.
3. Reliability greater than vacuum rectifier supply.
4. Regulation better than vacuum rectifier supply.
5. Uses readily available parts.

This power supply was built to supply a Heathkit HW22 transceiver and would be suitable for a Swan transceiver.

OA210s, or their equivalent, are available cheaply and, if space is not important, disposals condensers (100 μF. 150v. wkg. 200v. peak) may be used. These should be in series where indicated to cover the voltage rating. A resistor (50K) across each electrolytic would be necessary for the series arrangement to equalise the voltages. Capacitor values are not critical and smaller sizes may be satisfactory.

It will be seen from the circuit that voltage doubling and quadrupling is used.

The transformer used was rated at 120 watts (continuous) on the high voltage side and 60 watts on the 12v. winding. However, a sideband transceiver would require a transformer with about half these ratings.

—M. E. COLLETT, VK2RU.

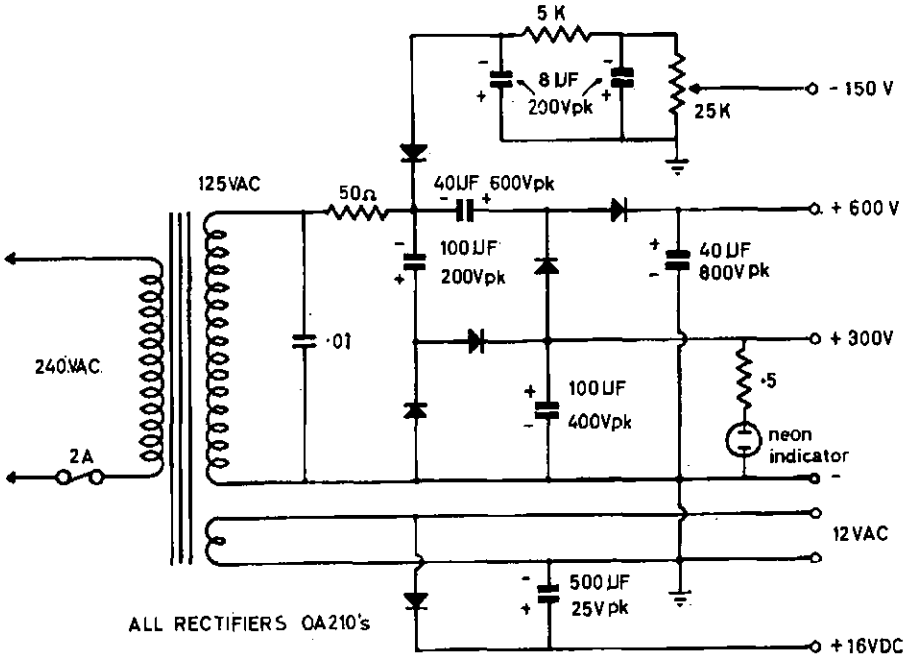



Fig. 1.—Semiconductor Power Supply.



## AMENDMENT TO NATIONAL FIELD DAY CONTEST RULES

Readers are asked to note the following alteration to the Rules of the John Moyle Memorial National Field Day Contest, 1965.

Delete Rule 8 as published in Dec. 1964 "A.R.," and substitute:—

"8. The following shall constitute Call Areas: VK1, VK2, VK3, VK4, VK5, VK6, VK7, VK8, VK9, and VK0."

AMATEUR FREQUENCIES:

USE THEM OR LOSE THEM!

# LASERS*

BY STANLEY LEINWOLL†

## Part 2—The Conclusion of Lasers; the Amateur's Role in this New Challenge.

THE laser is potentially one of the most revolutionary inventions in many decades. Its possible impact on Amateur Radio is far-reaching. Last month we presented a brief history leading up to the invention of the first laser. Since that historic occasion, significant progress has been made toward the use of the laser in communications, and several successful experiments using a beam of light to carry both audio and video have already been run. This is the concluding article on the laser and includes a look at the future in terms of the Radio Amateur.

### THE GAS LASER

In February of 1961 scientists at Bell Laboratories announced the first achievement of continuous operation of the gaseous optical maser. Although structually much different from the solid state laser, the basic principles are the same.

The device used as an active medium a mixture of gases. The cavity consisted of a quartz tube about 80 centimetres long and 1.5 centimetres in diameter.

The first laser used neon and helium gas in proportions of 90 and 10% respectively, at a pressure of 1 to 2 millimetres of mercury. It produced five coherent infra-red emissions, the strongest at 11530 angstrom units.

At either end of the quartz tube (see Fig. 5) highly reflecting parallel mirrors in metal chambers are used to reflect the stimulated light back into the cavity. Flexible bellows in these chambers would permit external adjustments to the mirrors. At the end of the system were two optically flat windows through which the undistorted laser beam could leave. The entire device was about 1 metre long.

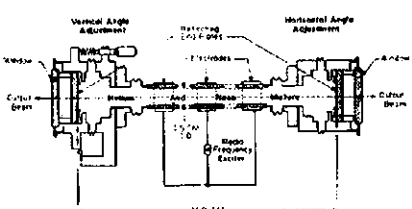


Fig. 5.—Construction of a gaseous optical maser built at Bell Laboratories. The r.f. excitation was at 28 Mc. and the output was in the infra-red region.

### R.F. PUMPING SOURCE

A 28 megacycle radio frequency generator fed energy to three electrodes surrounding the tube, creating a discharge inside the tube. Since the output was in the infra-red, an image converter was needed to see the beam.

The best maser beams diverge only about one minute of arc—at a distance of two hundred feet a beam would cover a spot less than one inch in diameter. The spectral linewidth of this emission is but a few billionths of an angstrom, or a few cycles per second, representing a linewidth many times less than that of the solid-state optical masers. Thus it represents the purest "color" ever generated.

Since the development of the first gaseous laser many refinements have broadened both the efficiency of the device, the frequencies produced, and the number of gases which were made to "lase". In addition to the helium-neon laser, devices have been developed which produce optical maser action in all the noble gases, helium, argon, neon, krypton, and xenon. Gas lasers using neon-oxygen and argon-oxygen mixtures have also been developed.

Frequency ranges now extend from the infra-red to the visible part of the spectrum, at a frequency of 6328 angstrom units.

Gas lasers have been extremely useful in performing precise scientific measurements, due to the purity of the signal produced, and the narrowness of the beam.

### THE INJECTION LASER

From the communications standpoint, and where the interests of the Amateur are concerned, perhaps the most significant development in the field of lasers occurred in November 1962, when an entirely new concept in the production of coherent radiation was announced by International Business Machines Corp., G.E., and M.I.T. almost simultaneously.

The new device, called an injection laser, employed a semi-conductor diode driven directly by an electric current, rather than by making use of an external energy source, as solid state and gaseous lasers had been doing.

The chief drawback to the use of solid and gaseous lasers for communications was in modulating and demodulating at frequencies in the million megacycle range.

The injection laser is easily modulated simply by varying the input current. Here is how it works:

The injection laser consists of a gallium arsenide semi-conductor diode through which an electric current is passed. When the current flow reaches a certain threshhold level the diode emits coherent light. The diode, shown in Fig. 6, consists of an n-type region

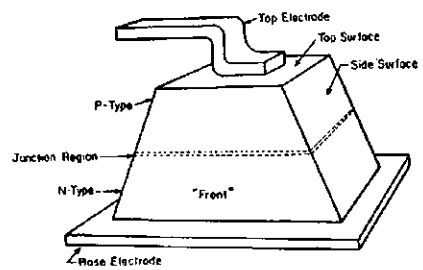



Fig. 6.—Construction of the General Electric Gallium Arsenide diode laser. The front and back surfaces are highly polished and perfectly parallel. The junction region is only about 1/10,000th of an inch thick and coherent light is emitted perpendicular to the front and back surfaces along the junction.

which contains an excess of electrons. This region is physically joined to a p-type region which contains a deficiency of electrons. A deficiency of electrons is also referred to as a "hole".

Light is produced in a semiconductor by passing a current through it. Electrons from the n-region move across the junction and are injected into the p-region, where they drop into holes. The electrons which move across the junction possess energy when they are in motion, and once they drop into a hole some of this energy is given up in the form of a photon of light.

Materials have been known for some time that emit light when subject to an electric current. These are called electroluminescent. What was not known, however, was that it was possible to produce coherent light by applying a large enough current.

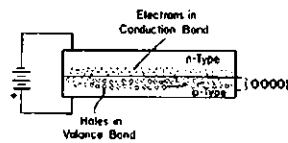



Fig. 7.—Diagram above shows how, on application of forward bias, electrons are injected into the p-region. When an electron drops into a hole, a photon is released.

### THE GALLIUM ARSENIDE SEMICONDUCTOR DIODE

Semiconductor diodes are prepared by adding impurities. The Gallium Arsenide injection laser is made by adding impurities in the form of tellurium and zinc, which produce n- and p-type materials. These are joined, producing a single crystal, one side of which contains the n-type material, the other the p-type.

On application of current, electrons move across the junction into holes. The process is called recombination, and results, as we have said, in the emission of a photon. This is shown in Fig. 7. These junctions, incidentally, have other unusual properties, and are the basis of most other semiconductor devices such as transistors and semiconductor rectifiers.

### PRODUCTION OF COHERENT LIGHT

If the forward bias that is applied to the semiconductor is great enough, a large number of electrons and holes will concentrate in a very narrow region, about 1/10,000th of an inch wide on the p-side of the junction.

In the active region large numbers of photons are emitted. These, in turn, stimulate the emission of more photons by accelerating the recombination of injected electrons with holes. Each time a photon stimulates the emission of a second photon, the emission occurs in **phase** with the first, and **in the same direction.** It is for this reason that the resultant light is coherent as shown in Fig. 8.

Since the thickness of the active region is so small, emitted radiation

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* Reprinted from "CQ," September, 1964.

† Radio Frequency and Propagation Manager, Radio Free Europe.

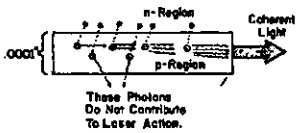



Fig. 8.—Emission of a photon when an electron drops into a hole can stimulate recombination of other electrons and holes. When this occurs, parallel to the plane of the junction, stimulated emission grows in intensity. Chain reaction continues until a pulse of coherent light is emitted.

propagates most strongly in the plane of the junction. Fig. 9 shows the highly directional emission obtainable from an injection laser 0.1 x 0.1 x 1.25 mm. made by the I.B.M. Corporation.

Waves travelling along the long axis remain in the junction region longer than any others. The rear face can be polished, as it is with the ruby laser, to obtain unidirectional action, as shown in the figure.

The side faces of the laser are usually sawed or etched to permit passage of radiation in this direction with a minimum of internal reflection.

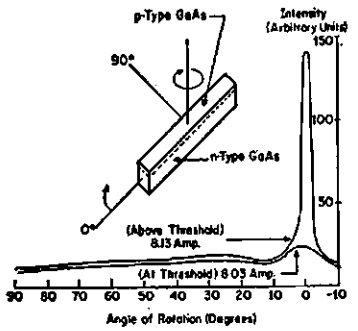



Fig. 9.—Directional light amplification obtained by cleavage. I.B.M. scientists obtained unidirectional radiation by polishing the rear plane.

## CURRENT LEVELS

Early injection laser models operated at extremely high current densities, of the order of 10,000 amperes per square centimetre. These models produced their light in pulses and could not operate continuously.

Subsequently c.w. injection lasers were developed to operate at much lower current densities, of the order of 100A/cm$^2$.

Recently developed injection lasers put out more than 1 watt for 5 watts input. This efficiency, of approximately 20%, compares with about 0.1% efficiency for ruby lasers.

Although injection lasers can be operated at room temperatures, such operation must be of the pulse-type, and even then the pulses must lie spaced in time such that overheating does not occur. Such overheating can easily damage the crystal.

Generally, injection lasers are operated at liquid helium, hydrogen, and nitrogen temperatures, ranging from 271° to 196° below zero Centigrade. These temperatures prevent excessive heating and enable the devices to be operated continuously.

## OTHER SEMICONDUCTING MATERIALS

Since the end of 1962 researchers have found other semiconductor materials that will lase. These include indium phosphide, indium arsenide, indium antimonide, and a gallium arsenide-gallium phosphide compound.

Development of additional injection laser materials furthers the potential of these devices by broadening their frequency range and thus their potential for use.

Frequency ranges of current injection lasers extend from 7,000 angstrom units for the gallium arsenide phosphide compound to 52,000 angstrom units for the most recently announced semiconductor laser, indium antimonide.

The frequency ranges produced by injection lasers run from 60 to 430 million megacycles per second. These frequency ranges are in the infra-red portion of the electro-magnetic spectrum.

## APPLICATIONS

The most significant advances involving injection lasers have come in the field of communications. Laser light is well suited to communications use because it is emitted in nearly parallel beams, allowing maximum transfer of energy. Since it is coherent, its information carrying capacity is far greater than ordinary light sources.

Thus far, pumped lasers, both solid state, such as the ruby, as well as the gas, have not been satisfactory because problems in modulating the light have not been adequately solved. Modulating the light produced by an injection laser is a relatively simple matter, since the intensity of the light output is a function of the current in the laser once the semiconductor has begun to lase; increasing the current increases the light output.

Since the injection laser can respond to driving current changes in a nanosecond (a billionth of a second) injection laser light can transmit up to one billion "bits" or units of information in one second.

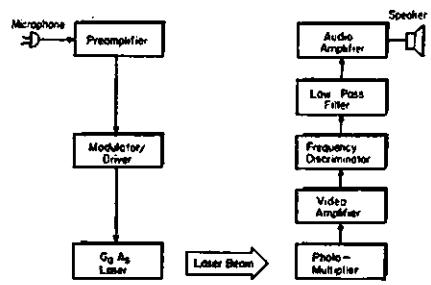



Fig. 10.—Block diagram shows the basic circuit elements used in an injection laser communication experiment demonstrated by International Business Machines Corporation. An audio signal from the microphone is sent to the modulator-driver which, in conjunction with the Ga As laser, transforms the audio signal into a series of laser pulses. The audio information, represented by the frequency of this train of laser pulses, is received by the photo-multiplier tube. The photo-multiplier tube converts the laser pulses to electrical pulses which are amplified, demodulated and used to power a speaker system.

The modulation technique used in the experimental I.B.M. system is called pulse frequency modulation. In this system, the rate at which pulses are emitted from the laser are varied in such a way as to represent voice or other information. The basic elements of the I.B.M. system are shown in Fig. 10. The apparatus consists of two basic components: the laser transmitter and its associated modulation circuitry, and the receiver, which consists of a phototube and demodulation circuitry. The modulation circuit is shown in Fig. 11.

Because it is small, light in weight, and more efficient than optically pumped solid state and gas lasers, the injection laser is ideally suited for a space communications systems, and will be able to fit easily into an earth satellite.

## LIMITATIONS

The small size of the injection laser, although advantageous, also presents some drawbacks. The region in which lasing action occurs is very small, since electrons, once they have crossed the junction, tend to drop into holes immediately. Since they do not move more than 0.0001 inch before recombination occurs, the power of the injection laser is limited.

A second limitation is beam width. Although the injection laser produces highly directional beams, they still diverge significantly more than those produced by other lasers, particularly gas. Beam widths of the order of degrees are often produced by injection lasers compared with a fraction of a degree for the gas laser.

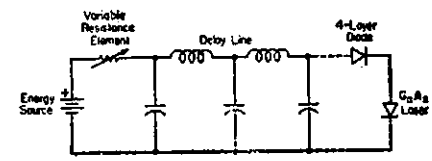



Fig. 11.—Diagram shows the modulation circuit used in injection laser communications experiment demonstrated by International Business Machines Corporation. The modulation technique, called pulse-frequency modulation, controls the rate at which the laser emits pulses, thus permitting audio signals to be transmitter over the beam. Output of the laser is controlled directly by impressing electrical pulses from the delay line through the device. When the delay line charges to a preset voltage, the 4-layer diode breaks down, discharging the delay line through the Ga As laser. The frequency at which these electrical pulses are delivered to the laser is controlled by audio signals through the variable resistance element.

## THE FUTURE

It is not certain at this point what direction laser research and development will take. Intensive studies are now underway in this country as well as in Europe, and new announcements are being made almost on a daily basis.

The consensus among most scientists and engineers working in the field is that the invention of the laser is one of the most important technological break-throughs of the century.

For the Radio Amateur the laser could turn out to be the most revolutionary development in the history of the hobby. It has been said that prior to World War II. every important advance in the field of radio communication was the work of Amateurs, with the professional scientists and engineers being able only to refine the pioneering efforts of Amateurs. With the advent of World War II., however, research and development in communications became too expensive and complex for the individual efforts of Amateurs working by themselves.

With the coming of the age of the laser and of space communications, the Amateur is once again in a position to contribute significantly to radio communications research.

(Continued on Page 12)

# The Historical Development of Radio Communication

## PART THREE—THE EARLY WORK OF MARCONI

J. R. COX,* VK6NJ

### CHAPTER 2

### 3. THE ERA OF FORMULATION

At the World Radio Convention held in Sydney, 1938, Sir Ernest Fisk described Marconi as a pioneer of applied radio and said, "We and the whole world of radio recognise him as the founder of our art and unquestioned leader for more than forty years."[37] This tribute to a remarkable man, who had shared the Nobel Prize in 1909, was both authoritative and erudite. Marconi had accomplished just what Sir Ernest had intimated. To him must go the credit of having founded the art of radio, and of having done so by comprehending, collating and bringing the independent investigations of previous experimenters to fruition in the form of practical wireless.

Born at Bologna, Italy, on 25th April, 1874, Marconi had just attained his majority when he initiated the experiments which had such resounding effects upon the development of wireless communication and mankind in general. Previously he had studied physics under Professor Rosa, of the Leghorn Technical School, and not only gained invaluable knowledge on Hertzian wave research but, from then on quite independently, it seems, to have made up his mind to use it for effecting practical wireless telegraphy. The prelude, as it turned out to be, to speech transmission which at that stage was hardly believed possible, let alone practical.

Development by this time had reached the point where electromagnetic waves could be artificially produced and propagated into space by Hertzian methods. Detection was by use of the coherer. Radiation was omnidirectional, of very low range, while reception lacked sensitivity and selectivity. Innovations implemented by Marconi assisted the lifting of these impediments to full utilisation.

The Hertzian radiator consisted of two balls; across the gap between a spark jumped when the air dielectric broke down. Radiation was directly from these spark balls; in the process, only a minute part of the energy created.[38]

Marconi had not long continued his experiments with the spark-gap oscillator when it occurred to him to increase its transmitting power by connecting large insulated conductors to each side of the spark gap. One spark ball of the induction coil was connected to a metal plate held aloft by a mast and the other to an earth plate. The elevated capacity and the earth now formed an oscillatory circuit and when the receiver was similarly equipped with aerial plate and earth connections the receiver was, indeed, situated on a remote part of the oscillator itself. Under this arrangement the earth was requisitioned as a conductor just as it had been successfully employed as a conductor in one-wire telegraphy since Steinheil's demonstration in 1838.

Marconi's innovation showed that the answer to the question of long distance radiation of Hertzian waves lay, not only in increasing the strength of oscillation, but in improving the efficiency of the oscillator as a propagator of electro-magnetic waves. Popov had used an aerial to receive natural electro-magnetic waves, so that the idea of a receiving antenna was not new, but Marconi's application of an antenna system to an oscillator was decidedly novel. This idea proved to be a major advancement of enduring fundamental importance to the future of wireless communication.

Progressing from this step forward Marconi inserted a heavy morse key in the primary circuit of the oscillator and in this way was able to make or break the flow of electro-motive force from the battery supply. This in turn governed the production of electromagnetic waves in the secondary circuit. Hence it was possible to regulate emission into spurts or trains of energy. A short tap on the key made a short space of radiation and a long tap a long period. Thus the means of transmitting dots and dashes—requisites for the employment of morse code—to frame messages was evolved.

Attention was also given to the betterment of receiving apparatus. It resulted in an arrangement of aerial wire—coherer—relay and a voltaic cell actuating a morse printing set which recorded the impulses received. The first advance was concerned with redesigning the Branly-type coherer. This instrument, though revolutionary when it emerged as a means of detecting wireless waves, was somewhat capricious in use. It was at times often very sensitive and then for no apparent reason became less sensitive. The relative advantages of various filings and combinations of filings were considered. Ultimately Marconi decided upon a mixture of 95% nickel and 5% silver, carefully sifted to ensure uniform fineness. When inserted in a glass tube, smaller than Branly's, the filings were compacted between two silver plugs very slightly apart. To each end of these plugs was attached a platinum wire which formed external leads for the device. The glass was then evacuated and sealed. The improvements effected by Marconi made this Branly-type device, which Marconi called a cymoscope, far more reliable and sensitive than any of its prototypes.

Next began experiments delving into the relation between height of antenna and maximum transmission range. Marconi found that the greater the height, the greater the reception range, and, by 1895, he had extended this range to a circle of radius of one and one-half miles with the aerial as a centre. Clear morse signals were received within this area when an antenna eight metres high was employed.

This encouraging preliminary work could now be considered completed and to have produced the first practical wireless system. Marconi now journeyed to England for the purpose of patent registration. Upon entry, he had first to undergo the trial of seeing suspicious English custom officials pull his gear apart, but, this past, his application for a patent was registered on 2nd June, 1896.[39]

Testing was resumed and over-water signals were transmitted for a distance of nearly nine miles, while on land a four-mile range was achieved, the discrepancy being due to the now fully understood effect of land attenuation. This example of true, practical, wireless telegraphy was not universally acclaimed. Most people, amongst them technical journalists, regarded the Marconi technique as a novelty; as proving nothing new and merely a repetition of previous experiments conducted by Hertz and Branly. On the other hand, the engineer-in-chief of the General Post Office, Sir William Preece, championed Marconi and expressed the view that "Enough has been done to prove and show that for shipping and lighthouse purposes it will be a great and valuable acquisition."[40] Later events vindicated his confidence.

Professor A. Slaby, of Berlin, was another to recognise the true meaning of Marconi's achievements in signalling over the distance that he did. Despite his utmost efforts, Professor Slaby had only been able to achieve a range of one hundred metres and he knew, that by exceeding this, Marconi had, indeed, contrived a very effective method of wireless telegraphy.

By conducting numerous demonstrations Marconi both improved his telegraphy system and at the same time incited interest from afar. As views on the real significance of his work began to crystallise, Army and Navy officials showed interest and attended tests. For instance they witnessed the one on Salisbury Plain in 1897 when the maximum range of transmission reached a distance of eight miles.[41] In the same year a twelve-mile contact between two Italian warships helped to confirm the military implications of the new medium. In this test wireless telegraphic messages were being handled at speeds of up to twelve and fifteen words per minute. The following year, 1898, marked the occasion of the new wireless telegraphy system being put into commercial use for the first time. Installed for the Corporation of

* Government School, Yornup, W.A.

[37] Institute of Radio Engineers (Aust.): "Proceedings of the World Radio Convention, Sydney, Australia," 1938, p.9.

[38] The problem of discovering a generator to produce quick electrical vibrations "possessing sufficient energy" to bring about "transmission of signals at a distance" confronted Marconi and also Alexander Popov of Russia. The sections quoted are from Popov's report quoted in Fleming: op. cit., p.517.

[39] Gartmann: op. cit., p.147.

[40] Fleming, op. cit., p.521.

[41] Wireless communication received its baptism under fire in the Herero Revolt, German South-West Africa, 1904 to 1908.

Lloyd's, the service operated between Ballycastle and the lighthouse on Rathlain.

Step by step, test by test, the practicability of wireless communication was proved and by 1898 superiority over other available means of short-range signalling had been established. Briefly, the points supporting this superiority were:

(i) The system operated in any weather—night or day—clear or foggy.
(ii) It worked very well over sea and high land between stations did not disrupt communication.
(iii) The usual morse code could be used and the apparatus handled by an ordinary telegraphist.
(iv) It could reach previously inaccessible places.
(v) It was not costly, compared with wire telegraphy, and except for the mast upholding the antenna, did not occupy much space.

By this time Marconi had discovered that transmission range increased proportionately with the square of the height of the antenna wire. This meant that with an antenna 100 ft. high, he achieved four times the distance managed by an aerial 50 ft. high. The immediate repercussion was the directing of attention towards pushing antennae upward as a means of developing long distance communication. It was reasonably easy to erect masts up to one, or even two hundred feet, but over that height engineering and financial factors curbed expansion. Hence there resulted a lull in improvement at the transmitting end.

Such was not the case at the receiving end of radio communication. In 1898 a further radical improvement was made to the Marconi receiver which immensely increased its sensitivity and reliability. This improvement involved the insertion of a small air-cored transformer linking the aerial and the coherer circuit. The primary coil was connected to aerial and earth terminals, whilst the secondary was connected to the terminals of the sensitive coherer tube. Previously the coherer had been connected directly between the lower end of the aerial and the earth terminal. Marconi knew that this direct insertion of the coherer was an inefficient arrangement because at that point of the antenna system there occurred a high value of current at a very low voltage. This affected the operation of the coherer because it was a voltage-operated device. On the other hand, as the transformer was able to step up the voltage from a lower to a higher value, it was able to increase the response of the coherer.

Such a transformer had previously been suggested by Sir Oliver Lodge, but he gave no specifications or details of the device to be used. Marconi, on the other hand, engineered the transformer to its proper form, described it in detail and gave it the name of a "jigger".[42] The jigger also endowed a power of selection not presented previously, since in its fabrication the length of the secondary coil winding had to have a definite relation to the desired length of the transmission wave. If the jigger was not wound to suit the transmission wave length employed, no signal was received at all. This made possible, for the first time, discrimination between stations. These step-by-step improvements brought Marconi nearer and nearer to his goal of extended range telegraphy. The first attempt was conveniently and imaginatively chosen, for he decided to span the historic barrier of the English Channel. On 27th March, 1899, he succeeded.[43]

At once interest soared as the press gave publicity to the feat and wireless telegraphy became news. Four months afterwards it was realised that wireless waves must somehow follow the curvature of the earth. British Navy ships, during manoeuvres, used Marconi apparatus to successfully signal over a distance of eighty-five miles. Onward pressed Marconi to develop a system which would hasten the traffic flow between wireless telegraphy stations.

The answer came in the form of a system called Multiple Syntonic Wireless Telegraphy. Under this system it was possible to hook up two transmitters to the same aerial. They could operate simultaneously and, as each transmitter was set to emit on separate and different frequencies, two sets of waves radiated from the aerial at the receiving end. One antenna served two receivers, each one tuned to a separate transmitter. This development made the commercial prospects of wireless telegraphy more attractive since it speeded up the rate of traffic by 100%.

In th year of Australia's Federation, Marconi established contact between the Isle of Wight and the Lizard in Cornwall, a distance of two hundred miles. By then Marconi had made up his mind to make an attempt at bridging the Atlantic with his telegraphic system; not simply as an experiment, but with the view of opening up the route for commercial wireless telegraphy. Having reached the practical limit of aerial height, Marconi decided that the way to achieve trans-Atlantic wireless telegraphy was to employ very high voltages to create much more powerful electro-magnetic waves. To help achieve this requirement the aid was enlisted of an expert, and pioneer in the field of handling extra-high voltage alternating current. Professor J. A. Fleming joined Marconi and they first experimented on a small scale, before beginning construction of the large costly plant needed.

Poldhu, on the coast of Cornwall, was selected as the best site for a transmitter and construction began in October 1900. As Fleming went ahead with the power house, Marconi designed the antenna he was to use. It consisted of twenty masts, each two hundred feet high and arranged in a circle two hundred feet across. The aerial wires formed a conical shape, the tops being insulated and the bottoms gathered in to form a point.

By November of 1901 arrangements were well advanced and so Marconi and two assistants, Kemp and Paget, set sail for Newfoundland to assemble receiving equipment. Arriving there on 5th December, 1901, Marconi ballooned an aerial wire on the 11th, but it broke away. The next day, a Thursday, a kite with aerial wire attached was flown to a height of four hundred feet. Hardly expecting to receive signals on his first attempt, Marconi was surprised and excited when he heard the morse letter "S" . . . on the afternoon of 12th December, 1901.[44] It is interesting to note that because of the rise and fall of the receiving antenna the electrical capacity was varying and so use could not be made of Marconi's specially designed receiver. Instead, he employed a telephone earpiece as a receiver and connected it in series with a coherer. It seems appropriate that this great achievement should also incorporate apparatus bearing the name of two other outstanding pioneers of communication, Alexander Graham Bell and Samuel Morse.

Marconi's feat was remarkable and no other experimenter was to succeed in detecting electro-magntic wave signals across the Atlantic until 1905, and then only at night.[45] This demonstration of Hertzian waves spanning the Atlantic Ocean created a sensation throughout the civilised world.

Subsequent to this, in 1902, Marconi made the discovery that reception differed between night and day. This fact was noted during an experimental voyage on board the S.S. "Philadelphia," when contact was maintained with Poldhu in Cornwall for a distance of 1,551 miles by night, and 700 miles by day. The evidence of this peculiarity led to speculation as to why it should be so and started off the study of wireless wave propagation.[46]

In 1903 transmission was successful over 3,000 miles between Cape Cod, Massachusetts and Poldhu. On this historic occasion, Mr. Roosevelt, President of the United States, sent the following message to King Edward VII.:—

> "To His Majesty King Edward VII., London. In taking advantage of this wonderful triumph of scientific research and ingenuity which has been achieved in perfecting the system of wireless telegraphy, I extend on behalf of the American people the most cordial greetings and good wishes to you and all the people of the British Empire."[47]

Then followed further long range experiments between the "Carlo Alberto," a naval ship stationed in the Mediterranean and placed at Marconi's disposal by a generous Italian Government, and Poldhu. Ranges of up to 1,000 miles over land were attained. These and other experiments advertised the utility of wireless communication to an incredulous public. From the tests made, Marconi gathered knowledge for the inauguration of shipping and later regular trans-Atlantic services.

## 4. THE ERA OF COMMERCIAL AND TECHNICAL EXPANSION

Before the advent of such, wireless communication as a whole underwent a period of stress. The inauguration of a regular reliable wireless network was no easy triumph. For now two main

[42] Fleming, op. cit., p.526.

[43] Ibid., p.529.

[44] Gartmann: op. cit., p.149.

[45] Erskine-Murray, J., "A Handbook of Wireless Telegraphy." Crosby Lockwood and Son, London, 1911, 3rd edition, p.135.

[46] Of the development of this study more will be said in Chapter 5 on directive antennae.

[47] Fleming, op. cit., p.548.

competitors emerged in the race to erect wireless stations and perfect systems; the Telefunken Company of Germany and the Wireless Telegraphy and Signal Company headed by Marconi. Both opposed one another and each in turn was opposed by the cable companies. Bitter commercial conflicts ensued as the battle of patents, rights, priorities and financial agreements was fought. Eventually the two wireless giants ran into financial troubles as each tried to outdo the other.

Even so, by 1904 some ocean liners were printing news sheets from information received over ships' radio, but the idea of wireless at sea as a worthwhile investment was by no means readily accepted. Ship-owners of that period were reluctant to equip their ships with "the expensive luxury" of radio equipment to enable their captains, as they ironically suggested, "to wish each other a safe journey on the high seas."[48]

Meanwhile, in 1906, wireless communication had attained international status when twenty-seven nations conferred at Berlin for the first World Radio Congress held to discuss matters of international concern. The signal "CQD" became recognised as an international distress signal and was used to startling effect on 23rd January, 1909. On this occasion the value of wireless as a safeguard against calamity at sea was emphatically illustrated. Badly damaged and sinking after a collision with S.S. "Florida" in the Atlantic, the White Star liner "Republic" transmitted the distress signal which resulted in seven vessels racing to her aid. All passengers and crew, who would have in all probability been lost, had it not been for ships' wireless, were saved.[49] Other instances occurred and, gradually, reluctance to equip ships was overcome until by the end of 1909 a total of more than three hundred ships had been fitted with radio apparatus by the Marconi Wireless Telegraphy Company alone.

Prior to this, in 1907, a limited wireless service had been inaugurated between Nova Scotia and Ireland and then extended to include London and Montreal on 3rd February, 1908. Strain was imposed upon wireless telegraphy systems by a demand for more reliability than the limited resources of radio communication could provide at that stage. The year 1910 saw the commencement of regular communication by wireless on a permanent basis between England and the United States of America. This system was managed and installed by the Marconi Wireless Telegraphy Company. However, it was not until just before the First World War that wireless telegraphic services were in a position to seriously challenge the cable and wire telegraphy systems. By then, after much litigation and prolonged deliberation, the two giants, Telefunken and Marconi systems, had reached agreement on 5th March, 1913,[50] and from then on the way was clear to a genuine system of world-wide wireless communication.

Eight years before this, Marconi had established communication between Queenscliffe in Victoria and Devonport in Tasmania, but it was not until 1909 that tenders were accepted for the erection of Australia's first permanent wireless stations at Perth and Sydney. When 1913 came there were nineteen coastal stations throughout Australia in operation maintaining two-way telegraphic communication with a limited number of ships at sea.[51]

And so this chapter details the early pioneering done by Guglielmo Marconi and in so doing chronicles the development of wireless communication from a period of disbelief to one of practical utility wherein trans-oceanic, and indeed, world-wide telegraphy by Hertzian waves was a reality. Without a doubt, the indomitable spirit and inventive genius of Marconi, together with those who gave financial and technical support, were responsible for this great advance. Marconi's work, however, was by no means over and he continued his contribution to radio for many years.

Now, with radio telegraphy a fact, inventive minds were already turning to tackle the problem of transmission of speech by means of wireless communication. Progress had already been made by 1914 but real success did not come until the advent of the transmitting valve, the introduction of which commenced a new era in the history of wireless communication.

(To be continued)

[48] Gartmann: op. cit., p.151.
[49] Hoeling and Hoeling, "The Last Voyage of the Lusitania," Hodder and Stoughton, London, 1956, 1st edition, p.134.
[50] Gartmann: op. cit., p.151.
[51] From an eight-page paper, "1913-1938—A Quarter Century of Radio Engineering in Australia," by A. S. McDonald, Institute of Radio Engineers (Aust.), op. cit.



## LASERS

(Continued from Page 8)

Already, laser light beams have been used for transmission of audio and video signals. I.B.M. is in the process of developing a laser space communications networks here on earth using a beam of light as carrier.

We have already seen that the Radio Amateur is capable of developing, building, and launching an earth satellite. Progress in this field has been remarkable. These are the ingredients of a revolution in the hobby. A synthesis of a programme of laser research in conjunction with the present Oscar programme could conceivably result in the development of an Amateur laser space communications network.

Frequencies in the upper microwave, the infra-red, and the visible portions of the spectrum are as yet unallocated. Anyone can experiment now without restriction! This is the time to join in and move toward new dimensions in communications! Use by Amateurs of the bands in which lasers operate could herald the dawn of a new age in Amateur Radio!

We can envision a network of three synchronous Oscar translator satellites capable of receiving and re-transmitting all the message traffic of all the world's Hams on a single beam of light. We can see Hams, equipped with a laser communications system, and their own personal 10 kc. channel to work on.

This is the challenge of the future.

I would appreciate hearing from any and all Amateurs who are currently engaged in laser research and development. I would also like to hear from any Hams who would, at some future date, be interested in participating in laser experiments, or who would like to build a laser of their own. If there is enough interest we can possibly undertake a programme of moving forward with the times toward a revolution in Amateur Radio! ●

# AN I.F. SPOTTER

JUST recently, under the gentle prodding of the XYL, I cleaned out the years of accumulated junk from the spare room and found myself the proud possessor of some twenty or so i.f. trannies of doubtful vintage, and decidedly unknown kilocycles. Not wanting to be guilty of throwing away any trannies that might one day become useful, I was in a quandary as to how I could sort them into unwanted and wanted, and luckily for me along came an article in that excellent magazine, "73," for April 1964, under the heading of "An I.F. Spotter."

With just two resistors, two capacitors and a tube, it was the answer to my search. The principle of operation is as simple as the construction. The tuned circuit in question is simply made to oscillate at its resonate frequency which can be then determined by tuning its radiated signal on the communication receiver. To set the unknown coil into oscillation requires the use of a simple "two terminal" oscillator as shown in Fig. 1.

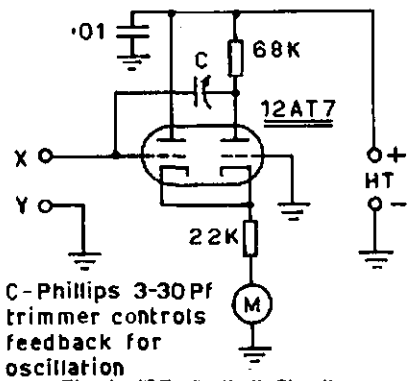



Fig. 1.—"I.F. Spotter" Circuit.

When any tuned circuit is connected to the two points marked X and Y, the circuit will oscillate at its resonant frequency. The construction was simple, it took me about an hour to build it up and try out the first i.f. tranny, and strangely enough for me it worked first time. I did not use the meter shown in the cathode circuit as it was only intended to show if the circuit was oscillating, but since then I have included an 0-5 mA. meter purely as a refinement to show that the circuit was oscillating OK.

This little tester was built in the first place to do just one thing—sort out some old i.f's in the junk box—but it was remarkable how many other jobs it was found capable of doing—and probably it will do tricks that I haven't thought of. One pay-off I discovered by accident was that it made an excellent b.f.o. for a receiver, especially for resolving s.s.b. signals. So much so, that I now have two made up in separate receivers for receiving s.s.b., and whereas before, my reception of this type of signal was somewhat uncertain at times, I can honestly say that now I can resolve with one hundred per cent. satisfaction.

Give it a go—build it up—you will be more than satisfied. Why, it will even test the range over which a tank circuit will tune, and if the tank circuit in question is the final, the meter will indicate when the antenna is brought into resonance.

Nuff sed. If you are not interested now, you never will be. But if it turns out the success it has been for me, don't forget to thank Howard W5WGF, who wrote the article. It was one out of the box for me.

Oh, I nearly forgot, the lead from the grid contact of V1 to the X post should be kept as short as possible with the least capacity to earth.

—WARWICK W. PARSONS, VK5PS.



# A.R.R.L. DX CONTEST

Amateur Radio operators throughout the world are invited to participate in the 31st A.R.R.L. International DX Competition. You may earn a certificate of performance award issued to the top **phone** and **c.w.** scorer in each country. In addition, you might QSO new States for the W.A.S. award or Canadian provinces for the W.A.V.E. award.

1. This 1965 DX Contest will be held over two week-ends for c.w. and two week-ends for phone as follows:

**Phone**: Feb. 13-14 and March 13-14.
**C.w.**: Feb. 27-28 and March 27-28.

2. The starting time in each instance is 2400 G.M.T. Friday and ends 2400 G.M.T. Sunday. Phone and c.w. are separate contests.

3. **Object**: The rules are unchanged from last year. Try to QSO as many W-K-VE-VO-KH6-KL7 stations as possible during the contest in as many different call areas possible **per band.**

4. **Exchanges**: DX stations send RS or RST report followed by a three-digit number representing power input. For example, on c.w. you might send 579050, which means RST 579 and power input 50 watts. U.S.A.-Canada stations will send you a number consisting of RS or RST report followed by the name of their state or province.

5. **Scoring**: Repeat QSO on additional bands are permitted. Your multiplier is the total call areas (not states) QSOed **on each band** (maximum of 21 **per band**). The 21 call areas are listed above. Each completed QSO counts three (3) points. Incomplete contacts count two (2) points. **Final Score** is the number of QSO-points times the multiplier.

6. Free log forms are available on request from A.R.R.L. You don't have to use these forms. Logs should contain calls, dates, times, bands, exchanges, and points. Send your log with summary data to:

**A.R.R.L. DX Competion,**
**225 Main Street,**
**Newington, Conn., U.S.A. 06111.**

Your entry must be postmarked by 24th April, 1965, to be eligible. Please enclose photos and soapbox comments with your report.

### SUMMARY SHEET

Your summary sheet must contain the following: Section (c.w. or phone), call, Country, Name, Address, Transmitter(s), Receiver(s), Power input(s), antenna(e), number of U.S.A. and Canadian call areas worked on each band, multiplier, number of hours of station operation. Then the usual declaration re rules, etc., and comments (new states worked, improvement in score over last year, band conditions, interesting experiences, etc.

### LACK OF NOTES

Many readers overlooked the fact that this issue of "A.R." would not contain any Notes, so they should not write in complaining of the omission. All copy for March "A.R." is due at Box 36, East Melbourne, C.2, by 8th February, 1965.

## VKO CALL SIGNS

### 1965 EXPEDITIONS

Doug Twigg (VK3IJ), of A.N.A.R.E. Headquarters, advises that the following call signs have been issued to 1965 A.N.A.R.E. members:—

**Macquarie Island**
VK0TO—Trevor Olrog (VK2TO).

**Mawson/Antarctica**
VK0GW—Gil Webster (ex VK-6ZBW).

**Wilkes/Antarctica**
VK0MC—John McKenzie (Wilkes, 1963).
VK0KH—Dr. Ken Hicks.

Mail QSL cards for above call signs via W.I.A. (VK3 Inwards QSL Mgr.).

—Eric Trebilcock, L3042.

☆

## DETAILS OF U.S.A. COUNTIES

I would be willing to help identify Counties from names of cities and towns given on QSL cards for the U.S.A. County Award. Send list and s.a.s.e. to Charles H. Thorpe, 81 Dawson Road, Allenstown, Rockhampton, Queensland.

—WIA-L4018.

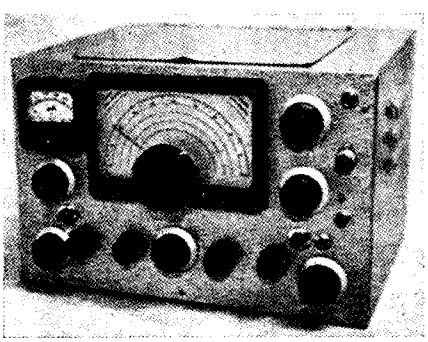
# H.F. BAND TRANSMITTER*

## FOR 10-80 METRES, A.M./C.W., RUNNING 50 WATTS – COMPACT DESIGN

*A. J. SHEPHERD, G3RKK*

THE transmitter described in this article was designed to meet the need for a simple, compact a.m./c.w. design that would give reliable results in fixed or portable use. The p.a. can be run plate-and-screen modulated to an input of about 50 watts on all bands 10-80 metres; 160 metres can quite easily be added if required. In order to reduce weight and ease mechanical problems with the metalwork, the unit does not have a built-in power supply, but may be run from a main p.s.u. or from such portable supplies as may be available.

Great care has been taken to ensure that there is a good margin of stability, screening and decoupling being extremely thorough, and the reliability of the design makes it extremely suitable as a beginner's first all-band transmitter. T.v.i. precautions are reasonably effective, and equal to those in many commercial designs described as "tv.i. proof". With a low-pass filter fitted, this transmitter should be suitable for use in most localities. In fringe areas, where the t.v.i. problem is particularly acute, a very carefully designed mixer v.f.o. system in conjunction with a class B p.a. may be the only answer. Some notes on alternative mixer-v.f.o. systems appear later in this article.



General appearance of the 10-80 Metre Transmitter for a.m./c.w., designed and described by G3RKK. It is a neat and compact job, suitable for fixed-station or portable use, and runs up to 50w. input on all bands. The design includes t.v.i. precautions, and the power supply unit is external.

**• This is the sort of transmitter that would be very suitable for the beginner (with some experience of constructional work) and will equally be of interest to those requiring a transmitter for general fixed-station or portable work, on c.w. and a.m. phone. In the circuitry and construction, all possible t.v.i.-proofing has been incorporated and, with an l.p.f. on the output side, this transmitter might well be found safe to use even in the most delicate fringe-area situation—at least on its two lower-frequency bands.**

### THE EXCITER

The v.f.o. uses a Clapp circuit with large grid swamp capacities C6, C7 (see Fig. 2a). The v.f.o. is always on the 80-metre band, so that for all bands the working conditions of this stage are such that the EF184 is only just oscillating. Under these conditions the highest order of stability can be achieved.

To obtain good bandspread, there are two v.f.o. ranges—3.5-3.8 Mc. or 3.5-3.6 Mc., selected by the bandswitch wafer S1a. The final output, by frequency multiplication, is: 80m., 3.5-3.8 Mc.; 40m., 7.0-7.2 Mc.; 20m., 14.0-14.4 Mc.; 15m., 21.0-21.6 Mc.; 10m., 28.0-30.2 Mc. A perfectly adequate tuning rate is given by a dial with a 10 : 1 reduction ratio. The oscillator units are specially produced by Electroniques (Felixstowe) Ltd., and allow excellent stability to be obtained.

A small amount of temperature compensation is provided externally by C1 and C4, and for best results their values should be adjusted experimentally for minimum drift. C3 (C3A, C3B, C3C) is a silver-plated 3-gang component; two sections in parallel are used on 80 and 10 metres, the remaining section being for 40, 20 and 15 metres.

Great care has been taken to minimise pulling of the oscillator frequency by subsequent stages—especially the p.a. This has been fully achieved on all bands except 80 metres, when all the amplifiers are operating straight through, and some pulling does occur on this band as the p.a. is tuned through resonance. Even this could probably be avoided by using an ECF804 or ECF82 instead of the EF184, and wiring the triode section as a cathode follower isolation stage. R2 and C59 would then have to be adjusted to maintain the correct oscillator conditions.

The oscillator output circuit, which is of the electron-coupled type, has a resistance load on 80, 40 and 20 metres, but is operated as a doubler on 15 and 10 metres. It has been found that this is less detrimental to stability than driving the buffer into grid current and doubling there.

Output is taken from V1 anode via C12, which is variable for optimum coupling, to V2, an untuned Class A buffer amplifier. This stage provides good isolation between the v.f.o. and the frequency multiplying stages, whilst affording a reasonable amount of gain. In the prototype, the h.t. supply to this stage is stabilised. However, this is not strictly necessary, and both arrangements are shown in the p.s.u. circuit. If the stabilised version is not used, then the h.t. for the stage can be taken from the junction of R10 and R14 via a 2.2K resistor.

The netting switch S2 enables the exciter to operate when the remainder of the transmitter is switched off.

V3 (6AU6) is an untuned buffer on 80 metres, a doubler on 40, 20 and 10 metres and a tuned buffer on 15 metres. Wideband couplers, L3 and L4, are used to reduce the number of front-panel controls. The output of V3 is controlled by varying the screen voltage to this stage by VR1. In order that unwanted harmonic production may be kept to a minimum, it is desirable that V3 and V4 should operate as near to the Class B condition as possible, whilst providing sufficient drive to the next stage.

V4 (5763) is the driver stage, working as a tuned buffer on 80 and 40 metres, a doubler on 20 and 10 metres, and a tripler on 15 metres. The anode circuit is accurately tuned on all bands by a front-panel trimmer C28, to keep harmonic production to a minimum. The appropriate tuning coil (L5-L9) for the band in use is selected by S1d.

This exciter has given most satisfactory service, with good stability and no trouble from t.v.i. With careful construction the v.f.o. drift can be reduced to less than 50 c.p.s. per hour. Even when multiplied to 30 Mc., this only amounts to 400 c.p.s. per hour, which is hardly excessive.

### MIXER V.F.O's

However, those living on t.v. fringe areas, or who require better stability on the higher-frequency bands, may like to experiment with mixer v.f.o's.

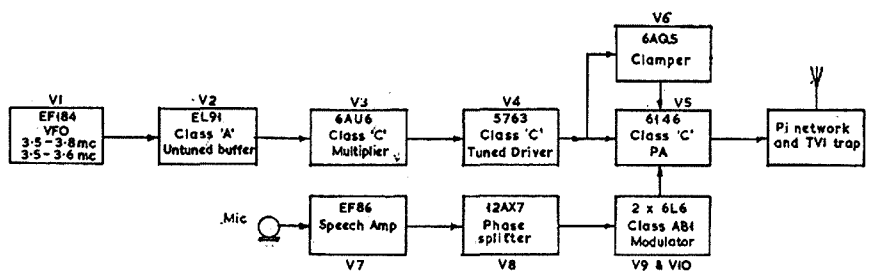



Fig. 1.—Block diagram of the a.m./c.w. transmitter designed and described by G3RKK. It runs about 50 watts input in the 6146 p.a., and covers all bands from 10 to 80 metres. Commercial coils are used throughout and the circuit arrangement is such that level drive is obtained through the whole range. Circuit details are given Figs. 2, 3 and 4.

* Reprinted from "The Short Wave Magazine," June, July, August, 1964.

In these, the v.f.o. is tuned over a fixed range and mixed with the output from a crystal oscillator to provide the required output frequency. In this way, frequency multiplication is avoided and so there is likely to be less trouble from harmonic output. Also, as there is no frequency multiplication, the stability of the final output is that of the v.f.o. and crystal oscillator—about 80 c.p.s. per hour on all bands.

Details of various types of mixer-v.f.o's have been published from time to time, and there is no reason why such an arrangement should not be incorporated in this design instead of the frequency multipliers. In addition to the increased stability, a worthwhile reduction in harmonic output may be obtained, provided that the mixing frequencies are carefully selected, the mixers are run at low level, all subsequent stages are in Class A, and adequate filtering is included to reject spurious products of the mixing process. However, these notes are only intended for the more experienced constructor. The beginner is advised to keep to the frequency multiplier unit used in the prototype, which is perfectly satisfactory unless the t.v.i. problem is very difficult indeed.

## POWER AMPLIFIER

The p.a. (Fig. 3) uses a single 6146 (V5) operating in Class C. The 6146 is very suitable for this purpose, combining small size with high efficiency. As grid current bias is used, it is protected by a triode-connected 6AQ5 (V6) acting as a clamp valve. Normally, this valve is cut off by the bias on the p.a. If the excitation is removed, the bias is lost and V6 conducts heavily, reducing the voltage on the screen of V5. This reduces the anode current of V5 and ensures that the maximum anode dissipation of 20 watts is not exceeded.

The inclusion of the capacitor C33 in the V6 h.t. line is rather unusual. It has been found that it improves the modulating characteristics of the stage by permitting the screen to follow the modulating voltage morse closely. It should be noted that, in order to obtain linear modulation, it is necessary to ensure that the p.a. is operating under the conditions recommended by the valve manufacturer. The correct voltages at various points are given in Table 2 for an h.t. voltage of 450, which is the best for general use. The correct drive must also be maintained, and the aerial loading is fairly critical. Unlike linear amplifiers, anode modulated Class C amplifiers are best loaded lightly in the absence of an oscilloscope to examine the modulated waveform.

Full precautions against parasitic oscillations and other forms of instability are taken, as it is generally easier to include full protection in the design than to attempt to cure the trouble once it arises. Parasitic stoppers L10, R19 and L11, R20 are included in the grid and anode circuits, and multiple by-pass condensers are used on the anode and screen h.t. supplies, ensuring that effective by-passing is obtained at all frequencies.

The output is tuned by a conventional band-switched pi-network, and a t.v.i. trap L13, C49 tuned to the local B.B.C. t.v. channel is fitted across the output.

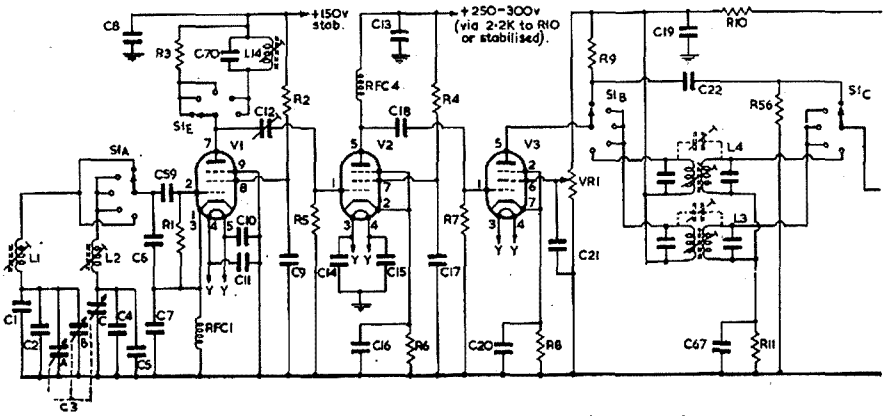



Fig. 2A.—The exciter section, V1-V4, of the G3RKK transmitter has its v.f.o., V1, covering two ranges, for reasons explained in the text. (Note: Read this circuit as including Fig. 2B opposite.)

In some areas a low-pass filter, in the coax. feeder into the a.t.u. or aerial, may also be required. As both the grid and anode circuits are on the same frequency, careful screening is required if instability is to be avoided. Nevertheless, if the layout diagrams are carefully followed, neutralisation should not be necessary, although it is provided for in the circuitry and some may like to include it to increase the margin of stability.

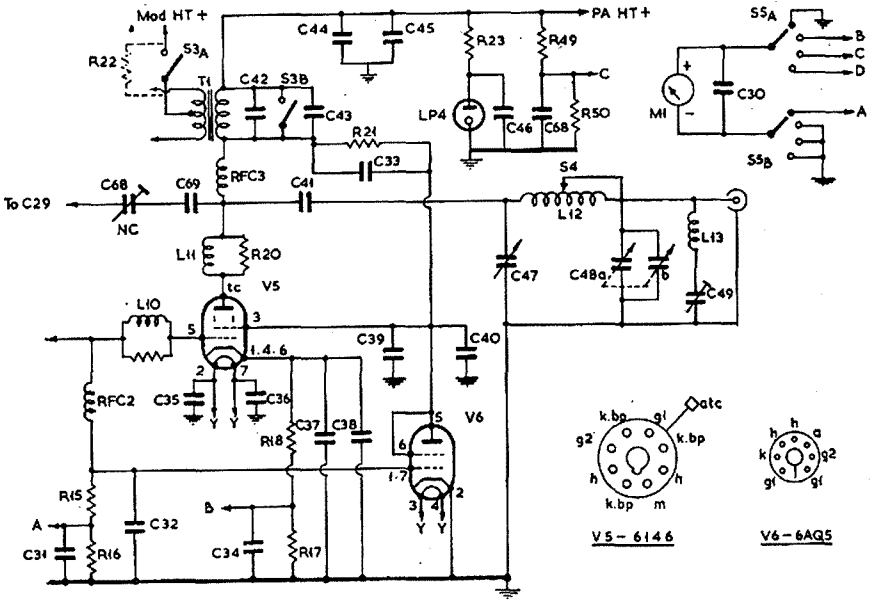



Fig. 3.—Circuit of the p.a. and its clamper stage. In some layouts, neutralisation may be necessary and this is provided for by the C68, C69 connection. C33 is explained in the text—it improves the p.a. action under modulation. Data for the construction of the p.a. tank coil, L12, are given separately. C49, L13 comprise a harmonic-rejection circuit, tunable to the local t.v. channel. Alternative methods of keying and clamping will be shown in Figs. 6 and 7 in Part 2. (Note: The resistor body for L10 should be marked R19. Also there are two C68's. One, in parallel with R50, is 0.001 μF.; other, neutralising condenser, is 1-10 pF. rated 1kV.)

C30, C31, C32, C34—0.002 μF. 500v.w. disc ceramic.
C33—0.003 μF., 500v.w. disc ceramic.
C35, C36, C39, C46, C68—0.001 μF., 500v.w. disc ceramic.
C37—0.01 μF., 500v.w. disc ceramic.
C38, C40—15 pF., 500v.w. ceramic.
C41—0.001 μF., rated 3 kV.
C42—0.01 μF., ceramic, rated 1 kV.
C43—100 pF., rated 1 kV.
C44—0.001 μF., ceramic, rated 1 kV.
C45—15 pF., ceramic or mica, rated 1 kV.
C47—250 pF. variable, type 817 Eddystone.
C48—500 plus 500 pF. BC type twin-gang, sections in parallel (0.001 μF.).
C49—3-30 pF., Philips trimmer.
C68*—1-10 pF., neut., rated 1 kV.
C69*—47 pF., rated 2 kV.
R15—18K ohms, 2w.
R16, R17—See text.
R18—82 ohms, 2w.
R19—500 ohms.
R20—100 ohms.
R21—Three 68K ohms in parallel, 2w.
R22—20K ohms, 10w.
R23—220K ohms.
R49—See text.
R50—10K ohms.
RFC2—2.5 mH. r.f. choke.
RFC3—R.f. choke, p.a. type.
S3—3-p., 2-w., ceramic Phone/C.w.
S4—1-p., 6-w., ceramic with shorting plate (see text).
S5—2-p., 4-w., meter.
M1—0.5 mA. moving coil.
L10, L11—APC's on R19, R20 (see text).
L12—Pi-network tank coil (see text).
L13—9 turns, 18g., ½ inch diam., self-supporting, turns spaced (local t.v. channel).
PL4—250v. neon.
V5—6146.
V6—6AQ5.

Notes:
All resistors are rated ½ watt carbon, unless otherwise stated.
C68* and C69* optional if neutralising required—otherwise, use C29* 0.002 μF. as given with Fig. 2.
Data for tank coil L12 given in text.

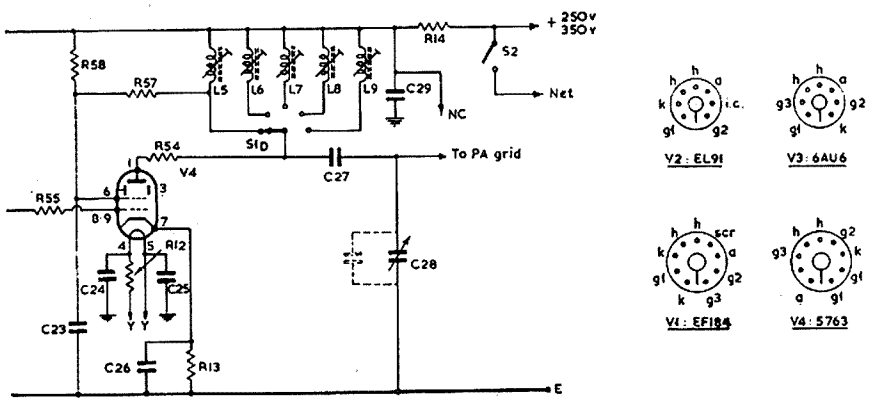



Fig. 2B—Continuation of exciter section. V4, the driver stage, is a 5763, giving ample drive into the p.a. on all bands 3.5-28 Mc. The circuitry could be adapted for 160 metres if required. (Note: R57 should be across L5 and not as shown.)

**TABLE OF VALUES**
**Figs. 2a and 2b.—Exciter Section H.F. Band Tx.**

C1—3 pF., ceramic N750 negative temperature.
C2—87 pF., poly.
C3—7-18 pF., three-gang.
C4—5 pF., ceramic N750 negative temperature.
C5—134 pF. poly.
C6, C7—0.0011 μF., poly.
C8, C13, C18, C17, C20, C21, C26—0.005 μF., 500 volt working, disc ceramic.
C9—0.01 μF., 500v.w. disc ceramic.
C10, C11, C14, C15, C24, C25—0.001 μF., 500v.w. disc ceramic.
C12—1-10 pF., air trimmer.
C18, C70—50 pF., silver mica.
C19, C23, C67—0.002 μF., 500v.w. disc ceramic.
C22, C27—100 pF., ceramic.
C28—25 pF., 10 pF. in parallel.
C29*—400 pF., 500v.w.
C59—20 pF., silver mica.
R1, R2, R11, R56—47K ohms.
R3, R4—10K ohms.
R5—100K ohms.
R6—220 ohms.
R7, R57—22K ohms.
R8—150 ohms.
R9, R58—15K ohms.
R10—2.7K ohms, 2w.
R12—See text.
R13—330 ohms, 2w.
R14—470 ohms, 2w.
R54—47 ohms.
R55—470 ohms.
VR1—100K ohm potentiometer, drive control.
L1—3.5-3.6 Mc., type DLM (Electroniques).
L2—3.5-3.8 Mc., type DLM (Electroniques).
L3—14 Mc., W/B coupler (Electroniques).
L4—7 Mc., W/B coupler (Electroniques).
L5—Type BP80.
L6, L14—Type BP40.
L7—Type BP20.
L8—Type BP15.
L9—Type BP10.
RFC1, RFC4—R.f. Chokes, type FCC5 (Electroniques).
S1A-S1E—Trolex cer., 4-wafer, 2-p., 6-w.
S2—S.p.s.t. rotary.
V1—EF184.
V2—EL91.
V3—8AU6.
V4—5763.

Notes:
C29* can be 0.002 μF. if neut. not required.
All resistors are ½ watt carbon unless otherwise stated.
Coils L5-L9 are Electroniques standard types.
Slow motion drive for C3 can be Eddystone 598 or Electroniques type SMD.
V.f.o. construction in Eddystone box type 650.

A single meter is fitted, which is switched across shunt resistors R16, R17, R46 and R49, R50 to check p.a. grid and cathode currents, modulator cathode and p.a. h.t. voltage. Cathode current is the sum of anode, grid and screen currents, and is measured in preference to anode current to avoid bringing high voltages to the front panel. The meter switch S5 should be of the break-before-make type. All metering circuits are fully decoupled.

Panel lights are provided to show when the p.a. and modulator h.t. and l.t. supplies are on. This is both a safety measure and an operating convenience.

The phone/c.w. switch S3 (S3A, S3B, S3C) disconnects the h.t. supply from the modulator and shorts the secondary of the modulation transformer to prevent keying transients which may break down the insulation—apart from putting a chirp on the note. Further details of keying arrangements are not shown in the circuit diagram as it is felt that most readers will wish to incorporate their own to work in with the existing station switching arrangements. For those who do not have a pet system, there are several to be recommended for this design.

The simplest, and in some ways, the most satisfactory is cathode keying of the p.a. (Fig. 6). The disadvantage is that the choke Ch. must pass the full p.a. cathode current, and will thus be a rather bulky component. For this reason, it may be considered preferable to key V4 in the same way. This is permissible as V5 is protected by the clamp valve V6. The circuit is the same as that given in Fig. 6, but the component values are different. Ch. now has only to pass about 30 mA., and a "softer" keying characteristic is required as it will be hardened by any following Class C amplifier—in this case the p.a. The values given for the click filter components are only approximate and in practice are best found by experiment. As it is generally inconvenient to try different inductors, a 500 ohm, 2W., variable resistor of suitable wattage may be connected in series with Ch. and adjusted to give the required "make" effect. Similarly, R51 can be set to give the required "break" characteristic. For those who wish to try a break-in system, V1 and V4 must be keyed in sequence, the order being V1 on, V4 on, V4 off, V1 off. This may be achieved mechanically by suitably adjusted relays or electronically by flip-flop circuits. Many articles about various systems of keying have been published from time to time, and the reader is referred to one of these for further details.

## THE MODULATOR

This is shown in Fig. 4 and has been designed to give good speech quality without undue elaboration. The speech amplifier (V7) is an EF86 audio pentode, with its input circuit arranged for a high impedance crystal microphone. This valve is especially suitable for low-noise audio amplifier service; it has a specially wound heater and ample internal screening and bracing to prevent hum and microphony. The h.t. supply is decoupled by C56, R28, while C51, R24 provide a low-pass filter to prevent r.f. pick-up at the microphone socket, which could cause trouble in the modulator.

The phase splitter circuit is of the paraphase type, chosen mainly because of its high gain. It is not the automatic self-balancing circuit, hence the balance must be adjusted by means of VR3. This is not necessarily a disadvantage, as self-balancing circuits are not always very happy with the fluctuating load presented by the p.a. The circuit shown here should have sufficient gain for most microphones normally used by Amateurs. If more gain is required, to enable a low output microphone or a self-balancing phase splitter to be used, the EF86 speech amplifier could be replaced by one using an ECC83 double triode. A suitable circuit is that incorporated in the G3BDQ transmitter, described in the October 1963 "Short Wave Magazine". The coupling time constants in the speech amplifier are chosen to reduce the response below

| Valve | R44, R45 (Ω) | R39 (K) | $R_L$ (K) a—a | Heater Current 6.3v. (each valve) | H.T. Voltage | Clearance (min.) above chassis | Spacing (centre to centre) | Comments |
|---|---|---|---|---|---|---|---|---|
| 6L6 or 6L6GT | 500 | 4.2 | 9 | 0.9A. | 400 | 4 inch | 3 inch | |
| 6L6G | 500 | 4.2 | 9 | 0.9A. | 400 | 5¼ inch | 3½ inch | This version has a larger bulb than the above. |
| KT66 | 500 | 3.9 | 8 | 1.3A. | 400 | 5¾ inch | 3½ inch | |
| 807 | 400 | 4.2 | 8.5 | 0.9A. | 450 | 5¾ inch | 3½ inch | Top cap anode. |
| 5B255M 5B254M | 400 | 4.2 | 8.5 | 0.9A. | 450 | 3½ inch | 2½ inch | 5B254M has top cap anode. |
| EL84 | 130 | 0.5 | 8 | 0.70A. | 300 | 3 inch | 2 inch | Output 17w. audio for low power version. |

Table 1.—Modulator Valves.

500 c.p.s., allowing a significant increase in the average modulating depth.

In the prototype the output valves used are metal 6L6s operating in Class AB1, providing an audio power of about 25 watts. Alternative valves are the 6L6GT, 6L6G, KT66, 807, 5B255M, etc. The necessary changes of component values with these valves are in Table 1. Ample ventilation in accordance with the valve manufacturer's recommendations must be provided.

Parasitic stopper resistors are fitted in the anodes, control grids and screens of the modulator valves, and all supplies are decoupled for both r.f. and a.f. C42 is connected across the secondary of the modulation transformer to reduce the response at high frequencies, and a small amount of negative feedback is applied over this stage via R33, R36. If microphones of the high-fidelity type are to be used, a further low-pass filter between the phase splitter and speech amplifier may be needed to prevent the signal from occupying an excessive bandwidth. Separate cathode resistors are provided for each valve, but they are taken to earth via the common shunt R46 to enable the combined cathode currents to be monitored on the meter.

The heaters are wired in two balanced systems which may be connected in series or parallel to allow 6.3 or 12.6 volt supplies to be used. All power supplies are taken to an octal and a 3-pin socket at the back of the transmitter to allow the greatest flexibility. This also permits the modulator heater supplies to be disconnected when operating portable c.w.

## CONSTRUCTION

It is recommended that the transmitter be built on a 16g. aluminium chassis size 2½" x 12" x 10", fitted with a 13" x 8½" front panel. That used in the prototype was slightly smaller, accounting for the cramping in the speech amplifier and v.f.o. compartments. The chassis is sub-divided above and below into various screened compartments, as shown in the pictures. Apart from the obvious purpose of preventing instability in the transmitter caused by stray coupling, it greatly adds to the rigidity of the structure and reduces the possibility of t.v.i. caused by radiation from the transmitter itself. Bottom plates (not shown in the photographs) are fitted to the v.f.o. and p.a. loading compartments.

It is recommended that all the metal work be bent and completely drilled before the wiring is commenced. At this stage the main components can be mounted to ensure that everything fits properly. It is very much easier to correct a mistake at this stage than after final assembly has taken place. All the screening is bent from 16g. aluminium. In the prototype the v.f.o. was built on a sub-chassis for experimental purposes. (This will not be necessary unless it is desired to experiment with mixer v.f.o's.) The position of all the main components for which holes must be drilled are shown in the pictures, but detailed drilling diagrams cannot be given in view of the lack of standardisation of some components.

## EXCITER

The first three stages are built in a medium-size Eddystone diecast box (650), which provides a very rigid framework together with a high degree of electrical screening, and protection against temperature variation and draught.

The box should be drilled first and then used as a template to drill the chassis. Good quality ceramic or nylon-skirted valveholders, with screens for V1, V2, V3 should be used. The bandswitch must be assembled at the same time as the box is mounted on the chassis, and before the screens are fitted. The screen inside the diacast box is an integral part of the bandswitch assembly and must be fixed at the same time as the bandswitch. The later wiring will be much easier if the switch wafers S1A-E are wired up before assembly. The coils should be mounted as far from one another and from the sides of the box as possible if the Q is not to be seriously impaired. (There is room for improvement on the prototype in this respect.)

Wiring is point-to-point where possible, but the use of tap-strips is essential if a reasonably neat layout is to be achieved. The valve-holders should be orientated for the best wiring run and care taken to ensure that the grid and anode circuits are isolated from one another. When wiring up the v.f.o., heavy gauge wire (at least 18g.) should be used, and all components especially rigidly mounted. The tuning condenser is mounted on a screening bracket above the chassis and connected to the drive mechanism by a flexible coupler. A single earthing point should be used for each stage, and all decoupling capacitors should be fitted as close as possible to the valve-holder pins. Care must be taken when soldering to the coils to avoid melting the polystyrene insulation.

The wiring of the p.a. is quite straightforward, and the same considerations about earthing and decoupling apply here also. In view of the high voltages present, it is essential that conservatively-rated components as specified be used and special care taken to prevent shorts and arcing. Also, above the chassis full precautions must be taken to ensure that the operator cannot accidentally touch a point of high voltage.

The anode r.f. choke should be of the type specially wound for h.f. p.a. use, e.g. K.W. or So-Rad. Ordinary types are apt to have series resonances inside one or more of the Amateur bands, with disastrous results. The pi-network coil used in the prototype was the K.W. design which is ready wound and fitted with a ceramic bandswitch. Other suitable assemblies are the Geloso 4/112 or the Codar PI-NET575. The latter requires a separate bandswitch, which should be a good quality ceramic type. For those wishing to wind their own p.a. coils, the details are: 30 turns,

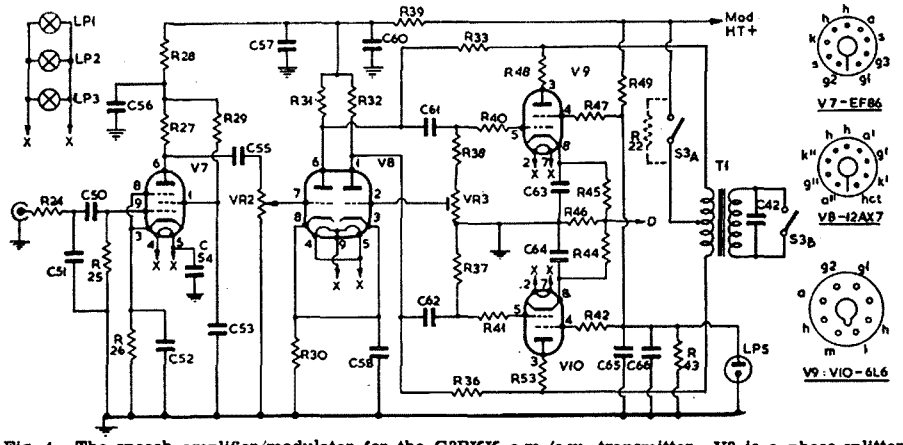



Fig. 4.—The speech amplifier/modulator for the G3RKK a.m./c.w. transmitter. V8 is a phase-splitter to drive the push-pull 6L6s; these are carefully balanced (see text) and other valve types may be used instead of the 6L6s—such as EL84s for less audio power in a QRP version of the transmitter. The switching protects the modulation transformer against transients when on c.w., an important point too often overlooked in some commercial designs; there should be no rise-and-fall on keying across any iron-cored component in the p.a. circuit, with the possible exception of the thump-filter across the key itself. The modulation transformer specified for this design is that sold by K.W. Electronics with their "Vanguard" transmitter. Whatever transformer is used, it must be rated for at least 25 watts of audio.

C42—0.01 μF., ceramic, rated at 1 kV.
C50, C55, C61, C62—0.001 μF., silver mica.
C51—200 pF.
C52—50 μF., 25v. electrolytic.
C53—0.1 μF., 500v.w.
C54, C57—0.005 μF., ceramic.
C56, C60—8 μF., 450v.w.
C58—25 μF., 25v.w. electrolytic.
C63, C64—25 μF., 50v.w.
C65—0.01 μF., 500v.w.
C66—8 μF., 500v.w. electrolytic.

R24, R28—47K ohms.
R25, R29—1 megohm.
R26—2.2K ohms.
R27, R31, R32—220K ohms, 5% high-stability.
R30—1.5K ohms.
R33, R36—2.2 megohms, 5% high stability.
R34—22K ohms.
R37, R38—680K ohms, 5% high stability.
R39—22K ohms, 1w.
R40, R41—10K ohms.
R42, R47, R48, R53—100 ohms, 2w.
R43—10K ohms, 10w.
R44, R45—470 ohms, 2w.
R46—See text.
R49—4.7K ohms, 10w.
VR2—500K ohms, a.f. gain.
VR3—25K ohms, balancing phase-splitter.
S3A-B—3-p., 2-w., Phone/C.W.
T1—Modulation transformer Woden UM1 or similar. (see text).
PL1—8.3v. heater-on indicator.
PL2*, PL3*—6.3v. 300 mA. dial lights.
PL5—250v. red neon.

V7—EF86.
V8—12AX7 (ECC83).
V9, V10—6L6 (see text).

Notes:
All resistors are ½ watt carbon unless stated otherwise.
*Lamps PL2, PL3 must be fitted when equipment used on 12v. supply.
For QRP working o/p valves can be EL84 (see text).
Alternative modulator valve types are given in Table 1.

wound 12 t.p.i. on a 1½" diam. former, tapped at the 27th, 12th, 8th, 5th and 3rd turns. This will give above optimum inductance in the 80 metre positions to allow the use of a standard 0.001 μF. loading capacitor; and below optimum on 15 and 10 metres, because of the difficulty of limiting stray and minimum capacities to the optimum values.

Parasitic stoppers, which should be soldered directly to the valve-holder or top cap, are made by winding a few turns of 22g. enamelled wire around a half-watt resistor. These are designated L10, R19 and L11, R20 in Fig. 3. The compartment containing C48 is fitted with a bottom plate to prevent r.f. from leaking round the screen into the grid compartment. Complete screening of the p.a. above chassis is unnecessary from the point of view of stability, but may be desirable as regards t.v.i. suppression. If the p.a. is to be completely screened, mesh must be used for the top of the screening box to allow adequate ventilation.

The lamp on the front panel labelled "R.F. Out" was originally connected to a loop wound round the p.a. pi-coil, and by its brightness gave a rough indication of the tuning. After burning out a large number of bulbs in an attempt to achieve uniform coupling on all bands, its use was abandoned in favour of an s.w.r. meter! The t.v.i. trap consists of a Philips' trimmer and an air-spaced coil and should be mounted close to the output socket.

In the speech amplifier, which should be carefully constructed, particular care must be taken to avoid mains hum in the early stages. All earth returns for the entire modulation are taken straight to a bus-bar of 16g. tinned copper wire, which is earthed at one end only, to avoid hum loops.

Similar comments apply to the phase-splitter stage. High stability resistors should be used where stated to maintain a good balance and, for the same reason, corresponding components in each half of the push-pull modulator should be carefully compared. The parasitic stoppers R42, R47, R41, R40, R48, R54 must be wired straight on to the valve-holders.

The modulation transformer should have a rating of at least 25 watts a.f., and must match the modulator valves to the p.a. A pair of 6146s in Class AB1 and 400 volts h.t. require an anode-to-anode load of 9,000 ohms—the corresponding figure for other modulator valves is given in Table 1. A 6146 operating at 50 watts input with an anode current of 115 mA. has an anode impedance of 4,000 ohms. The transformer used on the prototype is manufactured by Banner Electronics and is sold by K.W. Electronics as a spare part of their "Vanguard" transmitter. A slightly more expensive multi-range type is the Woden UM1. This has the advantage that it can be used with practically any combination of modulator and p.a. valves.

## METERING

The shunts for the meter are fitted directly in the earth returns of the stages to which they belong—not on the meter switch. The connections from the shunts to the switch need not be made using screened cable provided that they are carefully routed and decoupled at each end.

The ranges required are: 0-5 mA. (grid current), shunt R16; 0-150 mA. (p.a. and modulator cathode currents), shunts R17 and R46; 0-1,000v. (p.a. h.t. voltage), multiplier R49. Any meter with a full scale deflection of less than 5 mA. may be used, the shunts being adjusted accordingly.

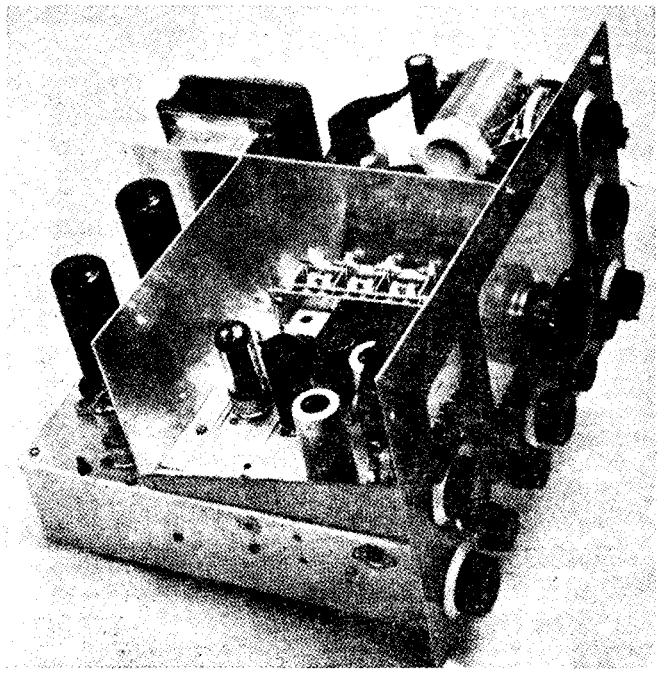
## POWER SUPPLIES

The basic power requirements for the transmitter are: V.f.o., 150v. 10 mA. stabilised; Buffer, 250-300v., 10 mA., preferably stabilised; Exciter, 300-400v. 50 mA.; P.a., 450v. 120 mA.; Modulator, see Table 1, 120 mA.; Heaters, 6.3v., a.c. or d.c., at 8 amps., or 12.6v., a.c. or d.c. at 4 amps.

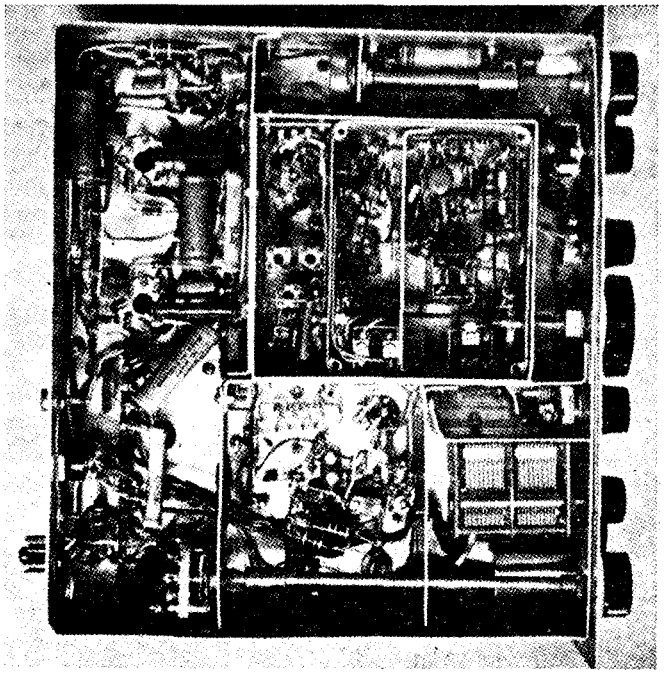
There are many possible designs for suitable power supply units. The reader will usually wish to use transformers and chokes that he can obtain on the surplus market, so these notes will be kept as general as possible.

Several apparently obscure faults can result from bad power supply design, particularly from interaction between the different supplies. Many of these arise from a combination of the following factors:—

(1) The current taken by a Class AB modulator varies with the amplitude of the speech input.
(2) When the p.a. or exciter is keyed, there are large variations in the current taken by the stage in question and the p.a.
(3) If an h.t. supply is not adequately decoupled at all frequencies, it may be modulated by either r.f. or a.f. which could then be passed to the low level stages. Reasonable protection against this is included in the present design.



Construction behind the panel of the G3RKK transmitter. The exciter section is in the foreground screened compartment, also containing V7, the speech amplifier, which is the canned valve in nearest view. The driver stage V8 and the 6L6 modulators are behind, with the modulation transformer at upper left. The 6146 p.a. is in the upper right-hand compartment, with the tapped coil L12 and the switch assembly S4—see circuit diagram Fig. 3. The three-gang tuner is C3A-C3C in Fig. 2.



Under-chassis wiring and layout in the transmitter designed and constructed by G3RKK. The detail in this view is such that the placement of most of the parts can be followed by reference to the main circuit diagrams. The condenser at lower right is C48 in Fig. 3, with C49, to tune out the local t.v. channel, immediately above.

(4) When the current taken from a power supply is varied, the voltage of the supply varies in opposite sympathy by a degree depending upon the regulation of the supply.
(5) The frequency of the v.f.o. is dependent upon its h.t. voltage.

Thus it can be seen that poor regulation and consequent interaction can lead to downward modulation (p.a. voltage reduced on speech peaks), frequency modulation and certain types of instability. Effects upon the v.f.o. frequency are reduced by stabilisation using a gas stabiliser, but this is only effective at very low frequencies, and adequate decoupling is also required.

Ideally, then, the three h.t. supplies should be independent of one another. Fig. 5 shows one way in which they may be combined without unduly affecting the performance. The circuit does not call for very much comment. Conservatively rated components, at least as specified, must be used; and the hardware and general mechanical design of the power pack should be chosen bearing in mind the high voltages present.

Silicon rectifiers are used for the p.a. supply in order to obtain good regulation, which is necessary if the stage is to be modulated correctly. A valve would probably be quite satisfactory, provided that its emission is not low and the transformer and choke are of good quality. If desired, of course, silicon rectifiers of suitable rating could be used instead of V1 and V2, but they would be very much more expensive. The transformer T1 need not all be one unit, of course, but could consist of several separate transformers with their primaries wired in parallel.

Mains dropper resistors in the primary of the transformer must be avoided as it will lead to interaction between the outputs. A surge limiter, such as Brimistor (R11) may, however, be found necessary to prevent the fuses from blowing when the equipment is first switched on.

The chokes Ch.1-Ch.4 must be low resistance types of good quality; the potted C-core type are recommended. The mains filter should be built in a small screened box, with good earth connections. Its purpose is to prevent t.v.i. from occurring by conduction through the mains.

## PORTABLE AND MOBILE OPERATION

If sufficient space is available, the transmitter may be used portable or mobile in the form described. The power consumption (and, of course, the output) can be reduced by suitable adjustment of the h.t. supply voltages.

However, if the transmitter is to be built specifically for this application, there are several small modifications that can be made to reduce both the size and power consumption.

The first is to cut the power input to 30 watts or less and use EL84s in the modulator. The necessary changes of component values are given in Table 1, and the p.a. h.t. supply should be lowered to about 350 volts. In view of the small physical size of the 6146, there is no point in replacing it by another valve. The heat generated is reduced by the lower power input. These modifications permit considerable reductions in power consumption and the sizes of the modulator and p.a. compartments. It is recommended that the smaller Geloso or Codar mobile pi-coil units be used in the QRP version.

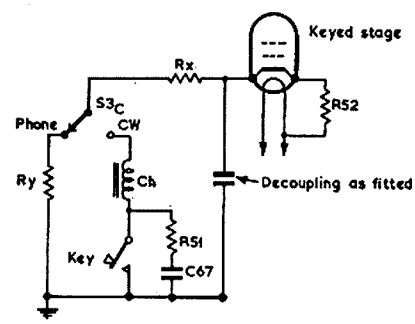



Fig. 6.—Keying circuit for the G3RKK transmitter, when breaking V5 cathode: C67, 1.5 μF.; R51, 100 ohms; R52, 220K 1w.; Ry equals d.c. resistance of Ch.; Rx plus Ry equals cathode res. as originally fitted; Ch., 2 Hy. 100 mA. If keying at V4: C67 is 1.0 μF. and Ch. is 5 Hy. 20 mA. See circuits of transmitter for references.

It may also be advisable to use a relay in preference to a valve for protection of the p.a. The circuit is the usual one. As the load on the r.f. section heater supplies is reduced, PL1 should be removed to restore the balance for 12.6v. operating, resulting in a saving of 6 watts.

If (for mobile use) a phone-only design is required, further reductions in size may be achieved by omitting the phone/c.w. switching. It is not recommended that the exciter section be made smaller than suggested, but with careful design the other compartments could all be reduced in size, the limiting factor being ventilation for the required power input.

## SETTING UP

When construction is complete, after a thorough check of the wiring has been made and all loose ends and solder have been dislodged from the wiring, the initial testing can be begun.

After fitting the valves and switching on the heater supplies, the main supply cable and non-reactive dummy load may be connected. The dummy load can consist of a number of carbon resistors connected in parallel.

First F1 should be removed and the exciter h.t. only switched on. L1 and L2 are set to give the required coverage, using a calibrated receiver to pick up the output of the v.f.o., and the coils

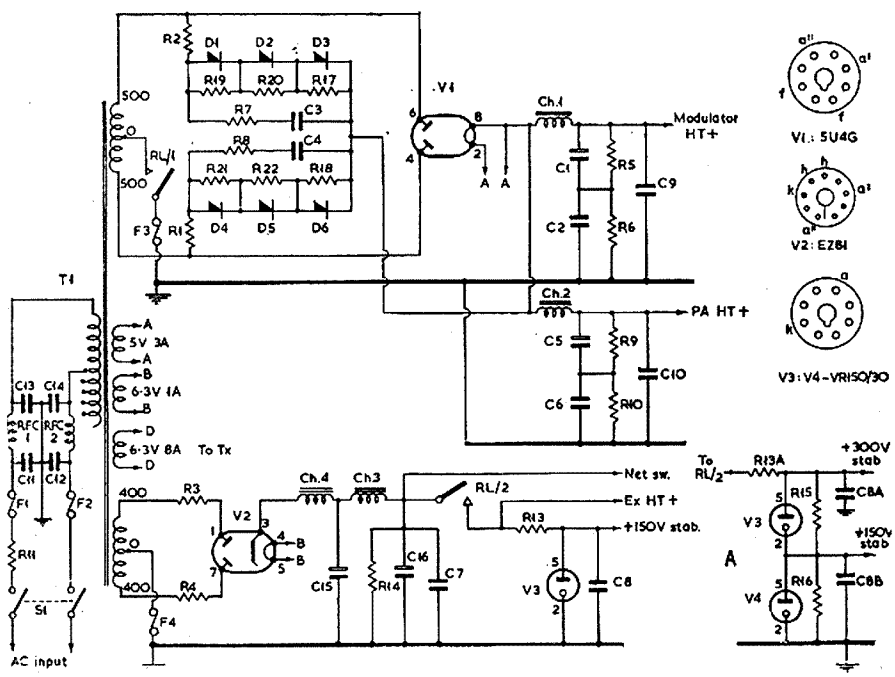



Fig. 5.—A power supply layout for the a.m./c.w. transmitter described in the article by G3RKK, giving all voltages and currents required and incorporating the necessary precautions against t.v.i. Of course, provided the loadings can be met, any other sort of power supply would be equally suitable, though the control and change-over system would have to conform to the circuitry around RL1, RL2 in this diagram. Conversely, this p.s.u. arrangement could be adopted for other types of AT-station equipment calling for about the same sort of loading.

C1, C2, C5, C6—32 μF., 450v.
C3, C4—0.02 μF., 1 kV.
C7, C8—0.01 μF., 500v.
C9, C10—0.01 μF., 1 kV.
C11, C12, C13, C14—0.01 μF., 300v. a.c.
C15, C16—18 plus 16 μF., 600v.

R1, R2—47 ohms, 2w.
R3, R4—100 ohms, 2w.
R5, R6, R9, R10—39K ohms, 2w.
R7, R8—10K ohms, 2w.

R11—1 amp. Brimistor, type CZ11.
R13—4.7K ohms, 5w.
R13A—470 ohms.

R14—82K ohms, 2w.
R15, R16, R17, R18, R19, R20, R21, R22—470K ohms.

Ch1, Ch2—20 Hy., 150 mA.
Ch3, Ch4—20 Hy., 80 mA.
T1—Prim.: 200-250v.; Sec.: 500-0-500v. 250 mA., 400-0-400v. 80 mA., 6.3v. 8 amp., 6.3v. 1 amp., 5.0v. 3 amp.
Ry1, Ry2—Relay coil to suit Tx/Rx switching, with 500v. 250 mA. contacts.
RFC1, RFC2—1.5 mH., 1 amp., mains type.
F1, F2—2 amp. fuses, anti-surge.
F3—500 mA. fuse.
F4—200 mA. fuse.
S1—D.p.d.t., 250v. a.c., 2 amp.
D1, D2, D3, D4, D5, D6—800 p.i.v. silicon rect., 200 mA.
V1—5U4G, or similar.
V2—EZ81.
V3, V4—VR150/30, or similar.

and wideband couplers are then aligned in turn to give maximum V5 grid current. The wideband couplers must be adjusted to produce, as far as possible, constant output over the entire band. Small 1-10 pF. air trimmers connected across the "hot" ends of the wideband couplers are helpful in obtaining the best performance.

The screen resistor of the v.f.o. (R3) must then be adjusted on the 80 and 40 metre ranges so that reliable oscillation is just obtained on both bands without falling off at the edges. For convenience it may be noted that the strongest oscillation is obtained with a value of about 22K, the gain decreasing as the value is increased. A d.c. voltmeter connected from the grid of V3 to earth via an r.f. choke at the probe end is a useful output indicator. Having done this, C12 is then adjusted so that the maximum output is obtained without driving V2 into grid current. Increasing the drive to V2 further will adversely affect the stability without a significant increase in the drive to the p.a.

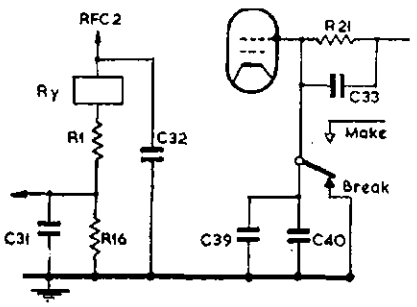



Fig. 7.—When the G3RKK Tx is used mobile or portable, the p.a. clamping circuit can be by relay, as shown here and originally described by G3LWM in Dec. 1963, "Short Wave Magazine". Condensers C31, C32, C33, C38, C40 and R16, R21 are as fitted in Fig. 3. In the circuit above, R1 is 18K, to equal the d.c. resistance of Ry (R1 and Ry replace R15) and Ry is any relay with a 2 mA. coil, having contacts rated at the control voltages involved.

With both bandswitches put to 80 metres and VR1 set to give 2.8 mA. grid current, the p.a. can be switched on. It should be possible to load it so that the cathode current dips from about 130 to 110 mA. as C47 is tuned through resonance.

With the v.f.o. valve removed, V6 should hold the anode current of V5 to about 30 mA. Under these conditions C28, C47 and C48 should all be rocked from side to side. If the p.a. is stable, no variations in anode current should occur and, of course, no grid current should be registered. Also, under normal conditions, variations of grid current when the anode circuit is tuned through resonance should be very slight and minimised by adjustment of the neutralisation control if fitted. The voltages at the points given in Table 2 should be measured, and the circuit conditions adjusted if any differ by more than about 10 per cent.

When the r.f. section is functioning correctly the modulator may be set up. With the p.a. still running into a dummy load, an audio oscillator with a frequency of about 400-2,000 c.p.s. should be fed into the microphone socket and VR2 adjusted to give about 95 per cent. modulation. The a.c. voltages from the grids of V9 and V10 to earth should now be measured using a valve voltmeter or a good rectifier type multimeter and VR3 adjusted until they are identical.

With a microphone now connected, the volume control should be adjusted so that 95 per cent. modulation is just reached on speech peaks. This condition must be maintained whenever the transmitter is used.

The t.v.i. trap is best aligned by very loosely coupling the output of the transmitter to the aerial socket of a t.v. receiver tuned to the local t.v. channel —in the sense of "showing it some r.f."

**TABLE 2**

For assistance in fault finding and setting up, a number of voltage readings taken on the author's transmitter are given below. They are only intended as a rough guide, but will give some idea of what to expect. In particular, they will have to be intelligently adjusted if different h.t. voltages are used.

**Measurement Conditions:** Bandswitches in 20 metre position. A.f. gain at minimum. Transmitter correctly tuned and loaded into a dummy aerial. Meter sensitivity 10,000 ohms per volt. 500, 25 or 5 volt range as applicable. All are d.c. voltages to chassis.

| | | |
|---|---|---|
| HT | End of R3 | 150v. |
| V1 | Anode | 80v. |
| | Screen | 50v. |
| V2 | Anode | 300v. |
| | Screen | 280v. |
| | Cathode | 6v. |
| V3 | Anode | 270v. |
| | Screen | 0-270v. |
| | Cathode | 1v. |
| V4 | Anode | 320v. |
| | Screen | 270v. |
| | Cathode | 8v. |
| V5 | Anode (H.t. end of RFC3) | 450v. |
| V5 | Screen (This is critical) | 150v. |
| | Cathode | 9v. |
| V6 | Grid | —50v. |
| V7 | Anode | 80v. |
| | Screen | 90v. |
| | Cathode | 2v. |
| V8 | Anodes | 200v. |
| | Cathodes | 2v. |
| V9 V10 | Anodes | 400v. |
| | Screens | 270v. |
| | Cathodes | —22v. |
| Junction R27, R28 | | 300v. |
| Junction R28, R39 | | 330v. |

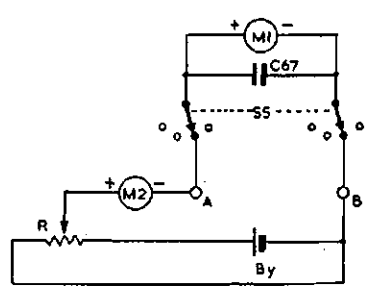



Fig. 8—Setting up the meter shunts for the H.F.-Band Tx. This takes care of all necessary checks and measurements. See Table 2.

—and adjusting C49 for minimum interference.

When loading up the transmitter, the best procedure is first to adjust C47 for a dip in anode current with the dummy load connected. C48 is then tuned for maximum r.f. output, and the procedure repeated until no further improvement can be obtained. The loading may then have to be reduced very slightly to give the best modulation characteristics. Then connect the main aerial and adjust the aerial tuning unit for maximum output, using an absorption wavemeter or s.w.r. meter as indicator (the latter is to be preferred). A well matched coax.-coupled beam or dipole may be fed directly from the output socket of the transmitter.

When first setting up the exciter and noting the approximate setting of C47 and C48 for the higher frequency bands, it is as well to use an absorption wavemeter to make sure that none of the tuned circuits is set up on the wrong harmonic.

The transmitter as described and illustrated here has now been in operation at G3RKK, with several different v.f.o. systems, over a period of six months, and reports on stability, speech quality and general performance have been most favourable. All that is required now is an aerial system that will do justice to it!

The writer hopes that anyone who copies this design will have many years of trouble-free service from it, and that other readers will at least have found something in this article to interest them. ●

☆

# HIGGINBOTHAM AWARD

The Publications Committee decided that as no technical article for 1964 merited the award, it would be better to broaden the scope of this prize to include meritorious service towards "Amateur Radio," and so the Committee are very pleased to announce that **Warwick Parsons**, VK5PS, has received the first Higginbotham Award.

It is very fitting that two men who have both contributed to "Amateur Radio" over such a long time should be named together.

Much could be said regarding Warwick Parsons, better known as "PanSy," but it is perhaps best summed up by the statement that this man has, over many years, devoted much time, has contributed towards, and has given assistance and pleasure to many Amateurs and readers of "A.R." During these years his own personal life has not been free from many problems, yet he has continued to provide a regular flow of Divisional news, much to the enjoyment of readers.

The Committee congratulates Warwick for his service to "Amateur Radio."

☆

**ERRATA**

Readers are asked to amend the Australian D.X.C.C. Countries List ("A.R.," January 1965) as follows:

Add: 9M2 (prior 16/9/63), Malaya.

Delete 9K3, Kuwait-Saudi Arabia, N.Z.

# TRANSMITTER FOR 70 CENTIMETRES*

## PRACTICAL DESIGN FOR UP TO 10 WATTS R.F. OUTPUT

THE circuit here is of a 70-centimetre transmitter designed by G3NNG and shown in the February issue of "QAV," of the Harwell (A.E.R.E.) Club group. Capable of an output of 8-10 watts on 432 Mc., the DET24 is in a resonant cavity, details of which are given in Fig. 2.

In some notes on the circuit, G3NNG makes the following points: All earthy pins should be soldered direct to chassis and the wiring kept short and direct. The first A2521 could be replaced by an E180F with only a slight reduction in output. A good screen should be soldered across V3 and V4 sockets to isolate inputs from outputs. In the case of V4, the screen forms part of the trough for L5.

R.f. chokes must be used as specified, and both heater leads of V3 and V4 need to have chokes wound to the dimensions given for RFC1; similarly, the heater side of V5 has chokes as specified for RFC4.

Grid drive is controlled by R11, and is set for maximum output at anode currents up to 12 mA.; about ¾-watt of drive should be available for the p.a.

* Reprinted from "The Short Wave Magazine," May, 1964.

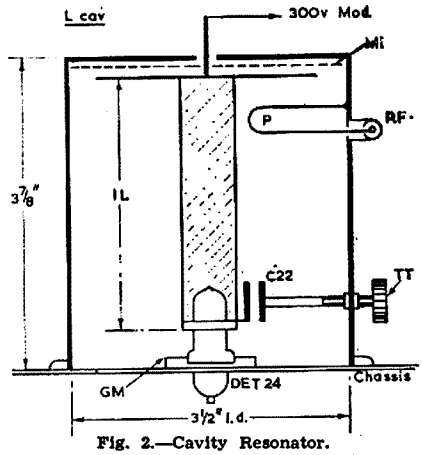



Fig. 2.—Cavity Resonator.

IL — Inner line, 1-in. o.d., with 1/16th-in. wall, brass or copper.
GM — Grid mounting, 1½-in. diameter brass ring insulated by one-thous. mellnex or mica from chassis, forming C21.
TT — Tank Tuning, discs of ⅞-in. diam. brass on 4BA rod, forming C22.
MI — Mica/Melinex Insulator, 1½-2 thous.
P — Probe, for taking off r.f.
Notes: Construction can be in brass or copper. Anode of DET24 clamped by disc to line to keep seal cool. Outer cavity 3½ ins. inside diameter by 3⅞ ins. long. P.a. h.t. fed to rod fixed to inner line.

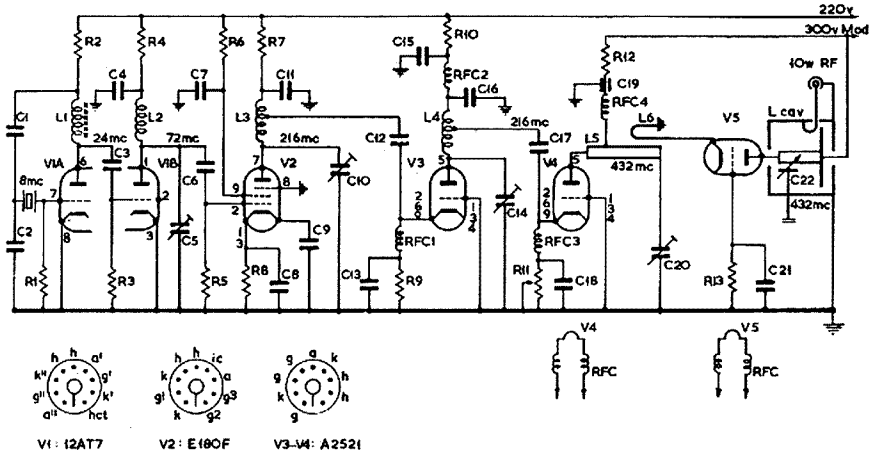



Fig. 1.—Circuit of the 430 Mc. Transmitter designed by G3NNG, with a DET24 in a cavity resonator (see Fig. 2) as the straight-driven p.a. (V5), capable of up to 10 watts r.f. output. Note that modulation is applied simultaneously to the anodes of driver and amplifier. This has been a particularly successful 70-centimetre transmitter design for the Harwell Club group, having won them three 430 Mc. contests during 1963. Note that in this circuit V3 should also be shown as taking heater chokes.

C1, C19 — 0.001 μF.
C2, C3 — 47 pF.
C4, C7, C8, C9, C11, C13, C15, C16, C18 — 0.005 μF.
C5, C10, C14, C20 — 2-8 pF. tuning trimmers.
C6 — 22 pF.
C12 — 220 pF.
C17 — 100 pF.
C21 — See Fig. 2.
C22 — Tank tune, see Fig. 2.
R1 — 12,000 ohms.
R2, R7 — 4,700 ohms.
R3, R5 — 33,000 ohms.
R4 — 1,000 ohms.
R6 — 22,000 ohms.
R8, R13 — 100 ohms.
R9 — 120 ohms.
R10 — 2,200 ohms.
R11 — 5,000-ohm drive potentiometer.
R12 — 8,200 ohms.
V1A, V1B — 12AT7.
V2 — E180F.
V3, V4 — A2521.
V5 — DET24.
L1—24 Mc.: 18 turns 28g., ⅜-in. diam., slug-tuned.
L2—72 Mc.: 4 turns 20g., ½-in. diam. by ½-in. long.
L3—216 Mc.: 1½ turns 20g., ⅜-in. diam., tap ¼-in. from cold end.
L4—216 Mc.: One turn 20g., ½-in. diam., with ½-in. anode lead. Tap ⅛-in. from cold end.
L5—432 Mc.: 5½-in. length of ½-in. diam. copper rod in one-inch square trough; h.t. tap 2 ins. from anode.
L6—Link, L5: Hairpin 1½-ins. long by ½-in. wide, 20g., placed ¼-in. above centre L5
Lcav—432 Mc. Cavity: See sketch Fig. 2.
RFC1, RFC2, RFC3—20-in. length of 24g. enamelled, wound to ⅜-in. diam. to be self-supporting.
RFC4—As RFC1, but 10 in. length 24g.
Note: R.f. chokes as RFC1 als in heaters V3, V4; as RFC4 in heater of V5.

The DET24 grid is mounted in a brass ring which is insulated from chassis by mica or melinex sheet to form the decoupling capacity C21. Care must be taken to ensure that no excessive mechanical strain is placed on the valve in its mounting, or the glass-metal seals may break. The key to the construction of the cavity is given with Fig. 2.

G3NNG reports that this neat design has been in use for about 18 months with reliable and most satisfactory results—indeed, all who may have worked the Harwell group on 70 Cm. field day occasions will have heard this particular transmitter, which won the A.E.R.E. boys three 430 Mc. contests during 1963. So it does work! ●

☆

# MODIFICATIONS TO THE 522

(Continued from Page 3)

This amount of C did not give enough variation to compensate for the average crystal to be brought to the net frequency.

It might be added that unless the final frequency is within 1,000 cycles of the net frequency copiability is rapidly lost when the distances between mobile and base are increased beyond approximately five miles.

When the frequencies are netted within this amount the range is considerably extended, particularly under weak signal conditions.

Also, unless the ratio detector or discriminator is at centre net frequency in a mobile vehicle, ignition and electrical hash will not be rejected by the discriminator, which will also tend to make the received signal uncopiable.

After experimenting with several crystal oscillator circuits, the original circuit was modified to the accompanying circuit and has been found to provide the best results to date, consistent with output and giving frequency variation of approximately 500 cycles at the crystal fundamental frequency without putting the oscillator out of oscillation.

Providing the crystals are slightly high in frequency to start with, this frequency shift at the fundamental, multiplied by 18 times, is sufficient to adjust the crystals to the net frequency.

It is hoped that this further information may help to avoid some of the teething troubles of multi-channel operation which have been experienced in the modification of this equipment at this QTH, when more than one channel operation is necessary—as it has become in Melbourne recently.

This modified unit has been in operation for some considerable time as a base unit and has been left running on the 145.854 Mc. VK3 channel A frequency almost continuously while in the shack, with excellent results on all other channels, and has proved to be comparable with the commercial 10-watt f.m. mobile unit. ●

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# NEW TIME SIGNAL SERVICE

A new time signal service, broadcast to all parts of Australia by short wave, has been introduced by the Australian Post Office.

The signals, broadcast from Post Office transmitters at Lyndhurst in Victoria, are sent out each second, 24 hours a day, except for short breaks for transmitter and frequency changes.

The signals are a series of pips sent out at one-second intervals with the minutes marked by the elimination of the 59th pip of each minute. A recorded voice identifies the station, VNG, during the first minute of each hour.

The signals are generated by special equipment designed and produced by the Post Office Research Laboratories and are accurate to better than one hundredth of a second.

The equipment is housed at the Department's speaking clock installation at the City West Telephone Exchange in Melbourne, and is connected to Lyndhurst by land line.

The service is broadcast on frequencies of **5425 Kc.** and **7515 Kc.** between 10.15 p.m. and 8 a.m., and on **7515 Kc.** and **12005 Kc.** between 8.15 a.m. and 10 p.m. This ensures a day and night coverage throughout practically all areas of Australia.



# NEW CALL SIGNS

**OCTOBER, 1964**

VK1UN—J. A. Robb, 25 Discovery St., Red Hill, A.C.T.
VK2BAF—S. E. Hodgins, Highway Motel, Holbrook.
VK2BCL—R. A. Love, Flat 1, 15 Hereward St., Maroubra.
VK2BEN—J. D. Blalock, 7 Thorpe Ave., Queanbeyan.
VK2BPY—P. R. Young, 2 Iredale Ave., Cremorne.
VK2ZHJ—J. F. Heron, Collwood Cres., Orange.
VK2ZMF—M. K. Francis, Hill St., Scone.
VK2ZMQ—S. K. McCarthy, 71 Como Pde., Como.
VK2ZNN—N. C. Nugen, 24 Carrington Pde., Harbord.
VK2ZOC—K. C. Oldroyd, 82 Hilma St., Collaroy Plateau.
VK2ZZW—P. R. Wellings, 5 Leumeah St., Cronulla.
VK3FU—L. E. Thorne, Station: 8 Walter St., Ascot Vale; Postal: C/o. Containers Ltd., 240 Geelong Rd., West Footscray.
VK3PN—C. K. Constable, 84 Cityview Rd., North Balwyn.
VK3QA—R. D. Glasser, 306 Wattletree Rd., Malvern.
VK3QF—T. N. Diviney, 3 Dalny Rd., Murrumbeena.
VK3YH—R. R. Howe, 9 Howell Drive, Mt. Waverley.
VK3ADO—A. Duckworth, 75 Wilson St., Middle Brighton.
VK3AFZ—E. H. S. Foot, Station: 79 Elwers Rd., Rosebud; Postal: 22 Laurel Ave., Boronia.
VK3AVK—N. O. Duncan, 13 Kenbry Rd., Heathmont.
VK3AYO—M. T. Webster, 79 Pearson St., Sale.
VK3ZBJ—G. S. Jennings, 555 High Street Rd., Mt. Waverley.
VK3ZFG—A. E. Hiscock, 3 Whitmuir Rd., Bentleigh.
VK3ZHA—E. P. Blake, 62 Riddel Pde., Elsternwick.
VK3ZHL—G. H. Loft, 36 Hopwood St., Echuca.
VK4IL—A. G. Lewis, 30 Bates St., Bundaberg.
VK4ZHB—F. H. Birkbeck, Flat 2, Haymarket St., Hyde Park, Townsville.
VK4ZJP—J. S. Perryn, 39 Woondooma St., Bundaberg.
VK4ZLT—L. O. Tully, 120 Victoria St., Fairfield.
VK4ZMG—G. W. McLucas, Station: 323 Bourbong St., Bundaberg; Postal: P.O. Box 510, Bundaberg.
VK4ZRW—R. C. Wright, 119 Elliott Heads Rd., Bundaberg.
VK5AU—W. E. Catchpoole, 74 Church Tce., Walkerville.
VK5NC—K. G. Ellis, B.C.A. Society, Control Station, Ceduna.
VK5OL—R. E. Maricle, 1 Stanhope St., West Beach.
VK5ZRW—R. W. Humphrys, C/o. S.A. Railways, Lyndoch.
VK5ZRS—R. S. Langhans, 32 Parry Ave., Somerton Park.
VK5ZHH—M. K. Rogers, 30 Portland Ave., Darlington.
VK5ZJC—J. C. Vayne, O'Loughlin Tce., Ceduna.
VK6ZEJ—J. K. Holt, 218 Flinders St., Mt. Yokine.
VK7ZLP—L. A. Pretty, 16 Garden Gr., Launceston.
VK7ZRS—R. E. Schulze, Valley Rd., Devonport.
VK7FG—C. H. Ranft, 12 Lime St., Launceston.
VK7ZGM—G. P. Casson-Medhurst, 9 Beach Rd., Sandy Bay.



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**COMPLETE** 10-80 mx 150-watt s.s.b. station. Heathkit s.s.b. adaptor, two 6DQ5s linear, vox, u.s.b./l.s.b., power supplies. AR7, product detector, spare coil boxes. All in 3 ft. standard rack. Other gear. See operating. £100 o.n.o. J. Mabbitt, 198 Foote St., Templestowe, Victoria.

**FOR SALE:** Complete Table-Top Station consisting of Hallicrafter HT37 a.m., s.s.b., 10-80 mx; Rx Drake 2B. Both these units as new, having very little use. Owner going QRT. £500. J. Martin, P.O. Box 239, Bairnsdale, Victoria.

**FOR SALE:** Cossor Scope, model 1039M, good condition, 2¾" tube, 5-step time base, 10 c/s. to 50 kc.; sync.; Y ampfl. gain: 75, 25 c/s. to 120 kc.. 20. 25 c/s. to 1.5 Mc., 30% down. £40 or best. K. Aggett, 2/9 Allen St., Glebe, Sydney, N.S.W.

**FOR SALE:** Hallicrafters model SX111, selectable sideband receiver, a.m., c.w., s.s.b., double conversion, selectivity 0.5 to 5 kc., six Amateur bands, 3.5 to 28 Mc., plus 10 Mc. band for WWV, 100 kc. crystal calibrator, factory condition, £200. Geloso Transmitter, type G222TR, 6146 final, plate modulated, 3.5 to 28.0 Mc., perfect condition, £75. H. Watts, 4a Phillip St., Toowoomba, Qld.

**FOR SALE:** Hammarlund HQ140-XA Receiver, 500 Kc.-30 Mc., bandspread 80-10 mx., Kokusai mechanical filter with switched crystal b.f.o. giving excellent s.s.b. reception, 100 kc. crystal cal., S meter, good condition, £120. VK2AXB, 114 Attunga Rd., Newport, N.S.W.

**SELL:** "Courier" 16-tube s.s.b. Transceiver, Collins mechanical filter, parallel 6146s linear, 14 Mc. compact p.t.t. good DX getter, with tubes, manual, no power supply, £100. VK4DO, Hobler, 190 High St., Rockhampton, Queensland.

**SELL:** Odd parts—engraved panel R. & H. July '62 Rx, somewhat modified; VCR138A c.r.t.; valves two 6SH7s, 6J5, 1K5G, 3S4, 80, 1R5, 1Q5GT, 1T4, 6AU6 with socket, shield, 6SN7GT, 10 other miniatures of unknown origin; Tranny, 150 a side at 30 mA., 6.3 at 2a.; Caps.: 2 x 4 μF. at 240 v.a.c., 2,000 μF. at 12v., 500 μF. at 12v., 150 μF. at 50v.; old radio containing 47, 2 x 57, 3 x 1 μF. at 1 kV. block, 3 x 0.25 μF. at 1 kV. block, electro-mag. speaker, large chassis, etc., good for parts only. £7 the lot or offer. Wanted: 3 el. 20 mx, pref. with rotator and feeders. Offers to WIA-L5067, 12 Fuller St., Walkerville, S.A. Ring 65-2050.

## ● TRANSISTOR IGNITION SYSTEMS

Mark 2 Hi-Fire—Ready to use, complete one-piece unit:

Positive Earth ..... **£23/18/0**

Negative Earth ..... **£22/10/0**

**Plus 12½% Sales Tax. Pack & Post 5/-.**

Please state whether 6 or 12 volt required. Enquiries welcomed for Tachometers, complete or in kit form.

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Available from stock: Line output and Frame Output to suit all makes. Changeover Service available on L.O.P. Power and F.O.P. Transformers. Write or call for lists.

## ● V.U. METERS

VR-3P 3¼" Square. Scaled —20 to +3 at—

**70/-**

Sales Tax Exempt. Pack & Post 1/-.

E.W.16—Edge Reading Style 3¼" x 1". Scaled —20 to +3 at—

**85/-**

Sales Tax Exempt. Pack & Post 1/-.

# WARBURTON FRANKI

## ● TRANSFORMER RECTIFIER SETS

A. & R. Transformer and Matching Contact Cooled Rectifier. **Output**: 250 v.d.c. at 60 mA. Much cheaper than ordinary transformers using valve rectifiers, or silicon diodes. Suitable for instruments radios, amplifiers, etc.

**36/- set** + S.T. 12½%

ALSO—

Low Voltage Sets—Transformer and Rectifier to give output of 12-15 volts at 2 amps. Suitable for model trains, transistor radio power supplies, etc.

**41/- set** + S.T. 12½%

## ● SILICON DIODES

**400 P.I.V. at 1 amp.**

Made in U.S.A.

**6/3 each** + S.T. 25% or

**70/- doz.** + S.T.

SPECIAL OFFER—

**Lots of 50**

**£13/10/0** + S.T.

## ● TRANSFORMERS

**Prim.: 240v., Sec.: 900v. at 100 mA.**

Housed in heavy metal case with mounting feet 8½" x 4" x 2½". Flying lead connections. Weight 11½ lbs. Few only to clear at—

**35/-**

**including Sales Tax. Plus Freight.**

## ● GRID DIP OSCILLATORS

**"Q" Max, Model GDO-2**

Made in England

Eight Frequency Ranges from 1.5 Mc. to 300 Mc. May also be used as:

1. Absorption Wavemeter.
2. Phone Monitor.
3. Oscillating Detector.
4. Signal Generator.

**£30/7/6**

**Plus 12½% Sales Tax. Pack and Post 2/6**

## ● 50,000 O.P.V. MULTIMETER BARGAIN

Sakura TR-18 measures—

A.C./D.C. Volts to 1,000.
D.C. Current to 250 mA.
Resistance to 10 megohms.
Decibel Scales: —20 to +22.
+20 to +36.
Capacitance: 0.001 to 0.1 μF.
Inductance: 10 H. to 500 H.

**£8/10/0**

**Plus 12½% Sales Tax. Pack & Post 2/-.**

## ● PANEL METERS

MR2P—Size: 1⅝" Square:—

| | | |
|---|---|---|
| 0-1 mA. | **29/6** | S.T. exempt |
| 0-500 uA. | **31/6** | „ „ |
| 0-50 uA. | **45/-** | „ „ |

Plus Pack and Post 1/- each.

## ● PROTECT your premises with the SCOTT ELECTRONIC EYE

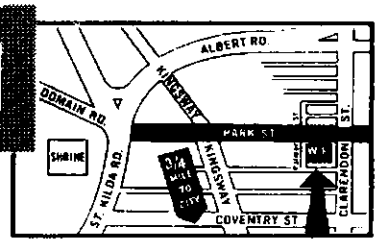
A.C. mains operated. Kit consists of Light Source and Eye Unit. Complete with power supply, amplifier, buzzer, hardware and connecting wires. Use across doorway or other openings up to 25 ft. wide.

**£16/13/4**

**Plus 12½% Sales Tax.** Plus Postage for weight of 4 lbs.

## WARBURTON FRANKI

**220 PARK ST. SOUTH MELB., VIC.** PHONE 30 lines **69-0151**




★ *TRADE ALSO SUPPLIED*

● *Please include postage and freight with all orders*

W.F.7

# AMATEUR RADIO

MARCH 1965

Vol. 33, No. 3

2/6

Registered at G.P.O., Melbourne, for transmission by post as a periodical

# NEW VALVES AT BARGAIN PRICES

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A3 | 2/6 | 10 a £1 | 2C66 | 15/- | | 6BE6 | 15/- | | 6SF5 | 7/6 | 3 a £1 | 12AH7 | 5/- | 5 a £1 | 808 | 10/- | | EF39 | 5/- | 5a £1 |
| 1A5 | 5/- | 5 a £1 | 2D21 | 12/- | | 6BQ5 | 17/- | | 6SF7 | 7/6 | 3 a £1 | 12AT7 | 12/- | | 809 | 20/- | | EF50 (VR91) | | |
| 1C7 | 3/- | 7 a £1 | 2X2 | 5/- | 5 a £1 | 6C4 | 5/- | 5 a £1 | 6SH7 | 4/- | 6 a £1 | 12AU7 | 15/- | | 830B | 15/- | | and socket | 3/6 | |
| 1D8 | 7/6 | 3 a £1 | 3A4 | 22/- | | 6C6 | 5/- | 5 a £1 | 6SJ7 | 12/6 | | 12AV6 | 7/6 | 3 a £1 | 866 | 25/- | | EF70 | 5/- | 5 a £1 |
| 1F5 | 10/- | | 3A5 | 10/- | | 6C8 | 10/- | | 6SK7GT | 20/- | | 12BE6 | 7/6 | 3 a £1 | 951 | 5/- | 5 a £1 | EF72 | 5/- | 5 a £1 |
| 1H5 | 7/6 | 3 a £1 | 3S4 | 10/- | | 6CM5 | 23/- | | 6SL7WGT | 12/6 | | 12C8 | 5/- | 5 a £1 | 955 | 5/- | 5 a £1 | EF73 | 5/- | 5 a £1 |
| 1K1 | 5/- | 5 a £1 | 3V4 | 15/- | | 6CW4 | 25/- | | 6SN7GT | 10/- | | 12H6 | 3/6 | 7 a £1 | 956 | 5/- | 5 a £1 | EF86 | 26/- | |
| 1K5 | 5/- | 5 a £1 | 5R1GY | 20/- | | 6CW4 | socket | 5/- | 6SQ7GT | 22/- | | 12J5 | 5/- | 5 a £1 | 958A | 2/6 | 10 a £1 | EL41 | 10/- | |
| 1K7 | 5/- | 5 a £1 | 5U1GB | 14/6 | | 6F8 | 5/- | 5 a £1 | 6SS7 | 7/6 | 3 a £1 | 12SA7GT | 10/- | | 1616 | 20/- | | EY91 | 5/- | 5 a £1 |
| 1L4 | 5/- | 5 a £1 | 5V4G | 17/6 | | 6G6G | 7/6 | 3 a £1 | 6U7 | 7/6 | 3 a £1 | 12SC7 | 5/- | 5 a £1 | 1625 | 5/- | 5 a £1 | QQE03/12 | 47/6 | |
| 1L5 | 10/- | | 5Y3GT | 13/9 | | 6G8G | 26/- | | 6U8 | 17/- | | 12SK7 | 5/- | 5 a £1 | 1626 | 5/- | 5 a £1 | QQE04/20 | £3½ | |
| 1LN5 | (CV781) | | 6A6 | 7/6 | 3 a £1 | 6H6 | Metal | 3/6 | 6V4 | 11/4 | | 12SQ7 | 5/- | 5 a £1 | 1629 | 5/- | 5 a £1 | QQV06/10 | 97/6 | |
| | 5/- | 5 a £1 | 6AB7 | 10/- | | 6J5GT | 10/- | | 6V6GT | 16/- | | 12SR7 | 5/- | 5 a £1 | 2051 | 5/- | 5 a £1 | QV04/7 | 25/- | |
| 1M5 | 5/- | 5 a £1 | 6AC7 | 7/6 | 3 a £1 | 6J6 | 10/- | | 6X4 | 10/- | | 19 | 5/- | 5 a £1 | 5763 | 28/- | | RL18 | 7/6 | 3 a £1 |
| 1P5 | 5/- | 5 a £1 | 6AG5 | 5/- | 5 a £1 | 6K7 | 5/- | 5 a £1 | 6X5 | 13/- | | 30 | 5/- | 5 a £1 | 6021 | 10/- | | UL41 | 7/6 | 3 a £1 |
| 1Q5 | 5/- | 5 a £1 | 6AG7 | 12/6 | | 6K8GT | 12/6 | | 7A8 | 2/- | 11 a £1 | 47 | 5/- | 5 a £1 | 9002 | 10/- | | VR53 | 5/- | 5 a £1 |
| 1R5 | 10/- | | 6AJ5 | 7/6 | 3 a £1 | 6L7 | 5/- | 5 a £1 | 7C5 | 5/- | 5 a £1 | 57 | 5/- | 5 a £1 | 9004 | 5/- | 5 a £1 | VR102 | 5/- | 5 a £1 |
| 1S2 | 18/- | | 6AK5 | 15/- | | 6N7 | 5/- | 5 a £1 | 7C7 | 5/- | 5 a £1 | 58 | 5/- | 5 a £1 | AV11 | 2/11 | 8 a £1 | VR103 | 5/- | 5 a £1 |
| 1S5 | 10/- | | 6AL5 | 14/- | | 6R7 | 7/6 | 3 a £1 | 7E6 | 3/6 | 7 a £1 | 717A | 7/6 | 3 a £1 | EA50 | 2/- | 11 a £1 | VR136 | 2/- | 12 a £1 |
| 1T4 | 10/- | | 6AM5 | 15/- | | 6SC7 | 7/6 | 3 a £1 | 7W7 | 2/6 | 10 a £1 | 725A | 20/- | | ECC35 | 20/- | | VR137 | 2/6 | 10 a £1 |
| 2A5 | 7/6 | 3 a £1 | 6AM6 | (EF91) | 10/- | 12A6 | 3/- | 7 a £1 | | | | | | | ECH33 | 20/- | | VT38 | (6D6) | 5/- |
| 2C42 | 15/- | | 6AS7GT | 20/- | | | | | | | | | | | ECH35 | 7/6 | | VT127 | 5/- | 5 a £1 |
| | | | 6B6 | 7/6 | 3 a £1 | | | | | | | | | | | | | VT501 | 7/6 | 3 a £1 |

Packing and Postage 5d. per Valve.

## AMERICAN CO-AX PLUGS AND SOCKETS

Screw on types.

Plugs **10/-**, Sockets **8/9**, Adaptors **17/6.**

## MIDGET VARIABLE CONDENSERS

Type T296, 10 pF., with shaft, **15/6.**

## HI-FIRE ELECTRONIC TRANSISTOR IGNITION SYSTEM

Fits all makes of cars, trucks, boats, etc. Only three wires to connect, 2 bolts to fit. Instant starts. Smoother running. More m.p.g. Increased acceleration. Complete with wire, bolts and fitting instructions for 6 or 12 volt negative or positive earth.

**Negative Earth, £29/5/0** (inc. tax)
**Positive Earth, £30/18/6** (inc. tax)

## MODEL SE-550 HIGH SENSITIVITY MULTITESTER

100,000 ohms/volt d.c., 12,500 ohms/volt a.c.

**Ranges:** D.c. volts: 0-0.5, 2.5, 10, 50, 250, 500, 1000. A.c. volts: 0-2.5, 10, 50, 250, 1,000. D.c. current: 0-10 uA., 2.5 mA., 250 mA. and 10 amp. Resistance: 1000R, 100R, 10R, 1R; (centre) 160K, 16K, 1.6K, 160 ohms (max.), 20M, 2M, 200K, 20K ohms. Decibels: 20 db. to plus 62 db. (0 db. equals 0.775 volt). Dimensions 6 x 4 x 2½ in.

**Price £13/17/6** (inc. tax)

## CENTRAL MODEL CT-330 MULTITESTER

20,000 ohms/volt d.c., 10,000 ohms/volt a.c.

**Ranges:** D.c. volts: 0-.06, 6, 30, 120, 600, 1,200, 3,000, 6,000 (20K ohms/volt). A.c. volts: 0-6, 30, 120, 600, 1,200 (10K ohms/volt). D.c. current: 0-0.06, 6, 60, 600 mA. Resistance: 0-6K, 600K, 6M, 60M. Decibels: 20 to plus 36 db.

**Price £8/10/0** (inc. tax)

## SILVER MICA CONDENSERS

Sizes available: 40, 60, 70, 100, 250, 400, 500, 800, 880, 1140, 1680, 1800, 1900, 2000, 2300, 2800, 3900, 5000, 5680, 5780, 5900 pF.

**Price: 1/6 each** Packing and Postage 5d.

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| | | | |
|---|---|---|---|
| 4¾" x 3" (291) | 3/3 | 6" x 4½" (292B) | 5/9 |
| 6" x 1½" (—) | 3/- | 6" x 6" (297) | 7/6 |
| 6" x 2½" (270) | 3/6 | 9" x 4½" (293) | 8/6 |
| 6" x 3" (296) | 4/- | 9" x 6" (298) | 11/6 |

## NEW TRANSISTORS IN STOCK

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|---|---|---|---|
| OC45 | 14/- | OC170 | 17/6 |
| OC71 | 10/- | OC171 | 17/6 |
| OC74 | 11/- | OC45 | 14/- |

Packing and Postage 1 -

## VERNIER DIALS

Ratio 8 to 1 reduction, scaled 0-10.
Type T501, 1½" diam. **17/6** inc. tax
Type T502, 2" diam. **22/-** „ „
Type T503, 3" diam. **28/-** „ „
Packing and Postage 11d.

## COPPER WINDING WIRE

**4 oz. Reels**

| | | | |
|---|---|---|---|
| 16 B & S Enamel | 9/6 | 26 B & S Enamel | 9/6 |
| 18 B & S Enamel | 8/6 | 28 B & S Enamel | 12/6 |
| 20 B & S Enamel | 9/6 | 30 B & S Enamel | 13/6 |
| 22 B & S Enamel | 10/- | 33 B & S Enamel | 15/6 |
| 24 B & S Enamel | 10/6 | 39 B & S Enamel | 27/- |

## RESIN-CORE SOLDER

**16 GAUGE**

**Five-Core in 1-lb. Packets:**

| | | | |
|---|---|---|---|
| 40/60 | 18/- | 60/40 | 22/- |

**or in 7-lb. Reels:**

| | | | |
|---|---|---|---|
| 40/60 | £6/2/6 | 60/40 | £7/12/6 |

**also per Yard:**

| | | | |
|---|---|---|---|
| 40/60 | 8d. | 60/40 | 9d. |

## SAKURA CIRCUIT TESTER

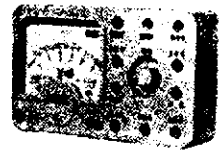
**Model TR65**

Sensitivity: d.c. 20,000 ohms/volt, a.c. 10,000 ohms/volt. Ranges, d.c. volts: 6, 30, 120, 600, 1,200; a.c. volts: 6, 30, 120, 600, 1,200. D.c. current, 60 μA., 6 mA., 60 mA., 600 mA. Resistance: 10K, 100K, 1M, 10M ohms. Capacitance 0.001-0.2 μF., 0.0001-0.01 μF. Inductance: 30-3,000H. Decibels: minus 20 to plus 17 db. (0 db.—0.775v.—600 ohms). Dimensions: 4⅛ x 6¼ x 2⅜ in. Weight 1.3 lbs.

**Price £9/5/-**

**LOG BOOKS 6/6 each,** postage 1/-

## TECH MULTIMETER



300 μA. movement.

AC and DC voltages: 0-10, 0-50, 0-250, 0-500, 0-1000v.

Current ranges (mA.): 0-1, 0-100, 0-500 mA.

Ohms range: 0-100,000 ohms.

Size: 3¼ x 2½ x 1¼ inches.

Complete with leads

**Price only £3,** post paid.

## CO-AXIAL CABLE

50 ohm, UR67, 3/8" diam., in 25 yd. Rolls **25/-**; or 1/6 yard.
72 ohm UR70, 3/16" diam., in 27 yd. Rolls **30/-**; or 1/6 yard.
72 ohm, 3/16", 35 feet **10/-.**

Packing and Postage 7/6

## SILICON RECTIFIERS

OA210/1N1763 500 p.i.v. 400 mA. **7/6**
OA211/AR800 800 p.i.v. 500 mA. **19/6**
Packing and Postage 1/-

## CRYSTAL DIODES

1N21 Mixer U.H.F. Freq. 3060 **7/6**
1N23A Mixer U.H.F. 9375 Mc. **7/6**
or **3 for £1.** Packing and Postage 1 -

## GERMANIUM DIODES

OA79, OA81, OA91, 1N34A ... **4/6 each**
Packing and Postage 1/-

## SLUG-TUNED FORMERS

3/16 inch diameter **1/6 each**

## SPEAKER TRANSFORMERS

E Type, 5,000 ohms to 3.5 ohms **18/6**
E Type, 7,000 ohms to 3.5 ohms **18/6**

## 122 AERIAL SETS

24 ft. high. Eight 3-ft. rods, ¾-in. diam., guy ropes and pegs, etc. **£3,** for rail.

832A P.T.F.E. Sockets **20/- each**

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# "AMATEUR RADIO"

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★

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★

## OUR COVER

Girls at St. Anne's Church of England Girls' Grammar School, Sale, who recently passed the Elementary Certificate under the W.I.A. Y.R.S. These are the first YLs to gain same in VK3. Back Row: Anne Martin, Bronwyn Roberts, Sharen Budge. Front Row: Barbara Knight and Joy Byatt.

## FEDERAL COMMENT

★

## MORSE CODE EXAMINATIONS

One of the lesser-known activities of the various Divisions of the Institute is that of training classes to fit potential Amateurs for the P.M.G. examinations in A.O.C.P. or L.A.O.C.P. grades. Classes are conducted in the theory, regulations and Morse Code standards necessary to pass the relevant exam. In addition, some Divisions also run correspondence courses which enable country aspirants to study in the same way as his town brother.

It has been fairly common practice by the Department to keep the level of their theory and regulation exams. consistent throughout the Commonwealth and between town and country, but this has not been so in the Morse Code exam. Different examiners in each State and the local Postmaster generally in country centres has led to considerable differences in the standard of the "fist" by which candidates pass or fail.

The learning of the Morse Code depends largely on the patience and perseverence of the instructor, and of course the desire of the aspirant to learn. The Institute has had some remarkable instructors in the past—in VK3 in particular, those who learnt under the late Herman Asmus, VK3ET, had to be good operators or one did not even get to the exam. A succession of Institute instructors in the various States has no doubt followed somewhat similar but individualistic lines. Most can be said to have had one thing in common—they were good instructors with more than average "fists", otherwise they did not hold their job.

Whilst it can be said that a good c.w. man can copy any "fist" served up to him, this is not true of the average student, particularly under examination conditions. He will need at least 4 w.p.m. "up his sleeve" and some good sending to boot. We believe that in the country particularly, many students have to try to copy a local Postmaster who perhaps has not sent Morse for years and this, added to the general stress of the exam., leads to a greater failure rate than should be the case.

In the interests of uniformity and in common with teaching practices established in other fields of education, we consider the time has come for the use of tape recordings, all of the same operator, who is an expert, so that the Morse Code exams. throughout the country will be the same and put all students on the same common basis for the receiving test. The machinery for implementing such a system should not be insurmountable by the Department which is generally well supplied with modern equipment.

By adopting such a system, the country stands to gain quite a few more c.w. operators which the nation will still need in time of emergency, but which at present may forever remain an L.A.O.C.P. despite his desire to be a full licensee. This innovation by the Department would be an incentive to Institute instructors and students alike.

FEDERAL EXECUTIVE, W.I.A.

## CONTENTS

# THE MINIWHIP

## EFFICIENT MULTI-BAND HELICAL WHIPS

*MAX J. SWABY,* VK4DA*

MY XYL insisted that if the Tri-Band Swan went into the Valiant it must look respectable, both inside and out. This meant that the centre-loaded 8 to 12 foot whip was out and the finished job must therefore look like a car radio antenna and be only 4 feet odd in length.

Very little of a practical nature has been published in regard to home-brewing the Helical Mobile Whip, hence the above ultimatum indicated an investigation of the Helical, and, leaving out the blood sweat and tears that went into finding out the hard way, the following is a summary of constructional details of whips for 80, 40 and 20 metres. The figures given and the conclusions reached are my own and are no doubt open to argument—but please not with me. The theory behind Helical Whips is somewhat contentious and I just don't know enough to argue the matter. They really work and work well; how or why they work is someone else's worry.

The 80 metre whip will produce S7 to S9 reports from ZL at night when conditions are right, and usually S7 over 1,000 miles odd around VK. The 40 mx job produces S5 reports from G land during the later afternoon when conditions are normal, and compares favourably with fixed station antenna set-ups. The 20 metre whip will consistently work DX during the period of band openings with surprisingly solid contacts, with reports varying from S5 to 20 db. over S9. All the above results are naturally under mobile conditions, and on each band the antenna loads heavily and presents a flat line to the Transceiver without the fuss that fractures 6DQ5s.

Each whip is wound on a 4 ft. 8 in. length of tapered fibre-glass fishing rod 8 mm. diameter at the base and 2 mm. diameter at the tip. A 2" ferrule is glued to the base with epoxy resin glue and the ferrule end of the whip is chucked into an electric drill for winding, with the tip suitably supported to stop whipping.

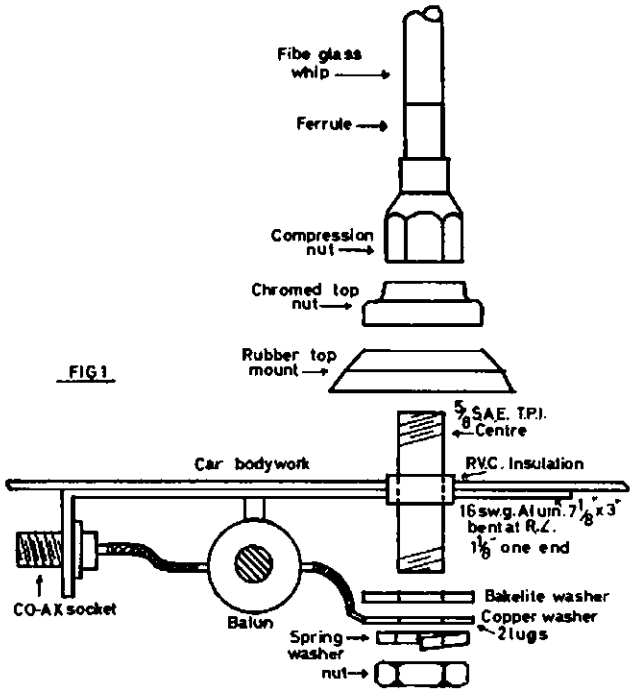
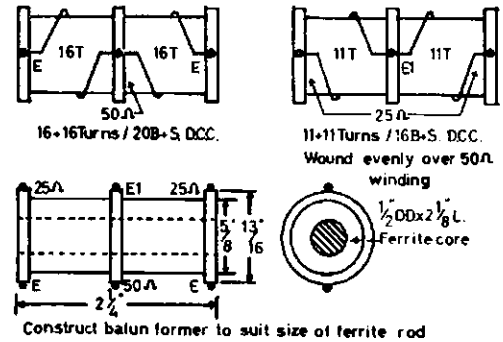



FIG 1



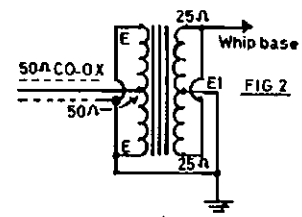




FIG 2

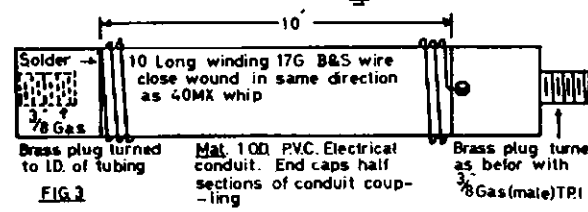



FIG 3

### CONSTRUCTIONAL DETAILS

**40 Metres:** Use 21 B. & S. tough enamelled wire and solder the first turn to the top of the ferrule. Starting at the ferrule wind 20 turns close wound, then 2 turns spaced over 4", and the remainder of the rod is close wound to the tip. The resonant frequency will be about 6.95 Mc.

If difficulty is experienced in acquiring the right size of rod materials, these blanks are readily available from Len Butterworth Pty. Ltd., 369 Stanley St., South Brisbane.

**20 Metres:** With the same gauge wire wind 6 turns over 24½" and the remainder close wound to the tip. The resonant frequency will be about 14 Mc.

**80 Metres:** Use 27 gauge B. & S. and completely fill the whole rod with close wound turns. This will be approximately 3.6 Mc.

Further experiments have now been carried out on the idea of the combination whip for 80 metres whereby the 40 metre whip is screwed to the top of a Resonator, the whole tuning to 80 metres, and as the results have been so promising constructional details of the Resonator are shown in Fig. 3.

Various tests indicate that the combination produces about 3 db. more signal Interstate than the straight 80 metre whip wound with 27 gauge wire. This is probably due to the lowering of IR losses by the use of a larger gauge wire on a larger former, and this is further borne out by an apparent increase in the Q of the combination, making it very frequency conscious with a bandwidth of only about 30 kc.

The base impedances of the above antennae will be very close to 25 ohms and will vary somewhat with mounting position, car construction, and fibre-glass characteristics. The base is coupled through a ferrite-cored 2 to 1 impedance ratio transformer and then by the shortest length of 50 ohm co-ax. back to the transceiver. The 50 ohm impedance figure was decided upon because a few commercial mobile transceivers use a fixed 50 ohm output, and these will load nicely to the above set-up.

* "Timberline," M.S. 902, Dalby, Qld.

## TUNE-UP

An Antennascope is recommended for accuracy, but a grid-dipper will do almost as well. Couple the dipper (or dipper and antennascope) to the transmitter end of the co-ax. and a dip will be found corresponding to the above-quoted frequencies; other dips are also present but can be ignored. Assuming that the car is reasonably removed from nearby reflecting or absorbing surfaces, the tip of the whip can then be trimmed with side-cutters, a few turns at a time, until just below the desired frequency. Then turn on the mobile transceiver and enough antenna radiation from the g.d.o. will leak through to give a signal. Trim one turn at a time from the whip tip and by following the g.d.o. on the receiver, the antenna can be put exactly on frequency.

From experience I find that recommended centre frequencies for the whips are 3.65 Mc., 7.090 Mc. and 14.250 Mc. These frequencies you will find are the most useful for mobile operation and the ones most likely to produce the maximum number of QSOs.

**Bandwidths**: The following figures are not on a db. rating, but the efficiency falls off rapidly past these limits:

| | | |
|---|---|---|
| 3 Mc. | .... .... | 40 Kc. |
| 7 Mc. | .... .... | 60 Kc. |
| 14 Mc. | .... .... | 150 Kc. |

## MOUNTING

My mounting is on the top of the rear offside mudguard, but any position reasonably high on the car and removed from the turret (or upper body portion of the car) is satisfactory. Bumper mounting is **not** recommended as it will drastically alter the base impedance and bring the high current portion of the whip close to the bodywork, resulting in a decrease in efficiency.

Fig. 1 shows details of the mounting arrangement I use, the materials being readily available and the construction requiring only simple hand tools. The centre threaded portion, the top insulators and the bottom fittings being all parts from Astor "Air Chief' car aerials of the 1948-55 era, and the bottom tubular section of this aerial will provide the ferrules mentioned above. The whip nut is a $\frac{3}{8}$" gas compression nut ($\frac{5}{8}$" S.A.E. thread) with $\frac{3}{8}$" internal bore and will fit the whip base ferrules which are belled at the bottom for a push fit into the compression nut. The mounting plate is 16 s.w.g. aluminium, shaped to fit the body contour at the mounting point.

Remove the paint over the area of contact between the car body and the mounting plate. By extending the thread on the centre portion of the Astor fitting and running the thread completely through the top chrome plated nut about $\frac{5}{8}$" thread will be available at the top to hand tighten each whip into position as required.

## COVERING

For mechanical and moisture protection, the whips are covered with epoxy resin glue ("Araldite") by applying an even coat and drying to a smooth transparent surface for a few minutes in front of an electric radiator, turning the whip to ensure an even flow of resin. They are then hung by the tip to dry for 24 hours. A better appearance and better protection may be obtained by covering with plastic tubing. Use 6 mm. tubing and cut a length 12" longer than the whip and after closing off each end, immerse the length in pure benzol until the whole length is soft and supple.

Trim the closed off ends and slide one end as far up the whip as possible, then by applying a regulated 10 to 20 lbs. of air pressure (or oxygen) to the open end the plastic can be slipped the full length of the whip with a lot of urging. The pressure must be watched, as it's quite disconcerting, and very noisy, when excessive pressure blows a hole in the tubing.

The base end is temporarily tied in position with tape and the tip end of the tubing is stretched until it follows the whip taper. Glue the top few inches of the whip, winding with an adhesive that does not attack the tubing, and tie into position until the glue dries and the tubing reforms to the shape of the whip. If the type of plastic tubing which will decrease diameter 50% upon the application of hot air can be obtained, the covering problem can be greatly simplified.

After each whip is completed, the tip must be covered by a plastic cap or the top three inches of the whip will burst into flame during the first damp day. This cap assists also in the reduction of corona noise during mobile reception. Suitable caps are obtained from small ointment tubes (Golden Eye Ointment, etc.) and are easily screwed onto the top few turns and cemented into position.


The above photo shows the author and his 40 metre whip on car mount. An assortment of experimental whips is leaning against the rear of the car. The author is holding a 40 metre midget that will work Interstate but with lowered efficiency and was wound only to find out if a Helical 12 inches long would load and radiate.

## IMPEDANCE TRANSFORMER

Details of this transformer are as shown in Fig. 2 and particularly watch the winding arrangement. The circuit as shown is correct although the phasing arrangement of the coils does look unusual. These transformers are available at a price that makes home-brewing dubious as the high frequency core material is somewhat difficult to obtain.

## COMMENTS

These whips are naturally not as efficient as a properly matched 10-foot centre loaded job, but the difference in performance would have to be measured as comparisons against both commercial and home-brew centre-loaded jobs showed no apparent difference. The 80 metre version is a compromise because the fibre-glass pole is not large enough to hold the right length of a heavier gauge wire. Its performance can definitely be improved by using a 5-foot length of larger diameter with 21 B. & S. wire although a slight base impedance mismatch may occur.

As indicated earlier in this article, the trimming to frequency is very critical and if you end up with a whip that is too high in frequency, the frequency can be lowered with top capacity by replacing the plastic tip cover with a metal cap of a length sufficient to bring the whip back to resonance. A 1" long cap will lower the frequency about 75 kc. on 40 metres.

If on completion the whip is slightly low in frequency, the resonant point can be raised by a shorted turn of $\frac{1}{8}$" wide shim brass over the plastic cover on the lower portion of the whip, which will produce a shift in the order of 25 kc. on 40 metres.

As the whips will run warm, when loaded to a Swan, at an area one-third of the length from the base end, it is considered that winding the first third of the whip with say 16 gauge B. & S. wire and the remainder with 26 gauge would produce a more efficient whip.

Although parallel rod in suitable diameters is readily available, tests have shown that due to the weight of the wire concentrated at a height above the base, the constant pendulum effect fatigues the rod at the mount and fracture eventually results. This can be obviated by moulding a thicker section for the first few inches. Fatigue and pendulum effect are not present with the tapered sections as described above.

The work done on the above whips has been most interesting and very worth while as far as results go. Possibly in this article I have missed a point or two, and if anyone desires further information I can be found around 3.675 Mc. almost any night or around 7.1 Mc. mobile on week-ends. Please don't write for details as I just have not the time available for correspondence.

An idea for an efficient 80 metres whip which has not as yet been tried, would be to wind a base section of 16 B. & S. approximately 2 feet long on $\frac{1}{4}$" fibre glass. This would have a male union on top to take the 40 mx whip. This would give an overall height of 6 feet odd and increased efficiency, but would necessitate experiments with

(Continued on Page 18)

# PEANUTS ON TWENTY METRES

*ROBERT H. BLACK,* VK2QZ*

WELL, you can never tell what will happen! One evening I thought I would make a bistable multivibrator to be flipped over by amplified ticks from my watch so that I could adjust its speed. The ramifications of this idea led to the construction of binary counters, gated amplifiers, coincidence detectors and finally a tiny computer. But this wasn't all: I had to make a WWV receiver—double conversion, crystal-locked on 10 Mc.—to provide the second pulses for comparison with the pips from my watch. To make the comparison a slow time base, long persistence c.r.o. was necessary: this evolved into a direct display electrocardiograph.

I haven't yet got round to adjusting my watch and some years have passed with time rather inaccurately measured. The 10 Mc. receiver makes a fine rear end for my v.h.f. converters: this meant the construction of a stable tunable oscillator on 40 Mc. and I dabbled with the Tessler circuit and investigated the performance of balanced mixers in the v.h.f. area. I think I have finally got this particular monkey off my back, but it just goes to show how an idle thought can get you involved.

In February of last year I read the article by W3JHR in "Amateur Radio." It was the description of a transistorised v.f.o., and I was off again. I had met transistors before when I once tried to make voice sounds electronically with a photo-transistor and a light beam interrupted by marks I made on a cleared x-ray film. The highlight of that session was the accidental finding that an uncleared x-ray of a chest made a perfect aspirate sound. This, indeed, was my only success: I made some noises like a bushman with laryngitis, but nothing else resembling English voice sounds.

Well, I made up a v.f.o. along the lines suggested by W3JHR and found it extremely stable on 5 Mc. When you have one of these you really have a "synthetic rock"—once you get the 2N384 transistor bases sorted out: these things have four leads, and only three are shown in the circuit. Of course, for long term stability you have to think of the ambient temperature in the shack.

What to do with a v.f.o.? I had a look at a set of FT241A crystals and thought of s.s.b., but my ancient love of 20 metre c.w. stirred again and I headed in that direction. There was, of course, a minor diversion while I looked at a high level mixer, but I got over that.

## THE TRANSMITTER

All of this is a rather peripatetic introduction to the description of a small c.w. transmitter which has raised a surprising amount of DX considering that it only feeds a dipole 15 feet high. (The XYL is rather difficult about beams and antenna masts in her garden —on six and two metres I use dipoles in the shack.)

The r.f. section is fairly straight forward and is shown in Fig. 1.

The v.f.o. operates at 4.67-4.70 Mc. It is separate from the main body of the transmitter and is enclosed in a heavy aluminium box. Output from the v.f.o. is amplified by a 6AC7: with a voltage divider supply to the screen a potentiometer in the cathode acts as a drive control to the final amplifier. The plate coil is slug tuned and mounted in a shield can. A second 6AC7 acts as a tripler and is required to deliver 40 volts of r.f. to the grid of the 6146 (QE05/40) and a minute amount of power only. The two 6AC7 stages are built on a 7" x 4" x 2" chassis and the final amplifier on a chassis of the same size. The transmitter is keyed in the cathode of the tripler stage and the filter gives a very pleasant keying characteristic. I found that keying the battery lead of the v.f.o. caused a decided terminal click.

There is nothing unusual about the class AB final except to note that you can get a little more out of it by running into permitted AB2 ratings with 0.2 mA. grid current. (See Philips "Pocketbook for Hams," p.N110). Resting plate current of the final is 20 mA., screen current 0.5 mA., and with the key down these rise to about 100 mA. and 10 mA. respectively.

(See A.R.R.L. Radio Amateur's Handbook, 40th Ed., 1963, p.180, for further details of this amplifier.)

The antenna is fed through an antenna coupler matched up by means of a simple s.w.r. bridge.

## THE POWER SUPPLY

The power supply (Fig. 2) uses a bank of silicon diodes (each rated at 600 p.i.v.) in a bridge circuit which provides power for the two 6AC7s, regulated screen voltage, and about 500 volts for the plate of the final. There is also a regulated bias supply. The capacitors between the primary winding and earth are designed to protect the diodes from surge pulses in the mains. The one-megohm resistors across the diodes have also a protective function.

## THE CONTROL CIRCUIT

On one memorable night in the British Solomons as VR4AF I put my 7 Mc. crystal into a commercial transmitter and worked a few stations on c.w. I started to send and the receiver went

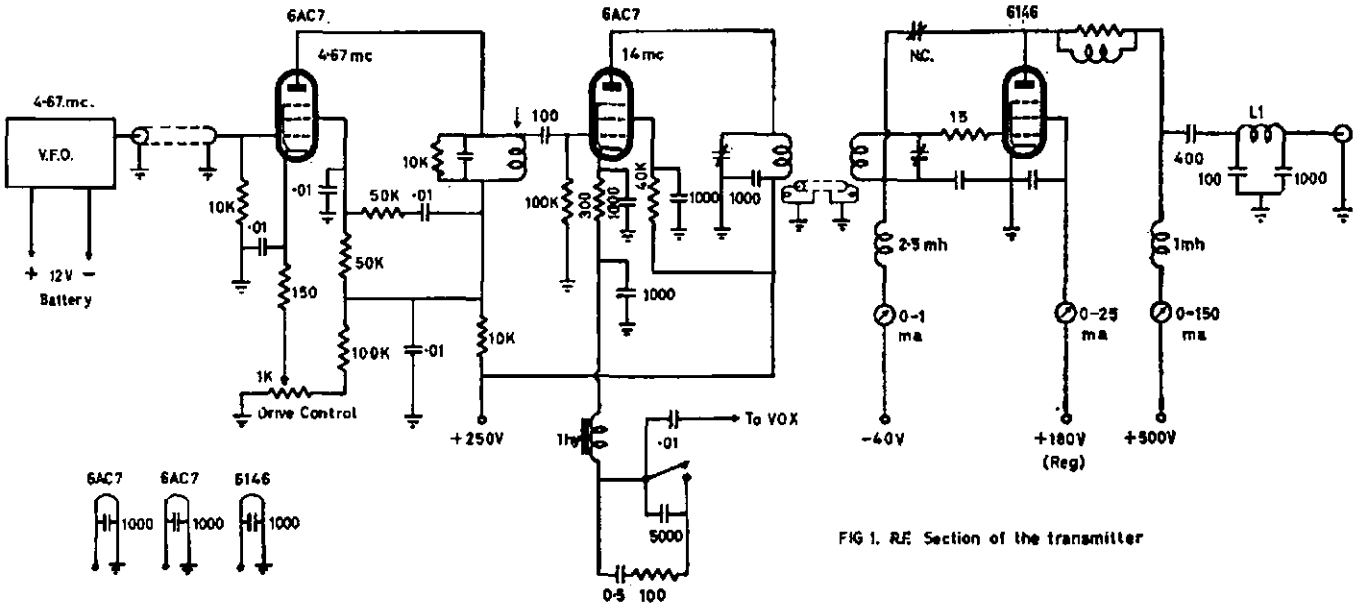



FIG 1. R.F. Section of the transmitter

* 2 Yerton Ave., Hunter's Hill, N.S.W.

off, the aerial was thrown over to the transmitter and the transmitter came on—all with the first depression of the key. I stopped sending and these conditions were reversed. I had been brought up on switches, and this was heaven. In the case of the present transmitter I wondered if I could catch another glimpse of heaven. After a few false starts, I remembered a vox control I had used on s.s.b. way back and which, somehow, had remained intact.

In Fig. 1 you can see that, when the key is depressed, a negative-going pulse can be obtained from the cathode side of the key and each time the key is depressed more negative pulses are produced. The vox-box had inputs from speech amplifier and receiver audio and simple experiment showed which was the correct lead to use—and also that the idea worked. Pressing the key down operated the relay in the vox which in turn switched the antenna relay, turned on the v.f.o. (it is battery operated), and disabled the receiver. The vox relay release could be adjusted to hang on as long as necessary between words, and when the over was finished the whole set-up changed back to receive conditions. (See "Single Sideband," A.R.R.L., 1954, p.168, for circuit of the vox. One amplifier and one diode can, of course, be omitted in this application.)

Finally, a spring-loaded switch was placed in the battery lead to the v.f.o. for netting purposes—the amplified fundamental signal on 4.67 Mc. gives just sufficient harmonic output on 14 Mc. for this procedure. If the transmitter is lined up on about 14.05 Mc. it will operate satisfactorily throughout the c.w. band (14.0-14.1 Mc.) without retuning and only slight adjustment of the drive control is necessary.

**COMMENT**

The signal will not compete with 150 watts and a three element beam, but it has worked through to the east coast of the U.S. and Europe. When I finally get frustrated by the higher powered stations and their beams I'll try a larger final amplifier—there should be enough drive voltage available. In the meantime the "peanut" (as the west coast kilowatters call it) is giving me plenty of amusement, and the XYL can still watch her t.v. set now that I have put a high-pass filter in its feedline. The beam for the t.v. set is out of sight in the attic just above the unshielded transmitter. ●

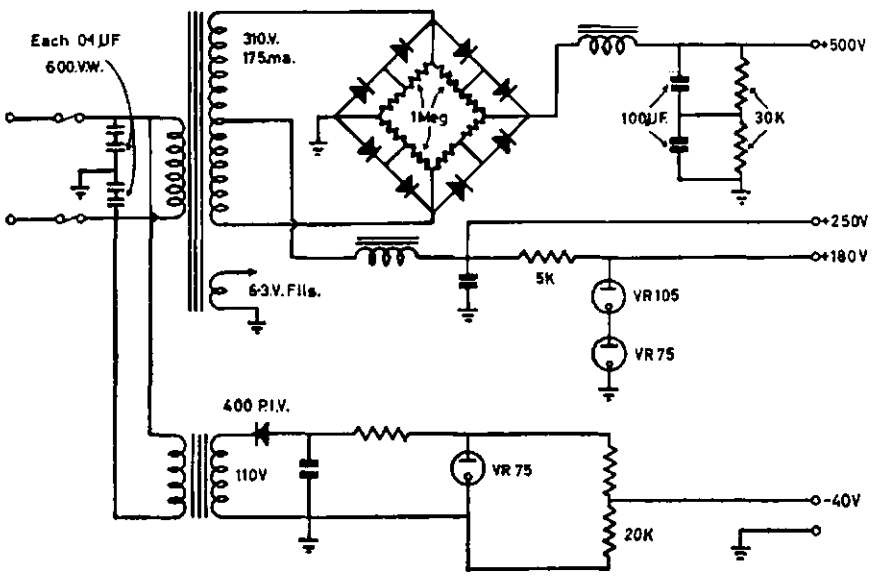



FIG 2 POWER SUPPLY



☆

# HOME-BREWED COMMUNICATION MIKE


**WALT ROGERS,* W1DFS**


THANKS to Al Glines who receives "Amateur Radio" in the Boston area, I have had a chance to read a few copies of "A.R.," which suggest that an article on a home-brewed communication mike may be of interest. Perhaps I can needle cobber George VK4JP so as we can make an occasional contact, as it has been a long time since our "eyeball" QSOs of 1944.

For Amateur communications, the audio range should be about 250 to 4,000 cycles and flat. I like it flat so that no peaks limit our reaching for 100% modulation before most of our voice is at this level too.

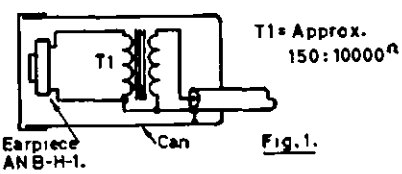



Fig. 1.—Diagram of Communications Mike.

While making many tests on old and new headphones, I noticed that one series was designed for an unusually flat audio response. This was the HS-33 (or the ANB-H-1 separate units). These units are electrically and acoustically adjusted for the desired audio range. My first try was to step up the impedance from about 150 ohms to 10K, with the aid of a surplus transformer costing less than one dollar. This transformer and mike unit were mounted in a small tin can. The shielded lead connected to the mike fitting at the modulator. This works well in place of a crystal mike, but with lower gain—about minus 58, if I remember.

Then came the revelation that the ear pieces of our telephone handsets now are a dynamic unit and might give better output. I was given a couple of these units (not borrowed, really!)


(Continued on Page 18)



* 24 Orient Avenue, Melrose, Mass. 02176, U.S.A.

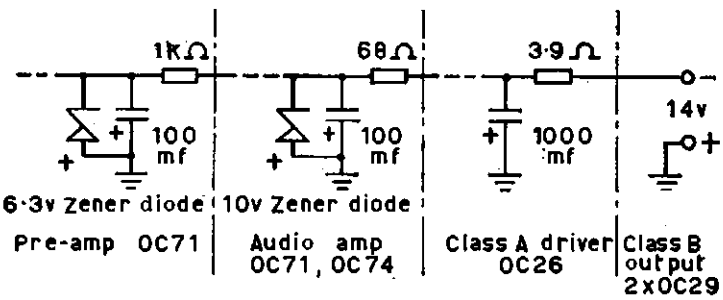
# TRANSISTOR MODULATOR TIP

ONE of the main troubles encountered in a mobile transmitter using a transistor d.c.-d.c. converter and a transistor modulator is the "hash" appearing on the common battery supply rail, giving rise to annoying noise on the signal. This "hash" finds its way back to the low level input of the modulator and due to the low impedances involved in the supply rail, it is very difficult to eliminate.

The modulator constructed for my mobile (40 watt Mullard design) suffered from this trouble until a 10 volt and a 6.2 volt Zener diode were included in the circuit shown in Fig. 1. Since these diodes were included the problem has been almost entirely overcome and only when the signal is extremely strong are any reports of "transistor whine" received. These diodes also have the advantage of reducing the tendency for the modulator to "take off" when the battery voltage is low and its supply impedance is higher than normal.

The mobile transmitter uses a 70 watt d.c.-d.c. inverter of Philips design, using OC28s and the modulator is the 40 watt Mullard design using OC29s in the output stage. The transmitter uses an 815 in the final, running about 45 watts input on 52 Mc. Total transmitter battery drain under average modulation is about 9 amps. from a 12 volt supply.

—G. BYASS, VK6ZDB.




TRANSISTOR MODULATOR MODIFICATIONS
(Balance of circuit as per published Mullard Modulator circuit)

Fig. 1.

# Your Pye Reporter with a Variable Frequency Receiver

FOR some time now I have been toying with the idea of making the Reporter unit I described some months ago able to receive the stations not on net frequencies.

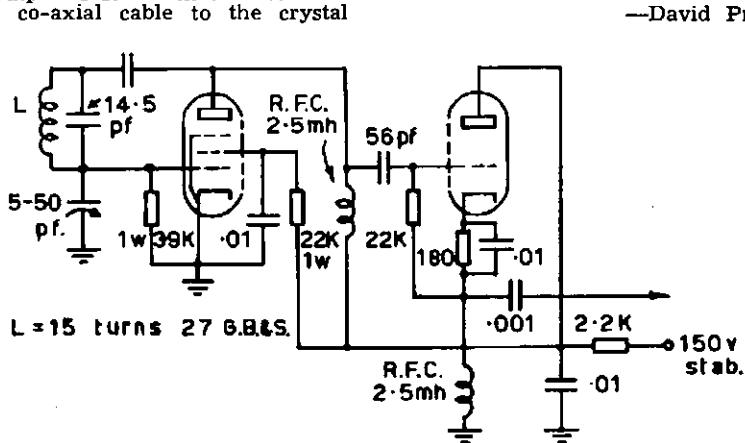
The circuit shown herewith uses a pentode master oscillator and the triode as a cathode follower.

I don't claim the circuit as original, but it is simple to get going, extremely stable, simple to build, and easy to tame.

The output is fed from the oscillator through co-axial cable to the crystal socket, and because one side of the crystal is grounded, the job is so much easier. The crystal is removed and out of circuit completely. The oscillator covers approximately 1.5 Mc., quite sufficient because the top half meg. of the 6 metre spectrum is rarely used.

It will be noted that by virtue of their construction, the Reporters are fairly critical in their aerial and r.f. assemblies. For best results, peak on your most often used frequency and then be able to tune either side of your selected frequency for about 800 kc.

—David Priestley.




# Establishment of a 144 Mc. Beacon

A keen group of Darling Downs and Brisbane Amateurs have combined to establish a 144 Mc. Beacon on the Bunya Mts. at an elevation of approx. 3,500 ft. above sea level, and excellent results are expected. The site is approx. 120 air miles west of Brisbane.

The group was started by Noel 4NH, of Toowoomba, who has made a transmitter available for use in the project and also a place to house the transmitter at the intended site.

A lot of work will be necessary before the transmitter is operating, such things as P.M.G. permission, checking, wiring of transmitter and alterations, making up of antenna, automatic keying device.

John 4ZWB and Bert 4CP are doing the necessary checking of the transmitter. Brian 4RX is designing and building the automatic keying device. Mick 4ZAA and Tom 4ZAL are constructing the antenna system.

The transmitter is an Admiralty Type 8C and is in reasonably good order. As soon as it has been checked, it will be re-assembled at John's QTH. It will then undergo on-the-air test transmissions for some time to ensure that it is operating 100% efficiently.

It is not considered a matter of urgency to have it installed on the Bunya Mts. immediately. The V.h.f. Group interested in the project can rest assured the transmitter will be operating from the Bunya Mts. for the next v.h.f. season, but if all goes well it could be operating much sooner.

Valves throughout the transmitter are not usually seen and all concerned consider it unwise to install the unit without a spare and complete set of valves.

If spares cannot be obtained readily the group have come to the conclusion that the transmitter will have to be converted now to easily obtained types of valves. As all v.h.f. Hams would appreciate, this would entail a lot of extra work and hold the project up, and it would mean completely rebuilding the transmitter, etc.

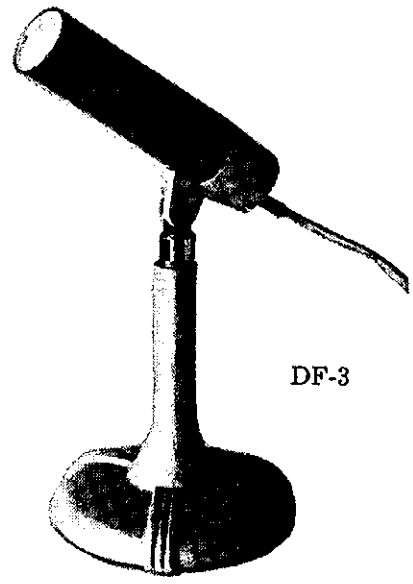
If anyone feels inclined to help the project and have on hand any of the following valves in the junk box, donations would be appreciated. Contact John 4ZWB or Bert 4CP.

**The following valves are required as spares: CV187, KT8C, KT66, TZ40, 834 or DET12, 304B, 3-50G2, TBI/60G, VH50. Local offers of valves should contact Mick 4ZAA or Tom 4ZAL. Thanks chaps.**

Later on, when all of the work has been done on the transmitter and everything is working satisfactorily, all will be advised of frequency and date of coming into service. Also an address to send reports of transmission to will be arranged.

This Beacon is coming into being in the interest of v.h.f. and will be operated and maintained by those interested in v.h.f. in the interests of v.h.f.

# FOSTER DYNAMIC MICROPHONES




## SPECIFICATIONS:

Output Impedance .... .... .... .... 50 ohms or 50K ohms
Effective output level —55 db. [0 db. = (one) 1V. Microbar]
Frequency response .... .... .... .... .... 50 to 15,000 c.p.s.

## OMNI-DIRECTIONAL DYNAMIC:

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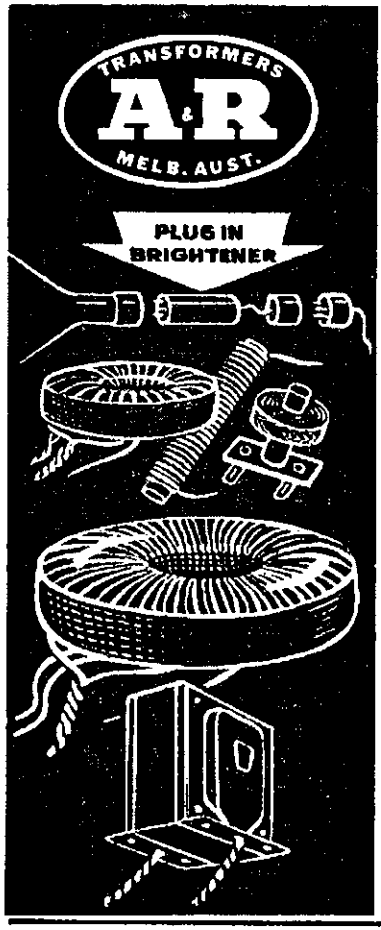


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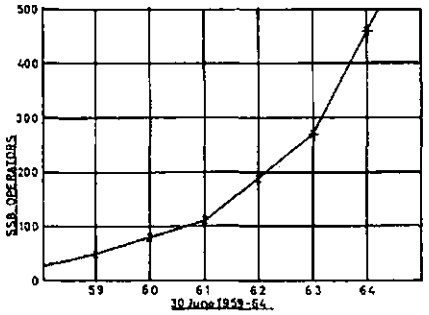
# ARE YOU IN THE GROOVE?

*LINDSAY DOUGLAS,* VK2ON*

Australian stations using s.s.b. equipment at 30th June:—

| | |
|---|---|
| 1959 .... .... .... .... | 50 |
| 1960 .... .... .... .... | 80 |
| 1961 .... .... .... .... | 110 |
| 1962 .... .... .... .... | 190 |
| 1963 .... .... .... .... | 270 |
| 1964 .... .... .... .... | 462 |




These figures, gathered carefully by Comps. **VK5EF** since his advent on sideband, show that increasing numbers of Amateurs are getting out of the groove and applying new techniques to their operating. Other information is that the average age of a sideband operator is 50 years. Maybe that average would be the same for the whole 4,500 Hams in VK. But the point is that the average Ham has had 30 years of operating and has, until recently, used the same procedures in contacts with other stations.

## IMPROVEMENTS IN PROCEDURE

What improvements in procedure are demanded by s.s.b. operation if its many advantages are not to be wasted? How easy is it for a 50-year-old Ham to change to new operating procedure?

"VK5XYZ from VK3BCD. All okay Joe, a very good transmission, no trouble at all. You're just booming in here . . ."

"This will be my last over, Bill, I won't bother coming back. VK-5WXY to VK4MNP."

"I'll just get a Roger from you, Mac, on that little point. Break, VK-7LMN from VK2CDE."

Just how redundent are all these words when one uses s.s.b.? All one has to do is ask a question and let go the button.

How good is the memory of the average 50-year-old? Not very good if it's anything like mine. Well then, why not deal with one point at a time and save the memory? I'm not talking about 3, 4 or 5 way QSOs, only two way.

## VOX OPERATION

A lot of newcomers to sideband have bought a box and the box has a "vox" but it might as well have a knife-switch considering the way some of them use it. The "vox" is good if it is working well, but can easily be replaced by a push-button or morse-key correctly used. The chief ills of the "vox" are:

(a) Its clicking disturbs the operator.

(b) It hangs on too long, and the first words of the other party are lost.

(c) Its operation is not stable with varying mains voltage.

(d) Receiver muting not fully effective.

All of these deficiences can be rectified by correct adjustment of the "hold" and "anti-vox" controls, using voltage regulation on the control tubes, and muffling of relays with rubber from mountings or box.

What is the ideal length of a transmission on s.s.b. operation?

Would your answer be 5, 10, 20 or 40 seconds? In other words, do you monitor the channel while you are talking? If so, how many times in a minute is this done? I would think 10 seconds answers the first question and five times a minute the second one. How many times have you heard s.s.b. stations "doubling"? How many words are lost upon the ether because of this? The answer would be "very few words" if the five times a minute rule was adhered to.

Have you ever heard Jim telling you all about the article in "QST" when you'd read it right through the previous night? Did you want to stop him and tell him you knew all about it, so as to save his precious operating time? Were you able to do so without waiting 3½ minutes? The five times a minute rule would allow you to get a word in edgeways, then you could ask Jim about something more to the point.

Have you noticed how easy it is to "break" some s.s.b. stations? As you know, this should be done with due courtesy and at an appropriate pause in the conversation, but how valuable is this new facility if only to arrange a sked with an old cobber!

## AUTOMATIC GAIN CONTROL

Another desirable feature for the 1964 type of QSO is a.g.c. in the receiver. Those who haven't got it don't know what they are missing. Can a.g.c. function when the b.f.o. is on for sideband reception? Well I admit that in an unmodified BC348 (1944 model) things are a little difficult. However, those who have heard the a.g.c. action in a Drake 2A would not be happy until this smooth feature was incorporated into their own receiver.

What is the use of a.g.c. when copying sideband? Well, you see, the various stations come in at varying strength and, if a VK6 calls you when you're copying a VK3, you want to be able to hear him. The instant-acting, slow-decay a.g.c. system is perfect for copying with this situation. A separate a.g.c. amplifier (see p.95, R.S.G.B. Handbook) produces a very smooth action, effective on very strong signals.

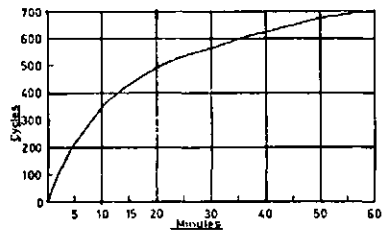
## RECEIVER MUTING

Receiver muting connected to the push-to-talk switch may seem an unnecessary thing on which to comment. However, one does meet an occasional newcomer to sideband who is not alive to its value.

## FREQUENCY STABILITY

"My set is really stable, I put it on zero-beat and it stayed there all day." This might mean something or nothing. How many of us with black boxes have put them through the hoops to find out their drift rate in the first hour?

"Mine's a Bloggs transceiver and that's the best you can get." Unfortunately there are good and bad specimens among commercial gear and, as we know, every model has approved modifications published every few months to cater for unsuspected minor defects in design. Measuring the drift rate of your model can be done by producing a 500 cycle note, beating the v.f.o. against the crystal calibrator. Then this 500 cycle note is compared with another audio tone from a calibrated audio oscillator. This comparison can be done by ear, or on the c.r.o., and a reading taken every five minutes over the first hour. The following graph is that of an HT32:—




How significant is drift in a sideband QSO? Have you ever heard three stations in QSO on three separate frequencies? Have you ever heard two stations on different frequencies? Can you imagine the effect on s.w.l's and other Hams who may be reading the mail? Drift is very important in s.s.b. contacts for obvious reasons:

(a) Two stations on one frequency take up less spectrum than two on two frequencies.

(b) A drifting station may drift on to another QSO, causing interference.

(c) As just mentioned, it makes the s.w.l's task more difficult.

## NETTING

Now with the HT32 as shown, one should re-net every 50 cycles during the drift period and this would be 14 times in the first hour. With a transceiver, the receiver and transmitter frequencies should be identical (not always the case if power supply stabilisation is defective) and here the v.f.o. stability requirement is less exacting due to automatic adjustment in the re-

* 5 Mason's Parade, Gosford, N.S.W.

ceiving mode. For this reason (and others) many s.s.b. men prefer transceivers.

**MULTI-WAY QSOs**

Are multi-way QSOs on sideband a good thing? Well, they were an excellent idea when there were few sideband stations about. One could always get a QSO by chipping into an existing contact, whereas calling CQ often brought no result (especially if one had a weak signal). These days the multi-way QSO has bad as well as good points. The whole smoothness and convenience of a rapid-fire contact is lost by converting it into a multi-way. However, one should observe that additional persons can join or leave the party with equal facility, proper courtesy being employed. Perhaps one wishes to converse with one of the gentlemen on a matter of personal interest, then it's an easy matter to say "See you up five kc., Joe," and he replies, Roger, excuse me fellers" and the move is effected.

**SIGNAL REPORTS**

Signal reports are of secondary importance to the sideband operator. One knows by the tone of the answers whether one's copy is QSA5. In fact it is common to forget about reports until the end of the contact and then obtain one for the benefit of the log book. Likewise automatic repetition of messages is bad practice. The other fellow will ask for a report if he requires it. These operating practices were mentioned in a list of rules by VK3AHR in "A.R." several years ago, but the number of sideband operators has quadrupled since then.

Always give honest reports on signals heard, report them as you hear them, mention your receiver, for this helps the other fellow to correctly interpret your report. Please accept the other fellow's report with good grace, he's not trying to be funny, only helpful and isn't that what we want?

Now that s.s.b. signals are dominating the bands, let us have better operating habits, and help show the unenlightened that a code of discipline can be maintained, from which we all benefit.

**AUTOMATIC LEVEL CONTROL**

Has your sideband transceiver been modified to give automatic level control? Half a handful of parts and a couple of hours' work will do the job. What advantages does this modification confer? It will allow you to concentrate more on the talking and less on the dancing meters. Also accidental flat-topping (with wide signals and needless interference with other stations) is prevented. Most transmitters can be modified easily. This is the simplest form of audio peak compression. Where it is difficult to install, a form of audio compression as used in f.m. transmitters would be fairly effective after proper adjustment. A simple a.l.c. circuit is shown on page 19 of "A.R." for August 1962.

Just take a careful listen on the bands next week-end and see if you observe any of the phenomena referred to. Here's to better, brighter and breezier sideband contacts. ●

# CORROSION

*WG.-CDR. C. G. HARVEY,* VK1AU*

**● The Amateur's Code suggests that Radio should not be one's sole interest in life. VK1AU reports how a problem encountered in yachting, found its solution through electronics.**

LAST year, after some modifications in VS1, I noticed a new aluminium alloy centre-plate on my International "Snipe" racing dinghy was showing some discolouration near the attachment of its hoist cable.

To a sailor, who is primarily an Amateur, it was soon obvious that the trouble sprang from the effects of dissimilar metals. The alloy plate was attached to its stainless steel shackle by a copper rivet, while the shackle was in contact with a brass thimble, to which a steel cable hoist was attached!

Although the electrolytic effects of adjacent metals was obviously unknown to the VS1 "mandore" who installed the new plate, it was obvious that the installation was "live".

A little research[1] soon showed that quite high potentials could be developed in fresh water, let alone in the salt (?) water of Johore Strait. For those who have noticed similar effects, a few figures might be of interest.

The following table shows the weight lost or gained by 20 square centimetre samples, subject to six months' exposure in tap water:—

| | | | |
|---|---|---|---|
| Mild Steel .. | lost | 16 | milligrams |
| Brass .. .. .. | lost | 2 | „ |
| Lead .. .. .. .. | lost | 292 | „ |
| Tin .. .. .. .. | lost | 3 | mg. |
| Copper .. .. | gained | 4 | „ |
| Aluminium .. | gained | 1 | „ |

Based on such physical changes, it is accepted in some quarters, that corrosion will be held to reasonable levels if the maximum potential difference between adjacent surfaces is kept to less than ¾ volt in sealed equipment, ½ volt in normal equipment, or ¼ volt in equipment exposed to "severe" environments (e.g. aerials).

So let us now look at the size of the potential which is generated by a film of fresh water between two dissimilar metals. See Table 1.

The gaps in the Table do not indicate the absence of a potential difference, such as would be encountered with brass, nickel and copper combinations. Potentials below ¼ volt have been eliminated in pursuit of the corrosion criteria suggested above.

The Table shows that it is difficult to avoid electrolytic corrosion and suggests that our outdoor equipment deserves an occasional inspection.

If you have a meter which gives reasonable indications below 1 volt, test runs can be done on your own bench. Simply use wet blotting paper as an electrolyte, and measure the potential difference across the two sample metals in contact with it. It may take a couple of hours for a steady reading to appear.

Oh the boat? It was cured by replacing the copper rivet with one of mild steel! ●

| | Alum. | M. Steel | Lead | Tin | Brass | Nickel | Copp. | Silver | Indium |
|---|---|---|---|---|---|---|---|---|---|
| Aluminium | — | — | — | 0.25 | 0.4 | 0.4 | 0.55 | 0.6 | — |
| Mild Steel | — | — | — | 0.3 | 0.4 | 0.35 | 0.3 | 0.5 | — |
| Lead | — | — | — | — | — | 0.3 | 0.25 | 0.55 | — |
| Tin | 0.25 | 0.3 | — | — | — | — | — | — | — |
| Brass | 0.4 | 0.4 | — | — | — | — | — | — | 0.25 |
| Nickel | 0.4 | 0.35 | 0.3 | — | — | — | — | — | 0.25 |
| Copper | 0.55 | 0.3 | 0.25 | — | — | — | — | — | 0.3 |
| Silver | 0.6 | 0.5 | 0.55 | — | — | — | — | — | 0.6 |
| Indium | — | — | — | — | 0.25 | 0.25 | 0.3 | 0.6 | — |

Table 1 (in Volts)

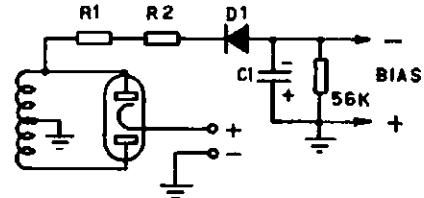
* Dept. of Air, Canberra, A.C.T.

[1] Marconi Review, XXVII., No. 152.

# BIAS THE EASY WAY

THE battery is the most used source of bias in use by Amateurs today. The system described here is not new by any means, but out of five Hams I have discussed it with, only one had ever used it, and three had never heard of it.

Using this method any voltage can be obtained very easily. Although only half the transformer is used, the balance will not be upset very much, certainly not enough to cause concern. True the voltage is only half wave rectified, but that is quite sufficient for bias supply.




R1, R2—Determined by required voltage drop.
C1—50 μF., 150v. electrolytic.
D1—AA119, OA81, OA85, OA210, etc.

R1 and R2 form a voltage dropping network, whilst R3 is sufficient to "fire" the diode to get it all working.

C1 is a 50 μF. 150v. working electrolytic to "smooth" the voltage.

—David Priestley.

Mr. W. Hayden (seated at mike), M.H.R. for Oxley, officially opened the Ipswich and District Radio Club (VK4IO) by sending greetings and congratulations to Australia-wide Amateurs. With Mr. Hayden are (left to right) Dave Ness (President), Bill Jehn (Publicity Officer), Dave Cooper (club member), Wayne VK4ZBN and Bob VK4LI.



# OPENING OF VK4IO

Mr. W. Hayden, M.H.R., officially opened the Ipswich and District Radio Club station with a broadcast message of greetings and congratulations over VK4IO, call sign of the club's station.

The club is divided into two sections—seniors and juniors—and there are 24 members in each section.

The opening ceremony was conducted at the Darling Street residence of Mr. Bob Linskett, the club's class manager, who constructed the transmitter used by the group.

Mr. Hayden, speaking to an invisible audience, the members of which might well have included overseas Hams, said he hoped the members of the Ipswich and District Radio Club would derive much pleasure from their club, and that what they learned as members would be of value to them.

"Amateur Radio is a very enjoyable pastime," said Mr. Hayden, "and does a lot for the betterment of the city."

The President of the club (Mr. D. Ness) said that the aim of the club was to interest boys in the fundamentals of radio, and perhaps give them enough knowledge to be able to apply for a Radio Amateur's licence.

"There are 18 Amateur Radio operators in Ipswich at present," he said.

# The Historical Development of Radio Communication

## PART FOUR—THE ADVENT OF THE VALVE

*J. R. COX,* VK6NJ*

### CHAPTER THREE

Marconi's successful bridging of the Atlantic with wireless telegraphy in 1901 commenced the present epoch of radio communication. By 1910, with a regular trans-Atlantic system installed, wireless communication attained a state of technical certainty. In hand with this, experimental findings indicated that, as well as telegraphy, speech could be broadcast. Associated though they were, the transmission of the human voice posed distinct problems when compared with wireless telegraphy. Valiant efforts were made by notable pioneers to overcome these problems even before the advent of the transmitting valve, upon which ultimate success depended.

The detailing of the progress made in wireless telephony before the amplifying valve's adaptation is important because it illustrates firstly the tenacity of the early inventors and, secondly, this pre-valve phase cultivated a "know-how", a demand for, and an interest in speech and music transmission. It was in this field of wireless communication that radio later was to find its greatest strength. By cataloguing development a realistic appreciation of the valve's worth, in developing wireless communication, is established. The story of the wireless valve is very largely the story of the development of wireless communication as we have come to know it.

Problems confronting early pioneers of speech broadcasting can be conveniently divided into two categories, namely, problems of transmission and problems of detection. An appliance capable of producing continuous uniform electro-magnetic waves had to be engineered and then these waves had to be manipulated by a voice-operated mechanism to form radio frequency pattern replicas of the spoken words. At the reception end the receiving wireless set had to be quantitative in operation, not merely set into operation by the arrival of electro-magnetic waves, like the coherer, but capable of producing an output proportional to the transmitted modulated radio frequency speech waves. That, then, was the task, and no wonder the comparison of difficulty between wireless telegraphy and telephony was likened to being "not far from that between ruling a dot and dash line and making a drypoint etching of an autumn landscape."[52]

It became clear to early inventors that the achievement of any practical success in the transmission of clear speech depended upon the production of a device to generate continuous, uniform electro-magnetic waves of a high frequency.[53] The plan was to vary the amplitude of this series of constant high frequency waves by impressing on it the instantaneous values of audio-frequency voltage derived from sounds of speech by means of a microphone. This system, later termed amplitude modulation, is still universally used today. Alexander Graham Bell's microphone was adaptable for converting voice energy into audio-frequency voltage and so the search resolved around a generator of high frequency waves.

At first the sole means of generation available was by Hertzian methods and so, naturally enough, attempts to gain the desired high frequencies centred around experimenting with spark-gap transmitters. Research in this direction was led by Mr. W. Duddell who engineered a "musical arc". This device was an arrangement of condenser and inductance connected in series with their terminals attached to solid carbon rods of a continuous arc which emitted a note of high pitch. The frequency of the resultant oscillatory waves approximated 10,000 cycles per second.[54]

In 1903 Mr. V. Poulson engineered an improvement when he arranged the electric arc between the end of a thick carbon rod, kept in slow, steady rotation, and a water-cooled rod of copper. The arc, set in a box of coal gas or vapour of hydrocarbon, was subjected to a very strong transverse magnetic field. This was successfully applied to the transmission of speech. Still other contrivances were made to produce the high frequency waves needed. One such derivation, engineered by Telefunken of Germany, used a set of twelve copper-carbon arcs set in series. A reasonably undamped continuous output resulted and was successfully employed for speech transmission.

Opinion was divided on the best way to generate the necessary high frequency waves to carry the speech transmission. One section believed the answer to be spark-gap transmitters, whilst yet another school championed high speed revolving alternators. The use of alternators in wireless communication stems from their initial use in generating alternating current electricity. Alternators were pioneered by Nikola Telsa who, in 1888, used them for powering carbon lamps.[55] A low frequency alternating current caused the lamp to emit an irritating hum. Telsa stepped up the frequency and during his experiments constructed an alternator capable of a frequency rating of as high as 12,000 cycles per second. Wireless experimenters knew that the minimum requirement for speech transmission is in the vicinity of 30,000 cycles per second, so they set about improving alternator design. Modified alternators using flexible leather belts and powered by steam turbines soon became capable of frequencies as high as 75,000 cycles per second. It was an American, Mr. R. A. Fessenden, who successfully put the alternator into use as a mechanical oscillator for speech transmission.[56]

The application of this system to wireless communication was restricted for two main reasons. One was the cost, especially if installed on train or ship, where special provision was necessary to stop gyrostatic action damaging the rapidly revolving bearings as the conveyance pitched and rolled. In addition, the power expenditure to turn the alternator at the necessary high speed was considerable, due to air and bearing friction. Thus, mechanical oscillators were useful in proving speech transmission possible, but in full-scale use were not entirely practicable.

To facilitate modulation of the oscillator's output a microphone had to be coupled to the oscillator circuit. In theory there are two ways of doing this; by direct insertion into the oscillator circuit or in a circuit inductively coupled to it. Either way provides means of controlling the amplitude of the emitted electro-magnetic waves in such a manner that the amplitude varies in exactly the same way, and proportional to, the sound waves actuating the diaphragm of the microphone. In practice this theory was not easy of accomplishment before the advent of the amplifying valve!

The main trouble was that the oscillator depended upon very high voltage, but the carbon microphone could not cope with more than a few volts and about one half an ampere in current. Hence the enormous energy of the oscillator had to be controlled by a microphone, robust enough to withstand excessive voltages and current, yet delicate enough to respond to the relatively weak power of the voice waves produced when speaking. The solution was not to eventuate until the amplifying valve arrived. Before this, in the absence of any device to amplify the microphone's output, microphones were designed to suit the means and many ingenious devices eventuated.

One of these featured water as a coolant to combat overheating, and another used eleven microphones in parallel actuated by the one central mouthpiece. The latter type was used when the microphone circuit current exceeded one half an ampere. This arrangement distributed the current

* Government School, Yornup, W.A.

[52] Ballantine, S.: "Radio Telephony for Amateurs"; Chapman and Hall, London, 1924, 2nd edition, p.12.

[53] High frequencies were necessary to continuously carry the speech pattern. If sufficiently high frequencies were not generated, breaks and interference to the music or speech being broadcast became noticeable. As well, the higher the frequency the shorter the wave length, and, as the most efficient radiation occurred when the antenna was an integral multiple of one half wave length, the use of higher frequencies also gave antennae of manageable size; e.g. a frequency of 1,000 cycles per second would be best served by an antenna 46.6 miles long. At 7,000,000 cycles per second an antenna 133.6 ft. long gives just as efficient radiation.

[54] The importance of Duddell's contribution was that he showed a way to produce a near-continuous high frequency oscillation as against an intermittent series of oscillatory spark discharges.

[55] United States Information Service; op. cit., p.21.

[56] Fleming; op. cit., p.849.

and tended to lessen the alarming effects of carbon heat-up and the objectionable arcing between the carbon granules. Another intriguing example was devised by Professor Majorana, of Rome. Named a "Liquid Microphone," it took advantage of the property of fluid jets.[57] The intensity of jets of slightly acidified water was varied according to the vibration of a voice-actuated diaphragm. The fluid was sprayed onto an insulated cup placed between two electrodes, so that a film of conducting solution, varying in thickness, offered a varying resistance to the passage of electrical current. Variance of resistance caused variance of oscillations in the antenna and therefore of the amplitude of the radiated waves. This remarkable microphone was successfully used and possessed the advantage of not generating heat like the carbon microphone. In addition, it could operate with much higher voltages without the arcing associated with carbon microphones.

Whilst these developments were taking place the receiving side of telephony was also being investigated. By 1906 a United States Army General, H. H. C. Dunwoody, discovered that a mass of carborundum held a unique property of value to wireless communication.[58] This property was the abiilty of the carborundum crystal to rectify by virtue of its unilateral conduction. Furtherance of this line of investigation is associated with the names of two experimenters, Professors Pickard and Pierce, who observed unilateral conduction in other substances such as hessite and anatose. General Dunwoody was the first to apply this special property of crystals by using one as a detector of wireless waves. By employing the crystal in a receiver circuit, using headphones, he was able to detect telephony and telegraphy. Selectivity was poor, but this, in the early days of wireless, was no drawback due to the comparative paucity in number and wide spacing of transmitters.[59]

Another form of detector attracting notice in the first decade of the 20th century was the "Ionised Gas Oscillator Detector".[60] This item was destined to have a pronounced effect upon the future rise of wireless communication. It originated from a "plaything" put aside by no less a renowned inventor than Thomas Alva Edison. The early history of this device really precedes Edison's interest in the subject, since as early as 1873, the connection between heat and its effect upon electricity was being investigated. This preliminary work formed the basis for a more detailed study of the phenomena associated with the emission of electricity from hot bodies. Also Elster and Geitel had conducted systematic investigation on the subject between the years 1882 and 1889 and their work did much to advance the discovery of the vacuum tube.[61] These two men arranged a metallic filament and a metallic plate within a glass bulb which was evacuated of air using a vacuum pump. They then connected a battery to the filament and regulated the temperature of the filament by varying the current passing through it.

Subsequently they discovered that the plate received a positive charge of electricity which increased in value as the filament temperature was raised to yellow heat. If the temperature went beyond that point, the positive plate charge decreased until, at white heat, the charge was very small indeed. Later Elster and Geitel also discovered that the electrification of the plate depended upon factors such as the nature of the gas inside the bulb and the actual substance forming the filament as well as upon the temperature of the filament. These preliminary investigations into thermionic currents were not directed specifically towards perfecting wireless valves, but they were the initial step towards them.[62] These two experimenters had, in fact, established that there were thermionic currents and that basically the current could be controlled by filament composition, heat and the nature of gas through which the emission occurred. The establishment of these basic facts was an essential step and of fundamental importance.

In the year 1883 Thomas Alva Edison, whilst experimenting with his newly invented carbon incandescent lamp, took investigations into thermionic currents a step further ahead. It was then that he found that if the plate was connected through a galvanometer to the positive terminal of the battery heating the filament, the galvanometer registered current which seemed to flow from the positive side of filament to the plate and then through the vacuum to the heated filament. Apart from confirming the work of Geitel and Elster, Edison's importance in this field of research is his establishment of the fact that hardly any current flowed around the circuit when the plate was connected to the negative battery terminal. Thus he founded the principle that the plate must be positive in respect to the filament for flow of thermionic current. Another most important aspect was his finding that the current would flow in one direction only. These peculiarities were given the name of "Edison Effect". They pointed the way to the use of a similar device as a unilateral conductor for detecting electro-magnetic waves. Thomas Edison did not concern himself with this significance, however, and indeed he gave several of his bulbs to a visiting English engineer, Sir William Preece,[63] to take home and "play with."[64]

## TWO-ELECTRODE VALVES

Sir William Preece was an associate of Professor J. A. Fleming, who had, for several years, been keenly following the progress of wireless communication. It was Professor Fleming who realised the possibility of developing Edison's device for use in wireless wave reception. Modifying the bulb arrangement into a more suitable form, Professor Fleming called his device an electrical valve[65] because of its ability to permit electrical current flow from filament to plate but **not in the opposite direction.** Professor Fleming then utilised this property of his thermal electrical valve to separate the positive and negative constituents of an electro-magnetic oscillation emitted from the antenna of a wireless transmitter. In this way the positive currents may be said to be sifted out and allowed to pass while the other set of currents were withheld by the valve. The emitted waves then formed a pattern capable of operating a telegraphy recorder or a telephone earpiece.

Thus the first thermionic valve entered wireless communication in 1904. Its successors were to have a dramatic influence upon the future development of wireless.

Marconi used Fleming's valves as oscillation detectors for wireless telegraphy early in 1905 after Professor Fleming had patented the device in November 1904. Later Fleming improved the emissive qualities of his two-electrode valve through superseding the carbon filament by a tungsten one which could be heated to a higher degree and nearer to the critical temperature discovered earlier by Elster and Geitel.[66]

For some two years the two-electrode valve remained at this stage and wireless communication languished for the want of a device to amplify weak signals, amplify weak voice currents for successful modulation and generate an unbroken uniform stream of high frequency electro-magnetic oscillations.

## THREE-ELECTRODE VALVES

When Heinrich Hertz illustrated the properties of wireless waves in 1888, a young man, then fifteen years old, may have heard of the incredible demonstrations. This youth later studied at America's Yale University and received his doctorate for a thesis on Hertzian waves. He was Lee de Forest, later the inventor of the three-electrode vacuum tube. This dynamic device revolutionised wireless communication and made long distance radio part and parcel of everyday life. The world learnt of the new vacuum valve when Dr. de Forest announced his "Audion" in 1906.[67]

The Audion, designed by Lee de Forest, consisted of three electrodes; filament, plate and a third called a grid inserted between the first two. All were enclosed in an evacuated glass tube with external terminals. The purpose of the grid was to control the flow of electrons from filament to plate. When the grid voltage was made slightly positive in respect to the filament, the

[57] Ibid., p.859.

[58] Ibid., p.472.

[59] The influence of this early work with crystal detectors on the development of the transistor is explained in the next chapter.

[60] L. Zehnder used such a device as a detector of Hertz oscillations before this in 1892, but only experimentally. Fleming, op. cit., p.476.

[61] Preliminary investigations into the phenomena of thermionic currents were started by F. Guthrie and then by Elster and Geitel (see footnote 62). Scott-Taggart, J.: "Thermionic Tubes in Radio Telegraphy and Telephony"; Wireless Press, London, 1924, 2nd edition, p.1.

[62] Elster and Geitel's work was even preceded by F. Guthrie who noted the effect of a red and white hot metal ball upon an electroscope in 1873. Scott-Taggart, op. cit., p.1.

[63] Sir William Preece was Engineer-in-Chief of the British Government Telegraph Service in the General Post Office.

[64] Lemon and Ference, op. cit., p.403.

[65] Fleming, op. cit., p.476.

[66] See Appendix 2, Principles of Vacuum Tube Operation.

[67] Scott-Taggart, op. cit., p.58.

grid assisted greatly the attractive force of the plate. This important factor accounts for the tremendous magnifying effect of the three-electrode tube.[68] Here, then, was the appliance to amplify weak signals and voice currents and, with its coming, wireless communication awoke to vast new horizons. It was indeed the keystone of modern wireless.

Apart from the tremendous fill-up given to wireless development, the introduction of de Forest's Audion valve had two other sidelights. One of these was the appearance of some uniquely designed valves, mainly evolved to circumnavigate the bonds of patent rights and also to capture the imagination with something "new". One valve had its grid outside the glass envelope but still between filament and plate. Another used two **metal plates** arranged on either side of the filament—one used as a plate and one as a metal grid. These and other arrangements preserved the action of de Forest's triode valve.[69]

The other sidelight was the development of litigation between Fleming and de Forest. Professor Fleming claimed that de Forest's valve was not an essentially different invention from his own two-element tube. On the other hand, Dr. de Forest asserted that his valve was the result of his own research. Controversy reigned, but the fact remains that de Forest was the first to insert the third element in a vacuum tube. Called a grid, this element made his valve capable of producing amplification whereas Professor Fleming's was not.

The German Telefunken Company was amongst the first to use the principle of de Forest's discovery. Their design was unique because the anode did not take the shape of a disc or plate, but consisted of a spiral of aluminium wire. The dimensions of this valve are historically important because they provide a standard to judge today's trend towards valve miniaturisation. The valve measured fourteen inches long and was four inches wide. At first the general tendency was to cement the glass bulb in an insulated base and connect the electrodes to a bayonet or screw-type socket which fitted a plug on the wireless set baseboard. Introduced later were plugs in the form of split pins which fitted into special valve holder sockets. The plugs were made so that the valve could only be inserted the correct way; this practice still prevails, although, as valves had more elements added, the additional safeguard of a lug on the valve base with corresponding slot on socket became necessary.

One of the failings of the first valves was that they were **soft**. That is, they were not highly evacuated and contained residual gas. As a result their plate voltage tolerance was low with about thirty volts the maximum. Application of a voltage above this critical value caused the gas in the valve to ionise which, in turn, caused plate current to rise rapidly and the valve literally burnt out. This defect made the earliest valves unpredictable in action and needful of very careful voltage adjustment. If valves were to improve in amplification and efficiency the inventors needed to devise a **hard** valve—one capable of high voltage operation.

The man to accept the challenge and eventually overcome the defect was Langmuir. He dispelled the earlier contention that gas was indispensable to valve operation. It was earlier thought that the thermionic currents were caused by some chemical action between the filament and its surrounding gas. Irving Langmuir proved, however, that a high vacuum **did not stop** the thermionic current and that in fact high voltage operation was possible under vacuum condition.[70] This work was further advanced when better evacuation methods became available. Improved pumps gave a better vacuum to the valve, and this was further advanced by the development of a process called "gettering". A small plate holding a portion of magnesium was fitted inside the valve bulb and after evacuation the magnesium was electronically ignited causing reaction with any remaining gas, so that the valve became "harder" still and so more stable in operation.

This increased the scope of application of the valve, which, up to the time of the First World War, was confined to use in radio receivers. It now became standard practice to use Fleming's diode as a detector feeding its output into the de Forest triode for amplification. This system of detection and amplification is retained to the present; even transistor receivers use the same combination. Thus the two antagonists, Fleming and de Forest, were to see the results of their experimentation and legal battles utilised in harmony—side by side.

## VALVE OSCILLATORS

There was another very important property of the three-element valve yet to be recognised and applied to radio communication. That was the property of self-oscillation and regenerative amplification, and about the initiation of the use of this property controversy still exists. Lee de Forest, E. H. Armstrong, J. L. Hogan, A. Meissner and Irving Langmuir all claim the distinction.[71]

This property of the three-electrode vacuum tube consists of transferring some energy back from the anode of the valve to the grid circuit. By judicious arrangement of a circuit, it was found possible to feed back the correct proportion of energy from plate to grid to keep the valve oscillating. This means of initiating self-oscillation was introduced near to the start of 1913 and proved of tremendous value, both for the reception and generation of continuous, uniform electro-magnetic waves. It was to prove the answer to the problem of breaks in continuity of speech, met with in spark-gap transmitters used for telephony. Thus by 1914, because of the valve, wireless communication had increased its efficiency and range. The onset of the 1914-1918 World War furthered this state of utility, as the demand for improved systems arose.

## TETRODE VALVE

Valves were first used for wireless telephony at the start of the war, and, in 1914, several systems were put forward for the generation and modulation of continuous waves. Radio telephony was responsible for the insertion of the fourth element in the valve. This occurred in 1916.[72] The General Electric Co. inserted a second grid to further improve means of modulating. This innovation increased the amplification efficiency of the ordinary triode tube because it corrected a noticeable defect in their behaviour. This defect was two-fold; instability caused by inter-electrodal capacity which itself caused unwanted reaction between plate and grid circuits.[73] The capacity also had the effect of increasing the space charge near the plate and this congestion of electrons reduced the amplifying efficiency of the valve. The four-element valve was later termed a tetrode and still finds use in wireless communication.[74]

Thus the First World War proved a stimulant to wireless communication and at its conclusion a good standard had been attained. Telephony, with valve oscillators and modulators, had proved successful. Continuous wave transmissions had been used with the resultant advantages of less power expenditure, less local interference and with greater range when used in conjunction with regenerative receivers. Indeed, it is recorded that the first German Broadcasting Service began in May 1917 when music and news were broadcast to troops on the Western Front.

When the conflict closed, scope existed for the peaceful adaptation of techniques developed under the stimulus of war. In 1919 daily, experimental, speech transmissions commenced in Germany at Konigswusterhausen and reports of reception came in from Moscow, Sweden, Holland, Britain and Yugoslavia.[75] Just one year after, the American presidential election results were reported by radio for the first time. In the same year Dame Nellie Melba sang on the English radio network and was heard in Milan, Italy.

## PUBLIC BROADCASTING

Just as Marconi's trans-oceanic telegraphy stirred public interest, so did these, and other telephony broadcasts over distance, catch the imagination of all. The enthusiasm of the public engendered a demand for valves and parts to build receivers. Commerce, not long released from defence contracts, was able to supply components at reasonable cost.

Wireless valves, although used in regenerative receivers made available to Amateurs in 1916, however did not

[68] See Appendix 2.

[69] The "triode" was the name given to a three-electrode valve by W. H. Eccles. This term persists today. Scott-Taggart, op. cit., p.58.

[70] Langmuir's work extended over 1914 and his patent for a "hard" valve was issued in July 1914.

[71] Scott-Taggart, op. cit., p.288.

[72] Ibid., p.376.

[73] Edwin Howard Armstrong also discovered a way of combating this defect of triode valves. His system is known as "neutralisation".

[74] The space charge is a cloud of negative particles of electricity occupying the space between filament and plate electrodes. C. D. Child first explained the space charge in 1911. Scott-Taggart, op. cit., p.9.

[75] Gartmann, op. cit., p.154.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| COLLINS KWM2 | | | X | X | X | | X | | | X |
| DRAKE TR-3 | X | | | X | X | | X | | | X |
| NATIONAL NCX-5 | | | | X | | | X | X | | X |
| SWAN 350 | X | | | | X | | | | | |

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# SIDEBAND ELECTRONICS ENGINEERING (ARIE BLES)

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become freely available until 1921.[75] This action motivated the remarkable period in wireless communication "when the wonders of wireless broadcasting seized the imagination of the people."[77] During this time, roughly from 1921 to 1931, valve production soared from 101,960 to 49,325,410 in the United States of America alone. Enormous quantities of other components were marketed and full-scale production of complete sets began.[78] A wireless craze hit the world and cultural life changed as man entered into the new stage of his existence—the stage of public broadcasting, brought about by the advent of the wireless valve. With it public broadcasting and long range telephony were made possible.

By 1938 direct speech transmissions between Australia and America had been tried and between Australia and Europe were commonplace. Because of the overwhelming influence of the thermionic valve, wireless communication by then had developed to the stage where it had "annihilated distance and banished isolation, and banded together the peoples of the earth closer than a crowd in a room."[79]

## SUPERHETERODYNE RECEIVER

In terms of the thermionic valve and its application to the advancement of wireless communication, one man's contribution is outstanding. An American born in New York on 18th December, 1890, Edwin Howard Armstrong began experimenting with radio receivers while still at school.[80] His boyhood interest led to a lifetime of service devoted to the science of wireless communication. He first came into prominence with his development, in 1913, of the regenerative circuit. Apart from beneficial factors already presented, this arrangement made loud-speaker reception possible. Five years later, Major Armstrong evolved the superheterodyne receiving circuit which tremendously improved wireless receiver sensitivity, quality and amplification. This type of receiver circuit is still universally used in ordinary domestic-type receivers.

Two other important processes in the development of radio communication were invented by this man, who became a Doctor of Science, Columbia University, in 1929. One was the super-regenerative circuit which made for greater amplification and high frequency short-wave broadcasting. Television systems use his other important invention of frequency modulation[81] for audio transmission of programmes. Frequency modulation is unique because it eliminates static. Major Armstrong was indeed a great pioneer of wireless communication and many of his contributions to the science form the basics for today's excellence in radio. He died in 1954 at the age of sixty-four.

Edwin Howard Armstrong's life encompassed the years of the thermionic valve's dominant influence in the development of wireless communication. During his time the valve had been discovered, improved, utilised to the full and then shown signs of decline as a governing factor in the future of radio. The improvements noted over the years were the development of the hard valve, increased emission capabilities, more efficient collection of electrons at the plate and lessening of valve size.

Increased emission was secured by making filaments from thoriated tungsten which also had the advantage of optimum emission at a lower temperature than pure tungsten. A still more efficient emitter was discovered in the nickel base sprayed with a mixture of the alkaline earth metals such as calcium and barium. Better control and collection of electrons emitted came with the insertion of the suppressor grid and the development of beam tetrodes—a valve with four elements and deflecting plates to beam electron flow.

The problem of annoying receiver hum developed by filaments heated by alternating current was resolved with the advent of indirectly-heated valves. In this type of tube the emitter is a cylinder enclosing, and insulated from, a heater consisting of a thin spiral of wire, much like a miniature household radiator, which heats up the emitter to start electron emission.

Just before the 1939 war an effort was made to reduce valve size and this factor, together with the adaptability of dry-cell battery supplies, contributed towards the introduction of an era of portability in wireless communication. By 1945 valves had been made the size of a lipstick tube and radio had entered the phase of portability proper. Even so, with all the innovations thermionic valves were not entirely reliable.[82] The battle against long distance had been won because of them, but the struggle for reliability had not.

[75] American Radio Relay League: "The Radio Amateur's Handbook"; Rumford Press, Concord, New Hampshire, U.S.A., 1930, 6th edition, p.6.

[77] Randell, W. L.: "S. Z. de Ferranti and His Influence upon Electrical Development"; Longmans Green and Company, London, 1946, new edition, p.15.

[78] United States Bureau of the Census per notice from State Library, Perth, W.A.

[79] Mr. W. M. Hughes, Minister for External Affairs, Australia, speaking at the Convention Banquet, World Radio Convention, Sydney, April 1938; Institute of Radio Engineers Aust.), op. cit., p.6.

[80] From a four-page booklet issued in honour of "Edwin Howard Armstrong, 1890-1954" by the Institute of Radio Engineers, 1954.

[81] Whilst the I.R.E. booklet claims that Armstrong invented the system, the basic principle of frequency modulation—the variance of frequency in accordance with the intelligence—was known just prior to 1914 but not practised. Major Armstrong was the first to conceive the idea that "frequency modulation might be a better system from the standpoint of noise discrimination" and he was the first to practise the theory of frequency modulation. He experimented from 1925 to 1937 and his work "resulted in an acceleration of the development in this field." The quotes come from Nilson and Hornung: "Practical Radio Communication"; McGraw-Hill Book Company, New York, 1943, 2nd edition, pp.388 and 389.

[82] Valves suffer the disadvantage of failing because of the extremely high operating temperature of the filament, which, like a light globe, eventually burns out. It has been said that "over ninety per cent. of the failures of electron tube equipment is due to the failure of the electron tube". "Transistor Fundamentals and Applications," a 43-page journal issued by the Radio Corporation of America and printed in Camden, New Jersey, U.S.A., 1958.

### APPENDIX 2

### PRINCIPLES OF VACUUM TUBE OPERATION

**The Diode**

With filament heated and plate voltage switch open, the filament emits small particles of matter called electrons. The electrons tend to concentrate in the vicinity of the filament.

When positive voltage is applied to the plate the negative electrons are caused to be drawn over to the plate (Edison Effect) and an electronic stream commences to flow.

**The Triode**

For a given filament temperature the current passing from plate to filament in a diode depends only on the difference in potential between them. By the insertion of a third electrode, in the form of an open wire mesh, amplification becomes practicable. Just as the plate attracts electrons when it is positively charged, so will the third element, called a grid, if a positive potential is applied to it. The electrons attracted towards the positive grid speed up and most will shoot past the open grid to the plate and thus increase current flow.

Because the grid is nearer to the filament than the plate, it is better placed for attracting the electrons. The result is that one volt positive on the grid has a larger effect on the plate current than one volt positive on the plate. For example, an increase of one volt positive on the grid may have as much effect as ten volts in the positive plate voltage.

A similar type of control exists when the grid is negative; if the negative grid voltage is reduced by one volt, it may have the same effect as leaving the grid voltage unchanged and increasing the plate voltage by ten volts.

In either case the valve is said to have an "amplification factor" of ten. No matter how feeble are the fluctuating positive or negative voltages applied to the grid, a relatively larger effect on the plate current results. Thus even very weak signal impulses applied to the grid will produce relatively large plate current variations. *It is in this action that the triode* has the ability to amplify feeble wireless signals.

☆

# *Publications Committee Reports That . . .*

Correspondence was received from the following: VKs 4ZPL, 3ZFB, 5GD, 5ZEW, 5NO, 2QZ, 3XQ and L5067. In addition technical articles were received from VK5BI and D. Priestley.

Many copies of "A.R." are being returned to P.O. Box 36 as "not known at address". Readers of "A.R." should notify any change of address about two months in advance, if possible, so that by the time the change has been put through the system "A.R." will be forwarded to the correct address. Members of the W.I.A. should notify their Divisional Secretary and non members should notify "A.R." direct. By attention to this matter your files of "A.R." will be complete.

Arrangements are currently being made to print a monthly Prediction Chart and this will be commenced as soon as plans are completed and the blocks are ready.

Readers will note an addition to the VK5 notes, and in fairness to 5PS it must be stated that he was unaware that this postscript was to be added. The Committee considered that this special note is so typical of 5PS that all should be permitted to know of it, and laugh with, not at, VK5PS.

**Attention is drawn to the Oscar Project and it is suggested that if you have not your equipment fully prepared by now you make way for the serious experimenters.**

**All f.m. net users of Channel A (145.854 Mc.) are requested to keep this frequency clear at all times, except in emergencies, whilst Oscar III. is operative.**

By your co-operation you will assist a serious Amateur experiment of great importance.

It is interesting to note the interest caused by the article on "Lasers" plus the fact that readers noted errors in this series. A comment upon one letter is appended and is not intended as an unappreciative remark upon the subject. This comment arose during our meeting and caused a laugh, hence it was reprinted.

# Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

### R.D. CONTEST RULES

Editor "A.R.," Dear Sir,

From time to time participants in the Remembrance Day Contest are asked to make suggestions with the object of, if possible, making improvements. Perhaps if you could publish the following letter, some interest might be engendered in the appropriate quarter.

During the last three Contests I have observed the Contest during the full period and wish to suggest a change in the rules. I believe this suggestion to be an extension of Leith Cotton's suggestion of two years ago.

I believe that three faults exist in the Contest at present:—

(a) There is, generally, no opportunity for Limited Licensee participation.
(b) The points range between the various States is much too wide.
(c) There is not quite enough activity to keep an efficient operator busy; during the last few hours of both Saturday evening and Sunday afternoon everyone seems to have worked everyone.

Fault (a) needs no comment, and in any case this was the point covered in VK5GL's suggestion.

Because of fault (b), it is just not worthwhile wasting time making contacts for one point each, when other contacts are worth five or six times as much. There should be some difference, of course, particularly in a few years' time, when shorter skip allows easy contact with nearer States, but at present a VK3 is always passed over, given a choice, for a more valuable contact. This discriminates against the larger States.

Allowing for conditions, the number of contacts made by the leading stations increases each year, but for a Contest of this type one would expect contacts to be made at the average rate of thirty or forty per hour.

The cure for these faults would be to increase all the points' values at present given for Interstate contacts by one, and to allow one point for an Intrastate contact. This would allow v.h.f. operators, using the three common v.h.f. bands, to make a reasonable score, and the extra v.h.f. activity should increase the possibility of Interstate contacts. Exactly the same argument applies for 1.8 Mc. On the h.f. bands the number of contacts that could be made would be increased without adding to the QRM.

There should be a separate section for v.h.f. only operation, as there is for c.w., phone, etc.

This suggestion has been discussed with several of the R.D. higher scorers and they all seem to be in agreement. It has already been made individually, some years ago, to the Contest Committee by VK2AHM and myself. I have tried to reach the Contest Committee through the "correct channels" to no avail. Possibly this letter may enlist some support from others more active or successful in Contests than I am.

Let's face it—at the moment it would be difficult for a VK5, VK6 or VK0 not to make the highest score; it is apparently only because of a lack of activity organisation that S.A. does not win the Contest each year. Therefore, in all fairness, this suggestion should come from this State and not from one of the larger States.

Another point in the rules that might be considered is the question of log-keepers. There is nothing in the rules at present to suggest that, as well as all operation, all log-keeping and other miscellaneous station functions should be done by the nominated operator himself. In some overseas contests this is specified, and A.R.R.L. have stated that it is understood in all their single-operator contests. To have an assistant log-keeper has become almost universal in the R.D., among the higher scoring stations. This is a little unfair on some country station operators, who cannot get help, but it does add to the enjoyment and atmosphere of the Contest as a whole. "Loggers" could be either banned or encouraged, or perhaps a "multi-operator" section introduced.

However, this last paragraph is merely an observation—the alteration to the points system is the important one.

—L. H. Vale, VK5NO.

### LASERS

Editor "A.R.," Dear Sir,

I wish first of all to commend your magazine for the informative articles such as the one on Lasers and the Historical Development of Radio Communication.

However, as I have often found in the past with articles of this nature, it is often wise to double check some of authorities to whom discoveries are credited.

In another technical magazine I found an item on Lasers. It was recent (December 1964 issue) and pointed out that among the 1964 Nobel Peace Prize awards was one "for original research work which led to the creation of the Quantium Generators and Amplifiers known as Lasers and Masers."

This Nobel award for Physics was shared by three scientists—Nicolau Basov and Alexander Prokhorov, both of the U.S.S.R., and Charles Townes, of the U.S.A.

I am sure that other readers would, like myself, have assumed that, as pointed out on page 17, column 1, Theodore Maiman had invented the Laser using Ruby.

Obviously this was at best very misleading. Of course it is possible that the writer of the article did not intend such an assumption, but it was bound to be made and it is obviously not justified by the facts.

After all, only one award can be made for original work which led to the development of Lasers and Masers.

I have for a long time now been aware of the parallel scientific work being done in many countries, even if some of "A.R's" contributors and probably readers are not, and it demands of all of us as scientific and objective assessment of the results of this research work, not something narrow or partial which ceases to correspond to truth.

—V. H. Richardson, VK3XQ.

• • •

Editor "A.R.," Dear Sir,

In the January 1965 issue you printed part 1 of an article about Lasers. Unfortunately this article does not explain why such a device produces light with a narrow frequency band.

Normally the optical atomic transitions mentioned have a spread of about 1,000 Mc. However, the Laser with mirrored ends behaves much like a long piece of transmission line. Clearly only certain frequencies are permissible. That is those with a voltage node on the mirrored surface.

Now, when some noise radiation inside the band of frequencies of optical transitions passes between the mirrors it excites transition and hence the wave grows stronger as mentioned. It should be remembered though that only those frequencies for which the distance between mirrors is an integral number of half-wavelengths can be amplified. Normally several such frequencies exist within the bandwidth of the optical transition.

Apart from this point, I believe that the article is very good and should help a few VKs get to know something about Lasers. One day they may even use one!

—P. J. Wilsen, VK5ZEW.

[Is it all done with mirrors?—Ed.]

• • •

Editor "A.R.," Dear Sir,

In your January issue of "Amateur Radio" you published an article on Lasers which was reprinted from "CQ," August 1964.

I now wish to point out some errors in this article which I have already pointed out to the Editor of "CQ". In fact not only have you reprinted the drafting errors in the "CQ" article, you have also added some extra ones.

On page 18, third column, line 14 (Jan. issue) E1 should be EI. Likewise in Fig. 4 drawing, and caption to same.

As you can see from the corrections I have made, you have made all the E1 and EI, E1; in fact due to this, one error in "CQ' has been corrected.

I feel that unless these corrections are made anyone reading the article cannot gain full understanding of how Lasers work as this diagram is really the most important one in the whole article.

—G. C. Ramsay, VK5GD.

### RADIO PHRASES

Editor "A.R.," Dear Sir,

As an XYL about to embark on her studies for an Amateur Operator's licence, I have discovered that several well known radio phrases have lost their original meaning. I feel that other beginners may benefit if I list a few of the phrases here, with their new meanings.

XYL—Provider of infinite number of cups of tea and coffee.
"I'm using a simple dipole"—I'm using a 6-element beam.
"Just a little ol' home-brew I knocked together"—I have a KWM2.
"QSY 5 down"—Anything between 5 and 10 kc. up.
"I will QSL"—Send me your card first.
QRX—Hold on a minute, mate, can't you see I'm talking to someone else!
"Yaw signals are fading"—I'm fed up with this QSO.
"I'm going QRT"—I'll wander down the band and see if I can't find some rare DX.

Hope these will prove helpful!

—Helene M. Schroeder (Mrs.).

☆

## HOME-BREWED MIKE

(Continued from Page 6)

for a go on what they would do as a microphone pick-up. And I can vouch that this unit does a swell job of it. Your ear piece may be even better.

The circuit is simple—see Fig. 1. The transformer can be almost any line or mike to grid transformer, even a small output to speaker transformer will do. I mounted the transformer with small machine screws—even an adhesive or potting compound may be tried. The ear piece may be wrapped at the edge to fit tightly and stuffing placed so that it is held securely against the cover. The cover required several holes and two small pieces of window screening so the voice might enter freely and the unit held in place.

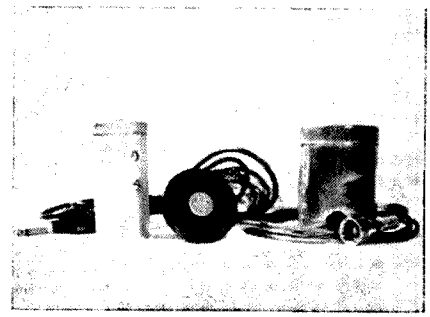

Fig. 2.
Left: Mike using ANB-H-1. Centre: ANB-H-1 ear piece. Right: Mike using new unit.

Place a grommet in the microphone cable hole to protect the lead wire. I didn't bother to paint the cans as I demonstrate their ruggedness by driving tacks with the completed mike—wonder if many of the crystal units would take that abuse? See Fig. 2 for the finished mikes.

The mike with the telephone handset has much more gain. It is wonderful to have such a rugged mike in the shack or for mobile use, as it is almost completely waterproof and shockproof. ●

— . . . —

## THE MINIWHIP

(Continued from Page 3)

an Antennascope to bring the base impedance of the combination to the 25-ohm figure.

My thanks go to Joe Reed, VK2JR, for theoretical and practical help in this project, because without a doubt, the success of multi-band Helicals is tied to the correct matching of their base impedances and without Joe's help in the balun department, this venture would not have been successful. ●

# D X

## VP4, OA4, BV, ZM7, 7GI, FP, AC5, MP4, ZC6, TY2

Sub-Editor: H. A. BEHENNA, VK5BB,
14 Stanley Street, Crystal Brook, South Aus.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Well I hope that 1965 has started well for all of you, DX and otherwise. All have probably made resolutions of a sort. I wonder how many of these still remain unbroken. I wonder how many of us have made resolutions regarding our Radio hobby. Too often on the air I hear disparaging reports about the state of the bands, etc., and the non-availability of the DX. Fellow Amateurs, it's there for one and all for the taking. Instead of complaining bitterly, we all should improve our little set-ups and make our own station as efficient as we can. Remember, we can only get out of our hobby as much as we put into it. Let's be progressive and cut out the wingeing.

We will dispense with the run-down of each particular band this month, as enough knowledge can be gleaned by reading through the notes and reports on this page.

**WHERE TO LISTEN AND WHEN**

Senator Barry Goldwater has been an Amateur since he was 13. His first call was W6BPI. Today his call sign is K7UGA and he favours s.s.b. mostly on 14 megs. He also holds the rating of command pilot and the rank of Major General in the U.S.A.F. In the family are four children.

4X4NNW is a YL station in Israel, operated by Dvora Sha Al, who is a school teacher at Haifa.

VP7DD is the call of American W5DZF, who is operating from the Atlantic Missile Range in the Bahamas.

SM5BMN is the call of Barbara Nord, at Linkoping in Sweden. She operates a.m. and s.s.b. on 20 and 80 mx. She speaks fluently German, French, English.

PY4AP at Horizonte, Brazil, favours 40 mx c.w.; has home-brew 150w. and has worked over 100 countries.

KS6BN, now active from Pago Pago, is ex-KH6AFJ. Not been active for some time, but making up for it now.

HP1JC is Juan Chen from Panama, on 14 megs., using Collins-Globe Champion TH4.

I1AMU of Italy says he expects the Vatican station HV1CN to be available on Sundays on 14 megs s.s.b. around 1900z.

VK9RB and VK9RH are on Norfolk Island, VK9WP at Nauru, VK9DR at Xmas Island.

YN3KN is active on 7 Mc. from Leon, Nicaragua. Operator is Jack Kelly Murphy.

Also on 7 Mc. W8EMD has three 30 ft. towers in a triangle which he switches—all are mounted on insulators.

5A2TJ of Libya is now back in the States and has the call W5GIT. For the two years in Libya he had 5,000 contacts.

VP8HY is reported to be active on 14 and 21 megs., from the South Georgia Islands. VP8HU is active from Deception Island, 7 Mc. c.w.

6O1WF after 11 years in Africa is leaving to return to Kansas.

Active from Malaysia is Danny Lockyer, 9M2LO, known for his DXing in '47-48. Older members will recall him as MD1D and later as ZC1CL. 14 megs. s.s.b.

With a 200w. tx and an antenna range of quad, dipole, yagi, long-wire and ground-plane, DM3RBM is active 3.5-144 megs.

OA4PF is a good contact from Lima, Peru, with 180w. on 14 megs. s.s.b.

9N2RM, Ron Marschke, is operating from 2 Sqdn. R.A.A.F. at Butterworth, Malaysia.

Frenchman Marcel le Brun, 7X3CT, is heard on 7 Mc., located at Colomb-Becher in Algeria, Nth. Africa.

W6BB operated from the University of Berkley, California, s.s.b. preferred.

Quite an impressive line-up of Collins gear is in use at YV5AHR, the station of Luis Rios at Caracas, Ven. KWM2 Collins station control, and a 30-LI linear, Mosley TA33 ant.

WB6DEX heard on 21396 with a good copiable signal working VKs at 0100z.

VR2DI, Ben Smith, at Suva, Fiji, has been giving the boys some good contacts on 14 megs. s.s.b.

KL7AQ from Anchorage, Alaska, puts in a nice signal with his Ranger of 75w. and a ground plane antenna.

W1WLZ has a new tribander, a new 3-el. vertical for 3.5 and is going after D.X.C.C. on this band.

In answer to requests from thousands of Hams throughout the world, Project Hope has completed the installation of 7G1H, a land-based station in Conakry, Guinea, so that DXers may claim a new country after having worked the station. Virgil Bowers, WA2WUV/HC8CA, flew over to Guinea with a Hallicrafters SR-150, SX117, beam and rotator, received official licensing for 7G1H, and set up the equipment in the Seamen's Club in Conakry. 7G1H will be used primarily as a DX station and will be manned by Virgil and other licensed Hope personnel with sufficient activity over the next eight months to take Guinea off the "countries wanted" list. This is good news for those Hams who contacted Jon Schmitt, W8BZB/7G1, but were unable to claim a new country because he was operating aboard the S.S. Hope, anchored at dock-side. As usual, with Project Hope, QSL cards, cards for the new station 7G1H should go to K8BPO, Harold Charvat, 207 Mandel Lane, Prospect Heights, Illinois.

From Don L2022, the following: Here in Albury I have found 20 metres right at the peak of its form, on rare occasions as good as it was in 1958; plenty of DX remains on 40 despite the intrusion of so many commercials. A small portion of the countries heard: **40 Metres c.w.:** UA9RQ, YO8CF, HA5AW, JA1KGT, Ws, BY1PK, YO4RF, YO4KBG, YO-5KAI, XE2AAG. **15 Metres c.w.:** UD6KAB was the only station heard.

**20 Metres c.w.:** ZP5LS, VR2ER, VK4TE (Willis), UL7CT, G3FGM, VU2PB, UJ8AC, SM5CZQ, KS6BL, EL0B/MM, VS6FO, PY1NFC, ON5HR, GC2, FK8BG, OH4NS, OH7PJ, UW-9OW, LA1CA, GW6YQ, PY2BKO, HA5AK, KC4USX, ZS6BKV, OZ5DX, HA5KFR, VR2DK, OA4PF, LU2DAW, UB5CK, F8FE, PY5OE, UL7PK, OK1KA, UA4IB, UD6KAC, VS9OC, UB5ART, HK7UL, HK3NQ, UO5BM, HP1IE, DM2AND, UH8AE, UN1BK, AP5HQ, CE4AD, FO8AQ, UM8AP, DU1OR, VS9MB, ZP5LS, OH-1XX, UI8LB, VK9RB plus the usual Pacific and American bases, etc.

**20 Metres s.s.b.:** You name it, I heard it. Gs, DU1SV, 9M8EB, SV0WR, OA4KY, SV0WFF, HS1I, HC2JT, OE1MFW, ON4BZ, YV5BB, HC-5NW, HS1HS, KG6IG (Bonin Is.), LU2DAW, VR1G, ZS8H, LA4ZC, VU2BK, HS1NM, HL-9TY, YV5BPJ, KW6EJ, UA3KBD, KH6CMM/KB6 (Canton Is.), VK9DR would be the pick of the s.s.b. DX heard here, realising that the AR7 is not the ideal rx for s.s.b.

One interesting point on 20 mx of late—and all the above 20 mx listings have been made between 0800 and 1200 GMT—is the number of stations coming through here on short skip. VK2 and VK3 stations not normally heard here on 20 are rocking in 5 x 9, in particular VK2EO has been putting a magnificent signal here on 20 c.w., also VK3XB.

**STATIONS WORKED, ZONES HEARD, ETC.**

From David Rankin, VK3QV, c.w. worked on 21 Mc.: DL3CM, GI3IVJ, HM5BZ, HM5CO, JA1NJX, OH1TN, OH5VF, OH7OK, UA3GM, UB5ARTEK, UA0GF, OE5CA, 5H3JI (1400z). S.s.b. worked on 21 Mc.: G3SVF, GW3TCV, HB9ZI, I1LCF, I1LCK, JA1DUB, JA4ABY, JA-6BI, KM6BI, KH6FCU, WA6HXG, F2LO, and SM5CO. WA4 was heard very weak on long path approx. 1330z. A.m. worked on 21 Mc.: DU1FR, DU1MR, JA1IIX, and ZC4AK was heard but not contacted. Tnx David, keep this band open OM.

Ken VK3TL has worked on 14 Mc. c.w.: EL2DA, OR4VN, VQ8BV, 4W1H, 9X5MW; on phone: K2JGG/JY, MP4BEK, PZ1AX, SV0WF (Rhodes), VP7NY, XW8AZ, YK1AA, 6O6BW, 7X7AB, 9X5MH. Ken's best QSLs: LU9CK, PZ1BW, ZC5AJ, 9A1ZG, CN8GB, ZS2ML, and CR6EI. Tnx Ken, cheers.

**BEST CARDS THROUGH VK5 BUREAU:**

UW0IX, UL7CH, UO5PK, UA2AC, HM1AX, LZ2FN, PY3AHJ, IT1AGA, OZ4PM, GI6TK, CT1DJ, F9RY/FC, HC8CA, 4W1B, YN3KN, VP2LS, VP2MM, OA4AO, OA4PF, YV5BVR, YV5AHR, HB9ET, UB5ARTEK, UO5PK, UA-2KAK, VE6AKP, K5HGF/KL7, YO7DL, DU6TY, YU3CCD, HB9IK, YV5AMV, W9WNV/KG6, HL9KH, KC6BO, 5B4GT, 5Z4IV, PZ1AX, HC-1EL, YJ1MA, HK3RQ, HP1IE, EP2DM.

**INTERESTING QTHs**

OR4VN—Via OR4VN.
9X5MH—Via DL1ZK.
4W1H—Via HB9ACD.
EL0B/MM—Via HB9AA.
ZS8H—Box 1729, Johannesburg, South Africa.
HC5NW—Box 55, Cuenca, Ecuador.
WB6ARW/MM—John Knapp, 2545 East 5th, Long Beach, California, U.S.A.
SV0WH—Via W5GMS.
VP3HAG—South Mackenzie, B. Guinea, S.A.
HC8FN—Via WA2WUV.
FG7XV—Via W2CTN.
4U1SU—Box 11, Geneva, Switz.
SW0GG—Via K1EAT.
4W1E—Via HB9ZW.
4W1G—Via HB9NL.
SV0WF—Via W2PCJ.
9M8EB—Ed Brogden, Simangang, Sarawak.
5N2CKH—Box 2609, Lagos, Nigeria.
FM7WQ—Via W4OPM.
KH6EDY—U.S.C.G. Loran Station, Navy F.P.O. 3080, San Francisco, U.S.A.

Cheers till next month. Thanks to the following: Hallicrafters U.S.A., VK3QV, VK3TL, Don L2022, VK5RX and VK2JZ. 73, Bert, VK5BB.



## W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

### PHONE

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK5MS | 24 | 310 | VK2ADE | 65 | 231 |
| VK5AB | 45 | 310 | VK2JZ | 61 | 224 |
| VK6RU | 2 | 306 | VK6KW | 4 | 211 |
| VK6MK | 43 | 297 | VK3WL | 14 | 211 |
| VK3AHO | 51 | 296 | VK3ATN | 26 | 204 |
| VK4FJ | 21 | 283 | VK4HR | 12 | 192 |
| **Amendments:** | | | | | |
| VK3TL | 62 | 187 | VK3TG | 48 | 132 |
| VK2APK | 64 | 147 | | | |

### C.W.

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK3KB | 10 | 327 | VK2AGH | 71 | 268 |
| VK3CX | 26 | 305 | VK6RU | 18 | 262 |
| VK2QL | 5 | 301 | VK3AHQ | 79 | 254 |
| VK4FJ | 29 | 298 | VK3ARX | 66 | 247 |
| VK2ADE | 81 | 298 | VK2EO | 2 | 245 |
| VK3NC | 19 | 286 | VK3XB | 75 | 238 |
| **Amendments:** | | | | | |
| VK2APK | 76 | 222 | VK3TL | 78 | 197 |
| VK3RJ | 42 | 221 | | | |

### OPEN

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK2ADE | 28 | 322 | VK3AHO | 76 | 299 |
| VK6RU | 8 | 311 | VK3NC | 77 | 287 |
| VK4FJ | 32 | 307 | VK3HG | 3 | 274 |
| VK2AGH | 83 | 301 | VK3JA | 43 | 252 |
| VK2ACX | 6 | 300 | VK7LZ | 23 | 242 |
| VK6MK | 74 | 299 | VK2VN | 18 | 238 |
| **Amendments:** | | | | | |
| VK2APK | 82 | 228 | VK3TL | 85 | 222 |

# S W L

Sub-Editor: Chas. Aberneathy, WIA-L2211
30 Urunga Parade, Miranda, N.S.W.

Well I guess by now all of our members have settled down to their various chores once again after the festive season. I do trust all had a very enjoyable time.

Early in January my XYL and self spent a week in the VK3 capital and had the pleasure of meeting a few of the s.w.l. members in that area. I would like to thank all for the hospitality shown to us during our short stay there.

**DISTORTION**

We all seem to have a pretty good idea of what distortion is, since we have all listened to the tinny, squeaky, and unnatural sounds of miniature radios, the noisy, crackling and tortured ones coming from an overloaded table model, and the boomy, and screechy ones being projected from so-called high fidelity record players. Being aware of this knowledge of the average radio listener (or should we say sufferer), we have talked about distortion being produced in amplifiers by "non linear" operation. But in order really to know what we are talking about we have to analyse distortion more closely according to the various forms it may take.

Ideally, if some waveshape that is an exact electrical representation of a sound passes through an audio amplifier completely unmodified, except as to amplitude, there is no distortion and the amplified output from the speaker will sound exactly like the original (provided, of course, that the speaker does not introduce any distortion). In practice a reproduced sound never sounds like the original even with an ideal amplifier and speaker. For one thing, a speaker is not a musical instrument and can never reproduce the sound distribution of a symphony orchestra, or even a grand piano. Another reason is that sound is usually reproduced by a single channel from one microphone through one amplifier and one speaker, while we listen with two ears. This time difference with which sound strikes each ear of the listener produces a realism of depth, which permits us to tell approximately where each sound is coming from. This effect cannot be reproduced by single channel reproduction, but has been simulated quite successfully by so-called stereophonic reproduction devices.

The three main types of distortion are frequency, phase or time delay, and amplitude or non linear distortion.

Frequency distortion is the limitation in the audio bandwidth caused by the amplifier coupling elements.

Time delay distortion is the unequal delay of different audio frequencies caused by phase shifts in the amplifier coupling elements. Frequency distortion in conjunction with time delay distortion produces poor transient response in an amplifier.

Amplitude distortion of the output waveform of an amplifier is caused by non linear operation, such as, plate current cut off, and grid current flow. Curved tube characteristics also cause amplitude distortion. Amplitude distortion results in the production of harmonic frequencies not present in the input signal. These cause distorted sound.

**NEW SOUTH WALES**

Not such a good attendance at our January meeting, but I guess that owing to our members being on holidays, this was only to be expected, and after all are once again settled back at their various chores, we should be at full strength. All are welcome at No. 14 on the third Friday in the month.

Sid L2258 now has a CR100 as well as an AMR300 rx. This is a very handy set-up as that second set is always a valuable asset.

Arnold L2291 in the near future hopes to erect a 60 ft. tower to take an inverted vee antenna. That printer let me down badly, and I trust that you were able to get local quotes to your satisfaction.

Alan L2——. How is the AR8 performing in Dubbo? I rang our Sec. re your number and by now you should have same. Keep me posted of your doings in that area.

Jerry L2229: By now those books are in Adelaide, and no doubt a letter of thanks from the club in that area should be coming your way. I know that they were well received.

Bruce L2283 sends a very impressive list of DX.

Ray L2287, at recent session, logged HC, 5A1, KH6, JAs and Ws. Thanks for the information re the JA S.w.l.

Don L2022: Pleased to know that you are coming nearer to Sydney, and I wish you and yours well on the change over. By your log book you certainly have had a quiet year, but your new QTH should be more favourable than the old one. Don sends the QTH of 9M8EB—Ed Brogden, Simanggang, Sarawak.

**VICTORIA**

During my recent visit to VK3 I tried to purchase a lighthouse from a certain s.w.l., but he refused to co-operate. I met with more success when one night I snooped around a house in Thornbury, where I went to see how this chap managed to always have so much to report each month. Yes, I found out all right, but I'm not telling (magpie).—Chas. L2211.

With the passing of 1964 we note that the number of our members going after their ticket decreased on other years and only three were successful. Perhaps 1965 will be a better year. The Victorian S.w.l. Group would welcome any interested persons to attend their monthly meetings held at 478 Victoria Pde., East Melbourne, on the last Friday of each month, commencing at 8 p.m. The Group proposes to continue to have technical visits throughout the year, as well as the monthly radio constructional night which keep so many of the fellows' sets in operation. The experiment of compiling notes for the Sunday broadcasts and having one of our members read them over the air has been most successful—a few volunteers to do the reading each Sunday morning would help spread the load a bit. The January and February meetings produced many familiar faces missing during the latter part of 1964 because of exams. and study.—Ian L3006.

Eric L3042 sends his statistics for 1964. Log entries 13,027, heard 148 countries in 37 zones. Sent out 1,181 reports to over 100 countries. Received QSLs from 121 countries in 36 zones. Heard 44 mobile marine (ships). Heard 27 car mobiles. Heard two aeroplane mobiles. To the end of December 1964 had made 287,876 log entries in 38 years' listening. Now if only Collingwood could win the V.F.L. final, hi! Nice to have met Jean and yourself, and I send my regards.

Greg L3138: It was my pleasure re that APC matter, and the information in your reply was reward enough.

Warwick L3211: Welcome to the page OM and I trust that you will continue to pen your doings. Warwick uses a home-brew rx of 10 tubes and sent a long list of DX heard. Tnx for your letter OM.

Colin L3188: Pleased to hear that you have moved to VK2. We seem to be getting quite a few L3s here lately. I wish you well with your A.O.C.P. course, and your new job. Keep me posted with your doings at your new QTH.

Lloyd L3141: I'm always glad to hear from you, be they few and far between, hi. When in Sydney phone as per number given.

Roger L3158/VK3ZRY: Nice to hear from you OM and many thanks for that offer of assistance, which I shall make known in the next issue as space will not permit at the moment. Pleased to add you to the DX Ladder.

Harry L3102: Many thanks for your letter OM, also your kind offer of assistance, which I can certainly use in the near future. Keep writing whenever time will permit.

Maurie L3055: It is my pleasure to once again add your name to our page. Really I thought that you had forgotten my QTH, hi. Sorry to have deleted you from the ladder and that I did not have the time to see you when in VK3. Still pleased to know all is well.

Noel L3101: We were very impressed by your set-up at No. 101, also by the hospitality shown during our recent visit, and offer sincere thanks to Gwen and yourself. That letter from VK9NT has been sent to the Editor and should be of interest to s.w.l's.

**QUEENSLAND**

Lew L4020: Many thanks for those suggestions, but I'm afraid that space would not permit. What's this I hear, you baking 40 bread rolls and them only lasting 10 minutes, hi! Okay on your G5RV antenna as it should give you very good results.

**SOUTH AUSTRALIA**

Alan L5065: For mobile work Alan uses a 10 transistor rx and seems to have a lot of fun. That small beam looks the goods to me and I may try it in the near future. Congrats. on the Joburg Award.

Tony L5073: I trust that the explanation of the QSL Bureau was to your satisfaction, and the books for the club were of some value. If I can be of any assistance to the club just pen your request.

Tim L5067: You are certainly having fun with those antennae, well there are plenty of designs to choose from. The sample of your new card looks very nice indeed and the price could not be better.

Brenton L5069: I was very pleased to have had the opportunity to have met you and Graham on your recent visit to Sydney. You might keep me informed re the radio club.

**WESTERN AUSTRALIA**

Bryan L6028: I suppose by now that you have the 5 element beam up and you are in business with the R208 rx on 6 mx.

Alan L6029: Your new antenna should be ideal and I hope that it brings plenty DX.

Geoff L6030: You lads over in the West seem to get amongst the DX. Geoff heard on 15 mx: SM6, 5A1, LX1, OE1, LA1, whilst on 20 mx DU9, PY2, SU1, M1B, FR7, 9M4 and YV4.

Peter L6021: I shall certainly tell you of my pre-amps. capabilities when it is finished, at the moment it is in the same place as yours, hi. Don't forget to let me know re that suggestion of the L6 area.

**TASMANIA**

Greg Johnston: Many thanks for your support from VK7, it is much appreciated. Your rig sounds very interesting with the inverted vees, 4-tube converter to a 9-tube rx—all home-brew. I can well imagine how study takes most of your spare time, still it is most important these days. During Dec., Greg netted some 60 countries—nice going OM.

I am indeed grateful to those members who are taking time to pen me a few lines, plus offers of assistance. It is rewarding to find that each month a few new ones are adding their piece to our page and I trust that they shall continue to do so. 73, Chas L2211.

**Cards from VK9NT:** Noel L3101 forwarded the following memo from Norm VK9NT:

"Would you please notify all members of your club that the usual way to obtain my QSL card is to write to my QSL Manager, who is W2CTN, Jack Cummings, Amityville, N.Y. 11701, New York, U.S.A. He has all of my Mt. Hagen cards, and I have very little of my Rabaul cards left.

"The job of making up a copy of my log is quite a big one, and it creates a bigger job when you have to also give a list of QSL cards received during the month, complete with full QTHs and number of I.R.C. received, plus the I.R.C. have to be included with the log, and eventually finishes up quite a bulky letter.

"I do not QSL via the Bureau, as I have things so organised that every card should come through W2CTN, and if the S.w.l's wish to have my card badly enough then they have to spend the price of a stamp, even though it may only be for surface mail.

"As you may realise, the demand for the VK9 card is very heavy, and not only does it become expensive, but occupies at least two thirds of your time if you do your own QSL chores. I know, as I had to do it before I had a QSL Manager. This is something that the average s.w.l. does not realise, and I feel sure that once it is brought to his notice, that he may realise why he sometimes does not receive a card.

"My suggestion is that he listens long enough to make sure whether or not the station he is listening to has or has not a QSL manager. I feel sure that if you were to advertise this information, a lot more fellows would receive satisfactory results. I can assure them that they will receive a hundred per cent. QSL if they do as I request as far as my station is concerned."

**S.W.L. DX LADDER**

| | Countries Conf. | Countries Hrd. | Zones Conf. | W States |
|---|---|---|---|---|
| E. Trebilcock .... | 285 | 293 | 40 | 50 |
| P. Drew .... .... | 153 | 257 | 35 | 31 |
| D. Grantley .... | 126 | 282 | 39 | 35 |
| M. Hilliard .. .... | 91 | 241 | 33 | 14 |
| M. Cox .. .... .... | 89 | 225 | 33 | 23 |
| G. Earl .. .... .... | 81 | 159 | 32 | 11 |
| L. James .... .... | 73 | 164 | 30 | 13 |
| R. Kearney .. .... | 70 | 146 | 32 | — |
| C. Aberneathy .. | 65 | 105 | 33 | 14 |
| W. Smith .... .... | 58 | 167 | 27 | 7 |
| N. Harrison .... | 56 | 176 | 31 | 37 |
| A. Raftery .. .... | 29 | 132 | 15 | 6 |
| R. Harrison .... | 18 | 70 | 16 | 5 |
| R. Oats .... .... .... | 17 | 40 | 13 | — |
| B. Prosser .. .... | 16 | 136 | 8 | 2 |
| B. Mackintosh .. | 10 | 55 | 10 | 1 |

# V H F

## 52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Another DX season and Ross Hull Contest has ended and the bands have returned to the pre DX activity, though the DX is still there. Activity in the Melbourne area was down on previous years, no doubt due to t.v. problems. The best band openings into Melbourne appeared to be after 5 p.m. and this prevented many from operating, except of course VKs 3ZNC, 3ZNJ and 3ZPC who hibernated to Mt. Buninyong near Ballarat to keep out of the t.v. sets in Melbourne.

Most States were well represented. No VK9s were heard or worked to my knowledge. VK8KK provided a good signal from Alice Springs with 8ZMD at Darwin holding up that position (8ZDI and 8ZCX being out of town). VK0 at Macquarie Island was heard on a number of days but have no knowledge of any contacts being made. ZLs were scarce in VK3, but apparently VK2 and VK5 worked quite a few. ZL t.v. was absolutely paralytic in Melbourne on occasions but no ZLs heard.

144 Mc. produced some good openings. The "usual" VK2-ZL openings occurred (refer to VK2 notes). VK4ZWB worked VK3ZJQ and VK7LZ. ZL3AQ heard a VK3 during the VK2 opening. This was probably VK3ZER, however we are not sure at this stage. Then VK5ZHJ worked VK6ZCN on 8th Jan. which looks like being a new VK record.

432 Mc. has had its share of attention with the distances being lengthened each week. Firstly VK3AEE to VK5AW last year, now VK3AEE to VK7LZ, 282 miles approx. on 14th Jan. in the wee hours. This band is becoming very popular in Melbourne, Adelaide and other centres. VK2ZBJ was mobile in VK3 earlier and worked VK3AEE over some 30 odd miles.

Made a quick trip to Adelaide just after the Contest concluded and met quite a few of the Adelaide Amateurs. Met 5ZDR, 5JQ, 5ZCZ, 5ZEJ, 5AO, 5RO, 5ZDA, 5ZMJ together with 2ZFB and 8ZCX. Thanks to 5JQ and XYL for their generosity during our stay and also to 5ZDR and XYL for their assistance also. Worked a few from 5JQ's f.b. QTH and felt very envious of the fine location and absence of Channel 0 which complicates us all in Melbourne and, of course, soon in Brisbane. Came back through Mt. Gambier and unfortunately only met 5ZLS who told me of activities there. Then on to Ballarat via 3ZER. Saw his fine set-up and looked over his Ross Hull log which looks like taking the honors for the current Contest, with 8KK probably a close second.

Just a word to all correspondents re the notes for the coming year. Please ensure that they reach me by the 2nd of each month. The job is much easier if they arrive on time. Often they arrive after the deadline for my notes to reach the Magazine Committee and consequently they cannot be printed.

432 Mc. schedules being observed between VK3-VK5-VK7, each day until further notice (all times E.A.S.T.):—

8.15 to 8.20 p.m.: 3ZER, 3ZDM to Melbourne.
8.20 to 8.25 p.m.: Melb. to 5AW and Ballarat.
8.25 to 8.30 p.m.: 5AW to Melbourne.
8.40 to 8.45 p.m.: Melb. to 7LZ (7LZ tuning).
8.45 to 8.50 p.m.: 7LZ to Melb. (7LZ 433.3).
9.30 to 9.35 p.m.: Melbourne to 5ZDR.
9.35 to 9.45 p.m.: 5ZDR to Melb. (5ZDR 432.6).

All 432 Mc. equipped Amateurs are invited to participate in these schedules Other directions and times can be made with any of the stations listed or 3AEE in Melbourne. Best of luck to all those concerned. How long before a Melbourne-Adelaide QSO on 432 Mc.? 73, 3ZGP.

### NEW SOUTH WALES

**50 Mc.**: Very good openings around Xmas-New Year, but declined rapidly after this.

**144 Mc.**: Activity improving again—possibly helped by New Year Field Day.

**432 Mc.**: Moderate activity. Les 2ZBJ portable at Wagga worked Eddie 1VP portable on Mt. Franklin in the A.C.T.—approx. 100 miles. Les was using a tiny halo on his car.

A Xmas Party, preceeded by a short fox hunt, was held at the home of David 2ZVW and Max 2ZH. It was most successful with about 70 people attending.

In Dec.-Jan. there were a number of very good openings to ZL on 144 Mc. from the Sydney area. Some stations worked a number of different ZLs and call areas.

The New Year Field Day was most successful with about 12 stations portable in the field. The best contact was 440 miles from David 2ZVW portable at Bald Hill in the Snowy Mts., to Paul 2ZPJ portable at Point Lookout in Northern N.S.W. Signals were S9 with little fading from 8 a.m. to 11 a.m. when operation ceased. 432 Mc. would have been interesting.

Paul was also worked by Peter 2ZZW, also on Bald Hill. Peter was using a 522 tx and rx and 7 el. beam—not bad work! The winner for the contest was Lance 2ZKP, assisted by John 2ZAV.

The V.h.f. Group is holding a new type of Convention on March 5-6-7. Programme: **Friday 5th**—Meeting at Wireless Institute Centre. **Saturday 6th**—Tour of electronics installation in the morning to be followed in the afternoon and evening by a twilight event, i.e. two fox hunts and barbecue tea. **Sunday 7th**—Main Convention to be held at Cattai Creek, north of Sydney. Events will include a mobile scramble, foot fox hunt, treasure hunt, hidden tx hunt, etc. Registration is free. This should be a most enjoyable Convention, so hope to see you there. 73, 2ZPI.

### VICTORIA

**Six Metres:** This band has been open on the average of four days each week since early Nov. In the main the openings have been to VK4 and VK2 with shorter openings to VK5, 6, 7, 8 and no 9s. ZLs were heard and worked on one or two occasions, but were extremely rare. ZL t.v. being heard quite often without any Amateur signals. Conditions generally were good, though a large number of openings were late in the day when the net frequency 53.032 stations worked quite a large number of DX stations. (4ZPL worked 40 odd on the net, 8 off the net.) Quite a deal of t.v.i. was caused during this period by stations outside of VK3.

**Two Metres:** This band has been very active with quite a number of new stations appearing. Quite a deal of country activity plus some openings to VK7 and VK5. Stations operating at Mt. Buffalo over the New Year week worked into VK2 and we believe VK3ZER was heard in ZL3.

**482 Mc.:** Activity has increased on this band —see elsewhere for details of VK3 schedules to other States. The best news of course was 3AEE's success in working 7LZ, 282 miles approx. for what looks like being a new VK record. Congrats. to both stations. 3ZER and 3ZDM are working into VK5 and of course looking for the VK7s. Will the next step be into 5ZDR? 3AGV at Colac has a tx on the band and has worked 3AEE cross-band.

**Ross Hull Contest:** There were four really keen operators in the Contest this year—3ZER, 3ZNC, 3ZNJ and 3ZPC, who spent the Xmas-New Year week portable on Mt. Buninyong, near Ballarat. Out of the influence of Chan. 0, they quickly ran up a high score on 6 and 2, working into areas beyond the reach of the Melbourne stations. Chan. 0 in Melbourne put a damper on 6 mx activity in the city and the degree of activity was low compared with other years. Of course, when six is open, so too is the t.v. set, as many found to their disadvantage.

**Traps for Channel 0:** A trap found very efficient for removing your signal from Chan. 0 is made up of 24 inches of 300 ohm ribbon, shorted at one end and having a 3-30 pF. or 3-50 pF. trimmer across the open end. The trap is taped to the antenna feedline to the t.v. set, as near as possible to the input to the set. (Some experiment may be necessary for best results.) The trap is not connected to the feedline but run parallel to it. Tuning is achieved with a non-metallic device and tuned for maximum attenuation of your signal. Its tuning is quite critical and for effective use should be centred on your frequency, preferably away from the t.v. channel.

It should be adjusted during test pattern hours, running tone from your own gear. Of course this assumes you are only radiating a signal between 52-54 Mc. Any spurious signal within the t.v. channel will not be affected. Of course, this we should all know. However, it is surprising how many signals are radiated off the operating frequency.

A further suggestion is that the trimmer be adjacent to the input end of the t.v. as this will facilitate the tuning of the trap without this end flapping around in the breeze. They may require occasional re-tuning, so be on the lookout.

Amongst the many visitors to Melbourne this year was Bob 4NG from Rockhampton. Bob was heard by many mobile around the city of Melbourne. 3ZGP had an eyeball QSO and heard all about the DX from up in north VK4. 73, 3ZCK.

### QUEENSLAND

"F.b. signal up here, OM. My number to you 59———. Your number received OK. See you again tomorrow." How many QSOs were made in this manner? Up here in VK4 everyone is still recovering from the high pressure operating of the Ross Hull Contest. Nevertheless, I think that every operator had a very enjoyable time.

During the 64-65 DX season all mainland States were worked as well as VK7. The band was open to ZL on several occasions. The ZL3s were very prominent with ZL1s very rare this year. A VK0 was heard up here and caused much interest. However, I have recently learnt that the VK0 in question does not have any 6 mx gear! What happened to VK9 this year? Very early in Nov. last year a VK9 was heard for about five minutes. There have been no further sounds from up that way at all. Also there was no sign of John 4ZCT in the Solomon Islands. The bands have not been kind this year for northward working.

One surprise DX opening occurred on Feb. 1. The band was open to VKs 2, 3, 5, 7. During the season just past some 2 mx DX was reported. The news of VK2-ZL contacts again this year on 2 mx spread like wildfire up here. John 4ZWB worked a VK7 on 2 and a few VK3s were heard up here, but not worked.

With the imminent arrival of TVQ0 here in Brisbane, there has been a noticeable trend toward 144 Mc. working. A few stations are looking forward to working 2 mx DX next season and with this in mind, a 2 mx beacon is to be established by a group of Hams about 90 miles from Brisbane. It will be on the Bunya Mountains about 3,000 ft. high and will run the legal limit of power. These plans are subject to P.M.G. approval. (Further details elsewhere this issue.—Ed.)

Latest news from TVQ indicates that the latest time a test pattern can go to air is March 31. The earliest day is March 10. How much co-channel interference will there be? Your neighbour is sure to blame you. The Chief Engineer of TVQ tells me that they are putting out reduced power in the Melbourne direction—only 25 kw.!!

The final item of news for this month comes from the Ipswich Radio Club. They have decided to adopt the VK3 net frequency as their own net frequency. 73, 4ZPL.

### SOUTH AUSTRALIA

Since the completion of the Contest, activity in VK5 has again returned to its annual post-contest state. However, during the Contest, VK5 activity was quite lively and from indications it would appear that the Contest winner will again possibly hail from VK5, but only time will tell.

Various openings have been recorded to VK2, VK4 and VK6 since the Contest, but as is usual, activity in other States appears to be very low around this period. Of interest on 6 mx is the increasing number of transistorised hand-held portables. To date Darrell 5ZKY, George 5ZGV and Trevor 5ZTM have been the leaders into the research of these units and from all accounts results have exceeded expectations.

The main interest on 2 mx has been centred on the contact made between Andrew 6ZCN and Colin 5ZHJ on Jan. 8, 1965. Signal reports of R5 and S5 were exchanged from both ends. A new distance record could eventuate from this contact, and official confirmation is being awaited with interest. Mick 5ZDR has been a little unfortunate in his attempts to work VK7 on 2 mx, as VK3 QRM has interrupted the two occasions that Mick could have "pulled" the contact out of the bag.

Activity on 432 Mc. mainly consists of Mick 5ZDR maintaining skeds into VK3. Regular contacts have been made by Mick with Herb 3NN with signals at times reaching S9. Reports

of Mick's 432 Mc. transmission from Dumbleyong has increased his ego to make it a two-way contact.

Activity on 576 Mc. is skyrocketing to mammoth proportions with approx. 12 stations very active on the band. All equipment is of the unstable variety and efforts are being concentrated on extending the VK6 record of approx. 100 miles. A recent contact of 98 miles between Rick 5ZFQ/P and Trevor 5ZTM/P to John 5ZJH/P at S9 signal strength does more or less indicate that a new 576 Mc. record is imminent. 73, 5ZHJ. (Many thanks for stepping into the breach, Colin. Keep up the good work.—3ZGP.)

**WESTERN AUSTRALIA**

The new year came in with a heat wave which caused all radio sets operating on 52 Mc. to become overheated and break down just when the other guys were working those ZLs. This was on Dec. 31 when everybody except me worked three ZLs each. It was a hard job working DX and it was necessary to listen continuously and work the station which came up for a few minutes.

On 8th Jan. Andrew 6ZCN worked 5ZHJ, both ways on 2 mx for about three minutes. He heard the VK5 beacon on 144.8 Mc. while tuning the band, called on 6 and contacted 5ZHJ immediately. They arranged for the latter to go on 2 and he was copied R5 and S5. Then both stations went on 2 and exchanged numbers. The last such contact was 13 years ago.

Andrew leads the Ross Hull Contest over here with 280 points. 6ZDS has 200 points and 6LK 169.

David 4ZEK and Dave 4ZAX were over here from 10/1/65, running 100w. mobile, f.b. OM.

Greetings to newcomers Max 6ZFM in Wembley and Bill 6ZBB in Midland. Max has an 815 and Bill a 6/40 with an overtone rock on 52.315 Mc.

Heard W0KBH from Minnesota at the last Morse exam. complaining that the Australian exam. was a bit stiffer than the American. Cecil will be on 20 mx s.s.b. if all goes well, otherwise he will apply for a Z call.

The Xmas fox hunt was an easy one as even I managed to find the tx despite the reciprocating beam Graham 6ZDB had devised. The party at Lance's home in Wembley was good fun and lasted well into the morning. Lance may be going on some real fox hunts soon as he is taking up farming in Moora. Good luck, fella! 73, 6ZAG.

**SIX METRE A.M. NET**

With the adoption of 53.032 Mc. as the 6 mx a.m. net by the Ipswich Group and the possibility of Brisbane also using the frequency, the population is growing in leaps and bounds. With both local and DX use, operation becomes rather difficult at times and it is suggested that all users adopt some procedure to permit full use of the frequency, both as a cross-town, mobile and DX channel.

Firstly, keep your calls and overs short! A long CQ is not necessary. If you don't succeed the first time, call again but don't keep calling CQ for long periods.

Observe a break of 3-5 seconds before replying to allow another station to call. You can never tell who is listening. VK2, 4, 5, 6, 7 and 8 have heard signals from Melbourne, so keep your ears open. Reports indicate that signals from VK3 were heard in VK8 right through the winter months. If the round table is large, adopt the procedure of having a break for the first minute in each fifteen minutes. Stations wishing to call in should use this period to identify themselves.

It is quite feasible for groups located remote from each other to use the net at the same time without mutual interference. However, stations operating from good locations and using high power should be wary of causing QRM to others.

Each week VK3WI uses the frequency for the Sunday broadcast at 1030 hours. This will provide a steady strong signal over a large area for receiver alignment. Immediately after a call back is taken and the opportunity can be taken to introduce yourself to other net users. The net is available to anyone who cares to call on the frequency. Whether you are crystal or v.f.o. makes no difference. Please do not use the frequency for the purpose of adjusting your antennae with long periods of unmodulated carrier, etc. This only causes inconvenience to all the other users and is not becoming of an Amateur.

Lastly, check your frequency; services are available. There are a number of stations with facilities for giving a frequency check. Many stations are using crystal-locked rx's and if you are more than a few hundred cycles off frequency you are not likely to be heard. Many use tunable rx's however and will hear you.

Soon we will be organising activity days on the net for mobiles, etc. Listen to the broadcasts for this information and endeavour to appear during the times requested. It may be to your advantage. Shortly a register will be commenced to log all stations appearing on the net for a "whose who" for all those interested. See you on the net. 73, 3ZGP.

☆

## V.H.F. DISTANCE CONTACTS

Following is the latest copy of the complete list of V.h.f. Contacts held on file. This includes all contacts known to me up till the end of 1964.

—David Rankin, VK3QV,
Federal Activities Manager.

**50 Mc. BAND**

| Call Signs | Date | Distance | |
|---|---|---|---|
| VK3ALZ-XE1FU | 1/5/59 | 8418 Miles | |
| VK2ADE-VE7AQQ | 8/4/59 | 7320 | " |
| VK3ZAQ-JA8BY (now VK3QV) | 28/3/59 | 5595 | " |
| VK3ZHF-K6HGP/KH6 | 18/4/60 | 5499 | " |
| VK6BE-JA8BP | 30/10/58 | 5490 | " |
| VK6ZAL/6-JA8WZ | 14/4/60 | 5482 | " |
| VK6ZAL6-JA8GG | 14/4/60 | 5455 | " |
| VK6ZAL6-JA8CC | 14/4/60 | 5445 | " |
| VK7LZ-JA9IL | 3/12/59 | 5426 | " |
| VK2ABR-JA8BP | 25/2/59 | 5397 | " |
| VK2HE-JA8BP | 28/3/59 | 5386 | " |
| VK5KL-W7ACS/KH6 (Darwin) | 26/8/47 | 5381 | " |
| VK4ZAZ-K6ERG | 16/3/58 | 5305 | " |
| VK4HD-W6NLZ | 29/3/59 | 5294 | " * |
| VK4HD-W6PUZ | 13/3/58 | 5272 | " * |
| VK2RU-JA1ANO | 1/4/56 | 4809 | " |
| VK4HD-JH6UK | 15/3/58 | 4679 | " |
| VK9AU-KH6DBY | 30/4/60 | 4312 | " |
| VK9AU-K6HGP/KH6 | 26/4/60 | 4281 | " |
| VK4NG-JA1AHS | 22/1/56 | 4140 | " |
| VK4HD-KR6AK | 14/3/59 | 4059 | " * |
| VK6HK-VR2CG | 3/1/55 | 3935 | " |
| VK6WG-VR2CG | 3/1/55 | 3818 | " |
| VK4NG-KR6AK | 8/2/59 | 3785 | " |
| VK4ZBE-VS6CJ | 5/4/59 | 3616 | " |
| VK9AU-JA7JH | 20/4/60 | 3292 | " |
| VK6BE-9M2DQ | 19/4/58 | 2853 | " |
| VK6BE-9M2DQ | 26/9/59 | 2853 | " |
| VK6ZAL-9M2DQ | 26/9/59 | 2845 | " |
| VK9DB-ZL3GS | 26/12/53 | 2809 | " |
| VK4HD-KX6AF | 24/3/58 | 2665 | " * |
| VK9AU-VK6ZBK/6 | 14/1/62 | 2628 | " |
| VK3IM-VR2CB | 30/12/53 | 2398 | " |
| VK9AU-VK7ZAI | 1/1/63 | 2305 | " |
| VK7BQ/7LZ-VK9DB | — | 2205 | " |
| VK4NG-VK9NT | 1/6/58 | 1328 | " |

* A1.

**144 Mc. BAND**

| Call Signs | Date | Distance | |
|---|---|---|---|
| VK2ZKP-ZL1ADE | 24/12/63 | 1351 Miles | |
| VK2ZKP-ZL1AUM | 24/12/63 | 1351 | " |
| VK2ASZ/2-ZL3AQ | 31/12/61 | 1342 | " |
| VK5GL-VK6BO | 30/12/51 | 1322 | " |
| VK5QR-VK6BO | 9/2/52 | 1319 | " |
| VK2AH-ZL3AR | 15/12/51 | 1307 | " |
| VK7ZAO-VK4ZAX | 27/12/61 | 1107 | " |
| VK4ZAZ-VK5ZK/5 | 30/12/62 | 1093 | " |
| VK4HD-VK5ZK/5 | 27/12/61 | 1040 | " |
| VK1VP/4-VK5ZK/5 | 30/12/62 | 1006 | " |
| VK3ZEA-VK4HD | 27/12/61 | 954 | " |
| VK3ZCG-VK4HD | 27/12/61 | 887 | " |
| VK4HD-VK5BC | 27/12/61 | 835 | " |
| VK3APF-VK4HD | 27/12/61 | 807 | " |
| VK2ZWC-VK5ZK/5 (now VK2ZPB) | 27/12/61 | 709 | " |
| VK5BC-VK7LZ | 28/4/59 | 609 | " |
| VK2ZAL-VK5BC (now VK2RX) | 18/1/58 | 600 | " |
| VK5BC-VK7PF | 28/4/59 | 571 | " |
| VK3ZCW-VK7LZ | — | 511 | " |
| VK3ALZ-VK7ZAK/7 | 10/1/60 | 379 | " |
| VK3GM/3-VK7LZ/7PF | 9/3/52 | 311 | " |

**432 Mc. BAND**

| Call Signs | Date | Distance | |
|---|---|---|---|
| VK3AEE-VK5AW | 13/11/64 | 226.6 Miles | |
| VK3OB/3-VK3ZER/3 | 12/9/64 | 119.7 | " |
| VK3OB/3-VK3ZAV/3 | 19/1/64 | 97.3 | " |

**576 Mc. BAND**

| Call Signs | Date | Distance | |
|---|---|---|---|
| VK6LK/6-VK6ZDS/6 | 15/12/63 | 101.2 Miles | |
| VK3ANW-VK3AKE | 11/12/49 | 80.1 | " |

**1215 Mc. BAND**

| Call Signs | Date | Distance | |
|---|---|---|---|
| VK2ZAC-VK2ZCF/2 | 4/3/62 | 46.8 Miles | |
| VK5LA/5-VK5ZCR/5 | 4/1/62 | 1.0 | " |

**2800 Mc. BAND**

| Call Signs | Date | Distance |
|---|---|---|
| VK3XA-VK3ANW | 18/2/50 | 9.0 Miles |

**8300 Mc. BAND**

| Call Signs | Date | Distance |
|---|---|---|
| VK3ZGT/3ZGK/3-VK3ZDQ/3 | 14/12/63 | 63.5 Miles |

# YOUTH RADIO CLUBS

First mention for this month should go to VK3. Neil 3AVK quite rightly mentions that this column does not give as much detail for VK3 activity as for VK2. There is a reason, of course—I get more letters and details from VK2 and VK4, even counting the excellent Newsletter sent by Ken Matchett. (In 1964, I was considered unimportant in other Divisions —and who am I to argue? I have better hopes for 1965.) Anyway, Neil sends details of four young A.O.C.P's that he knows. Rodney 3AIE is active on 80-40-20-2 mx with 30w. on homebrew, will be doing Matric. this year at Scotch College, passed A.O.L.C.P. before 18. Peter 3AZL obtained A.O.C.P. at 15, has been aetive on 80 with 15w., has nearly finished a 5.5 Mc. filter s.s.b., does Leaving this year. Bruce 3ZCR is active on 2 mx and is pushing away at c.w., aged 16. Neil 3AVK is on 80-40 with 25w., has a high power linear nearly ready for s.s.b., is 16 and does Matric. this year at Carey Grammar. Let's hope there are more like them this year.

Here are some excellent results in the N.S.W. Leaving Certificate from four well known young Amateurs. Susan Brown 2BSB (Booragul) obtained two Honours, an A and two B's. Joseph Mace 2ZMH (King's School) obtained two Honours, two A's and two B's. Roger Davis 1RD (Lyneham) obtained three A's and two B's. Jim Watson 1JR (Lyneham) obtained one Honour, four A's and a B. All four were given Commonwealth Scholarships.

One more feature item this month (all Divisions please note) is that Mr. M. Henderson, Head of the Physics Department at Sydney Teachers' College, has made a special point of advising his students about the advantages and possibilities of the Y.R.S. It is probable that a transmitting club will be established at the Teachers' College this year. Teacher trainees other than science students should find Amateur Radio a wonderful thing when sent out to lonely one-teacher schools. There is no doubt that the Teachers' College in each State should be a prime target for the Division resources.

Some other news from VK3—Bill Allen, leader of Gowrie Park State School Y.R.C. spent 10 weeks in Heidelberg Repat. Hospital, but is now out and enjoying a holiday before going back to work. Phil Lavery, Instructor at Christian Bros. (Bundoora) has gained A.O.L.C.P. and the club should be on the air (3ZFR) on 2 mx by now, with the assistance of Dave 3ZMX.

Loads of news in VK2: Continued interest in Keith 2AKX's Electronics by Radio on 160 mx. Nick Dzydik (Kingsgrove North) is a technician trainee at Western Electrics at Sydenham. Transfers noted are Mr. J. Standard (2BS) from Kingsgrove North to Epping, and Roger Graham from Inverell to Kiama (help urgently needed at Inverell High!). Jan Oosterveen, 2BJO (Westlakes), has finished P.M.G. trainee technicians school and will be attached to Singleton Exchange. Maitland Y.M.C.A. considering radio amongst projected activities and help wanted from Amateurs. Inter-School Christian Fellowship organising an Electronics Holiday at a camp for schoolboys with loads of parts and plenty of projects—an interesting idea and would like to hear more of it. Flight Sgt. Terry Crews (R.A.A.F.), formerly of Gosford High, has had two promotions during 1964 in the Radio Apprentice Course at Laverton and has been selected for a four-year Signals Officers' Course —a great effort!

John Thyrd (Kingsgrove North) is now a trainee in Dept. of Civil Aviation in a five-year course on latest equipment. More negotiations for liaison with Boys' Brigade and Australia Air League. Colour slides of Y.R.S. activities wanted by Rex 2YA. Lastly, a little from VK1: David Davies, 1DD, now on the air with a transmitter from Lyneham but soon will have his own rig finished. David, George 1GB and Jim 1JR did an all-night stint for the Field Day with assistance from Bill Tweedie (Lyneham). The younger muscles did a lot of the hard work for 1ACA. 73, 1KM.

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**ERRATA**

Readers are asked to note the following corrections to the article "Modifying F.M. Carphones," Dec. 1964 "A.R.," p.3. Fig. 1, lower drawing: The 6AU6 plate tuned circuit caption should be transposed with 40 Mc. double grid connection. Fig. 2: The three crystal sockets on the left should be marked "Rec." and the three on the right should be marked "Tx".

# NEW CALL SIGNS

**NOVEMBEB, 1964**

VK2BS—J. W. Stannard, 66 Shadforth St., Mosman.

VK3QJ—V. N. Tuohill, Tanjil Gr., Lakes Entrance.

VK3ACW—E. R. Hake, 543 High St., East Prahran.

VK3APN—P. R. Nesbit, 32 The Grange, East Malvern.

VK3ASK—C. Sterling, 3 Bloomfield Ave., Maribyrnong.

VK3ZDV—D. W. Wright, 282 Springfield Rd., Nunawading.

VK3ZEF—W. H. Kelly, 58 Finn St., Bendigo.

VK3ZEV—A. P. Telford, 292 Riversdale Rd., Camberwell.

VK3ZEY—J. C. Meyland, 5 Gayer Ave., Wangaratta.

VK3ZFD—N. G. Chalmers, 7 Balmoral St., Essendon.

VK3ZKX—T. D. Lamb, 7 Rosebank Ave., Strathmore.

VK3ZND—N. W. Deague, 26 Somers Ave., Malvern.

VK3ZPN—N. J. Watson, 85 McNamara Ave., Niddrie.

VK3ZPW—P. J. Wright, 16 Louise St., East Brighton.

VK3ZTL—T. L. Lindsay, Station: Lot 107 Dunloe Ave., Norlane; Postal: Radio Station, 1 B.F.T.S., Point Cook.

VK4ET—E. T. Pendleton, 38 Chartwell St., Aspley.

VK4ZZG—G. D. Nixon, St. Patrick's Ave., Kuraby.

VK5HH—M. K. Rogers, 30 Portland Ave., Darlington.

VK5ZDE—D. B. Murdock, 32a King St., Mile End.

VK6FL—F. C. Lambert, 83 Second Ave., Bassendean.

# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL QSL BUREAU

Congrats. to John VK5KO on his further DX on 160. Latest additions are JA6AK and 9M4LP.

Cards from ex VK0JC have recently come through for his Antarctic work during 1960!

Ken VK3TL, recently on a DX-pedition to Norfolk Island signing VK9TL, piled up QSOs in business-like manner, both on c.w. and s.s.b. The Galaxy outfit worked fine. QSLs to Ken either at home QTH or via this Bureau.

Bob VK9RB completed his tour of duty at Norfolk Island during January and returns home to G land. All QSLs should now go via R.S.G.B.

George CR6GO, QSL Manager for Angola, expresses his desire to help any station who has outstanding QSLs from CR6. Contact him at Box 404, Luanda, Angola.

V.E.R.O.N.A. (Netherlands Antilles Section of I.A.R.U.) advise of their new Curacao Certificate. Full details from this Bureau.

Ray Jones, VK3RJ, Manager.

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## NEW SOUTH WALES

### HUNTER BRANCH

"There was nothing ugly about that duckling!" This was the remark made by one of the thirty members, associates and visitors who attended the February meeting of the Branch held at the Technical College on Friday 5th. The reason for the remark was the description and demonstration of a beautifully built sideband transceiver, made by Alex 2JZ. Old gentlemen on the 80 mx band are sometimes heard to refer to certain commercial equipment as ugly ducklings and thus the title, which has come into general use. Alex is to be complimented on the standard of workmanship in the unit, which he says is nearly as efficient as a "bought one". He described with the aid of block diagrams and circuit sections how the transceiver worked and how, by using some cunning ideas, one valve could be made to provide several functions by biasing. Several of the members who are conversant with the mysteries of the farmyard mode plied Alex with questions and, following the lecture, one of the old gentlemen aforementioned, Lionel 2CS, moved a vote of thanks which was carried by hearty acclamation. I was unable to get a close look at the gear because of the large gathering of bods already round the demonstration table. However, what I saw convinced me that this was an excellent project, construction and operation wise.

Although the attendance book was passed around the room, some of those present failed to sign it. If it is impossible for you to write your name then make a mark of some kind to record your presence.

There are several theories as to why we did not have the company of the President, Frank 2APO. One very uncomplimentary type said that he had forgotten the meeting, but I favour the second reason—he was mending the holes in his net. Some of them are really quite large, being about 8 kc. wide, but repairs have resulted in the size being reduced to 3 or 4 kc. Our fireman friend was there too, although he must have left his helmet outside since he was not wearing it during the lecture. You don't know of whom I speak? Rodney 2CN is the lucky holder of the title since the big burn-up at NBN3.

Stan 2AYL threatened to keep all the QSL cards he had for me if I made any more errors in his call sign in these notes. Having lowered myself to my well worn knees and promised, Stan brought my huge bundle of cards from behind his back—three all told and two of those were for my piratical companion—may his fowls all die! Still, it does prove that I am on the air at times and that I am considered illustrious enough to have my call sign pirated. Chris 2PZ was most interested in the ducktalker and perhaps this indicates an early change from a.m. Being no prophet, I am unable to promise that this will occur but I can promise that by the time you read this, Chris will have had some publicity—complete with pictures for 2AXC, the Cessnock Radio Club. Those who read the Newcastle Herald will join me in congratulating Jennifer Cox, the President's daughter, for the really excellent job she is doing in publicising Amateur Radio in this area. I am informed that the Saturday column is more extensive than that in any other Australian newspaper and that circulation throughout the valley and along the coast ensures that the news of Amateurs goes into more homes than elsewhere in the country. And think of the handsome, intelligent, eligible young men who have featured in the photographs! (Just address your letters to my call book address please fans.)

Returning briefly to earth, I have to report that our old friend Bob 2AQR, who is known to some of his more coarse associates as Sir Cumference, has defected to the Central Coast and, worse still, up to the time of writing, he hasn't even turned the receiver on! Things must be pretty busy among the apothecaries of East Gosford. Bob had hoped to record his 5,000th contact with Bill 2ZL before he left, but they just could not make it. Bill is not giving up hope though and he is looking forward to regular lunch-time QSOs as soon as things are back to normal. He tells me that his new diet is most successful and that I should try it. Of course the truth is that having Mrs. 2ZL in hospital has resulted in him cutting down to four meals a day. It is to be hoped that by this normal meal times will again prevail at Phenyle Bay.

Some of the Westlakes boys put on a field station for the John Moyle Memorial Field Day, but what success they had is not reported. They are grateful to all who helped, especially Bill 2XT who loaned some very compact 2 mx gear. The same Bill has been leading a leisurely existence of late at his country seat by the beautiful lake and it was during this time that he heard of the proposed field activity. If you have any old lawnmowers about, please contact Stuart 2AYF who has some diabolical plan afoot to use them for generating the currents necessary for field operation.

With the State elections soon to be upon us, maybe you would like to get some heckling practice. If so, please be in attendance at the usual place, Room 6, Clegg Building, Newcastle Technical College, on Friday, 5th March, at 8 p.m. Reason, it is the Annual General Meeting of the Branch and the time for new officers. Please try to be there. For one thing democracy must be satisfied, and for another all the other blokes will be there, so why not you? See you, 73, 2AKX.

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## QUEENSLAND

### DIVISIONAL COUNCIL NEWS

The monthly Council meeting was held at the Institute of Social Services, Berwick St., Valley, Brisbane, on 28/1/65 at 8 p.m. Peter 4PJ (President of the Division) was in the chair. The Council meeting was well attended and a few visiting members were also present. Correspondence was read and adopted and then it was brought to the notice of the meeting that Stan 4SA, who has been A.O.C.P. Class Manager, has decided to relinquish this position since he was about to undertake extensive motoring tours with his XYL.

Seven new applications for membership were approved by Council and names will be submitted to the next general meeting for ratification.

Federal Councillor Laurie 4ZGL reported that a motion was to hand from VK2 to the effect that "As the minutes from the 1964 Convention have not yet come to hand, the VK2 Division puts forward a motion that the 1965 Federal Convention not be held." The VK4 Council voted against this motion as it contends that the 1965 Convention should be proceeded with.

### SILENT KEY

It is with deep regret that we record the passing of:—

VK3ZD—Ron Williams.
VK5DA—S. R. Buckerfield.
Ex-VK6JJ—J. T. Jewell.

The Treasurer's report was read and adopted. The Treasurer 4DG tendered his resignation from the position and his place has been taken by Don 4DZ. The President, while accepting Keith's resignation, stated that he had done a very good job and due to his efforts, the financial position of the Institute had never been stronger.

Don 4DZ has also been appointed organiser for the Sunshine State Contest. He has formulated proposals for improving the Contest. These proposals will be published in "QTC". It is suggested that comments will be invited from all members before these proposals are adopted.

The W.I.C.E.N. movement has been very slow. Some entries have been received from the country, but Brisbane members seem to be very reluctant to offer their services.

It was moved by Al 4LT that Council accepts the recommendation of the sub-committee that we purchase a Galaxy 5 s.s.b. transceiver for 4WI. The motion was carried. (Not to be read by 5PS!)

The question of the setting of papers for the Youth Radio Scheme and also the marking of same is causing some concern. Quite some discussion took place on this matter. Most of this stemmed from the points raised by Frank 4FN at the January general meeting—quite a meeting, wasn't it, Frank?

Jack 4JF, the VK4 QSL Officer, reports that VK2 VK3 and JA QSL Bureaux are returning quite a few cards since the owners are not W.I.A. members or do not bother to collect their cards.

Finally congratulations to the Ipswich Radio Club. The official station of the Club, VK4IO, was opened recently by the Patron of the Club, the local M.H.R. The Club Station opened with a contact with VK4WI during the Sunday morning news broadcast. 73, Bill 4ZBD.

### TOWNSVILLE AND DISTRICT

Since writing the last notes I have not received much in the way of news, so I must not resort to padding, which is the sole prerogative of that much maligned scribe and foe of our worthy Editor.

Basil 4ZW called in on his way back from the capital city, proud possessor of a new car of which he tried vainly to make me jealous (and how). Swears that Zoe was a poor navigator, yet she found my new QTH at 15 Chubb St., Belgium Gardens, Townsville.

Charlie 4BQ also had a pleasant trip over the north and as far south as Bundaberg. No doubt to taste it's famous rum?

Met 4WH the other day in the city after a long time and Eddie has seemed to forsaken Radio in favour of the corner pieces, which he is busy sorting and evaluating. Hope it reaches high enough that he can retire.

As I have moved to this new QTH and have no skywire at present, am unable to glean any news by eavesdropping. So, all my friends have patience a little longer and make good use of the quietness, ere I can bash your ears again.

Vern 4LK and his wife were welcome visitors after quite a long time. He has other hobbles that bites into the time.

Bert 4LB is pleased that the new quad is back again in position and higher than before. He was quite a help in dismantling my tower, together with Merv 4ZMD. Hope it is not long before I have it up, then will compete with 4PS (not 5PS) on the other side of the hill from me, while we both look down on Ken 4KT on the lower reaches—he being in a more favourable position for DXing.

Perhaps my memory is failing, but I have a recollection that 5PS has handed me the Cuppa way back in 1958, when Gordon 5XU took me along to the Council meeting at 5PS' QTH. I well remember Doc (late 5MD) bringing me back into the city, after he had received strict instructions that I be accommodated with the free lodgings at taxpayers' expense.

Frank 4PF was met the other day and says that he has not been active for quite a while. His co-partner, Bob 4MF, is quite active with his latest transceiver. Ye Ed., how about a cuppa? 73, Bob 4RW.

## OBITUARY

**RONALD ARMAND WILLIAMS, VK3ZD**

It is with sincere regret that the W.I.A. announces the sudden passing of Ron Williams, VK3ZD, who died at the Maroopna Base Hospital (near Shepparton) on 8th February, 1965, aged 48 years.

Born 11th December, 1916, educated at Trinity Grammar (Melbourne) and an early member of the Wireless Institute of Australia, Ron was a true Ham with the ardent curiosity to know not only "how something worked" but "why it worked", and this tenacity of purpose stayed with him right throughout his commercial career.

Joining the Australian Military Forces during the war he was commissioned as a Lieutenant in Southern Command Signals where he applied his knowledge and experience as an Amateur to the service of his country. During this period he also obtained his Broadcast Engineer's Certificate of Proficiency and was an associate of the Institute of Radio Engineers.

At the conclusion of hostilities an opportunity came for him to move into the field of broadcasting and he (now with his wife and family) moved to Warragul where he worked for 12½ years as Manager and Chief Engineer of 3UL, one of the country stations of the Associated Broadcasting Services network.

Despite the zest and energy he gave to his work in this field, as he did to all he undertook, he found time for sport, becoming a highly ranked tennis player and Eastern Country Champion; President of the Warragul Branch of the Australian Rotary Club and later a member of Rotary in Shepparton, as well as playing his part on many local committees and associations operating in the public interest. His great drive in everything he undertook made for him many friends in all walks of life.

With television appearing on the horizon Ron found time to study television technique and programming for which he attended the Royal Melbourne Institute of Technology, travelling from Warragul to Melbourne several times a week to attend night classes. When the opportunity presented itself he applied for, and obtained, the General Managership of GMV6 Television in Shepparton and from the commencement of the foundations he supervised the entire installation until its inaugural opening and for the three years of its existence until his untimely passing.

It is worthy of note that engineers, technicians, electricians, programme staff and all other sections of the broadcasting and television staff, together with many business and personal friends, travelled to Shepparton from Interstate and within Victoria to pay their last respects to a relatively young man who dedicated his life and energy to his profession. Amateur Radio has lost a real Ham from its ranks and Amateurs everywhere extend to his relations and friends their sincere and deep sympathy. VK3ZD has passed beyond the veil leaving behind him a fine example to those who must carry on his work.

**SIDNEY ROY BUCKERFIELD, VK5DA**

The VK5 Division announces with sincere regret the passing of Sidney Roy ("Buck") Buckerfield, VK5DA, on 11th January, 1965.

Licensed in 1924, he was an active Amateur up to the time of his death, and during his long association with radio he was connected with the building and installation of 5KA's first transmitter, and as a technician with the P.M.G's Department he assisted with the installation of the 5AN transmitter in the old Central Exchange Building, and also with the installation of 5DR at Darwin. He was, for a time, Officer-in-Charge at Crystal Brook with 5CK, and later assisted with the early experiments associated with the f.m. station at Mount Bonython, from whence he retired under medical advice in 1962.

One of the few remaining real "old-timers," his sudden passing leaves a gap in the history of Amateur Radio in VK5 which cannot be filled, and to his sorrowing wife, Selma, his son, Graham, and his two daughters, Anita and Joan, the VK5 Division extends its deepest sympathy and can only hope that time will ease the burden of his departure.

**J. T. (JACK) JEWELL, ex-VK6JJ**

Jack Jewell, the Superintendent of Radio in Western Australia died suddenly on 15th January, 1965.

Until the war, Jack was active as VK-6JJ in the Amateur sphere and was a foundation member of the Subiaco Radio Society. Up to the time of his death he was Radio Superintendent for 2½ years. For several years he was Chairman of the Amateur Advisory Committee. Being an Amateur, he was sympathetic to their requests and at the same time looked after the interests of the Department.

Jack leaves a widow, a married daughter and a son, and our sincere sympathy goes out to them.



## SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division for January was held in the club rooms to what my informant tells me was a well attended gathering of members and visitors. The meeting opened in a somewhat spectacular manner with a lot of running hither and thither, mostly thither, by the President (Phil 5NN), with the lecturer for the night, and/or his assistants at times trying to get into the act. The reason for the hither and thither business was finally established as being caused by the absence of the caretaker and the inability to locate certain pieces of equipment necessary for the lecture, but as our President usually gets his man in the end, I don't know which end, the meeting eventually settled down to normal.

The lecturer for the night was Dr. Briggs, from the University of Adelaide, who discussed at length all aspects of the Ionosphere and its effects on radio transmissions. Among the many points raised by Dr. Briggs was one to the effect that St. Kilda is a reasonably quiet location, and another one that the University is considering a proposal to erect about 100 dipoles at Buckland Park, spread over about one square mile of territory, to which will be connected 100 transistor receivers by means of some 50 miles of co-ax. cable. The lot to do with experiments to measure wind velocity in higher altitudes and star signals.

If you should bump into me walking down one of our main streets with a transistor rx glued to my delicate ear, listening to the Yar-Yar music, then you can safely deduce that I have been dallying in the vicinity of Buckland Park!!

The lecturer answered questions as he went along and the members who did the asking certainly seemed to be well on the ball so far as the subject matter was concerned, whilst the non-question asking members never seemed to get their minds off the fact of so many transistor receivers lying around not earning their keep The vote of thanks to the lecturer was ably proposed by Rob 5RG and the applause which followed definitely indicated how successful the lecture had been.

Very little business of importance was transacted, there was some discussion on frequencies for W.I.C.E.N. in the 53 Mc. region, but it was thought that the general meeting was hardly the place to deal with this; the President drew attention to an article recently printed in "CQ" re the I.T.U. Convention at Geneva, which he considered highly informative and he will seek its reprint in the magazine for general reading; and last, but by no means least, some items available, and some hoped-to-be-available, to members were on display.

Several visitors were welcomed by the President, among whom was G3KSL who is residing, at present anyway, at Windsor Gardens —QRM for Dave 5DS?—or is it vive-voce, who was brought along by Jack 5JS; also Messrs. L. Collins, A. Trott, J. Harvey, D. George, P. Leonard and H. Graham. A little more hither and thither business brought the meeting to a close, and members left for their couches of virtue, most of them anyway, well satisfied with the night's entertainment. My thanks go to my new cub reporter, Tom 5TL, who helped me out by covering the meeting. What's that? He is no cub, oh get away with you, we are only as old as we feel. Look at me, goo, goo, goo, gurgle, gurgle, gurgle, and other expressions of baby talk!!!!

Had quite a job digging up some information on Buck 5DA for his obituary. As is usual with the average Amateur, Buck had quite a lot of "Firsts" and credits to his name in his hobby, but no official records had ever been written down, and whilst most people remembered something or other about his career in radio, nobody could pinpoint anything in particular. During the digging process for information, I was amazed to note just how many of the "Big Brass" in the P.M.G. were on christian names basis with myself. This was due, of course, to the fact that I had worked alongside most of them back in the old days when they were just simple peasants like myself. The part that did amaze me was that although they were in big positions, they still retained their sense of humour and their equilibrium. I range Engineers, Radio Superintendents, retired State Engineers, etc., etc., and only struck one who was inclined to be a little upstage. I used to work with him down on telephone construction, more years ago than I care to remember, and he soon came down offstage when I addressed him as "Boofhead" and drew his attention to a couple of incidents that occurred out on the job, with he and I as the guilty culprits. We finished up as matey as matey could be—I think!!

I received a lot of letters and cards over the Festive Season, for which goes my sincere thanks. It was good to know that I had more than just the one reader I had hopefully

thought I had. However, I was a little perturbed to note that quite a number of the writers went out of their way to mention that they were pleased that I had taken such a stand on such and such a subject, or had stood up for this and that. I hasten to write that I never have, and I hope never will, take a stand on anything in these Divisional notes. Anything that I have written about has only been because I felt that it was of interest to the reader, or perhaps might stimulate discussion which would react for the benefit of the notes in the magazine, thus keeping the VK5 Division to the front, and after all, that is the prime purpose of the notes. So-o-o-o-o, the next time you think I am taking a stand on anything, forget it. I only thought you might be interested. That's one of the reasons I have managed to last as long as I have!

One of my spies in VK2 reports that a certain gentleman by the name of Reg 5RR passed through the said spy's locality recently at a speed that suggested that he was in training for the Monte Carlo Rally. On checking up, I find that there is a suggestion that Reg travelled non-stop from VK5 to Albury, which certainly lends support to the report. Before long he will be known as Ho-Halong Harris. All right, all right, I thought it was original.

I have it on the highest authority in the land that Frank 5MZ was Father Xmas at the Perry Engineering Works' Xmas Party. There were 480 nippers at the party and when they had finished with dear old Father Xmas, he felt more like the Easter Bunny. Frank must have given a wonderful performance in the part because his two grand-daughters Susan and Joanne did not recognise him, and if all is to be believed, he is likely to get nomination for this year's Academy Awards. He is known as Sir Cedric Bentley to his intimates, or is it Richard Burton Bentley!!??

Talking of Frank, naturally also brings in Carl 5SS, who has apparently grown tired of the dickey birds and has now taken up the art of breeding prize gold fish. My source of information also tells me that he is an ardent gardener, and is selling his spuds and tomatoes cheaper than that well known figure in VK5 —Tom the Cheap Grocer. Be careful, Carl, with the weather as it is at the moment in VK5, you might get the colleywobbles in the spuds and the wolleycobbles in the tomatoes.

Received a letter from Les 8UX saying that he was sorry that he and Beryl would not be able to make the Xmas Social this year (last year to you), nor the v.h.f. picnic. He sends his 73 to all the gang down here, and is bemoaning the fact that a recent high wind and dust-storm brought down his dipoles and he has been too busy to put them up again. He cheered me up by telling me that he managed to get down to just below 20 stone in weight for a week, but it was not worth the effort! You and me, too, Brother.

Harry 6WZ dropped me a line, also a Xmas card, with the QTH of P.O. Box 149. The explanation for the P.O. Box was the fact that he could not manage the rent for the great big house, so had moved to a post office box! Good to hear from you OM, was beginning to think that you had floated off somewhere. Also noted no Ham activity since September 1957—that's no good Harry, pull your socks up.

My old sparring partner, Ken 1KM, also wrote suggesting that I visit his locality for the Easter Convention and also suggesting that we could then drink a toast to all the brave "A.R." correspondents who bravely venture into battle each month, not with each other, but with the pleblan hordes. Tut-tut, Ken, cut out the bad language. No good me trying to get to the A.C.T., my espionage agency would make me a bad security risk, and wouldn't you like to get me behind the wire?

A certain 5BI, located at Cowell, was another of the boys to tread the boards during Xmas in the guise of the red suited, white bearded dispenser of toys and goodies. His stature, unlike Frank 5MZ, did not appear to have come up to scratch, with the result that a couple of pillows were added to the girth, plus an extra issue of white whiskers. In his own words, he looked like a "wool blinded sheep," but apparently his performance came up to the expected standards, because none of the little Sebastians, I think that was the name, woke up as to just who he was. Nice work OM, you might even get to Hollywood.

Had a short QSO with Rex 5DO and Doug 5DW on Xmas morning, and we all exchanged the seasonal pleasantries. In the background of Doug's transmission was the twittering of birds and the occasional buzzing of bees—I think—and he explained that his shack was close to an aviary. My suggestion that he be sure and keep his hat on so that we should know which were the galahs, met with the usual coarse reply, but his sense of humour finally won out. Stout fellow is Doug, he used to be a VK3, but we have cured him of all that. It has taken time, but it was worth it!!

Received a letter, signed "A 5PS Fan," all the way from Meningie, enclosing a cutting from a copy of "Amateur Radio" of 1949, on the "Letters to the Editor" page, in which was ringed with blue pencil a letter full of praise for the then VK5 scribe—my natural modesty forbids me to say who that scribe was—and signed R. H. Atkinson, 6WZ. All I can say is I don't know how I missed it Harry, I certainly never remember seeing it, but this I will say, since reading it none of my hats will fit, not even my space capsule hat. Oh well, if you will stop twisting my arm, I will give you a clue as to who the VK5 scribe was. He was known even then as Petunia, or was it Aspidastra, no it was Convolvulus, or it could have even been Tiger Lily. Growl, growl.

Darcy 5RJ noticed at the meeting, and also noted that his membership fees will have to be increased because he now resides at Mitchell Park. The call of 5RJ has so long been associated with Kadina that it will seem strange to think of him anywhere else. Welcome back to the city, Darcy.

Rob 5RG commenced the new year in the right manner with a new tower, assisted by several willing workers, one of whom apparently enjoyed himself so much that he left his dark glasses behind. The tower must have come up to expectations because Rob has been heard reporting good European DX on 21 Mc.

Pat 6PH was temporarily located over the Xmas period at the Kingston Park caravan park and bobbed up on the 5WI session one morning. He was very appreciative of the fact that George 5CV contacted him about 150 miles inside the S.A. border and practically talked him into Elizabeth, where he was made very welcome at George's QTH, for which he was grateful. Good public relations on the part of George, I thought.

Did you hear the W.I.A. broadcast on the morning of Jan. 3 Some of the noises off sounded like burglars breaking in, although no mention was made as to whether the programme was one of construction or destruction! By the way, a well conducted session I thought, keep up the good work—I have to say things like that, because after reading this paragraph, the operator might have thoughts of punching someone on the nose, or action along those lines!

Ses 5GP reported on holidays and gone eastward. Nobody knows how far east, but if he has ventured over the border, I can only say, "I told you so." Those VK3s are cannibals where VK5s are concerned!

Uncle Tom 5TL now living at Glandore in a pretty slash-up cabin, if I might be permitted to say so, invited me down to collect some figs, peaches, and apricots. I could not get down there quick enough with my trailer —ahem—and was rewarded with a load of fruit which would have made Carl 6SS turn green with envy. Tom tried to entice me to climb the ladder and pick some peaches, but after I had climbed the 49th step and still was not able to reach the peaches, I lost confidence and climbed down, especially when I noticed that Tom was madly cutting through the leg of the ladder with a sharp saw. What some people won't do for revenge, why I might have fallen and broken my intentions!

Received a letter from Brenda 3KT and John 3AFU in which, apart from "having a lend of me," they told me of their harrowing experiences in trying to pay their Amateur licence other than direct to the Receiver of Public Moneys. My sympathy was definitely pointed in their way until I read at the bottom of the letter that they "looked forward with anticipation to working me on sideband in the distant future." The final thrust came with a P.S. to the effect: "Where on earth is Rose Park?" I tell you, you can't trust these VK3s—male or female!

Did you notice in the January issue of "A.R.," at the bottom of the reprint from the R.S.G.B. Bulletin, how Ye Ed. spurned the olive branch that I had held out to him in recent VK5 notes? Naturally I see further behind the scenes than he gives me credit for. He is not a bad sort of bloke himself, but with Rasputin (3AFJ) at his elbow concocting his schemes of revenge, what chance is there for me. You had better be careful—there is always the VK5 Journal! In fact, the editor of that excellent little publication has been offering me unheard of figures to ditch the magazine—no noughts either—why the last offer reached 1/7½, what's that? A week, break it down, I am not that good—no a year!

The sudden passing of "Buck" 5DA came as a shock to all VK5 members, and the number of Amateurs who attended the funeral indicated just how well known he was in Amateur and P.M.G. circles. He and I were mates back in the middle twenties, when we both worked in the telephone section for the P.M.G., and I, as an ardent short wave listener was trying to get my Amateur ticket. No questions or probing for information on Amateur Radio ever bothered him, and his readiness to assist the up-and-coming Amateur, both theoretically and practically, were well known even in those early days. One of his outstanding contributions to Amateur Radio was when the P.M.G. sent him, complete with his home station to Kangaroo Island to maintain communications between the island and the mainland during a break in the submarine cable. Popular, well esteemed for his undoubted standing in the realm of radio, by amateur and professional, his cheery voice and personality will be missed by all, and his sudden passing leaves a gap in the history of Amateur Radio in VK5 that cannot be filled. So Mote it be.

Well, I make it a practice never to close these notes on a note of sadness, so I report that I met Jack 5JS at Buck's funeral and he said that he supposed he and I would be having our annual QSO from Oakbank soon, where he coarsely insinuated I sold peanuts on the racecourse each Easter. I was cut to the quick at this suggestion, and told him in no uncertain manner that people who made such statements could be sued for libel. After all, everybody knows that I sell pies and pasties! Peanuts indeed, I told him just what he could do with the peanuts—a suggestion that seemed to give him cause for intense merriment. 73 de 5PS—PeanutS—er—er—I mean PanSy to you.

[The following is published by "A.R." and was not included in the 5PS notes.—Editor: "To the members of the Magazine Committee, Dear Sirs—Spelt Curs!!—You will notice that there is no reference in these notes to the Higginbotham Award and the front page of February's 'Amateur Radio.' There are two reasons for this, (1) the notes were finished and ready for posting before the arrival of the 'mag,' (2) for once in my life I am completely speechless at the duplicity of all concerned. I knew about the award, George 3AOM had notified me, but the photo was right out of the blue and I am now in the process of finding out how you achieved it. I can only say that I do not consider myself worthy of the award—but—try and take it away from me! I thank you all sincerely for your lack of judgment and will endeavour to try and live up to it in the future.—Warwick."]

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## WESTERN AUSTRALIA

News is rather short again this month but we will endeavour to write something which will interest all.

It is with regret that we have to report the passing of Jack Jewell, the Superintendent of the Radio Branch. Jack was always willing to help anyone who asked for assistance.

Vic 6VK has just returned from a trip to England and Scotland where he had a preview of the type of equipment which will be installed at Channel 9. This brings to mind the representation of Amateurs working in this establishment. There are Vic 6VK, Cedric 6CD, and Tom 6DP that I can call to mind at present and possibly more.

One spy has reported to me that one of our new full call signs is busy building up s.s.b. gear and has already got a Vacar v.f.o. working very well. We wish you all the best on the low bands Harry 6HP and don't get carried away with all of the DX which comes along.

Pat 6PH has been holidaying in the Eastern States and should have settled down to work once again now. It's about time that you had that s.s.b. gear finished too Pat or did you call and see the commercial built gear and yield to temptation?

At our last Council meeting I was once again elected Federal Councillor and I trust that I will be able to carry out this job fully and give something of value to our hobby.

Bill 6DX is very busy up in Kalgoorlie and would like some assistance in running Amateur Radio Station at the Kalgoorlie Fair. Not only would he like manpower but would also like gear and test equipment to put on display. Bill hopes to have a station operating the whole time that the Fair is on. If you cannot help any other way at least call the station if you should hear it.

Another field that has attracted Bill is the Youth Radio Scheme and if he only achieves half of what he visualises it will be very big.

We hear signals coming from Bob 6RG which are very nice and easy to resolve. Bob has spent much time building and wrecking this gear of his, but the result is very pleasing to hear.

The Division could be losing the sevices of Alyn 6ZDM, our Secretary, as he has been posted away to another State, but has managed to get a three-month stay of proceedings. Should he have to go, then we will require a volunteer to take over the Secretary's job. If you are at all interested then how about letting your Council know.

6WI's transmitter has now been shifted from Kalamunda and is now being housed in Nedlands.

Here I think that we should one and all thank the many people who make our news broadcasts a success. Not only do we have the one person involved, but several other relay teams in operation. These relay teams help out in the running of the news broadcasts and make things so much easier for Mac 6MM.

Well this seems to be all for this month, so see if you can give me more information for our next notes. Remember, you can let me have them right up to the second of the month. You had better start thinking about another scribe also as I have given a date after which I will not submit any notes for publication. 73, Roy 6RY.

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## TASMANIA

Here we are into the third month of the year already, which means sub. month and Annual Meeting, and Dinner month as well, so make it a good roll up this year; the date is 27th March. Venue for the meeting will be the club rooms at 147 Liverpool Street, Hobart, while the Dinner will be held at the C.W.A. Rooms in Criterion Street. The cost will be £1 per head, so make up a car load and let's have a real get-together.

Last November (that's a long time ago so it seems) we had a visit from George 3ZLG and his XYL Joan, who toured the State m their station sedan and visited quite a large majority of shacks in VK7.

Ian 7ZZ reciprocated in early January by spending a very pleasant day at George's place at Wacol, VK4, while he was in that fair State with his cricket team.

Our February lecture, following the general meeting, was given by Mr. Rod Sutherland, the title of which was "The Application of Electronics in Heart Research." This was without a doubt an exceptional lecture, by a gentleman who has considerably more than a layman's knowledge on the subject. I understand he is to give us a further talk on the subject and I would advise all those who can make it to come along "'cos it's sure a fascinatin' subject".

The Institute once again provided radio communication between starter and judges for the rowing events at this year's Royal Hobart Regatta—the largest aquatic carnival in the southern hemisphere, and our thanks to the volunteers who operated the equipment on the two days.

After a lapse of some considerable time, W.I.C.E.N. has got going again in VK7 and an exercise held in mid January saw 16 stations on the air. We learnt where our faults were (and still are at time of writing), but still we consider it highly successful.

Mid January also saw a breakthrough to VK4 from VK7. 4ZWB being the Queenslander concerned and if my memory serves me right, the VK7 stations who worked him were Col 7LZ from Launceston, John 7ZJG and Wilf 7ZAQ from Hobart.

Sorry there's not more chaps (the Ed. will be pleased), but pressure both from business and the home front is keeping me pretty busy at the moment.

Don't forget subs. are due on 1st March. Don't let us have a repetition of previous years, ask everyone you see has he paid his yet, and we might get them in a bit quicker (perhaps). 73, 7ZAS.

### NORTHERN ZONE

Firstly, I must apologise for the lack of notes over the last few months. Nothing very startling has been happening but I will try to outline the happenings in the Zone now.

Firstly, to the h.f. bands. Den 7DK supplies the only constant activity here, and has, since the last lot of notes, acquired an s.s.b. transceiver which puts out a very nice signal. Using it mainly on 20 mx, Den has worked a surprising amount of DX.

Occasionally a few other stations pop up on these bands, but since John 7JF has left our ranks, only 7DK supplies constant activity.

Going higher in frequency, 52 Mc. was reasonably well populated during the Contest. A newcomer to this band was Mike 7ZMH, and of course all the old regulars turned up to work their share of stations. This band was not as good as it has been to VK7, but seems to have lasted longer than usual.

Going up to 2 mx, an extremely good opening to VK3 occurred on 14th and 15th Nov. The band opened on the Friday night and did not close until the Sunday night.

Early in the New Year an opening occurred to VK4 and Col 7LZ became the first station in the Zone to work VK4 on 2 mx.

Several new stations are on this band. They include 7ZBW, 7ZGP and 7ZLP.

There are only two stations active on 432 Mc. They are Len 7BQ and Col 7LZ. Col has worked VK3 on this band, which is a new Australian record. Reg 7RL is also on, but cannot get into Launceston from his QTH.

By the time this is in print, the 7AJ Intra-State Memorial V.h.f. Contest should be over. Hope to hear plenty of activity. 73, 7ZLP.

### NORTH-WEST ZONE

Another very good roll-up to our February meeting with our President (Syd. 7SF) in the chair. Several visitors were welcomed including Den 7DK, Len 7LN and our latest new member to the Zone, John 7JF, who is now at Gowrie Park, and also Frank Richards, who is anxiously awaiting the results of the latest A.O.C.P. exams. Best of luck Frank.

We had an excellent illustrated lecture by our old friend, Lon Jensen, called "40 Years of Ham Radio" and we really saw some old-time equipment being used. This was followed by a talk with some professional looking colour slides by our worthy Treasurer Max on his recent trip to New Zealand. It was very interesting to see some of the ZL boys that we have had QSOs with in the last few years. A very enjoyable evening indeed.

Yours truly had his first introduction to v.h.f. mobile the other evening when Kevin 7ZAH called and we worked bob 7ZAA and Winston 7ZWN with 5 by 9 sigs all round. Could be another convert to v.h.f. mobile. There has been quite a lot of activity on the v.h.f. bands here lately and many Interstate contacts have been made.

Don't forget the Annual Dinner to be held in Hobart, chaps. Hope to see you all there. Next meeting a check will be made to see what equipment is available, suitable for the W.I.C.E.N. net. Check up on your mobile and portable rigs and make sure they are in working order. 73, 7KH.



## HAMADS

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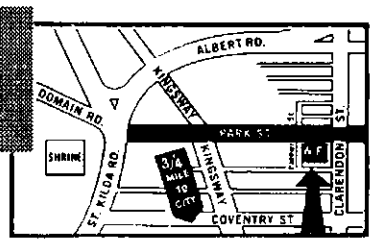


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# AMATEUR RADIO

APRIL 1965

Vol. 33, No. 4

2/6

Registered at G.P.O., Melbourne, for transmission by post as a periodical

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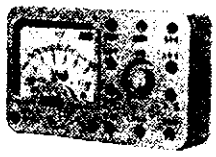

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# "AMATEUR RADIO"

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## OUR COVER

A scene following the disastrous Victorian fires. Photo from "The Herald," Melbourne.

## FEDERAL COMMENT

★

### FEDERATION—WHAT DOES IT MEAN?

The present proposal for the Federation of the Divisions of the Wireless Institute of Australia is the concern of each and every individual member and warrants deep thought by Divisions before ratification when it will become binding on all. A step as important as this one should not be entered upon in haste for on its adoption will hinge the future growth of the Institute.

Two major proposals were submitted—the first, the concept of a Federal body, similar to the R.S.G.B. and the A.R.R.L., to which any Australian Amateur could become a member irrespective of the present Divisional boundaries. The second alternative was that of the present Divisions, as autonomous bodies, belonging to a Federal company, each as individual members.

For the last three years, this matter has been seriously under consideration and the second alternative was adopted by the Federal Council as the one which would meet the majority of members' wishes. The first alternative was such a radical departure from the existing organisation that Divisions were reluctant to consider it in great detail. The second proposal however, being closer to the present organisation, was considered in much greater detail and over the last few Conventions modifications and amendments have been made to suit the majority.

The Convention will be held again this month during Easter in Melbourne and once again, items dealing with the new Constitution will form the bulk of the agenda items. Divisional Councils in the States have had different approaches to the method whereby they "sound" the feelings of their members. Some wish to circulate a copy of the final draft to every member while others believe this is a matter which should be left to the Divisional Council to consider.

One thing that all Divisions would agree on is that the interests of the members' equity in their present Divisions will be safeguarded and the Federal Councillor will eventually speak for his whole Division when the time comes. But what is the average member doing about it? Is he prepared to leave these mundane tasks to his Council or does he wish to wade through the draft and make his own comments?

Whichever category you fit into, your answer is, do something now or let it "ride". If you are a "do-er", see your Divisional Council and ask to see the draft or find out what they propose doing about the Constitution —but if you are a "rider", go back to your shack, work some DX and forget the whole matter.

If you value your hobby and the strength and growth of the Institute so that it may better represent your individual views when needed, we believe that there should be very few "riders" and a lot of "do-ers". Although the Constitution is perhaps the most important Institute matter to be considered for many years, it is not one that can be allowed to drift on forever, so ACT now!

FEDERAL EXECUTIVE, W.I.A.

## CONTENTS

# THE AMATEURS' PART IN THE GIPPSLAND FIRES

**OVER 80 Victorian Amateurs were part of the vast army that fought the recent disastrous fires at Gippsland in Victoria. Over 60 of these Amateurs were actually in the fire area, the remainder manning base stations. A total of 40 private cars equipped with 146 megacycle f.m. equipment or 80 metre equipment were used at one time or another. The Amateurs' role in these fires lasted for eight days.**

By Wednesday, 3rd March, 1965, fires had been burning in heavily timbered country in the Gippsland hills for nearly a fortnight. Until that time the fires had posed no serious threat to persons or property. However, on that day the joint State Co-ordinators of the Victorian W.I.C.E.N. Organisation, John Battrick (VK3OR) and Michael Owen (VK3ZEO), were advised by the Liaison Officer of the State Disaster Plan that the fires in the Gippsland hills were causing grave concern and that the State Disaster Plan could be involved, requiring W.I.C.E.N. assistance.

Simultaneously the local P.M.G. Divisional Engineer (who is directly responsible for communications in the area) was contacting the Eastern Zone W.I.C.E.N. Co-ordinator, Graham Collie (VK3QZ). Thereafter the Zone and the State Co-ordinators were in close contact with each other and with P.M.G. Officers in the area and in Melbourne. At the same time metropolitan and country W.I.C.E.N. operators were alerted. Even at that early stage it was clear that the immense communication problem posed by fire that could stretch for over 60 miles could only be met by a heavy commitment of Amateurs from the metropolitan and other zones not directly involved.

On the following day, Thursday, 4th March, further discussions took place, the Zone and State Co-ordinators being kept constantly informed of developments in the situation. On the Thursday afternoon it was decided that a nucleus of a net should be established by establishing base stations at the two places selected to be base headquarters, Heyfield and Bairnsdale. As well, the Institute's official station VK3WI and the Zone Co-ordinator's home station were also to be manned. Therefore in the early evening of that Thursday the first group of four Amateurs from the metropolitan area was on its way to the area, 180 miles away, to assist zone members establishing these base stations. With this first group was the W.I.C.E.N. State Controller, Harold Hepburn (VK3AFQ). He was one of those to remain in the area for the whole of the emergency, and for most of the period was to bear much of the responsibility for the operation in the area.

The plan was to establish these base stations with a minimum commitment of personnel and equipment, to form the nucleus of a net if a heavier commitment was needed. These stations were in operation by early Friday.

By Friday lunch time the situation had deteriorated so much that the W.I.C.E.N. Organisation was requested to provide mobile units to be attached to the two base headquarters.

That afternoon the first group of mobiles left the metropolitan area and were the first of a large number of mobile units to ultimately be utilised.

Those that assisted came from all over Victoria. Lack of sleep was an occupational hazard. Food and drink varied from the lavish to the breadline. Showers and even decent washes were dreams rather than realities, and danger was always very near.

In the eight days that the emergency lasted and W.I.C.E.N. was employed, a total of four disaster headquarters were manned. The first two were at Heyfield and Bairnsdale and the tasks undertaken consisted in the main of accompanying water tankers and fire carts to the fire fronts and providing them with a speedy and reliable means

Mrs. Young and her son. She was taken through fire ravaged roads by ambulance from Ensay to Bairnsdale after W.I.C.E.N. had carried the message. She arrived at hospital in time for the birth.

—Photo courtesy "Bairnsdale Advertiser"

of passing situation reports and requests for further assistance back to the main plotting table at headquarters. This, in turn, facilitated a quick appreciation of the total fire situation in the whole area and was part of the vital communications function in enabling the co-ordination of all the available resources to provide assistance where it was most needed.

On one occasion two W.I.C.E.N. operators travelling in a car were trapped near a bridge over a river with fires on either side of the river. The operators jumped to the river, but even there found that their hair was singed, though of course it could be quickly doused. The bridge was sprayed by a fire-tanker and the operators were able to resume their tasks.

Another incident that many operators recalled was when the W.I.C.E.N. station established at Ensay sent a message to the disaster headquarters at Lucknow that the birth of a baby was imminent. The roads to Ensay were cut, medical assistance was needed and an immediate blood transfusion was a possibility. The Bairnsdale Medical Clinic was contacted and further information was obtained through the Amateur networks. A St. John Ambulance was ultimately successful in negotiating the roads to Ensay and the mother was brought back to Bairnsdale.

By the evening of Sunday, 7th March, the fires in the Bairnsdale and Heyfield areas had been confined. The town of Bairnsdale was safe. Accordingly the Heyfield disaster headquarters and its associated W.I.C.E.N. operators were transferred to Bruthen. This small township is about 15 miles north of Bairnsdale and was at the time still surrounded by fire. At various times fire had cut the Bairnsdale-Bruthen road, the Omeo-Bruthen road, and the Buchan-Bruthen road and at one time, on Saturday morning, had entered Bruthen township itself, destroying some eight houses.

Since this town was strategically placed at the junction of both the road system in the area and the P.M.G. trunk line systems, it became of great importance. From Monday, 8th March, until it rained on the following Friday, the fight to save Bruthen became a continual battle and the fires were never far from the town.

On several occasions W.I.C.E.N. operators found themselves isolated as the winds fanned smouldering fires into blazes and first this and then that road was temporarily blocked by flames and falling trees.

The confluence of trunk telephone lines at Bruthen and the successful quelling of fires around Bairnsdale led to a new role for W.I.C.E.N. It became its task to provide an alternative means of communication while the P.M.G. lines were being restored after being cut by fire or falling trees and during this period many urgent personal messages were carried to the homes of many people.

With Bruthen as the base station, additional stations were set up at Ensay and Tambo Crossing (about 40 miles to the north of Bruthen), at Orbost (some 40 miles to the east), and at Gelantipy away to the north-east of Bruthen. These four stations were roughly in the form of a square and a 24-hour watch on 3550 kilocycles was kept to ensure no loss of vital communications when telephone lines were cut.

This role was a dramatic change from the surprisingly adventuresome job of providing communications to the fire front and most operators found the transition to the frankly irksome job of watch-keeping a difficult one.

Fire fighting and fire spotting was transferred to Gelantipy, where a small force of four mobile units operated for about three days in the wild bush country near the Snowy River. The fires had started in this area, and it is hoped, will finish there.

(Continued on Page 3)

# W.I.C.E.N. IN VICTORIA—THE BACKGROUND

THE starting point of the W.I.C.E.N. Organisation in Victoria, as it exists today, was undoubtedly the disastrous fires in the Dandenong Ranges in January, 1962. There a small number of Victorian Amateurs were pressed into service and were able to use the v.h.f. f.m. mobile equipment obtained through the Victorian Division's disposals committee.

Up to that time W.I.C.E.N. was little more than a name. It formed no part of any larger overall organisation, had no official recognition, and generated little enthusiasm.

As a result of these fires, the State Disaster Plan was developed in the years that followed and W.I.C.E.N. became part of that Plan. The broad concept of the State Disaster Plan was to co-ordinate all the services that would be involved in a major disaster and, in particular, to enable the service which was directly responsible for dealing with the emergency to deal with it effectively with as much assistance as is possible.

As well as its normal police function, the Victoria Police became responsible for the ultimate co-ordination of all the services used and the Chief Commissioner of Police became the chairman of the State's Disaster Committee. Other members of the committee were responsible for equipment, medical assistance, communications and welfare.

Communications became the responsibility of Mr. H. S. Robertson, of the Postmaster General's Department. As well as the resources of that Department, W.I.C.E.N. became responsible for providing radio communications. It was decided at an early stage that its activities should centre around net operations on two frequencies, 3550 Kc. a.m. and 145.854 Mc. f.m.

Very strenuous efforts were made by the Victorian Division to obtain as much suitable equipment as possible in order to foster mobile net operation on a day to day basis, to enrol sufficient operators, and to conduct suitable exercises for W.I.C.E.N. operators, both alone and in conjunction with other organisations involved in the State Disaster Plan.

It was basic to the thinking of the Victorian W.I.C.E.N. Organisation that interest should be maintained over a long period. To this end repetitious practice nets were avoided completely. Heavy reliance was placed on large scale and intrinsically interesting exercises once or twice a year. At all times the closest possible liaison was maintained with the P.M.G. Officers responsible for co-ordinating the communications of the Plan.

The first exercise was constructed around a two-day car trial in September 1963. W.I.C.E.N. activities were watched by the P.M.G. Co-ordinators of the State Disaster Plan and this exercise enabled a good assessment of both the strengths and weaknesses of the W.I.C.E.N. system then operative. It also emphasised to the authorities the potential of the Amateur body for emergency communications. They appreciated the significance of a competent body of operators, all volunteers, who could both operate and maintain their own equipment, whose hobby was communications and who were, within themselves, both highly organised and self-disciplined.

Over the succeeding year several more exercises were held in conjunction with the State Disaster Plan built around simulated emergencies and each time W.I.C.E.N. was found to be better equipped, better manned and in every sense more capable of coping with the demands that were made of it.

One of the most important decisions made during this period was to form a striking force of six mobiles whose operators were able to obtain their employers' permission to be available at any time for emergency work. It was (and still is) the job of this small task force to be the first to the scene of any disaster where W.I.C.E.N. assistance is required and to start operation as soon as possible. If the particular incident called for additional operators and equipment then all available means could be used to summon, brief and deploy these additional personnel.

This second phase was co-ordinated by VK3WI on the net frequencies and by telephone.

This was the planning behind the large scale utilisation of W.I.C.E.N. in Victoria during March 1965, and it was within this framework so many gave so much of their time and effort to assist in these potentially disastrous fires. That no lives were lost is in itself a tribute to the success of the State Disaster Plan, and Victorian W.I.C.E.N. operators can be proud that they can perform a vital and effective part of this Organisation.

## THE AMATEURS' PART IN THE GIPPSLAND FIRES

(Continued from Page 2)

It was in this area that the provision of communication for fire fighting parties was doubly necessary and the ability to spot, report and douche stray fires started by air-borne fragments of still burning debris was an essential task.

Throughout the emergency two main base stations were utilised. VK3WI at the Divisional premises in East Melbourne was manned for 24 hours a day, as was the home station of Zone Co-ordinator, Graham Collie (VK3QZ) at Traralgon. These stations sent and received messages from the various disaster headquarters in the field. VK3WI was connected by direct telephone lines to the disaster room at the Russell Street Police Headquarters. In addition to the passing of messages, VK3WI and VK3QZ were responsible for keeping the h.f. channel policed and anyone using the channel for non-emergency purposes was requested to change frequency to ensure that no interference to traffic was experienced by stations in the fire areas.

Since there were four medium powered stations operating from the Bairnsdale headquarters (W.I.C.E.N., Country Fire Authority, Army, and Country Roads Board), mutual interference became intolerable. Therefore a 6 metre a.m. link was set up between the disaster headquarters and the home of local Amateur VK3LL in Bairnsdale and all Melbourne bound traffic was routed through this link to VK3LL for re-transmission to Melbourne. Due to the high noise level at VK3WI, 80 metre traffic was received by VK3ZCE at Frankston and relayed via a separate f.m. channel into the city.

In addition to the communication function performed by W.I.C.E.N. throughout the emergency, many of the operators were given the job of repairing C.F.A. transmitters and receivers. One P.M.G. Officer has commented that it is now realised that due to the vastness of the area covered and the many fronts of operation, the emergency could not have been controlled without the big and complex communication system of which W.I.C.E.N. performed a vital part. A P.M.G. representative at one of the headquarters was told by Country Fire Authority Officers and Forest Commission Officers that in all its tasks W.I.C.E.N. operators had fulfilled a vital function.

The part played by the communication services in this emergency was perhaps best summed up in the following statement made by Mr. H. S. Robertson, the Co-ordinator of Communications under the State Disaster Plan.

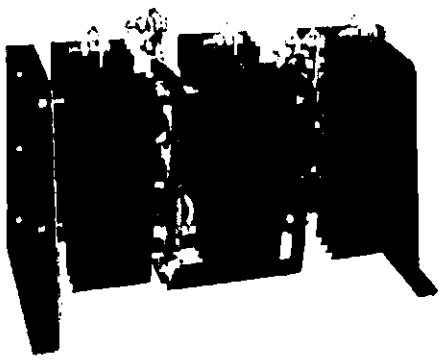
Mr. Robertson said: "The communications network, provided to assist the fire fighting and auxiliary services, was the largest ever to be established during a major disaster in Victoria. This network was set up quickly in accordance with a pre-arranged plan and operated at a very high level of efficiency throughout the disaster period. In this plan, W.I.C.E.N. was assigned an important role and in its achievement earned well merited and enthusiastic praise from all participating authorities. W.I.C.E.N. members can feel justifiably proud of a job well done."

### BAND ALLOCATIONS

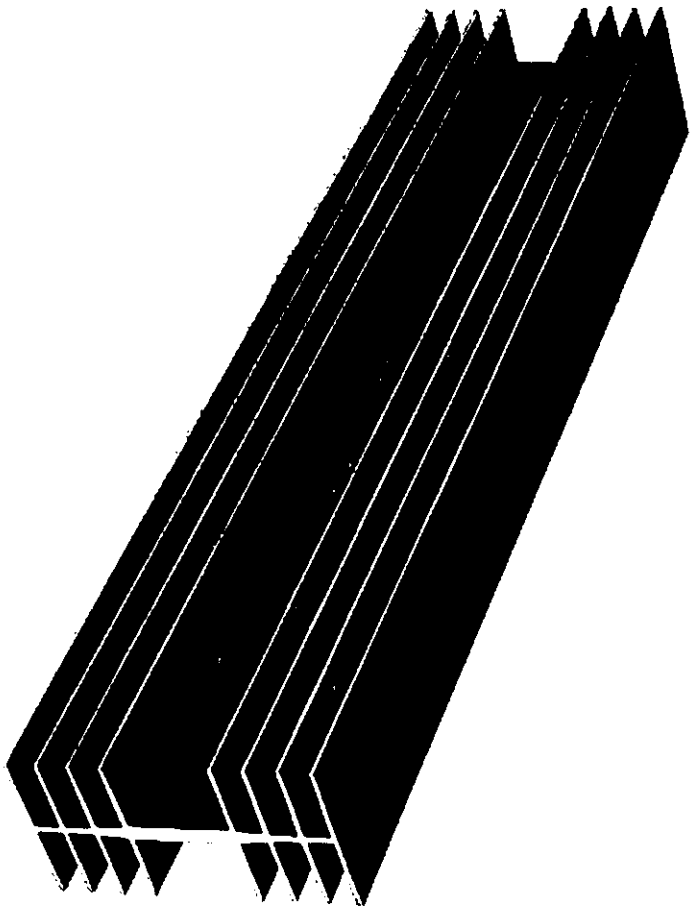
| C.w. Only | C.w. and Phone |
|---|---|
| Kc. | Kc. |
| 3,500 - 3,535 | 3,535 - 3,700 |
| 7,000 - 7,030 | 7,030 - 7,150 |
| 14,000 - 14,100 | 14,100 - 14,350 |
| 21,000 - 21,150 | 21,150 - 21,450 |
| 28,000 - 28,200 | 28,200 - 29,700 |

# Heatsinks for Diodes, Transistors and Thyristors

- ***High Efficiency***
- ***Robust Construction***
- ***Reliable Rectification***



Mullard three-phase bridge rectifier assembly using silicon power diodes mounted on three heatsinks.

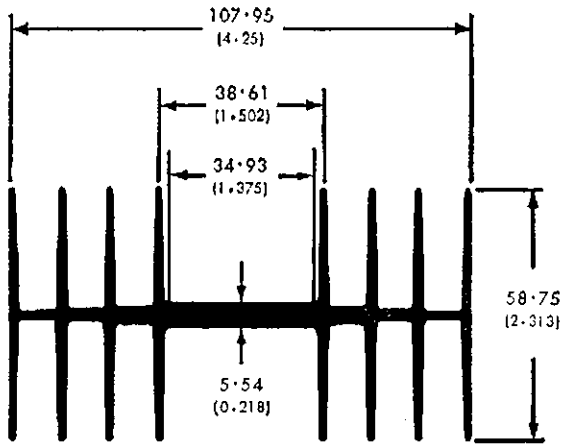


High efficiency, robust construction, reliable rectification — these are the factors gaining ready acceptance for the Mullard rectifier stack assemblies.

Much of the efficiency is due to the extruded aluminium heatsinks used in these assemblies with their low thermal resistance enabling high power ratings to be economically achieved.

The drawing on the right shows only the Mullard 40D heatsink extrusion.

A leaflet is available, detailing the range of patterns of Mullard heatsinks, their thermal characteristics such as the temperature rise above ambient tabulated against power dissipation and their outlines and dimensions. To obtain a copy of this leaflet, forward a stamped, self-addressed foolscap envelope endorsed "Heatsinks" to the Mullard offices shown below.




Dimensions in mm, Inch conversions in brackets

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M129A

# A LOW EFFICIENCY TRANSMITTER FOR 80 METRES

*M. J. McDONALD,* VK6MM*

NOT only is the efficiency of this transmitter low, but it is also of low power, and if used in conjunction with a whip antenna is guaranteed to provide some most frustrating moments.

The r.f. section uses three transistors of the same type, one as a crystal oscillator and the other two in parallel as a modulated amplifier. The oscillator tuned circuit is adjusted for minimum d.c. input current to the oscillator consistent with sufficient drive to the modulated amplifier. 20 to 25 mA. should be about right. The final will then draw about 200 mA. off resonance and about 150 mA. when correctly loaded and tuned.

Theoretically one transistor should be capable of this, but because of difficulty in driving it is more expedient to use two in parallel. One could be operated by itself of course at half the power input (and output), but as modulator power is available for two, why not use two.

Collector efficiency is of the order of 50%.

Coupling the output to an aerial can be accomplished by a suitable L section or in the case of low impedance by a tapping on the coil.

Heat sinks on the transistors are not absolutely necessary, but could prevent overheating and burnt fingers during initial adjustments. A word of caution, however. The metal case is connected to the collector.

The modulator is the 1-watt amplifier using a commercially available printed wiring board. Because it is operating off 12v. instead of 9v. as intended, it is necessary to modify the bias network of the class B stage and increase the value of decoupling resistor feeding the class A stages.

A special modulation transformer would enable 100% modulation to be obtained, but is not really warranted since in excess of 90% modulation is possible using the normal speaker transformer connected as shown.

For a transmitter-receiver set-up, the audio section could, of course, also be used for the receiver by employing suitable switching. ●

* 75 Stirling Highway, Nedlands, W.A.

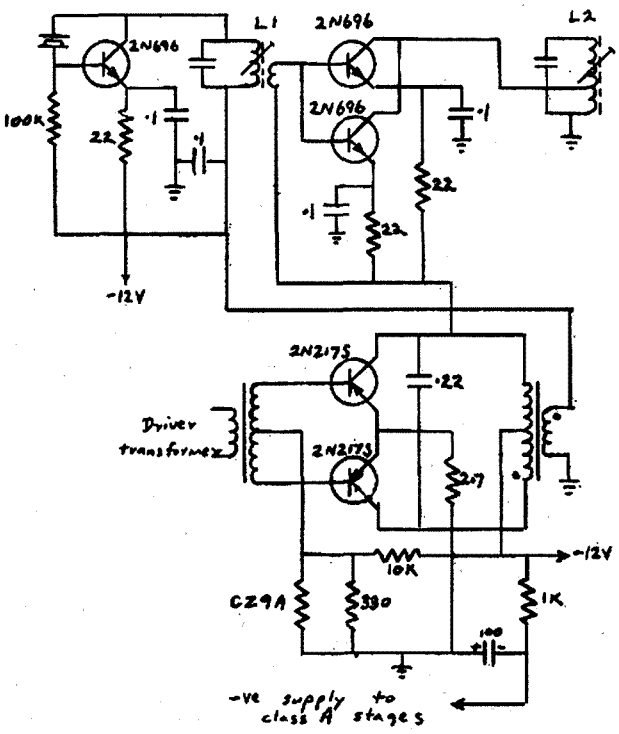



**Fig. 1.**

**Schematic of 80 Metre Transmitter.**

**Coils used in original (not necessarily optimum):—**

**Formers—7 mm. diam., slug tuned.**

**L1, Primary—25 turns of 27 B. & S., tuned with approx. 820 pF.**

**L1, Secondary—12 turns of 30 B. & S., wound over primary.**

**L2—16 turns of 23 B. & S., tapped at 5 turns, tuned with approx. 820 pF.**

## CALL SIGNS

"One thing that I cannot understand about s.s.b. is why, after suppressing their carrier and one sideband, they also have to suppress their call signs."

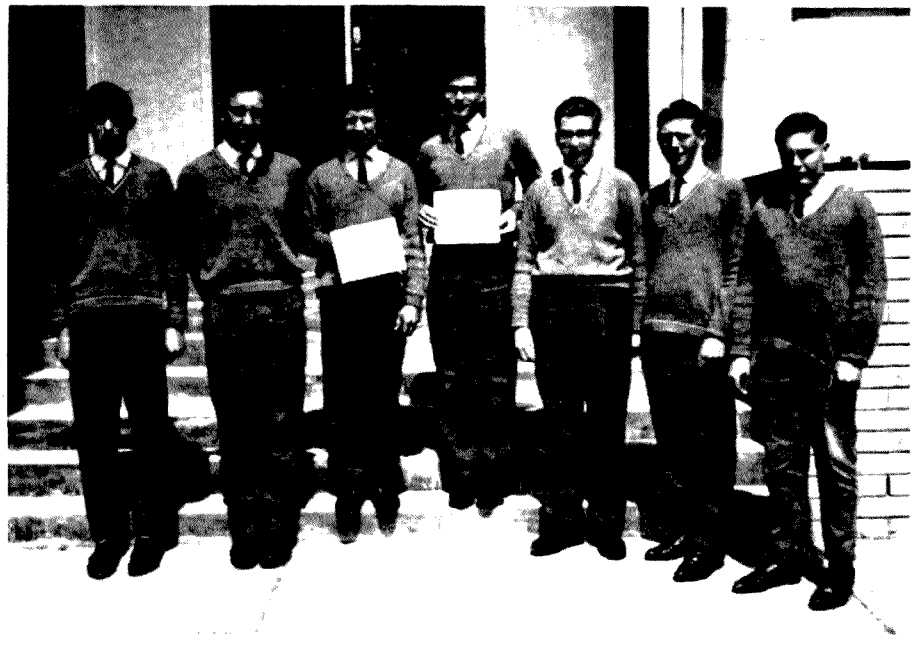
—"The Cornish Link"

— · · · —

## WAVELENGTH OF TEN MILES

The familiar transmissions from WWV on the h.f. bands are accurate to one part in ten million; but the new VLF stations WWVB and WWVL at Fort Collins, Colorado, will be accurate to one part in ten billion. The former is on 60 kc. and the latter on 20 kc. (at present only with one kilowatt but destined for 50kW.). These enormous aerials, high-powered transmitters and long wavelengths are back with us because short-wave transmissions do not reach distant points via a reliable path—ionospheric reflection introduces irregularities which nullify the accuracy of a time signal (when talking in terms of astronomical and space-age requirements). Hence VLF and "ground wave" . . . world-wide coverage without reflection, since the ionosphere and the earth's surface form one enormous wave-guide. The wavelength of station WWVL is roughly 10 miles!

—"The Short Wave Magazine," August, 1964



These lads from the Korumburra High School Y.R.C. were the first in VK3 to gain the Junior Certificate under the Y.R.S. Left to right: K. Stone, R. Proudlock, R. Stewart, I. Robinson, P. Tyers, J. Heath, and G. Tuile.

# THE SWISS QUAD

## DESIGNED BY HB9CV, BUILT AND TESTED BY VK6DR

*W. H. H. WEDEMEYER, VK6DR*

A DESCRIPTION of a Swiss Quad appeared in the October issue of "DL-QTC," the German version of "Amateur Radio." This antenna is a very appealing one, especially as it would solve the problem of having the elements supported by bamboo or aluminium piping. The Swiss Quad, designed by HB9CV and patented in Switzerland, claims gains up to 14 db. in DX work. This would be extremely good if it could be realised.

The following article will give a description of the Swiss Quad as per "DL-QTC" and also the construction and first working experience of a 20 metre version at this station. A write up also appeared in the R.S.G.B. Bulletin (June 1964), but unfortunately was not at hand here.

The quad consists of two parallel squares with a quarter wave side length and a distance of 0.1 to 0.075 wavelength between elements. Both squares are supported directly on a vertical mast by bending all horizontal elements 45 degrees in the centre as per Fig. 1.

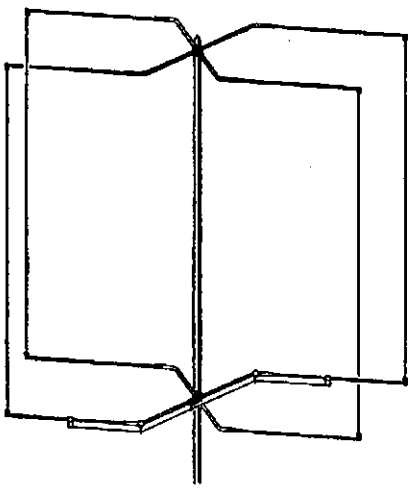


Fig. 1.—General arrangement of the Swiss Quad.

The vertical elements consist of Litz wire but solid copper wire has been used in my quad with success. The horizontal elements are aluminium piping and to improve mechanical strength, the pipes go past the centre mast to form part of the other element. The cross-over point is maximum current and needs no insulation from the other element and the mast.

It was found that only a parallel positioning of the squares produces proper phase conditions with suitable radiation pattern, i.e. the main lobe containing 95% of the radiated power and very small side lobes. The cross-over portions are not interacting as the currents in them are opposite and little radiation takes place.

* 9 Arthur Street, Lesmurdie, Western Aust.

The extraordinary small distance between the squares of only 0.075 to 0.1 of a wavelength would normally produce a very low radiation resistance and a small bandwidth, but the feed to both elements distributes the energy evenly to all four dipoles, keeping the feed resistance to 30 to 40 ohms.

With a recommended distance of 0.1, the bandwidth is sufficient for the 20 metre and 15 metre bands. The radiation pattern does not change very much, even with a change of as much as 9% from actual resonance.

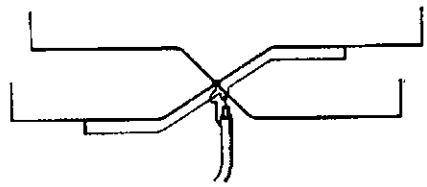


Fig. 2.—Co-axial feed and matching system.

The quad is fed from the lower cross-over point, but may also be done from the top if desired. A double gamma-match is recommended for co-ax feed of 52 or 75 ohms and twin lead feed 75 to 600 ohms is matched best with double T arrangement.

HB9CV explains then further, that the necessary phase difference of about 180 degrees between both squares is achieved wholly by having a 5% difference in circumference between both squares. The smaller one becomes a director and the larger one the reflector.

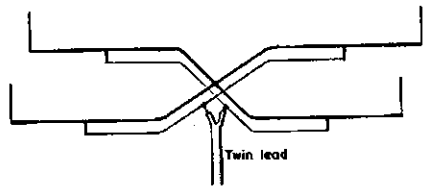



Fig. 3.—Balanced feed and matching system.

With two directly fed and electrically the same squares, it was found that the inductive components in the reflector and the capacitive ones in the director in relationship to the feed point are cancelled. Confirmation of this is that the resonance of the whole antenna as measured at the feed point is in the middle between the self-resonance of each antenna square.

The optimum difference in circumference of 5% between each square was found through several test measurements. The side lobes increase if the difference is made less than 5% and a difference of more than 5% increases the horizontal radiation (broader main lobe) and the gain decreases. With a 5% difference between both elements the feed and matching of the Swiss Quad shows the advantage of being equal to that of a dipole.

### ADVANTAGES

**Mechanical**: Full metal construction, no supporting parts, mechanically stable through having both squares mounted directly onto a mast, and small wind resistance.

**Electrically**: Simple feed to both elements, small current loss through evenly distributed energy into all four dipoles, the use of pipes at high current points, no dielectric losses as all high voltage points are free of supporting structures, and the use of all types of feed lines.

### PERFORMANCE DATA

The following data are practical ones, measured in tests in the 14 Mc. and 21 Mc. bands:—

| | Gain Over Dipole |
|---|---|
| Direct radiation: | |
| Short distance .... .... .... | 6 to 7.9 db. |
| Intercontinental distance | 12 to 14 db. |
| Front-to-back ratio: | |
| Short distance, 10 miles .... .... | 15 db. |
| Short skip, 600 miles .. | 10 to 12 db. |
| DX work, more than 1,800 miles .... .... .... .... | 18 to 24 db. |
| Rejection off the sides (about 80 degrees off main lobe) .... | —32 to —40 |
| Width of main lobe at half power points .... .... .... | 60 degrees |

The radiation pattern is shown in Fig. 4.

### MEASUREMENTS FOR CONSTRUCTION

The whole length of a square has to be a little longer than a full wavelength, circumference equals wavelength times 1.12. This factor is independent of element thickness.

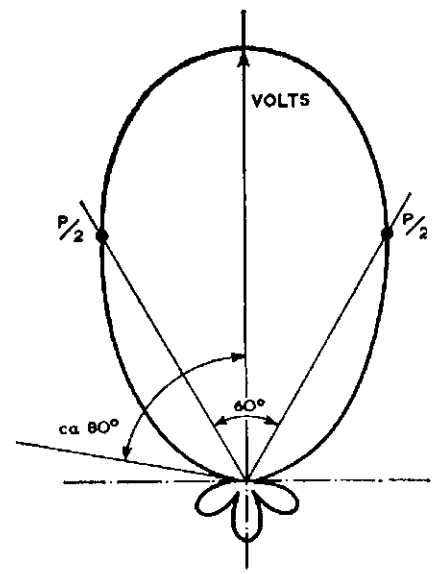



Fig. 4.—Polar diagram of Swiss Quad Aerial.

With a length difference of 5% between director and reflector, the director has to be 2.5% shorter and the reflector 2.5% longer than the resonance length, i.e. the centre frequency of the whole antenna. We now have:

Length of reflector:
1.12 × wavelength × 1.025 = 1.148.
Length of director:
1.12 × wavelength × 0.975 = 1.092.
Spacing between elements:
0.1 wavelength.

The difference in length is for practical purposes distributed only between the horizontal sections, the vertical length is the same.

To adjust the quad for the chosen frequency, the lower horizontal assembly is shifted up or down on the vertical mast, thus obtaining even shortening of director and reflector.

Table 1 gives the measurements for different bands.

The width is measured between the outer points, without considering the kink in the middle. To find the pipe length, scale antenna onto a piece of paper and measure.

| Frequency | Wavelength in Metres | Height (Inches) | Width Reflector (Inches) | Width Director (Inches) | Spacing (Inches) |
|---|---|---|---|---|---|
| 28.50 Mc. | 10.52 | 116 | 121.5 | 110 | 41.3 |
| 21.20 „ | 14.14 | 156 | 164 | 148 | 55.5 |
| 14.15 „ | 21.20 | 234 | 246 | 222 | 83.5 |

Table 1.—Swiss Quad Measurements.

The connecting points for the gamma match or T match are found by experimenting as conditions vary too much, but for the start it may be best to connect half way between the ends of the horizontal element and the bent part towards the mast. The distance of the gamma match wire is about 1/200th of a wavelength and any stiff wire having a diameter close to that of the inner conductor of the feedline may be used. For v.h.f. quads, the whole square can be made of piping.

HB9CV then carries on with mechanical construction details of his 15 metre quad, but as I had the need for a 20 metre one, it was obvious that the described mechanical construction was not adequate at all for 20 metres.

Having lost two conventional quads through storm and improper construction before, I decided to build this one as good as it can be done in any engineering shop. Another important factor was, that I could not rely on plenty of help by someone to put this thing up.

The following is an account of what may be done to get any sort of antenna up, not only a quad. It took quite a bit of hunting around for suitable aluminum pipes and I finally settled for ¾" hard-drawn ones and some ⅝" pipe which fitted perfectly into the ¾" pipe. This pipe is obtainable here in the West, and anybody requiring the address of the firm may contact me any time. The quantity needed is four lengths (18 feet per length) of ¾" and two lengths (also 18 feet) of ⅝" diameter for a Swiss Quad on 20 metres.

To have each element going past the crossover point at the mast, it is necessary to bend the pipes twice (see Fig. 5). Bending pipes is a problem in itself. I was lucky to be able to borrow a pipe-bender from the local welding shop. To avoid kinks in the bends, pipes are usually filled with fine sand tightly and the ends are sealed. As the season was against me, the sand was wet and took far too much effort to fill four pipes, so I gave it a go without filling and it worked okay. Two of those bent pipes on top of each other and you have the top section.

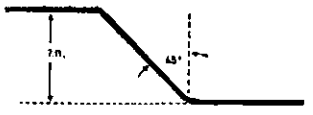


Fig. 5.—Plan for bending pipes.

The centre support needed a lot of planning to make it easy to build and stable enough to be the main support. It worked out like this: Two one-foot lengths of angle iron ¾" x ¾" x ⅛" welded onto a piece of angle 1½" x 1½" x 3/16" 2½" long. Fig. 6 shows the view from the top.

This type of construction needed only three sawcuts and some welding, forming two crossed cradles, to place the pipes into. The centre angle iron fits onto the mast, its actual size depending on the vertical mast diameter. This angle is drilled under and above the welded one-foot long angle iron to take the bolts holding the lot on to the mast. To stop the pipes rotating in their cradle, and also to provide the electrical centre point and connection, I have drilled a ¼" hole through the pipe into the angle iron and tapped the angle to provide a good electrical contact. This connection has to be made right in the centre, and only there, to prevent any unbalance.

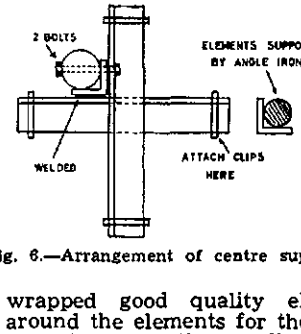


Fig. 6.—Arrangement of centre support.

I wrapped good quality electrical tape around the elements for the whole length of the supporting cradle so that only the centre bolt provides the electrical contact, also holding the element firmly in its position. Close the ends of the angle iron, water-hose clips were tightened around angle and pipe (still insulated by tape) to give it a good support. To obtain the exact electrical and mechanical centre, I measured from the outside of the elements along the bent portion to the centre bolt; both sides needing to be of the same length. (See Fig. 7.)

The lower horizontal assembly is done in the same way.

The ⅝" pipe is fitted into the outer ends of the ¾" elements to extend to the required width, and then secured by a clamp with a saw-cut giving it the necessary room for tightening.

The length of the director in my case is 18 ft. 6 in., and the reflector 20 ft. 5 in.

The outer ends of the ⅝" pipes are flattened and then drilled to take a 3/16" gutter-bolt which is holding the vertical wires. I assembled both sections on a 6-foot pipe, dug into the ground, and the work was quite easy, at the same time providing the same conditions under which that section will be when up in the air.

Even the use of ¾" aluminium pipe did not give the assembly enough rigidity and the outer ends of the elements tended to pull apart under the weight of the vertical wires. I had to keep the ends from shifting with respect to one another and as those points are high voltage ones, good insulation was needed. As there is no insulation material of seven feet in length, very light in weight and small in size on the market, I finished up buying some ⅜" round ebonite rod, fitted a foot of it into each end of a 7/16" diameter aluminium pipe to give an overall length of seven feet to go between the outer ends of the elements.

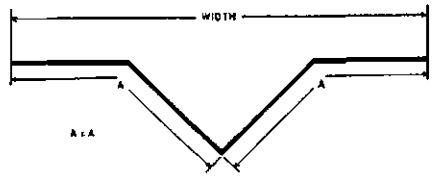


Fig. 7.—Both sides must be equal length.

The ebonite rods were tapped 3/16" in the centre and then screwed into the gutter-bolts which support the vertical wires. The rod on one side can be secured tight to the pipe while the other side must turn in the pipe in order to screw onto the opposite element. Once it is screwed on, a small hole can be drilled through pipe and ebonite rod and split-pin will stop it from unscrewing.

As the tips of the elements are a fair distance from the centre (about 9 to 10 feet), there is a certain amount of sag, also the weight of the wires is not helping any. It is therefore necessary to give the top horizontal assembly a good amount of upward prestressing to counteract this sag. I did this, but found that I should have given it even more. A better idea is the use of nylon guys from an extended portion of the vertical mast to the outer ends of the elements.

After completing both sections, I mounted the top part with the wires dangling down onto a 1" pipe of full length, lifted it up in the air and secured it to a small iron post in the ground. The lower section can now be clamped onto that mast with a G clamp, the vertical wires temporarily con-

nected to the lower elements and the wire for the gamma match fitted, held in place by strips of plastic tape.

A short piece of coax. with a two-turn coil on one side was connected to the double gamma match and the centre bolt on the mast. A g.d.o. determined the resonant frequency, being coupled to the coil. This frequency may now be raised or lowered by shifting the lower horizontal assembly up or down on the mast, at the same time adjusting the vertical wires. I found that my g.d.o. gave two readings—when loosely coupled it was 14.2 Kc. and tightly with a good dip, at 14.1 Kc. As it did not worry me which of those was the proper one, I left things as they were, drilled the holes in the mast to fit the lower section into its permanent place and then proceeded to improve on the matching construction by fitting clamps with strips of 4" long fibreglass 3/16" thick to the elements to hold the gamma match wire in place.

The connecting point to the element was done as recommended and when I excited the Swiss Quad, the s.w.r. was 1 to 1 in the middle of the band, going to 1 to 1.5 at 14.3 Mc. and 14.1 Mc. This was pure luck and others might have to shift the connections to obtain the lowest s.w.r.

Incidentally, I made both gamma wires the same length, the one going to the reflector being shorter when measured from the outside of the element. But of course measured from the centre, will be equal. The distance between element and gamma match is 4".

**RAISING THE QUAD**

This completes the quad proper and the next problem was to get it into the air. This is the way I have done it. A 2" water pipe was drilled with 3/16" diameter holes 18" apart all along its length. Then a 1½" pipe went into the 2" one, leaving two feet of it sticking out. This pipe was then drilled, in the same way, using the holes in the 2" pipe as a guide. Both pipes can be drilled together—it is of importance that the holes are all in line.

Into the 1½" pipe went a 1" pipe (this being the one to which we fitted the horizontal elements before in the test set-up). My 1" pipe was only 15 feet long and I fitted a 10 ft. length of ¾" waterpipe into it, to make the overall length 25 feet. The ¾" is a tight fit and some filing had to be done. All you have now is three lengths of pipes, telescoped into each other, with a total length of 25 feet. It is not too hard to get the lot into the vertical position.

To support this lot, I have robbed one of the trees in the garden of its crown and a solid metal structure is holding the pipe in its position at a height of 20 feet. The foot of the pipe rests in a concrete foundation on a bearing, the foundation taking any side-strain. The sawn off tree provides quite a good platform (cat-walk if you like) to work from and from here the top horizontal assembly was fitted on to the inner pipe.

The next step is to lift out the pipe plus top assembly, following its lower end with a heavy nail or what have you through the pre-drilled holes. The nail has to pass through both drilled pipes. The lifting involving only a distance of 18 inches or less if the holes were drilled closer together. Any XYL or harmonic can assist, by pushing the nail or pin through the holes while the OM is standing on the platform doing the lifting.

After the first pipe is out far enough, it was secured by a bolt to the second pipe and the lifting started once more, this time after the lower horizontal assembly was attached to the mast at the pre-drilled holes. At this point, we had to fit the permanent feedline to the gamma match and tape it to the mast. Again, the pin followed the lifting, passing through the 2" pipe only. Another bolt secured the second pipe, the lot now being 60 feet to the top. A handle on the lower part of the 2" pipe turns the whole assembly.

The Swiss Quad was watched carefully for the first weeks and still is, as it sways quite a bit in the wind. I hope it will stay up. It may be advisable to use large diameter seamless tubing, using the same method of telescoping, to counteract the swaying.

**FIRST TESTS**

Reports from various VK6 Amateurs showed varying results, but excellent front-to-back ratios—all of course measured with S meters of undefined calibration or none. Some DX worked showed that the signal was quite substantial, usually getting a reply if conditions seemed fair. No proper tests could be conducted, as the QSB was too heavy on most DX stations. The transmitter input was 80 watts, with screen modulation.

Very successful close-range tests were run with VK6QL and through careful calibration of the S meters in both stations, a reliable indication of front-to-back ratio was achieved. The front-to-back ratio was 19.5 and 20 db respectively, the distance being about 15 miles.

In his article, HB9CV states that a rejection of —40 db. may be obtained at 80 degrees off the main lobe centre and that these points are very sharp. This proved to be true, the sharpness at one point is remarkable. It is possible to turn the quad so that this "rejection notch" phases out an interfering station and still being able to copy "your" station, as the main lobe width is fairly broad (60°).

It was found that the side with the director facing the station had a better rejection than the side having the reflector facing it. A reason for it may be the feed of that side. Comparison test with a standard dipole are in progress, but as the quad will show its best only in DX work. I have to wait for better conditions to try if the claimed gains in DX may be achieved. ●

# DX-PEDITION TO NORFOLK ISLAND (VK9TL)

*KEN MATCHETT,* VK3TL*

LYING about a thousand miles east of the Australian mainland and half way between New Zealand and New Caledonia is the tiny island of Norfolk. Discovered by Cook in 1774, the island is best known through its associations with the convict era of Australian history, but is also well known by DX enthusiasts as a separate "country" in their A.R.R.L. list.

The preparation for the trip was the same for any holiday, the usual clothing, shaving gear, writing tablet and a hundred other items; but in addition quite a deal of attention had to be given to what might be required in the operation of a radio station to be set up on the island. A telescopic aluminium vertical was prepared for 40-metre operation and a tri-band beam for the higher frequencies. In addition, a dipole antenna was packed up for good measure. It was so necessary to attend to details. Seemingly simple things things such as a length of earth wire, log-book pages, U-bolts and clips for the attachment of wire to tubing and spare fuses could hold up activities for hours were they not available when required. Furthermore, simple tools, a soldering iron, a multimeter and, of course, the necessary transceiver, headphones, c.w. monitor, loudspeaker, Morse key, s.w.r. bridge, co-ax leads and many other items required a place in the luggage.

The 40-metre vertical consisted of four sections of aluminium tubing, each ten feet long, which could be bolted together. These items with the tri-band beam made up a considerable parcel by themselves! Although Norfolk can be reached by ship, time dictated the use of aircraft, flights of which are scheduled twice weekly from Sydney during the summer season. Excess luggage costs were a prime consideration in the planning of the DX-pedition.

Travelling with fellow science lecturer Jack Hyett, of the Burwood Teachers' College, the trip was made to Sydney from Melbourne on 2nd January. After an overnight stay in Sydney, we were ready to take off for Norfolk early the next morning. The flight to Norfolk Island is made in a DC4 aircraft, the airstrips at Norfolk apparently being unable to cope with heavier planes. The air trip itself is rather uneventful except that Lord Howe Island, another interesting spot of DX activity, can be seen from the aircraft. The journey takes a little over five hours, one's watch being put forward one and a half hours before landing. While on Norfolk it was found easier to keep the station log in local time and later on return to Melbourne to make a second column in the log for G.M.T. (11½ hours behind Norfolk Island time).

One of the most beautiful sights one could imagine is the first view of Norfolk Island jutting out of the blue ocean with its many patches of white breakers. Steep cliffs with their jagged dark basalt rocks rise precipitously two hundred feet or more from the sea. The plane just seems to skim over the top of the cliff and it is then when one realises for the first time the beauty of the Norfolk Island pine. There are thousands of these magnificent trees, some of which are two hundred feet high. A truly lovely picture is made up by these tall trees and the almost lawn-like appearance of the short kikuyu grass which spreads itself like a bright green carpet over most of the island. Now and again the flatness of the land is broken by the many valleys and rises which make up the undulating pattern of the island. Only in the north-west does the land reach any considerable altitude. This is the area of jungle vegetation associated with Mount Pitt and Mount Bates, both of which rise about a thousand feet and from which an excellent view of almost the whole island can be obtained.

There are two air strips on the island, one of coral limestone, the other of grass. Our plane landed on the grass strip and it was as if we were landing on a golf course. Before any passenger may alight from the plane, the interior of the plane is sprayed with insecticide, a necessary precaution against the accidental introduction of the fruit fly. We were met at the airport by Ray VK9RH. While on the island, we had the good fortune to be entertained by Ray and his family and to be shown over the D.C.A. transmitting station where Ray is employed.

Photo of Ken VK9TL atop the old water tower. Norfolk Island pines are in the background.

We started to set up the rig on Sunday, January 3. Although I knew that a disused water-tower was on the site where we were to stay, I had no idea of the difficulties which were to confront us in the erection of the beam. Very fortunately our next door neighbour, Karl, came to the rescue and it was mainly through his efforts that the damaged vanes of the wind mill tower were cut down so as to enable the erection of the antenna. This operation itself took several hours. Winds can be quite strong on Norfolk; for only eight months previously, it was the force of a hurricane that had rendered the steel water tower useless.

In the afternoon of the 3rd, the first QSO was made with a Hawaiian station, and after that the calls came very quickly. Fortunately the DX-pedition had received prior publicity through "QST," "CQ," R.S.G.B., Dutch "DX-Press" and several other DX news magazines. For several months previously the VK3 Outwards QSL Manager, Ivor VK3XB, had included a roneoed information sheet with the bundles of QSLs forwarded to each QSL Bureau. The beam worked well. I had no prior information just how far my room in the boarding house would be from the tower and so sufficient co-ax and connectors had to be taken to cover all possibilities. In order that the beam could be rotated independently of electricity, a lever system was devised which could be easily attached to the top of the beam and be rotated by means of four long lengths of nylon cord. I was very anxious to learn of path openings especially to Europe, Africa and the U.S.A. since I knew that a lot of chaps were expecting contacts with me and I was keen to give them the QSO for which they had been waiting so patiently.

Briefly the daily time-table read something like the following: 1930 G.M.T. (6 a.m. local time) there was some 40-metre activity but more importantly, some long-path openings to the east coast of the States. Unfortunately these long-path openings were not available as frequently as I had experienced from VK3, but I tried to make the most of them when they occurred. From about 2130 (0900 local) to about 0200z (1.30 p.m.) there were spasmodic openings on 20 metres to the States, most of the QSOs being made on c.w. In the early afternoons there was very little activity and I took the opportunity to catch up on sleep during those off-periods.

In the late afternoons there were a few openings to the Pacific area, California and South America. I also had a regular sked with ZS6NE. It was just unfortunate that the time in South Africa was about 9.0 a.m., which meant that so many South Africans were unavailable at the time when the band

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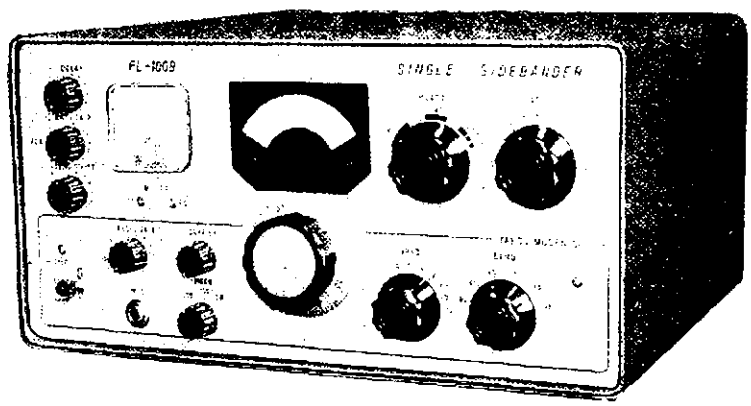


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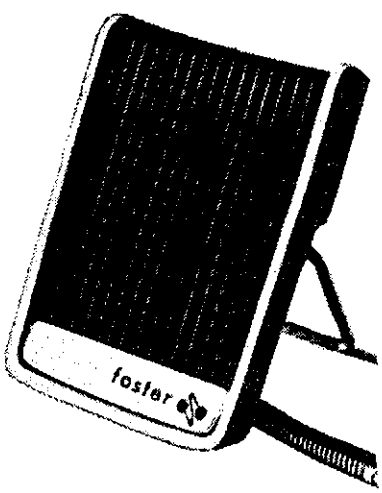


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was open. After this, I used to swing the beam around to the north and work JAs on c.w. for a couple of hours. The long-path opening to Europe started about 0830z (8 p.m.), but unfortunately didn't last for long on most evenings. After this, the short path to Europe would open.

After the first day of the operation, Jack, Karl and myself erected the 33-foot 40-metre ground plane. I had a job balancing on the top of piled-up boxes so that, using my left hand, I could bolt on the last ten-foot section to the bottom of remaining 23-foot length of tubing which I was holding up in the air with the other hand!! The finished structure was held vertically by means of six "guy wires" of tough nylon cord and was stood on a six-inch insulator on top of the stack of boxes. To the base was attached the co-ax and a series of three (later increased to six) radials. Because the ground plane had to be erected between two buildings, these radials, each a little over 33 feet in length, could not come off in straight lines, but despite this fact the antenna worked remarkably well.

Possibly 800 QSOs were made with this ground plane antenna on 40 metre c.w., the great majority being with Stateside stations. The time at which best results were obtained to the U.S.A., the Caribbean, and the South American continent was from about 1130 to 1430z (11 p.m. to 2 a.m.). Generally I used to take a break during this period to sked Dom IT1TAI. We used to remark that we had a pipeline between us, since there were very few European stations that could copy or who were available at that particular time (1300z) and yet we were exchanging reports of Q5, S9.

Although QSOs were made on all bands from 10 through to 80, the great majority were made on 20 and 40. On the whole, band conditions were not good; this was the period of sunspot minimum and in any case the month of January is well known as a rather poor month for DX activity from the Southern Hemisphere. These facts made DXing from Norfolk a long drawn-out process at times.

Despite the fact that the rig was on at least eighteen hours of each day, it was a remarkable thing how one could quickly become accustomed to a limited amount of sleep. Rest during the day presented no problem since Norfolk is really a quiet place. There is no public transportation and although there are several motor scooters hired out to tourists on the island, the lasting picture that one had of the countryside is the dusty country roads and the many cows that wander almost aimlessly about. I saw no flies during the time I was there. However, mosquitoes did their best to annoy me in the evenings, and I had to take steps to wipe around the window with kerosene each evening. The total absence of snakes and frogs on Norfolk no doubt accounts in some measure for the number of mosquitoes.

Because Norfolk is just a tiny island (it is only five miles by three miles) and is surrounded by a great body of water, one expects a very equable climate. The temperature never rises above 80 degrees and while we were there it seldom dropped below 60. Some tourists may be troubled by the humidity which is frequently 80, but it gave Jack and me little worry. I did find, however, that I was unable to wear rubber sandshoes.

I must confess that I did not see as much of this beautiful island as I should have. Occasionally I took an hour or so to make a car trip to scenic beauty spots and places of historic interest. Some of the cliff scenes are breath-takingly beautiful. Not much remains of the old convict prisons at Kingston, much of the building material having been removed in days long since gone by the Pitcairn Islanders when those people migrated to the island a hundred years ago.

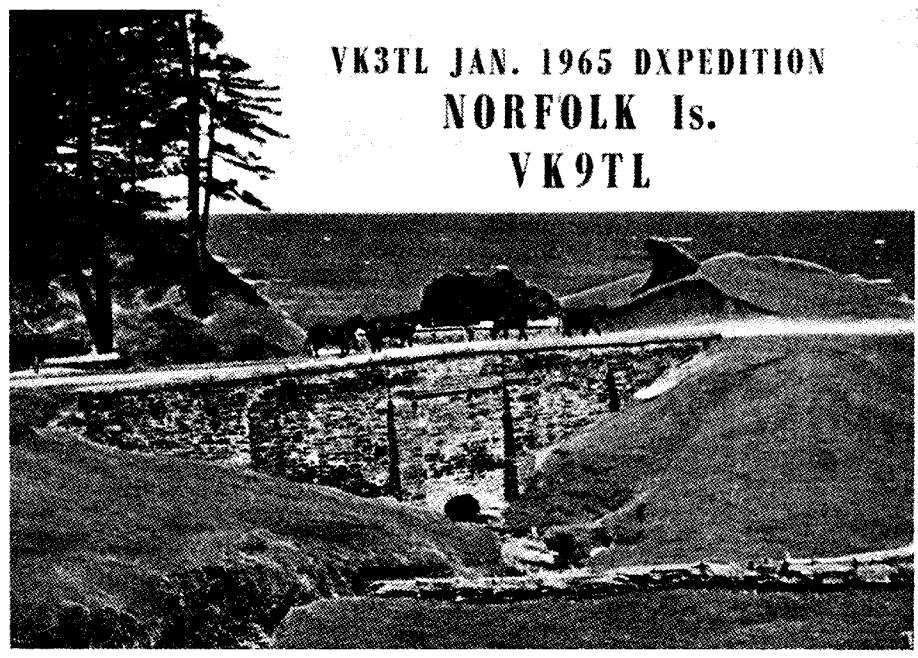
The population of Norfolk is somewhat less than a thousand and several of these have the dark skin of their Tahitian ancestry. Now and again, we went down to the airport where mail from home could be collected. The administrative centre is at Kingston where, in addition to the prison ruins, there is the post office, liquor bond store (there are no hotels on the island) and Government House. The island is under the charge of an Administrator appointed by the Commonwealth of Australia. At the post office the delightful postage stamps of the island can be purchased.

Close to Government House is the old cemetery containing the many graves of soldiers and convicts of the old penal settlement. The headstones of the graves make fascinating reading of a grim page in Australia's history.

Life moves at a very leisurely pace. The people are friendly but one has the feeling that they wish to be left alone. Several fear the possible commercialisation of their beautiful island home. The main source of income is the growing of various tropical seeds and nuts and, of course, tourism. There is no income tax on the island and although the cost of living is not cheap, luxury goods such as radios, watches and jewellery can be purchased at prices far below those ruling in Australia and New Zealand.

Washing presented a problem at times. The red volcanic dust of the island permeated one's clothing, and owing to the water shortage at that particular time of the year, the position could have become critical. It rained heavily only once during the month. Water tanks were speedily replenished during one evening when no fewer than 230 points were recorded within four hours.

Electricity is expensive by mainland standards. The rate of one shilling per kilowatt-hour made up a sizeable account by the end of the twenty-eight days of operation. The voltage is 240v. a.c., but there were times when it dropped appreciably below this. There were four power failures, fortunately only two occurring in the middle of a QSO.




VK9TL's QSL Card. Original in multi-colour.

QRM was a major problem with which one had to contend. Powerful VK, ZL and other Oceania stations made copy difficult at times, particularly of signals from Europe. But one just has to accept this. Several stations very kindly co-operated by QSYing from near the frequency. Worst QRM came from I.P.S.O., the Ionospheric Prediction transmitter in the near neighbourhood. This transmitter's signal made copy almost impossible every thirty seconds on each quarter hour in addition to other transmissions timed on the hour, G.M.T. It was unfortunate, too, that extra sweeps had to be conducted from I.P.S.O. to correspond with the passage of a satellite over the island during the second and third weeks of the DX-pedition. This seriously interferred with long-path openings in the early morning (local time) to the Eastern United States.

(Continued on Page 14)

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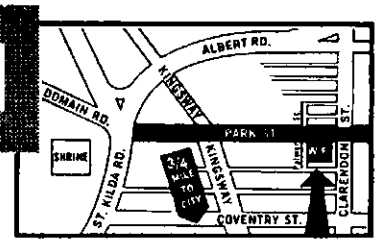


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# The Historical Development of Radio Communication

## PART FIVE—THE ADVENT OF THE TRANSISTOR

J. R. COX,* VK6NJ

### CHAPTER FOUR

### The Conquering of Mobility

"The transistor was the unexpected result of scientific curiosity" and is "essentially a triode form (three contact) of the old-fashioned crystal detector."

—United States Information Service: "Twelve Inventions that Changed the World."

In 1948 the transistor "arrived" and with it came a new era in wireless communication. By the experience of these past fifteen years it can now be realised that this device has brought about the partial eclipse of the vacuum valve as a dominant factor in the development of wireless communication. It can be said that, as a result of the advent of the transistor, "we are in the midst of a technical revolution".[65] This present period could aptly be called the transistor period. As new as the discovery of the transistor is, the events leading to its finding are not by any means as recent. They do, in fact, stretch back to radio's infancy.

The transistor is a semi-conductor and depends upon conduction of electricity through a solid. Early pioneers began to assemble information about conduction in solids as early as 1906. The actual property of semi-conductance or unilateral conductivity was noted by F. Braun in 1874 who observed this phenomenon in various metals,[84] long before the advent of wireless itself!

General H. H. C. Dunwoody's work with point-contact crystal detectors has already been mentioned, but bears mention again as the transistor has been described as "essentially a triode form (three contact) of the old-fashioned crystal detector".[85] General Dunwoody pioneered, it may be added, the application of a very low and steady electromotive force to the crystal detector.

"A transistor may be considered as an extension of an ordinary junction diode which consists of two pieces of semi-conductor matter of slightly different composition"[86] bears direct association with this analysis made in 1910: "It has been found that a contact of small surface between certain conductors as, for instance, between tellurium and aluminium, also between silicon and copper, possesses the power of rectifying high frequency alternating currents".[87] Other investigations on the performance of semi-conductor detectors were made in 1906 and 1907 by Professors G. W. Pierce and G. W. Pickard.[88] They, in fact, established two basic facts in regard to conduction through crystal detectors. One such fact was that the conductor possessed unilateral conductivity and that the conductivity did not obey Ohm's law.[89]

The aforementioned details support the interesting observation that the pioneers of early wireless communication can be linked with the discovery of radio's newest mode of development—the transistor. By their scrutiny and experiments such men as Dunwoody, Pierce, Pickard and Fleming helped find the elements later used for transistors and, by so doing, formed a starting point for the further progressive research which ultimately led to the foundation of the modern theory of conduction in solids. This itself was a factor which led to the discovery of the transistor.

The forerunner of the transistor, a two-element semi-conductor, could not amplify signals but was extensively used in early wireless receivers as a detector. Usually in the form of a "cat whisker", crystal detector, it formed a primary means of detecting Hertzian waves; then, later, as a detector feeding the rectified signal to a following triode valve amplifier.

The diode crystal detector suffered from two defects which caused its decline. A very loud signal or a burst of static often destroyed the point of contact between crystal and cat whisker. When this happened a new point had to be found, and a mishap like this in the middle of a programme did not enhance its popularity. The other defect was its inability to amplify the signal. Thus when valves improved to the stage where they could simultaneously detect and amplify they superseded crystal detectors and by the early 1930s crystals were rarely used.[90]

Scientific interest in semi-conductors did not lapse, however, and by 1939 knowledge of them had vastly advanced since the time of Pickard and Pierce. The onset of the Second World War was responsible for an intensified research into semi-conductors and this investigation helped bring the discovery of the transistor nearer. The research was undertaken because of the demand for an efficient detector for radar waves. It was found that the most satisfactory device was the crystal detector and so it once again came to the fore. The benefit of its revival extended beyond the solution of this wartime emergency. But, because of this pressing need, data was unearthed on semi-conductors which afterwards incited curiosity in electrical flow across semi-conductors.[91] It was by pursuing this line of thought that the transistor eventually materialised in 1948.

For a few years prior to the Second World War a demand for mobility in wireless equipment gradually had grown. Two causes stimulated the directing of wireless production towards mobility. The first reason was the actual increase in the mobility of society itself. From about the middle 1930s onward people travelled more and this made the concept of portable radio receivers a very acceptable one. Secondly, when the war started the necessity had become more urgent. The 1939-1945 conflict was a mobile war and this accentuated the need for dependable mobile wireless communication equipment.

A certain amount of mobility had been achieved before 1939 by reducing the size of valves and, during the war, other special methods of attaining mobility were invoked. From these methods various wireless sets resulted, but the degree of mobility, though useful, was not entirely satisfactory. In the first place, because all equipment depended upon valves, the possibility of breakdown because of their inherent frailty was always present. Such attainments in mobility as were achieved, were mainly due to two factors: the designers' skill in cramming components into the smallest possible space, together with the manipulation of circuitry, enabling some parts to serve dual purposes. These two features also facilitated the construction of wireless sets, in compact units, capable of both receiving and transmitting. And so, cramming and manipulation, rather than miniaturisation, brought about some reduction in size, which in turn made mobility feasible and convenient.

There was, however, a limit to overall size reduction in mobile equipment under these conditions; a limit governed by the dictates of valve usage. These dictates were the necessity for a high voltage to enable the valves to function, and the need to have space around each valve to safely dissipate its heat. The degree of miniaturisation of components was also restricted by the employment of high voltages.

A good example of pre-transistor mobility is found in the instance of the No. 11 Department of Defence Wireless Set. Manufactured in 1942 for military use, this model was extensively used by British forces. It displays the intricate wiring, array of valves, component cramming, and combination of receiver-transmitter. The set was powered by two twelve-volt, wet-cell, batteries actuating two genemotors which produced the requisite four hundred volts. Apart from adding to the bulk of the outfit, the genemotors drew about twenty to thirty amps. from the batteries to initiate the gene-

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* Government School, Yornup, W.A.

[65] United States Information Service: "The Transistor—Miracle Tool of Electronics"; a 24-page booklet printed in U.S.A., 1959; p.4.

[84] Fleming: op. cit., p.473.

[85] United States Information Service: "Twelve Inventions that Changed the World"; pp.26-27.

[86] Radio Corporation of America: "Introduction to Junction Transistors"; a 29-page journal printed in Camden, New Jersey, U.S.A., June 1959; p.1.

[87] Fleming: op. cit., p.473.

[88] Ibid.

[89] Ohm was a Bavarian scientist who discovered the relationship between the values of current, voltage and resistance in a circuit. His law can be stated to be that the current flowing in a circuit is directly proportional to the applied electro-motive force, and inversely proportional to the resistance. The law can be expressed as an equation: I equals E divided by R, when I is current in amps., E volts, and R resistance.

[90] Manly, Harold P.: "Drake's Radio Cyclopedia"; Frederick J. Drake and Company, Chicago, 1929, 3rd edition; 700 pages—not numbered.

[91] See Appendix 3, Principles of Transistor Operation.

motor action. The genemotors also created their own interference. Then valued as portable or mobile wireless sets, the No. 11 and other similar types are indeed very cumbersome when compared with today's mobile sets utilising transistors. It was only near the end of the last World War that valve miniaturisation made further reduction in set size possible. The real obstacles, valve failure, heavy power drain, and heat dissipation, persisted until the appearance, some years later, of the revolutionary transistor device.

This remarkable device entered practical radio as a result of scientific investigations carried out at America's Bell Telephone laboratories. A trio of scientists, William Shockley, Walter Brattain and John Bardeen, were conducting research on electrical behaviour of surface atoms in certain elements when they became curious "about the ability of electricity to flow across the surface of a semi-conductor".[92] The follow-up of their interest invented the transistor. This was announced on 22nd June, 1948.[93] On that date a new device to regulate and control electrons in a wireless circuit was born, and the transistor era began.

When the transistor was announced it had very limited applications in radio and, as far as wireless broadcasting was concerned, it was "an unpredictable device".[94] Since then, it has developed into a component which can be employed in a wide variety of wireless circuits.

Bearing some resemblance to the triode vacuum tube inasmuch that it has three elements and is capable of generous amplification, the transistor possesses many superiorities when compared with the vacuum valve. These advantages stem from the minute size of the transistor itself and its dependence upon only low power sources for operation. Not having to withstand high voltages makes possible miniaturisation of other components as well, and, together with added features, the use of the transistor in wireless communication has taken mobility to a degree never before envisaged, a mobility which has been made possible by reduction in general set size without loss of performance.

Because of the lack of heat generation in transistors, wide spacing of parts is no longer necessary. Again, because of only low power operation some parts necessary in high power receivers are now redundant. Their removal simplifies circuitry and further reduces size. [95]

Another consideration which makes for mobility in transistor receivers is the smallness of batteries required. As they use only low voltage, and draw minute current, small batteries can power transistor receivers effectively. Ordinary torch dry cells are adequate, but generally special shape batteries are fitted to suit the contour of the container housing the wireless set.

[92] United States Information Service: "Twelve Inventions that Changed the World"; p.26.

[93] Ibid.

[94] Hurst, R. N.: "Introduction to Junction Transistors"; a journal issued by the Radio Corporation of America, June 1959; p.1.

[95] Valve wireless sets use quite bulky power transformers or large batteries, but not so transistor sets.

In many cases, due to the very low current drain of transistor-operated receivers, battery life is long; often as long as the normal shelf life of the dry-cell batteries. This is in direct contrast to the No. 11 Wireless Set, which had a considerable current drain even when used as a receiver only, and in which the battery life, from full charge to stop, would be about eight hours, a time roughly one hundredth of the effective battery life for a transistor receiver giving equally effective performance.

Transistors were first used in commercial-type broadcast receivers. The reduction in weight and size was dramatic even when compared with miniature valve type portables. By 1957 the smaller transistor sets were much in favour for their mobility. This appeal has steadily increased. Simultaneously improved production techniques have made for the production of smaller and even more robust wireless sets. One example of these techniques is the innovation of printed circuitry. Under this arrangement connection between parts of the wireless set is made through metallic lines stamped onto a base board to which necessary components are affixed. In this way the danger of loose wiring or frayed leads, and consequent failure, is obviated. A much more robust job ensues.

Transistors lend themselves to use in low power transmitters. There they can be utilised as oscillators, thus replacing larger valves, and also prove highly satisfactory in amplifying audio power from a microphone. They do, in fact, have a distinct advantage over valves for this latter function. Such is so because of the absence of hum noticeably associated with valve amplifiers due to heater-cathode leakage. Transistors also have a very low noise level when compared with valves used as audio amplifiers. This fact assumes importance in lower power mobile equipment.

One of the outstanding benefits of transistors in mobile equipment is the reliability of the transistor itself. They seldom fail, and stand up to rugged use in situations of strain, stress and shock. They can be made impervous to weather and even operated under water.

When transistors were first developed they were only capable of low frequency operation. Since then, new construction techniques have been developed which make possible the manufacture of silicon transistors equal to very high frequency operation up to a maximum of three hundred megacycles. This is an indication that the embargo on even higher frequency operation and higher power operation may be lifted by further developmental techniques. Consequently the use of transistors in wireless equipment will extend.

### APPENDIX 3

### PRINCIPLES OF TRANSISTOR OPERATION

In general, the transistor can be compared to a vacuum tube. The base is similar to the grid of the vacuum valve in that they both serve to control electron flow through the device. The emitter and cathode both supply the source of electron flow. The collector of the transistor and the plate of the valve are similar inasmuch that they are both normally part of an output circuit. However, these similarities are only approximate. It must be remembered that, whereas the operation of an amplifying valve depends upon conduction through a vacuum, in a transistor, the fundamental process of conduction depends upon the passage of charge carriers in a semiconductor. Also, it is as well to state that whilst the grid of a vacuum tube and the base of a transistor do approximately correspond, they also differ. A vacuum tube grid in normal operation draws no current; the total cathode current flows in the plate circuit. This is not so in a transistor, as the base shares the emitter current between itself and plate. Hence the base has an appreciable current flowing in it.

Information gleaned from:


(i) Wolfendale, E.: "The Junction Transistor and Its Application"; Heywood and Company, London, 1958.

(ii) R.C.A. Service Company: "Transistor Fundamentals and Applications"; Radio Corporation of America, Camden, U.S.A., 1958; a 43-page journal.


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## DX-PEDITION TO NORFOLK IS.

(Continued from Page 11)

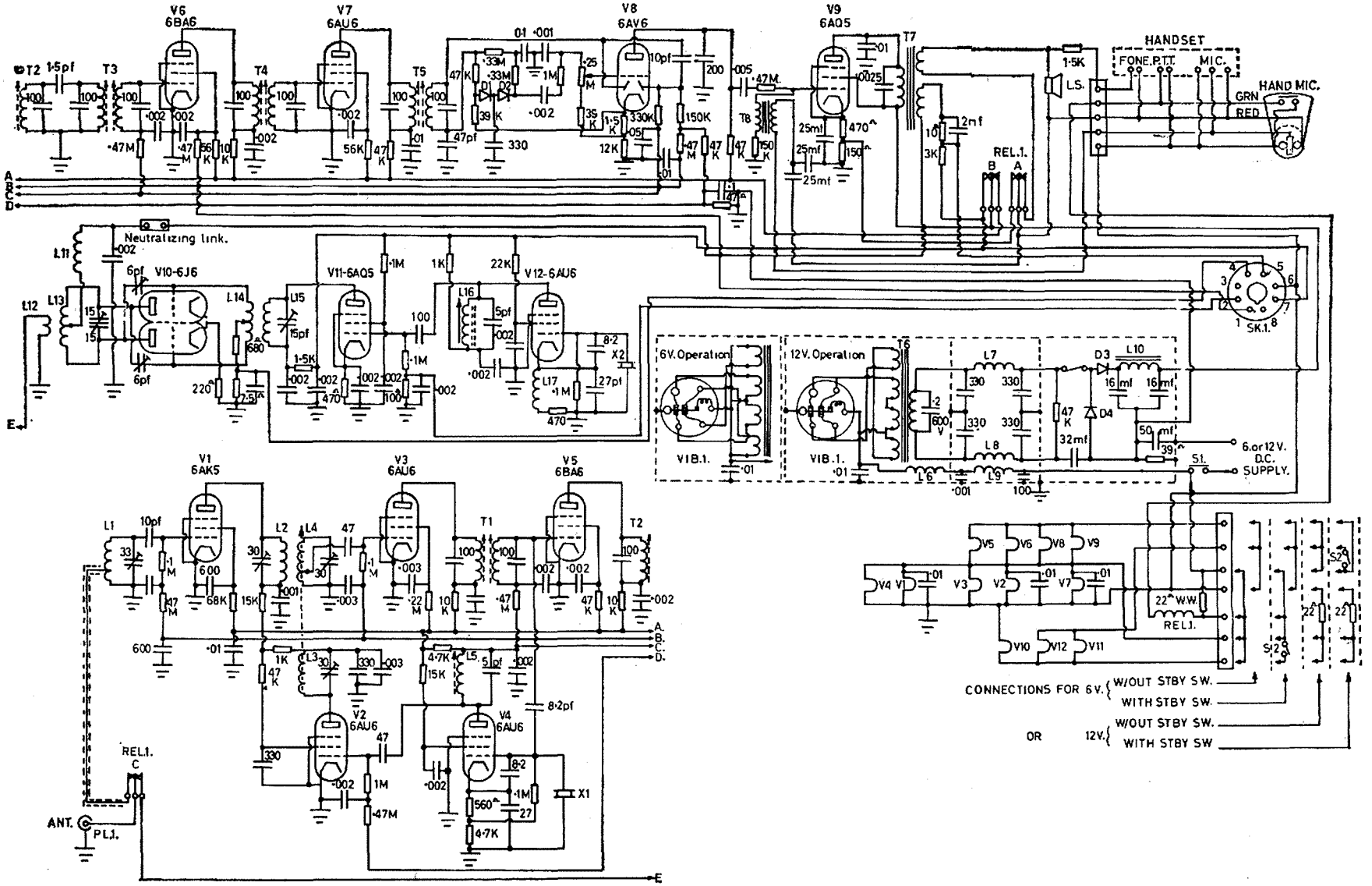
I must pay tribute to the skill of the great majority of DX operators whom I had the pleasure of working. With very few exceptions they heeded the request for no repeat QSOs on the same band/mode and instructions regarding the frequency on which to call. Their co-operation regarding QSL exchange was also appreciated.

The last QSO of the DX pedition was made on Saturday, 30th January, with a German station. Owing to a change in the airways flight schedule, departure was quite a hurried affair, and we felt very pleased that the 40-metre ground plane had already been dismantled on the previous day in anticipation of such an event.

Back home at Templestowe, there were approximately 400 air mail QSL cards neatly stacked according to date of arrival by my young daughter. The number was to increase as the days went by. Through the co-operation of the printer who had done an excellent job with my own VK3TL card, several hundred QSLs were made ready for despatch within a week of my return. At this stage I must acknowledge the wonderful help of my wife Shirley who, in addition to keeping the fort while I was away, gave assistance as my QSL manager and was so tolerant of the whole adventure. I am appreciative of the co-operation of the Australian P.M.G. Department in issuing the call VK9TL in response to my request for it, and to the Norfolk Island Tourist Bureau for the supply of some very beautiful postcards of the island in natural colour. Recipients of the VK9TL QSL card will also appreciate this kind gesture of the Bureau.

My thanks to Galaxy Electronics, of Iowa, U.S.A., to Arie VK2AVA and Bill VK3AHT, who kindly gave me the loan of equipment, and to the many Hams on all continents who endeavoured to assist me establish contacts in their areas.

For those interested in figures, the number of QSOs were 3,021 and the A.R.R.L. country tally, 127. Approximately 60% of the QSOs were made with the Morse key. The DX-pedition made a greater inroad into my banking account than I had anticipated; but the trip was made worthwhile, quite apart from the aspect of adventure, by the many notes and letters of appreciation of DX enthusiasts for whom Norfolk Island was "a new one". ●




## SIX-METRE TRANSCEIVER

As a service to readers, "A.R." has drawn the circuit of the "Pye" Reporter. No other details of this equipment are available direct from Messrs. Pye Pty. Ltd.

# THE CRYSTAL CHECKER*

*E. H. MARRINER, W6BLZ*

**● The simple device described was built to determine the condition of the many crystals around the shack. It may also be used as a calibrator for band-marking and as an accurate signal generator for aligning i.f's since it is designed to function at the low end of the spectrum as well as the high end.**

SURPLUS crystals are cheap! Every surplus store has a crystal grab table set aside, piled high with surplus crystals. They come in every size, shape, frequency and holder. Mail order catalogues and flyers are filled with crystal advertisements. Some dealers sell nothing but surplus crystals which they have bought by the carload lot.

These crystals, now available, may be good, bad or broken, but at a bargain price of ten cents each. There are still plenty of them on the markets. Now would be a good time to stock up for future use. They can be used later in transmitters, receivers, oscillators, mobile converters and many other projects.

As the buyer is aware, these crystals have been around a long time but are generally in good condition. Some may need only cleaning of the crystal to make it work. The best way is to check them out before you buy them. You can either take a plastic bag-full home with you or check them at the store with this crystal checker. Just ask the clerk if you can plug into the wall outlet, insert in your selected crystals and check them out before you buy. You might be surprised by the enjoyable afternoon you can spend searching for these goodies at ten cents apiece instead of $3.00 each at a regular store.

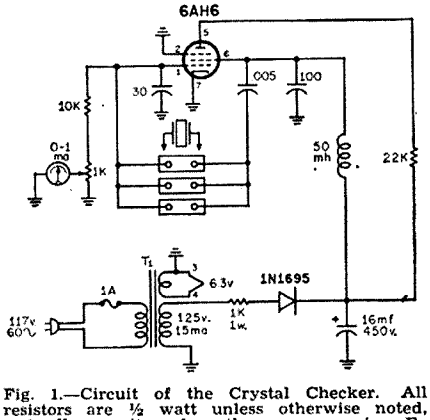



Fig. 1.—Circuit of the Crystal Checker. All resistors are ½ watt unless otherwise noted, and all capacitors less than one are in μF., greater than one are in pF.

Someone is sure to ask, "Why not a transistorised crystal checker? Why bother with a checker that has to plug into the wall socket?" Many crystal oscillators using transistor circuits are very critical to the frequency. Parts have to be tailored for just that frequency and generally they do not oscillate over a large frequency span. This tube type crystal checker is much more versatile, not only checking crystals through the 2 to 30 Mc. range, but also testing the ones in the 200 Kc. to 500 Kc. range, or fundamental crystals.

After all, the tester isn't much bigger than a transistorised unit and what could be easier than just plugging it into the wall sockets, inserting your crystal and reading the meter?

* Reprinted from "CQ," July, 1964.

## OPERATION

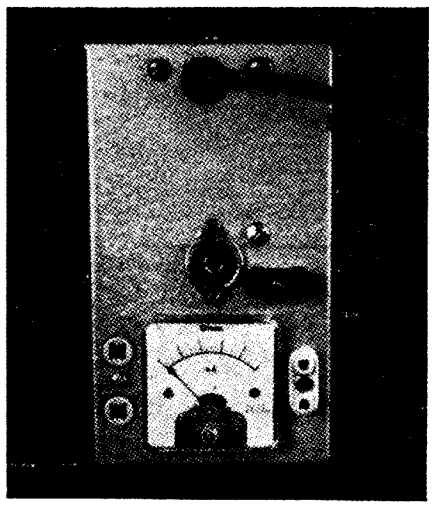
This circuit employs a 6AH6 tube in a parallel Pierce oscillator circuit. By using a large radio frequency choke in the screen lead, the circuit will oscillate at very low frequencies besides the high frequency range. When the crystal is plugged into the socket and the circuit oscillates, the grid circuit will draw grid current which can be read on a meter.

A good oscillating crystal will cause from 0.5 mA. to 1 mA. of grid current. By taking a good crystal and checking the current, you will see that this can be used as a reference for other crystals. A bad crystal will produce a low current and the following is a scale of activity:—

0.0 to 0.2 mA.—Bad Crystal.
0.2 to 0.3 mA.—Fair Crystal.
0.3 to 1.0 mA.—Good Crystal.

## CONSTRUCTION

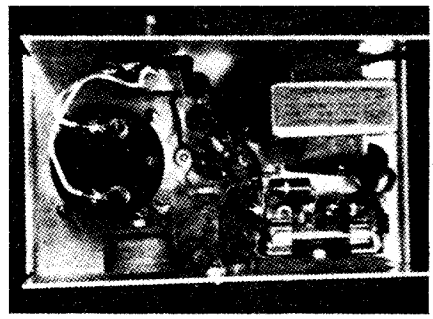
There are no particular precautions to be observed in building this circuit. All of the parts fit nicely into a chassis box, 3" wide, 5" long and 2" high. The only thing to watch out for is to select a crystal socket or sockets for the type of crystals you think you might like to test. The FT-243 is the most common type. Just leave enough room when locating the crystal sockets so they can be inserted without hitting the tube or meter.



Front view of the Crystal Checker showing the parts location. Note sensitivity pot. on the right side of the box.

## TESTING

When the circuit is finished, select a crystal that you know is active. Put it in the circuit and set the 1,000 ohm potentiometer so that the meter reads 1 mA. When other crystals are put into the circuit they can be compared with this meter reading.



Bottom view of the Crystal Checker showing parts location. Picture was taken before the extra crystal sockets were added. Note the simple but compact wiring.

Test gear like this is worth having around the shack since it can be used for a calibration oscillator as well as a crystal checker. There are all kinds of possible uses such as aligning receivers, keeping a check on Amateur band edges, or even keyed in the cathode lead and used as a code oscillator when listening to the crystal frequency in a receiver with a b.f.o. Why not give it a try? ●

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## BACK ISSUES OF "A.R."

We have a limited quantity of back numbers available at 1/6 per copy post paid, or 1/- each if collected. If your files are not complete, write to the Secretary, W.I.A., P.O. Box 36, East Melbourne, immediately. The copies available are:—

1959: February, March, April, May, June, August, September, October, November, December.
1960: January, February, May, June, July, October, November.
1961: January, March, April, May, June, July, August, September, October, November, December.
1962: January, February, March, November.
1963: February, March, June, July, August, September, October, November, December.
1964: All months.
1965: All months to date.

# From Our Reading

**"QST," December 1964**

No Tubes—Four Watts—Six Metres is a description of a fully transistorised transmitter and modulator and provides some interesting answers to the problems encountered.

Transmitter Keyer/Muter for Collins S Line will interest owners of this equipment who would like to operate break-in c.w. without relays.

A Low-Cost Transistor Mobile Power Supply describes a supply capable of supplying 35 watts continuous duty with an efficiency of 92% under full load, but the toroid core may be difficult to obtain here.

High Power Version of the Keyed Antenna Relay may be the answer to those having trouble with relay contacts welding together, but again parts may be difficult to obtain if exact duplication is intended.

First Maxim Award to Reinartz summarises the contributions that the late John L. Reinartz made to short wave radio.

The Antalo is an unusual development of the halo antenna and purports to give up to 9 db. gain. Mobile enthusiasts may even try one on their cars.

A Easy-to-Make, Coax.-Fed, Multiband Trap Dipole gives all the information necessary to construct one of these topical antennae.

Extending the Range of the BC221 Frequency Meter details the modifications necessary to extend the range of this fine piece of equipment up to 200 Mc., still maintaining the accuracy of the normal ranges.

A Heterodyne-Type Transmitter for 144 Mc. describes an interesting way to provide a v.f.o. control transmitter for 2 metres suitable for a.m., c.w., or s.s.b. Very few will duplicate this equipment, but the ideas provide food for thought.

Recent Equipment reviews the Lafayette HA-30 receiver.

**"CQ," December 1964**

The ARC-Port describes another way of using the ever-popular Command receiver, this time as a portable c.w. transmitter-receiver and could be ideal for those interested in a small rig for holidays.

More output from your Hammarlund HX-50 may interest owners of this equipment.

A Transistorised HV-LV Mobile Supply is an inexpensive d.c. to d.c. converter providing outputs of 100 and 250 volts suitable for receivers, and 800 volts for transmitters at 250 mA. The size of 4" x 6" x 8" should not be a drawback considering the output.

R.t.t.y. from A to Z is part 5 of the series.

Eliminating t.v.i. in Modern Transmitters deals with the problems encountered in a Hallicrafter HT37, but should provide answers for other commercial gear as well as home-brew equipment causing t.v.i.

A No Clobber Converter for 6 Metres has been designed to achieve the maximum in cross-modulation and overload characteristics and should be a must for those suffering from Channel 0 interference.

Thevenim's Theorem and Its Applications is another method of determining the voltage across a certain component.

Automatic Carriage Return for the Model 15 will interest only the r.t.t.y. enthusiasts.

"CQ" Reviews gives a rather comprehensive review of the Heathkit SB-400 Transmitter.

More on the 6BLZ Special suggests some improvements to this excellent receiver—described in "CQ," July 1964.

**R.S.G.B. "Bulletin," December 1964**

A Wobbulator for Communications Receiver Alignment describes a complete unit with continuous coverage over most desired frequencies.

The G3IAS Transistorised Electronic Keyer gives a detailed description of a rather sophisticated keyer and also describes the paddle.

R.S.G.B. International Radio Communications Exhibition gives an interesting summary of some of the latest commercial and Amateur equipment now available in England.

Relay Supplies, simple style, shows that it is not always necessary to have a separate relay power supply.

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If you are a member of the W.I.A., your Divisional Secretary will supply you with the Badge. It is your privilege to wear.

## TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

Manuscripts should preferably be typewritten but if handwritten please double space the writing. Drawings will be done by "A.R." staff.

Photographs will be returned if the sender's name and address is shown on the back of each photograph submitted.

Please address all articles to the
EDITOR "A.R.,"
P.O. BOX 36,
EAST MELBOURNE, C.2,
VICTORIA.

# NEW CALL SIGNS

**DECEMBER 1964**

VK2ZJ—E. J. Roberts, 26 Gammell St., Rydalmere.
VK2ACW—C. O'Connor, 53 Ocean St., Windang.
VK2BAM—I. M. Bartlett, Portion No. 683, Princes Highway, Waterfall.
VK2BDG—D. G. Buckman, 26 Winifred Ave., Epping.
VK2BMK—M. K. Francis, Hill St., Scone.
VK2BRM—R. V. Miles, 9 Croydon St., Lakemba.
VK2BRW—W. R. Beveridge, 18 Murdoch St., Turramurra.
VK2ZEO—A. W. Beasley, 328 Cressy St., Deniliquin.
VK3QO—K. McL. Roberts, 32 Redesdale Rd., Ivanhoe.
VK3ASJ—S. J. Excell, 33 Girlon Cres., West Geelong.
VK3AVS—D. G. Warring, 158 Melville Rd., West Brunswick.
VK3ZGN—A. E. Osland, 159 Bent St., Northcote.
VK3ZPR—I. R. Phillips, 179 Abbott St., Sandringham.
VK3ZZO—R. J. Callander, 383 Warrigal Rd., Burwood.
VK4AJ—A. T. Newell, 1223 Ipswich Rd., Moorooka, Brisbane.
VK4DE—K. E. Darch, 45 Goldfinch St., Inala.
VK4HW—D. J. Hutchins, Lake Manchester, C/o. P.O. Mt. Crosby.
VK4IO—Ipswich & District Radio Club, 77 Darling St., Ipswich.
VK4MI—I. Mackellar (Wide Bay Amateur Radio Club), Station: Avoca St., Bundaberg; Postal: 231 Bourbong St., Bundaberg.
VK4QH—Queensland Branch Hdqrs. Boy Scouts Assn. Radio Club; Station: 132 Wickham St., Valley; Postal: P.O. Box 50, Broadway, Brisbane.
VK4TO—D. C. Lynch, 63 Barolin St., Bundaberg.
VK4ZLD—L. A. Dobbs, 202 Horton St., Koongal, Rockhampton.
VK5ZTM—T. G. Marshall, 47 Ayre St., South Plympton.
VK6KT—K. Tsiaprakas, 24 Kennard St., South Perth.
VK6NS—N. F. Schroeder, Mowanjum Mission, Box 37, Derby.
VK7ZBC—B. H. Christensen, 104 St. John St., Launceston.
VK7ZBK—R. J. Geeves, 47 Bowden St., Glenorchy.
VK7ZBW—B. R. Waldron, 62 Connaught St., Launceston.
VK7ZDL—D. E. Llewelyn-Butcher, 19 Hunter St., Launceston.
VK7ZTX—B. N. Muir, 126 Montagu St., New Town.
VK9CR—R. J. Conway, Cocos Island.
VK9ZFE—F. E. Earley, C/o. Supr. Technician, Radio 9RB, P.O. Box 301, Rabaul.
VK0GW—G. W. Webster, Mawson, Antarctica.
VK0KH—K. E. Hicks, Wilkes, Antarctica.
VK0MC—J. F. McKenzie, Wilkes, Antarctica.
VK0TO—T. Olrog, Macquarie Island, Antarctica.

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## STATISTICS

Some interesting non-amateur statistics: There are now 2,380 t.v. transmitting stations in the world—nearly six times as many as in 1954 . . . in the same decade the number of sound broadcasting stations has nearly doubled, and is now 12,600 . . . At the receiving end, the U.S.A. leads on t.v., with 60 million sets in 90 per cent. of the homes; Japan comes second, with 13 million sets, which represents 95 per cent. of Asia's total. Finally, in the ten years, 1954-64, the world total of radio receivers has risen by 60 per cent. and that of t.v. receivers by 300 per cent. (population growth during the same period has been about 26 per cent.)

—"World Communications," U.N.E.S.C.O.

# S W L

Sub-Editor: Chas. Aberneathy, WIA-L2211
30 Urunga Parade, Miranda, N.S.W.

It is with pleasure that I have to make it known that the Moorabbin Radio Club have decided to issue a certificate to S.w.l's. The conditions are as follows: For Australian listeners (excluding VK9) QSL cards from 10 Club members are required. For overseas listeners, QSL cards from 5 Club members are required. The Club would prefer QSLs themselves, but will accept in lieu a certificate from an authorised person confirming the existence of the cards. Within Australia this person is to be either the President, Secretary or Treasurer of the local branch of the W.I.A., or for overseas listeners, the equivalent officers of the local branch of the appropriate national organisation.

Cards or their equivalent can be sent to the Certificate Officer, Moorabbin and District Radio Club, 17 College Grove, Black Rock, Victoria. When sending cards (in Australia) include a stamped addressed envelope, and when from overseas an addressed envelope plus one I.R.C. for the return of cards.

On behalf of our members, I must thank the above Club for making their certificate possible as I know their fine gesture will be well received by all S.w.l's.

During February, I received offers of assistance from three different States, and it has been arranged for these chaps to accept s.w.l. problems from our members living in the State concerned. This we thought would ease the congestion at this end, and so speed up replies to our members. So if you have a query, pen it and enclose a stamped addressed envelope for your reply to:

N.S.W.: Sid Underwood, 99 West Botany St., Arncliffe, N.S.W.

Victoria: Boger Harrison, 1 Mary Street, North Balwyn, Vic.; or Harry Major, 30 Seaton St., Glen Iris, S.E.6, Vic.

Western Aus.: Peter Drew, 84 Adelma Rd., Nedlands, W.A.

From Bryan L6028 comes propagation details as heard from the V.O.A. station on 21/2/65, for 1965:

160 mx: Good openings if patient enough.
80 mx: Late night time DXing.
40 mx: Night time best for DX.
20 mx: Will open longer in the evenings.
15 mx: Day time DX will increase in 1965.
10 mx: Will open for DX in October 1965.

**TRANSFORMERS**

Two coils coupled by mutual inductance constitute a transformer. The magnetic field may link the coils either through an iron core or an air core, the latter usually being used for radio frequencies. The coil connected to the a.c. voltage supply is called the primary winding, the other coil, which is ordinarily connected to a load, is called the secondary winding. A transformer is useful for transferring electrical energy from one circuit to another without direct connection, and for stepping up or stepping down voltage or current levels.

In a transformer having a closed iron core practically all the magnetic flux lines produced by the primary winding link every turn of the secondary winding. Such a transformer is almost perfect, since it has practically no leakage flux. For a given magnetic field, the voltage induced in the primary coil is proportional to the number of turns in its winding, and since the secondary coil of a perfect transformer is in the same field, the voltage induced in the secondary is proportional to the number of secondary turns. Hence, for a perfect transformer, the ratio of primary to secondary voltage is equal to the ratio of the number of turns in the two windings.

If the magnetic fields in the primary and secondary of an iron core transformer are to be equal, their respective magnetising forces must be equal. The magnetising force of a coil is expressed as the product of the number of turns times the current flowing in the coil (called ampere turns). Consequently, the primary current multiplied by the primary turns must equal the secondary current multiplied by the secondary turns.

By comparison with the previous expression, it is apparent that the current is stepped down, when the voltage is stepped up, and vice versa.

**S.W. RECEIVER**

If you own a standard broadcast receiver it is possible for you to acquire a good short-wave receiver with relatively little work and at no great cost. A broadcast receiver contains almost the same parts as a s.w. receiver, and by adding a self constructed preselector to make up for its deficiencies in regard to sensitivity, selectivity and frequency range, you will obtain a very good short wave receiver.

**NEW SOUTH WALES**

There is not much activity in this State at the moment, maybe with the beautiful weather they prefer swimming to listening these days. If so, they have missed some really good DX on 20 metres.

Sid L2258 has erected a vertical antenna, which he claims is the most, and has logged OA4, GW3, 9M4, VU2, YV5, DL6, YK1, UB5 and many others. I am pleased to hear that you have started the A.O.C.P. course, and I wish you well.

Henry L2271: I believe that you are back in Sydney. Just could not stay away from your old mates, hi. How about a few words of your doings in the near future?

Mac L2174: Many thanks for your consistant support. I only wish that we had many more as reliable as you. That tape on sunspots should be of interest, so bring it to one of our meetings. The L3 boys send their regards to you.

Ray L2287: 'I trust by now that the idea of getting going on v.h.f. has developed, as you shall not be disappointed for it is a most interesting band. Recent loggings: CR9, ZP5, UN1, UL7, UQ2, OH2 and ZS6, with QSLs from XW8, VU2, OH2 and ZS6.

Alan L2018: Bad luck with the AR7, but I guess that 7 Mc. on the other one is something at least to tide you over until a better rx comes along. I do hope that the wire arrived and it shall be of some value. Best of luck with the A.O.C.P. course.

Arnold L2291 is a member of the South Broken Hill Radio Club (2AOD). He says that they are on the air each Friday night and would like to make skeds with other radio clubs on the 20 or 80 metre bands.

**VICTORIA**

The Victorian group got off to a good start for 1965, when an article in the daily paper about the group's activities produced another 30 new faces at the March meeting. We now have a full roster for our Sunday broadcast readers and hope that all members are listening for details of group activities. Country members who are down in the big smoke are reminded to call in to the club rooms on the second or last Friday of each month to say hello to the fellows. The group now has its AR8 rx installed in the club rooms, and will be available for members to listen on at the meetings. We hope to have a suitable aerial erected in the near future if we can find space among the mass of sky wire on the roof. We regret that a lot of members did not have their numbers recorded in the Call Book, so to prevent this happening in the future, we are working now on the list for the next Call Book.—Ian L3006.

Many thanks Ian for your monthly contribution of your Group's doings. This I can assure you is much appreciated.

Noel L3101: I do trust that Gwen and yourself have a very enjoyable trip. Okay on your K5 QSL; yes, they can take a long time to make the grade. Pleased to hear you both enjoyed the films.

Greg L3138: At long last you received your R.H. award 1963/64, congrats. That score of yours in the N.F.D. is really something. Recent QSLs: VR2, PA0, VK9, HM2.

Eric L3042: I hope that Jean and yourself have a nice holiday in VK5. Heard on 3.5: VE3, KH6, JA3, JA7, W6, W8; on 7 : DJ0, GI3, G6, GB2, OK1, 9M4, OE1, UG6, VS9, VR4; on 14: AP5, FO8, FK8, TM5, VS9, 4S7. QSLs to hand: DL, EI, HA, HL, UA9, UT5, UQ, 4W1, YO, 9M4, etc. Eric has suggested that I mention that action has been commenced on two new awards to be made available to s.w.l's. So later in 1965 we should have yet a few more awards to work for.

**SOUTH AUSTRALIA**

L5065: Alan, I'm very pleased to hear that you had such a good time on 6 mx when you logged all VK States. Congrats. on getting your award for the N.F.D. 1964. Latest QSLs to hand: VQ8AR and JA1AEA.

Brenton L5069: Pleased to hear that you both arrived home safely, also that you had a nice time in Sydney.

Tim L5067: That T2FD antenna sounds pretty good to me. Have you ever tried a vertical? Sid L2258 has had excellent results, and if you are interested send him a s.a.e., and he will gladly send you the info.

Tony L5073: I trust by now those books have come to hand for the radio club and that they are of some value.

**WESTERN AUSTRALIA**

Bryan L6028: Thanks for the propagation details OM. Those little items of interest are very helpful. Heard recently, 20 mx: ET3, CX9, HS1, LA7, KX6, 4X4, 5A4, 7Q7, KA8, 7Z2; on 15 mx: EP2, 9K2; 10 mx: KR6.

Alan L6029: I do hope that you are back home again after your stay in hospital and that all is well. Bryan told me that before your accident that you had logged: YV5, VS9, HZ3, GM3, SM5, MP4, 5A5, UD6, E13, PY3, XW8, FB8, FR7, OA4.

Geoff L6030: Thanks for your letter OM. Added to your log this month I notice are: KC4, KC2, CR8, HB9, KH6, KJ6, YO4, PJ3, KL7, SP5. Quite a nice variety.

Peter L6021: I notice that you are still getting amongst the DX to the tune of: KS6, VU2, SP4, HK4, OA4, DL4, 9J2, UV9, HA1, OE8, F3F, ET3, AC5, KS6, OZ2, etc. QSLs from: G8, LZ, OA4, OK1, OK2, PA0, K0, 4X4, 5N2, and 7GI.

**TASMANIA**

Although there is not an s.w.l. group in VK7, any person interested in getting an L number in that State can join the VK7 Division by applying to the Secretary who will issue listeners' numbers.

Greg Johnson: Those scraps of information as you call them are very welcome indeed, so keep sending them. I only wish more of our members would do likewise.

**GENERAL**

For the card swappers: Here are two more JA S.w.l's: JA1-1953 and JA1-3893. Send your cards to Yutaka Tanaka, 66-1 Bancho, Koshien, Nishinomiya, Hyogo, Japan.

Well chaps, that's about it for this month, but remember, tools don't cause accidents, it's how they are used. 73, Chas L2211.

**S.W.L. DX LADDER**

| | Countries Conf. | Countries Hrd. | Zones Conf. | W States |
|---|---|---|---|---|
| E. Trebilcock .... .... | 285 | 293 | 40 | 50 |
| P. Drew .... .... | 158 | 258 | 35 | 34 |
| D. Grantley .... | 126 | 282 | 39 | 35 |
| M. Hilliard .. .... | 91 | 241 | 33 | 14 |
| M. Cox .. .... .... | 89 | 225 | 33 | 23 |
| G. Earl .. .... .... | 83 | 160 | 33 | 11 |
| L. James .... .... | 76 | 174 | 30 | 14 |
| R. Kearney .. .... | 70 | 146 | 32 | — |
| C. Aberneathy .. | 65 | 105 | 33 | 14 |
| W. Smith .... .... | 58 | 187 | 27 | 7 |
| N. Harrison .... | 60 | 176 | 31 | 37 |
| A. Raftery .. .... | 31 | 148 | 15 | 6 |
| R. Harrison .... | 20 | 70 | 17 | 5 |
| R. Oats .. .. .... | 17 | 40 | 13 | — |
| B. Prosser .. .... | 17 | 136 | 8 | 2 |
| B. Mackintosh .. | 10 | 55 | 10 | 1 |

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# *Publications Committee Reports That . . .*

To the 15th March correspondence was received from the following: VKs 3ZC, 3KB, L4018, L3102, L5067, 2AXS, 6ZDM, 5JE and Ted White, plus technical articles from 5TN, 2AMA, 3ZGZ and 7LE, and a note from M. T. Done at Gawler.

Due to the lateness of the Publications Committee meeting caused by members being on the W.I.C.E.N. net for the bush fire period, it has not been possible to publish all correspondence in this issue. Readers will appreciate the unusual nature of the delay and will, we trust, be tolerant of the absence of their letters.

This report is very brief due to the reasons stated above, and in our next issue all will return to normal with a more comprehensive report on your committee's activities.

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AMATEUR FREQUENCIES:

ONLY THE STRONG GO ON—
SO SHOULD A LOT MORE
AMATEURS!

# DX NOTES

Sub-Editor: H. A. Bebenna, VK5BB,
14 Stanley St., Crystal Brook, S.A.

Wel this month will be about the shortest DX page on record. Firstly, we are moving to a new QTH. We are in the process of preparing the above. Consequently Amateur Radio has had to take a back seat. And will have to remain so over the next couple of months. Over the past month my nightly skeds have stretched out to fortnightly ones.

I make this appeal to the good hearted ones to send in their reports. This will relieve the situation no end here. This month I have received the staggering amount of two reports, which further complicates the DX reporting from here.

From Ken VK3TI: Ken is back from Norfolk Island and has 800 QSLs waiting to be answered. 3,021 QSOs were partaken of, and 127 countries were contacted.

Among the best were the following: AP5SQ, AP5HQ, BV1USG, CP5EZ, CR4AJ (Cape Verde Is.), CR7GF, CR9AI, CRCT, CX1AAC, CX1AAP, CX7CO, DU, EI3S, EI9V, EP3RO, EP2EI, EP2AU, ET3USA, FK8, FO8, HC, HL9, HM1AB, HM1AQ, HP1IE, HR1RP, HS1J, HZ3TYP, IT1TA1, IT1AGA, IT1ZGY, IT1LOP, IT1RAI, JT1AJ, KG6SB, LX1CO. M1B, MP4BCC, MP-4BEK, PY, PZ1CP, SL5TRS, SL6BH, SV1AE, SV0WF (Rhodes), TI, VP7NS, VP7CX, VP7BG, VP9FH, VQ8AM, VS9, XW8, YN, YS1SRD, YS1RRD, YS1RFE, ZC4CZ, ZC4GT, ZD5R, ZS8G, ZP5CP, ZP5EC, ZP5LS, ZP5KT, ZP5BC, 3A2CP, 4U1ITU, 5A1TW, 5A1TR, 5A1TT, 5Z4ERR, 5A2TR, 6O6BW, 6Y5MJ, 7Q7PBD, 9M4, 9M6AA, 9M8EB. All the above worked on 20 metres.

On 40 metre c.w. CE0AG (Easter Is.), CX7BY and EA8CM (Canary Is.). Many thanks, Ken.

From Syd VK2SG the following: 5X5JG will be closing down in early March from Uganda and anyone who has not received his card should write to his home address:

J. Marland,
C/o. Mooney, 7 Moorcroft Street,
Kirkholt, Roshdale,
Lancs., U.K.

Regarding the bands, says Syd, he worked mostly 20 metre c.w. and s.s.b., though I do look at 15 during the day time, but 15 mx is pretty dead, only W and JA. 20 mx is fairly good for most of the day both to the east and north.

At nights Europe via the short path and North Africa firing about due West, long path to Europe is a bit spotty, although the path due East seems to be the best for mid afternoon and day time to Europe and the Mediterranean area. South Africa is rather poor for normal operating, though 0500 to 0600 seems fair and 1800 again is fair but there are no real booming signals coming through.

VU2NRA has been heard and worked twice while VQ8AMR has been heard. Owing to the number of stations that will call him on his own frequency, he does not listen on his own frequency, but only 15 kc. up or down as the mood takes him. VK4TE on Willis Island is on every week-end and really lifts the receiver off the bench.

Very special thanks to Ken 3TL and Syd 2SG for their reports this month. 73, Bert VK5BB.

## W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

### PHONE

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK5MS | 24 | 310 | VK2ADE | 65 | 231 |
| VK5AB | 45 | 310 | VK2JZ | 61 | 224 |
| VK6RU | 2 | 306 | VK6KW | 4 | 211 |
| VK6MK | 43 | 302 | VK3WL | 14 | 211 |
| VK3AHO | 51 | 297 | VK4HR | 12 | 208 |
| VK4FJ | 21 | 283 | VK3ATN | 28 | 204 |

New Member:
VK3LW 66 107

Amendments:
VK3TL 62 196 VK2AGH 55 118

### C.W.

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK3KB | 10 | 328 | VK2AGH | 71 | 274 |
| VK3CX | 26 | 305 | VK6RU | 18 | 262 |
| VK2QL | 5 | 301 | VK3AHQ | 79 | 254 |
| VK4FJ | 29 | 298 | VK2EO | 2 | 250 |
| VK2ADE | 81 | 298 | VK3ARX | 66 | 247 |
| VK3NC | 19 | 286 | VK3YL | 39 | 240 |

Amendments:
VK4HR 8 235 VK3TL 78 203

### OPEN

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK2ADE | 28 | 322 | VK2ACX | 6 | 300 |
| VK6RU | 8 | 311 | VK3NC | 77 | 287 |
| VK4FJ | 32 | 307 | VK4HR | 7 | 254 |
| VK2AGH | 83 | 305 | VK3JA | 43 | 252 |
| VK6MK | 74 | 304 | VK2VN | 18 | 243 |
| VK3AHO | 76 | 301 | VK7LZ | 23 | 242 |

Amendment:
VK3TL 85 229

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# YOUTH RADIO CLUBS

In the December issue of "Wireless World," there is an account of the big International Communications Exhibition in London. In his opening address, Mr. G. M. Stone, President of the R.S.G.B., stressed the need for attracting young people. He said, "We feel that in the past our Society has not done enough to encourage Amateur Radio as a hobby among boys and girls, and we are now looking at ways and means of taking Amateur Radio into secondary schools. In the first instance, we plan to do this through schoolmasters who are members of our Society. The R.S.G.B. has formed a new Education and Training Committee." The Soviet Union, probably more than any other country, officially encourages young people to become interested in Electronics by its "Radio Circles" in elementary schools and in club houses of its Young Pioneers (ages 9-14). In China, there is a very large organised scheme of teaching simple electronics in primary schools, followed by heavy emphasis in secondary schools.

Having survived the opening flurry of the new school year, most club leaders will now be in business. When they can find time they should notify the State Supervisor that the club is in existence and also send out some news (perhaps a little in my direction). More power to your arms!

Our club at Lyneham is again very pleased with a full A.O.C.P. success, this time by Andrew Davis, younger brother of Roger 1RD. Andrew is 15½ years, so will have to be patient. Andrew is the fifth A.O.C.P. in our group in recent years. He is in Leaving year but is finding a little week-end time for building a 7 Mc. transceiver. Would club leaders please send me details of other successes in the January exam?

Ken Matchett, 3TL, somehow found time to print his February Newsletter. The Science Teachers' Association has been informed of the Y.R.S. Why not a special pressure on the Teachers' College, as in Sydney? Phil Lavery, instructor at the Australian Postal Institute, has received his A.O.L.C.P. Christian Brothers Bundoora Club is to use 3ZFR as station call sign.

VK2 items are plentiful as usual. Jim Webster at Birrong High School, regularly produces a Newsletter of 8 (!) foolscap pages. Special mention must be made of Gary Tippett, a 1964 third form student at St. Edward's College, Gosford, who gained full A.O.C.P. towards the end of last year. This is the first instance of a third former passing. Congratulations to Gary—and this result should encourage many more round Australia. First candidate to gain a Radio Telephony Operator's Certificate is Warren Donald, of Punchbowl Boys' High, instructed by Allan 2ABA. For 1965, there is a prize list of 18½ guineas, three pennants, a trophy, and many parcels of radio components for a total of 15 competitions in VK2.

Hints to club leaders: It's a great thing to help the family budget of your young devotees by scrounging as much as you can for them, but take care that your hard-won gear does not vanish into thin air and force you into perpetual motion scrounging. At any age, there is a tendency to grab, even if there is only a vague idea of using it in 1970. Keep firm control by carefully registering all gear taken by each one and checking that it is pronerly used or returned in a reasonable time. While some will construct more than others, see that there is a fair share for all. You may even have to be wary of parents who consider that, if the boy makes small alterations on a valuable piece of gear, he automatically owns it. Our social aims will not be realised unless we teach the proper club spirit of fair shares and everybody help the other one. 73, Ken 1KM.

# "CQ" WORLD-WIDE S.S.B. CONTEST

## APRIL 10-11, 1965

(i) **Contest Period:** 1200 G.M.T., Saturday, 10th April, to 2400 G.M.T., Sunday, 11th April, 1965. Only 24 hours out of the 38 hours permitted for single operator stations. The 12 hours of non-operation can be taken in two periods, at the beginning, end or during the contest. It need not be in two equal periods, but must total a minimum of twelve hours and be clearly indicated on the log.

(ii) **Bands and Participation:** All bands 3.5, 7.0, 14.0, 21.0 and 28.0 Mc. can be used but operation is confined to two-way sideband emission only.

(iii) **Type of Competition:** 1—Single Operator: (a) all band, (b) single band. 2—Multi-operator: (a) all band only.

(iv) **Equipment:** Only one transmitter may be operated at any one time, and competitors may use the maximum power permitted under the terms of their licence. (Multi-transmitter operation is NOT permitted in this contest.)

(v) **Serial Numbers:** The contest exchange will be the usual five-figure serial number, RS report plus a progressive three-digit contact number starting with 001 for the first contact.

(vi) **Points:** 1, contacts between stations on different continents will count three points; 2, contacts between stations on the same continent but not in the same country will count one point; 3, contact between stations in the same country will be permitted for the purpose of obtaining a Prefix multiplier, but will have no QSO point value.

(vii) **Multiplier:** The multiplier in this contest will be determined by the number of different prefixes worked. A "prefix" is considered to be the two or three letter/numeral combination which forms the first part of an Amateur station call. (W1, W2A,, DJ2, DL4, GB2, 4X4, 5A1.) Each different prefix may be counted only ONCE during the contest.

(viii) **Scoring:** 1, the score for a single band entry will be the total contact points on that band multiplied by the number of different prefixes worked on that band; 2, the score for an all-band entry will be the total contact points from ALL bands multiplied by the total number of different prefixes worked on ALL bands; 3, a station can be worked once on each band for QSO point credit; however, prefix credit can be taken only once regardless of the band; 4, those sending in a log for a single band will be eligible for a single band award only. If a log shows more than one band, it will be judged as an all-band entry unless indicated otherwise; 5, a station will not be eligible for more than one award.

(ix) **Awards:** Certificates will be awarded to the highest scoring single operator station in each country and each call area of the United States, Canada and Australia. 1, for the highest score on each single band; 2, and for the highest score on all bands. Certificates will also be awarded to the highest scoring multi-operator station in the same areas but for all band scores only. (Alaska and Hawaii will be considered as separate countries for both scoring and award purposes.)

(x) **Disqualification:** Violation of the rules and regulations pertaining to Amateur Radio in the country of the contestant, or the rules of this contest, or unsportsmanship conduct will be deemed sufficient cause for disqualification.

(xi) **Log Instructions:** Indicate a prefix only the first time it is contacted. Use a separate sheet for each band and also a tally sheet or report form. All times indicated must be in G.M.T. And the 12-hour rest period must be clearly indicated. All contestants are expected to compute their own scores. Logs should be checked for contact and prefix duplication and proper point credit before they are submitted. Unscored logs will be used as check logs only. A prefix check list is not only desirable but a must for proper contest operation. Make sure name and address is clearly shown on each summary sheet, print or type. Each contestant must sign a pledge that all rules and regulations have been observed and that the report is a true one. Official log forms are available from "CQ". Send a large size, self-addressed envelope with sufficient postage to cover your request. If official forms are not available use a duplicate form. The size is 8½ x 11 inches with 40 contacts to the page. It is suggested that you send your prefix check-off list along with your log.

(xii) **Deadline:** All logs must be postmarked NO LATER than 30th April, 1965. Send logs to "CQ," 14 Vanderventer Avenue, Port Washington, New York 11050; attention: WW SSB Contest.

# V H F

## 52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Apologies for the brevity of the v.h.f. notes for this issue. Just at the critical moment we became involved in the State disaster organisation, brought into action by the Gippsland bush fires. A considerable number of Amateurs were involved, both on the h.f. and v.h.f. bands. 2 metre f.m. and 6 metre a.m. net frequencies were involved along with 3550 kc. in the 80 metre band. The operation began on 4th March and at the time of writing was still continuing. (Concluded on 12th March.—Ed.) Details will probably be covered at a later date. Thanks to all who took part for the excellent job done by all. 73, 3ZGP.

### NEW SOUTH WALES

**V.h.f. Group Has Own Call Sign:** It was felt that the time had arrived for the Group to have its own call sign, to be used on its many activities, like the National Field Day, when there were not enough official call signs to go round. The call granted is 2BWI. The committee has decided that in future all Group activities will use the new call.

**National Field Day** is over. The Group was active with two stations. 2AWI, under the direction of 2ZOD and 2ZPJ, set up camp at Terry Hills; 2BWI was located at Kanangra Walls. Operation was on 40, 20, 6 and 2 mx. 80 mx would not operate well from this site. Over 200 contacts were made in the 24 hours. The stations were manned and operated by VKs 2HO, 2ZH, 2BSB, 2BSC, 2ZOO, 2ZVM, 2ZPI, 2ZTM. Thanks to all who helped in any way.

**General:** 6 mx JA signals have been heard in Sydney. On 2/2/65 in the late evening, Keith 2BK was working a JA on the h.f. bands when the JA mentioned that he was copying a 70 Mc. signal. They then tried 50 and Keith was able to copy. He could not reply as the tx was not available. There is every chance that JA could be worked in the next few weeks, so watch for them, but remember they are on 50, not 52 Mc.

**Two Metre Openings to New Zealand:** From Reg VK2ZMR. At 1655 E.S.T. on 8/1/65 the band opened to ZL and remained in until 1915 hrs. During that time signals were from S4 to S9 plus. It appears that six Sydney stations worked, and were 2ZBJ, 2ZKP, 2ZPT, 2ZDW, 2ZMR, 2ZDP. Five other stations were heard by ZL but not worked. The ZLs were ZL1AVZ, ZL1AZR, ZL1ACO, ZL2AQL, and ZL2AAH. It appears that the contact between VK2ZMR and ZL2AAH will beat the present record. On 9/1/65 at 0930 E.S.T., ZL2AQL was heard by VK2ZMR, VK2ZCK and VK3ZMQ/VK2, but no contact was made.

The above are extracts from the VK2 V.h.f. Newsletter.

### VICTORIA

In recent months the Amateur has been asked to assist in various projects associated with the propagation of radio signals. To assist in these projects and help stimulate the interest of Amateurs, the V.h.f. Group has formed a small group to collect this information and pass it on to the interested parties.

Firstly there is Project Task Bridger—this project is being carried out to help clarify the characteristics and nature of anomalous trans-equatorial propagation via the ionosphere—and is being undertaken during the International Quiet Solar Year—I.Q.S.Y. by the Weapons Research Establishments and its collaborators.

Part of this project is the reception in the Southern Hemisphere of fixed stations located in Korea and Japan between 40 and 50 Mc. One of interest to Amateurs is the beacon station JA1IGY in Japan.

JA1IGY is operating continuously from Tokyo on the following frequencies, running 50 watts: 29.0 Mc. (A2 emission), 50.5 Mc. (A1), and 145.35 Mc. (F2). The antennae are horizontally polarised and rotate once each minute.

It would be of great value to the research team if Amateurs would monitor the 29.0 and 50.5 Mc. frequencies on the following basis:

(1) Observe on world days from 2100-0100 E.A.S.T. World days occur on three consecutive days each month when efforts by all teams are concentrated into their various spheres. These world days are as follows: March 16, 17, 18; April 20, 21, 22; May 18, 19, 20; June 15, 18, 17; July 20, 21, 22; August 17, 18, 19; Sept. 14, 15, 16; Oct. 19, 20, 21; Nov. 16, 17, 18; Dec. 14, 15, 16. (These are Tues., Wed. and Thurs.)

(2) Observe on world days from 0100-0400 E.A.S.T.

(3) Observe on Sundays from 1100-1300 hrs. E.A.S.T.

(4) Observe on Sundays from 1300-1700 hrs. E.A.S.T.

(5) Observe Saturdays 2100-0100 E.A.S.T.

(6) Observe irregularly but keep a log of times.

(7) Use a pen recorder during observing periods.

The type of information required in reports would be: (a) Times when an attempt was made to hear the signals; (b) Times when signal was heard and signal strength report; (c) The frequency being monitored.

It is also emphasised that reports of signals not heard when the frequency was monitored are just as useful as reports of signals heard.

Further to this project, Amateurs have been asked for details of tropospheric openings on 144 Mc. and above. No date has been fixed for the beginning, so look back through your logs and extract details of the openings you have taken part in over the past years up until now. Details should include band, date, time and areas worked plus any observations you may have made on the extent of the openings—particularly the possible duration of such openings. Reports from all areas are welcome—city, country and interstate.

These projects can contribute much to the Amateur cause. We are always protesting about the loss of our frequencies, but seldom is much concerted action taken to assist in providing information likely to assist our cause. Here is an excellent opportunity to render a service to the scientific side of radio and advance the case that the Amateur does contribute to the furthering of the art of communication rather than waste the frequencies allocated to him.

The following would be very pleased to hear from you: Bill Rice, VK3ABP (phone 65-8549); Ken Jewell, VK3ZNJ (93-6487), Len Poynter, VK3ZGP (35-8577). Any information you can supply will be greatly appreciated by all concerned. If you can be of any assistance a call to one of the concerned will solicit in detail the information required. 73, 3ZGP.

### SOUTH AUSTRALIA

Activity within VK5 has steadily regained its composure after the annual cessation at the completion of the Ross Hull Contest.

During February, the annual general meeting of the VK5 Group was held with approx. 30 members and two visitors present. The officers elected for the ensuing year (1965-66) are: President, Brian 5TN; Vice-President, Rick 5ZFQ; Sec./Treas., Robert 5ZDX; Councillors, Eric 5ZEJ and Colin 5ZHJ.

The activities of the Group were widely discussed and to the fore the main field of research and experimentation is to be centred on: (1) The application of s.s.b. on the v.h.f. bands; (2) the continued development of transistorised portables—of which five units are already in use by various members on 6 mx.

Six metre activity is centred on rag-chewing and the other leg for 6-2 duplexing. In recent months no DX has been reported, which is the opposite to previous years.

Two metre activity is of a high order, mainly due to quite consistent tropospheric openings into VK3 and the South East of VK5, with the VK5 night watchman Mick 5ZDR having the most success, with the interstate operators.

Activity on 432 Mc. has gone stagnant, which was to be expected after the initial surge of activity expected from a new frequency allocation. The exception, however, is the t.v. transmissions from Maitland 5AO, on the top end of the band, complete with f.m. sound channel.

The pre-mentioned imminent 576 Mc. record has unofficially been broken and awaits confirmation for Rick 5ZFQ, Trevor 5ZTM with John 5ZJH and Trevor 5ZIS. The contact was made on 31st January over a distance of approx. 120 miles with signals R5 and S9 both ways. M.o.p.a.r. tx's running approx. 20w. to 16 element collinear arrays were used in conjunction with 6CW4 super-regen. rx's. Congratulations chaps, it was worth the effort. 73, 5ZHJ.

### WESTERN AUSTRALIA

The fox hunt on 20/2/65 was more difficult than some I've been on. The signal disappeared over the causeway so I proceeded to open the clue and found it was in the hills. So off to Lesmurdie, about 15 miles away where I got a bonza view of the City of Lights and a weak signal which was tracked down to Whistle Pipe Gully. Here the sniffers failed to work, but the prickly bushes didn't! 6ZCF and 6ZAY found it by pointing their car in the direction of signal and turning on two headlamps and two spotlights, and kept walking until they fell over it. The beam was pointing east and was only two feet above the ground. These two were the only ones to succeed and this was at 10.45 p.m. The fox was immediately killed and everybody went to supper at 6ZEG's in Rivervale.

The V.h.f. Group meeting on 22/2/65 was well attended. 6ZAS was present and has replaced his RK34s with a 6/40. 6ZBZ is now 6HP and worked 22 countries in his first week on 14 Mc. s.s.b. He tried raising his power by using a 12BY7 driver; got some reports of horrible audio, so dug out a Marconi monitor and found a nice parasitic on 230 Mc. in the plate circuit of the neutralised 12BY7. I won't use one either, Harry, if I ever get a chance.

Tony 6ZDT and Doug 6ZDW were assisting Chas. 6LK in the National Field Day. Only 22 contacts were made on h.f. with the Geloso 25w. a.m. rig and 56 on v.h.f. Points score of 410 was down a bit on the usual 8,000. That s.s.b'ing of Jim 6RU kinda helps when its around.

A V.h.f. Field Day has been arranged for the week-end of 3rd-4th April. Same rules as last time, only early morning sessions are 1-2 and 5-6 a.m.

Some of the boys used their a.m. mobiles (what's a.m. mobile?) in another Vintage Car Club Rally on 28/2/65. The cars went to Rockingham and the run was over by lunch-time.

Roy 6ZBD is having fun with transistors. A 144 Mc. rig using AF118s refuses to percolate on 2 mx. A 150w. toroid transformer is going well with a pair of ADZ12s. It can't be heard at arm's length either. It took eight hours to wind though so I'll put up with the noise from my 30w. job for now. 73, 6ZAG.

### NORTHERN TERRITORY

As our district is so vast with difficulty of finding out what the gang are doing in Darwin (who else has to work 1,000 miles to get a QSO with his own district to get W.A.S.?), the news is a little limited.

The contest was fine from here in the "Centre" but very poor from the top end. It was certainly not due to lack of activity that the Darwin gang was not heard more often, but simply due to conditions. Before the contest began both 8KK (Alice) and 8ZDI (Darwin) held rigid lunch time skeds and it was not until 11/12/64 that a QSO was made, but from then on contacts became common. During the contest the 14th Dec. there was DX openings each day from Alice but only about five for the whole duration extending to Darwin and even these were very poor.

All States were worked including ZL, but not VK9s. The most consistent States were VK6 and northern VK2, with Darryl 2ZLP being worked daily. The hardest appeared to be Sydney and Hobart areas. Multi-district openings were very rare, unlike previous years when 2, 3, 5 were heard at the same time. It seemed to be very much more short skip than long skip.

JAs were heard several times, but unable to be raised above 52 Mc. I'm afraid too many ZLs missed a QSO with VK8 due to business being fierce at that time with VK.

T.v. openings on Channel 5 and 5A were viewed here several times and on 8/1/65 were seen for four hours.

Next year it is proposed to concentrate on 2 mx from Alice for DX purposes, which should be very interesting.

In closing, may I say that it was interesting to note that t.v.i. on Channel 0 was caused on many occasions, but it was an unavoidable "evil"?

Stations on v.h.f. in VK8: Alice Springs—8KK; Darwin—8ZMD, 8ZDI and 8ZCX. 73, 8KK.

# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL

### RECIPROCAL OPERATING

The U.S.A. has now amended its Communications Act to open the way to bilateral reciprocal operating privileges and Costa Rica became the first nation to sign. W8NRB, a Russian-speaking member of the U.S. Information Agency, was permitted to operate his station in that country. The U.K. similarly granted operating authorisation for visiting Amateurs to the recent R.S.G.B. Exhibition. Belgium has permitted visiting Amateurs to obtain mobile licences. These moves all indicate a welcome trend in inter-nation Amateur operation.

### COMMEMORATIVE STAMP

The special commemorative stamp honoring the 50th Anniversary of Amateur Radio in the U.S.A. has been sighted at Executive. No doubt many Amateur Radio philatelists will also have copies. First-day covers have been sent to each I.A.R.U. Society by the A.R.R.L.

### I.A.R.C. STATION 4U1ITU

The International Amateur Radio Club in Geneva will have 4U1ITU on the air continuously during May 16-17 to commemorate the centenary of the International Telecommunications Union. A special QSL card is being printed for the occasion which should be of interest to all DX-ers.

### CYPRUS CLOSE-DOWN

The Cyprus Council of Ministers under Archbishop Makarios met on Sept. 3, 1964, and cancelled all Amateur licences including the I.Q.S.Y. station, 5B4WR. No reasons have been given, but it should be noted that sovereign base stations signing ZC4 calls are still active.

### I.T.U. MONITOR REPORTS

For the period March to August, 1964, the I.F.R.B. monitoring section has reported the following unauthorised broadcast stations:—

7035 kc.—Peking and Moscow.
7050 kc.—Cairo and Peking.
7060 kc.—Peking.
7075 kc.—Egypt.
7080 kc.—Peking.
7090 kc.—Peking and Tirane.

### BAND-SENT F.S.K.

The P.M.G's Department, on a request from Federal Executive, has now varied the regulations covering the use of r.t.t.y. The present permission covers only the use of machine-sent f.s.k. and this has now been extended to cover the use of hand-sent f.s.k. The same technical requirements will still apply, but simpler equipment may now be used in obtaining similar propagation advantages.

### RETIREMENT OF FEDERAL SECRETARY

Mr. Jim (Jay) Lancaster, VK3JL, the Federal Secretary of the W.I.A., retires this month after over four years in the position. His retirement has been precipitated by a period of ill-health which has undoubtedly been aggravated by this onerous job. His precise business-like memos, toned by his quiet efficient personality, will be missed by Executive and Federal Councillors alike. Good health, good luck and thanks Jay, for a job well done. Mr. Peter Williams, VK3IZ, takes over this important and exacting task.

### PHONE/C.W. BAND SEGMENTS

Below is shown the voluntary sub-division of the various h.f. bands. These sub-divisions have been agreed by all Divisions, and all Amateurs are asked to co-operate by adopting them. It should be noted that the 21 Mc. exclusive c.w. segment is one that the W.I.A., as an I.A.R.U. Society, has agreed to adopt internationally.

| C.w. Only | C.w. and Phone |
|---|---|
| 3,500- 3,535 Kc. | 3,535- 3,700 Kc. |
| 7,000- 7,030 ,, | 7,030- 7,150 ,, |
| 14,000-14,100 ,, | 14,100-14,350 ,, |
| 21,000-21,150 ,, | 21,150-21,450 ,, |
| 28,000-28,200 ,, | 28,200-29,700 ,, |

## FEDERAL QSL BUREAU

Cards handled through the Bureau for the W.I.A. year ending Feb. 1965 totalled 53,249. This is the highest handling since 1949!

Mis-sorts by overseas Bureaux are increasing alarmingly. Recently the VU Bureau included with the VK despatch all cards having a prefix commencing with the letter V—a total of 50 mis-sorts!

The annual DX contest of the U.S.S.R. is scheduled for May 8 and 9, 1965. Full details from this Bureau.

The annual Polish DX contest is set down for 1500z, April 10, to 2200z, April 11, 1965. Details on application to this Bureau.

The 1965 P.A.C.C. Contest (Netherlands) is scheduled from 1500z, April 24, to 1800z, April 25. Details from this Bureau.

The C.H.C. 1965 QSO Party is to be staged from 2300z, June 4, to 0600z, June 7, 1965. Full info. from the Federal Bureau.

The station signing TM5AA, currently active on 14 Mc. c.w. (Mar. 1965) should be viewed with suspicion. Claims name is Tom and QTH Indonesian Borneo. Several features throw doubts on his bonafides.

The DX-pedition to the Saudi-Arabia/Iraq Neutral Zone in January 1965 passed off successfull. Operator was Vic Crawford, HZ3TYQ/W1TYQ. In the four days 1,340 QSOs were made with 71 countries. Operation was conducted from an unheated, unsheltered tent in high winds and rain with temps. in the 20-30F. region! The area is one of the remotest in the world, inhabited by only a few Bedouins and accessible only by 150 miles of camel trails! QSLs for contacts with HZ3TYQ/8Z4 should be routed via Ned W1RAN, 207 Thames St., New London, Conn., U.S.A.

—Ray Jones, VX3RJ, Manager.

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## NEW SOUTH WALES

### HUNTER BRANCH

Seen any Flying Saucers lately? Perhaps if you look up on the way to the next Branch meeting you'll be lucky. Some strange sky lights were visible just prior to the March meeting and this was, no doubt, the forerunner of several other unexplained happenings of that night. To begin with, Sherwood 2AJF was in attendance, secondly there were no hecklers during the election of officers—a very undemocratic procedure—the lack of hecklers that is. And thirdly, no cries of "shame" or "swindle" or such like terms of endearment were heard when I was elected to the illustrious and highly paid office of zone correspondent. Now, I ask you, could there have been a more unusual evening? But there's some more even yet.

Associate members Henry Schroeder and Mike Latham so delighted the generous P.M.G. examiners at the January quarter sessions that their terms of imprisonment by the receiver have ended and they will soon be heard on the air, a small trifle of some Morse speed being all that prevents them at this present. At the time of writing, results are not known of the other candidates, Belmont Bob and his mates Fred and Bones, but they are hoping, and so am I.

To get back to this election lark. It is, with minor changes, a case of the same that went before. Frank 2APO is President once more—a worthy choice you will agree since the second year of Presidency is always more interesting than the first, and the remainder of the executive—democratically elected, mark you—is: Vice-Presidents, Les 2RJ and Keith 2AKX; Hon. Treas., Bill 2XT; Hon. Sec.: Gordon 2ZSG; Social Sec./Treas.: Bill 2ZWM; V.h.f. Liaison: Tony 2ZCT; QSL Officer: Stan 2AYL.

### SILENT KEY

It is with deep regret that we record the passing of:—

VK3SB—A. L. (Bert) Brehaut.

Welcome to the newcomers, Les, Bill and Tony, and welcome also to Frank 2APO in his new capacity of assistant zone correspondent. Now, you see, it is impossible to blame me for everything you read in the notes.

The election was conducted most ably by Vic. 2VL, Divisional President, and honoured guest for the occasion, aided, so the Federal Councillor would have it, by several, and I use the term advisedly, "hatchet men". And since he made the remark, Pierce 2APQ was there also in his official capacity. Following the presentation of his report, which this year was available as a copy to each member, Frank handed over to Vic. who gave a short dissertation on the doings of the Institute, statewise. After much discussion, a worthy procedure to be sure, Vic. handed over to Pierce who was able to put members in the picture from the Federal point of view. So numerous were the questions that it was after 10.30 when the monthly meeting closed, following the usual votes of thanks all round. Those who attended will agree that the evening was profitably spent and that the remarks made by all speakers contributed to our enjoyment of the hobby. It may be said that it behoves the Amateur to interest himself in the politics of our association, since only by concerted action supported by the votes of members will the executives at club, divisional and federal level be able to obtain the rights and privileges to which we, as Amateurs, are entitled.

This leaves not much space for the doings of the month around the Branch, but something which did interest several of our young members was the John Moyle Memorial National Field Day. Allen Legge, John Bedford, Bruce Morley and Jan 2BJO journeyed to Mt. Heaton for this event and using the call 2ATZ/P logged 72 contacts on h.f. and v.h.f. Westlakes Radio Club, which the boys represented, was proud of this score, especially considering the 15w. available. It is a deplorable thing that some field stations should have blatantly used power well in excess of that permitted in an all-out attempt to win. After all, this field day is a competition. Some "amateurs" would have it made a race. Two other members of Westlakes Club, Susan 2BSB and David 2BSC, helped out with operation at another field station in the Blue Mountains.

The Saturday column for Amateurs in the Newcastle Herald is doing a remarkable amount for good publicity. However, it needs your support to keep up the flow of news. Please contact Jennifer Cox if you have anything which could be of interest for this venture.

John 2ZJG has been in hospital recently and although he has had a transceiver at his bedside I am sure he would rather be at home. The chaps wish you a speedy recovery John. Bill 2ZL is one who has made a speedy recovery and this since Mrs. 2ZL has returned home from hospital. Reason—Bill now does not have to cook for himself!

Did you get fooled this April 1? I expect the usual trickery prevailed and that the most careful fell for something. However, I can assure you of one April event that will really be worthwhile. That is the meeting of the Branch the day after All Fools Day. We commence business at 8 p.m. on the 2nd in Room 6, Clegg Building at the Technical College, Tighes Hill. All the details of what is on will be in the broadcasts. Till then, when I'll see you, 73 2AKX.

### CANBERRA RADIO SOCIETY

The Canberra Radio Society will have an interesting programme for its second Easter Convention. There will be all the tourist resources of Canberra for the family, interesting scientific visits, and more than the usual number of Amateur contests.

A summary of the programme is as follows:

**Friday:—**
Day—Mobile Contest, greatest number of contacts in any four hours.
Night—Satellite Films and conversational QRM.

**Saturday:—**
9 a.m.—Special Visit to the instruments at Tidbinbilla Space Tracking Station (now tracking the craft to Mars).
11 a.m. to 1.30 p.m.—Picnic Lunch at Cotter Reserve.

12.30 p.m.—Receiving Contest (a.m. voice code transmissions on 7 Mc.; tx power gradually reduced to near zero).
2 p.m.—H.f. Tx Hunt.
4 p.m.—V.h.f. Tx Hunt.
8 p.m.—Dinner (if booked).

**Sunday:—**
10 a.m.—Special Visit to Australian National University Nuclear Physics Dept. (the problems of 7½ million volts).
2 to 3 p.m.—All-Band Scramble.
3 p.m.—Mt. Stromlo Observatory.
4 p.m.—H.f. Tx Hunt.
5 p.m.—V.h.f. Tx Hunt.
8 p.m.—Films, Prize-Giving, and White Elephant Sale (bring something!).

**Monday:—**
10 a.m.—Special Visit to Belconnen Navy Tx (problems of several hundred thousand watts, acres of antennae including a log-aperiodic, frequency synthesisers, two tone morse, etc.). This will take two hours, ending in the Officers' Mess.

**Registration:** 10/- (XYLs free).

**Accommodation:** Cheaper type still available in private houses or hostels—possible cancellations in higher class. Plenty of camping, and shelter for those with an air mattress.

Any enquiries should be addressed to Ken Mattel, VK1KM, 86 Wilshire St., Dickson, A.C.T.

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# VICTORIA

### WESTERN ZONE

It appears to be my turn after all this time and find I have very little to contribute, owing to not being home to listen or having a mobile completed.

The country area seems to be well organised with David 3ADS and his team of fire network operators. He certainly is putting the most into it.

George 3GN has at last chased the spiders and moths from his gear and is now in the throws of building a mod. and erecting the aerial, so it won't be long?

It has been some time since the Jamboree-on-the-Air, but I feel a lot of thanks should go to those Amateurs who assisted the boys. In Victoria 130 groups participated by the courtesy of 120 Amateur radio stations, making 1,850 group to group contacts within Australia and 108 contacts overseas, and more than 3,000 Scouts actually took part in Victoria. The 8th Jamboree-on-the-Air is set for 16th and 17th October, so please try and avoid this date for the conference. 73, 3AQD.

### MOORABBIN & DISTRICT RADIO CLUB

Moorabbin and District Radio Club members were actively engaged in the W.I.C.E.N. participation in the recent tragic bush fires in East Gippsland. Members active were VK3s AFQ, ACS, XK, ZPC, ZRD, ZNS, ZGQ, XV, AHZ, AFJ, EM, ARD, AKB, APD, ZNJ, ZRT, ZOP, ZOO and RN. These notes are being compiled at Disaster Headquarters and as so many members are engaged, it is very possible that some call signs and members have been overlooked; if so we apologise.

Club members were responsible for the setting up of various base stations located at Bairnsdale, Bruthen with mobile operators covering areas from Heyfield to Orbost and Omeo areas. Early and constant participation in W.I.C.E.N. and Field Day experiences enabled members to readily adapt themselves to the conditions and as a result assisted to set up lines of communication which were called upon repeatedly by the Fire Control Authorities. Work ranged from ambulance escorting, fire spotting, water tank escort, patrols, evacuation.

Kevin 3ARD and Peter 3XK were present at the dramatic fires which surrounded Bruthen and Sarsfield. The windscreen of 3ARD's car was shattered, thought to be due to the tremendous heat whilst in close proximity to fires. Hospitality was extended during the rare lulls by country W.I.A. members and in particular Merv. 3LL and his XYL Val. We extend our gratitude and are hopeful that a return visit can be organised for the future when conditions are less trying. Members operated on 80 metres (a.m.), 6 and 2 metres f.m. (channel A and B).

And now more pleasant going ons. Members visited the Brighton Bowl for a social evening in February, showing their skills in alley bowling. These evenings have been held quite frequently and provide another venue to enable XYLs to get together—sounds like Moomba—let's get together and have fun—yes, sir!

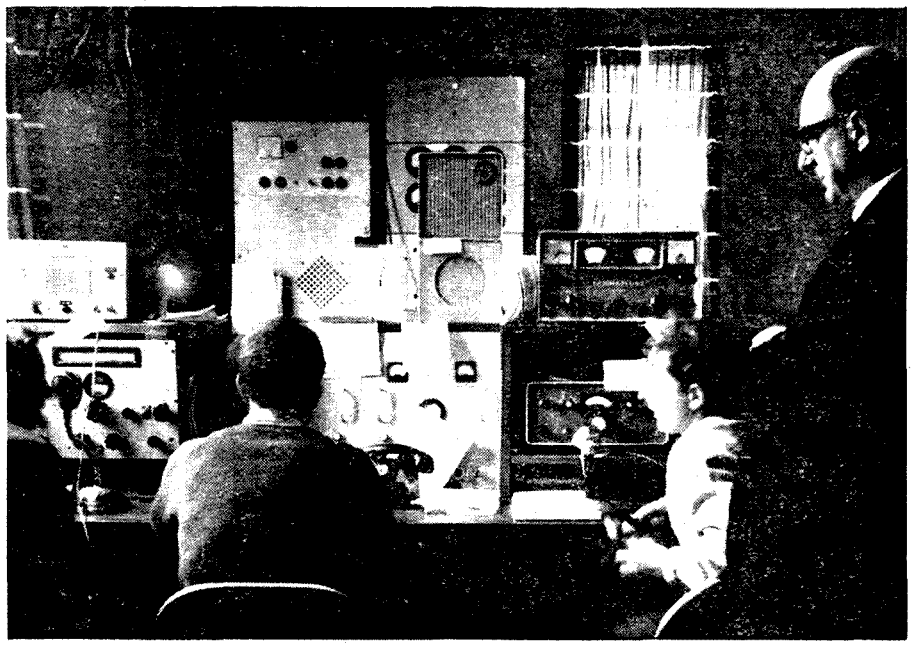
Mc. gear plus other projects. Members heard on s.s.b. have been 3ARD, 3ZE, 3BM and it is believed others are busy constructing. It may be not far in the distant future when the Club 80 mx net will be resumed with s.s.b.

During the National Field Day, members were active under 3RN/P (3ZOP, 3XV, 3APD, 3AFQ, 3XK), 3ZAK/P (3ZNJ, 3ZAK, 3ZNC, Bunninyong), 3LC/P (3JI, 3CB, Crib Point), and 3ACS at Blue Mountain.

A tx hunt was recently held and as usual fully patronised, in fact more onlookers than hunters. Social evenings will be resumed and the first was held in March at the QTH of 3XK. A fund-raising activity of paper collecting is current for the purchase of a projector. All members please note.

Keith 3AKB is frequently active from his new QTH—all bands. Ted 3TG moved to the country recently. Tom 3ZIQ is now active on f.m. net and re-building 2 mx a.m. gear. Clive 3LZ gave members a talk and showed slides of his recent overseas trip. Jack 3VT is running 15w. on 2 mx; nice to hear you around again Jack. Arthur 3AWO was welcomed back after his trip overseas. Max Patman sporting new mast and skeleton slot for 2 mx.

And finally, a nudge from the Treasurer. Any members with a guilty conscience who have not come forth with their annual sub., can either mail their greeny to the Club Secretary or pay at a Club meeting night. Any member who becomes unfinancial will be struck off the list and not mailed our monthly newsletter, as it costs money these days. 73, 3XK.



One of the Amateur Receiving Centres during the disastrous Victorian bushfires in March was VK3WI, pictured here as staffed during the actual emergency, complete in all its untidy state. The Federal President Mr. G. M. Hull is seen viewing the operation.

## OBITUARY

### ALBERT LESLIE BREHAUT, VK3SB

It is with regret that we announce the death of Bert Brehaut, VK3SB.

Bert was involved in a motor accident in the latter part of November, and although badly bruised he continued working at his customs agent business, under extreme difficulty. However the effort was too much and Bert passed away suddenly on 16th December. Bert's wife predeceased him a few months earlier, after a long illness.

VK3SB was one of the "old brigade" and usually worked the 20 metre band. This three element rotary beam at Oakleigh was somewhat of a land mark in the district. He was also one of the pioneer 200 metre gang when Sunday transmissions of musical items were permitted, and his programmes were very popular with the locals.

Bert leaves three married daughters and our sympathy goes out to them.

With the Ross Hull Contest over and done with for 1964/65, some members of the Club operated portables from Mt. Bunninyong for approximately ten days. 3ZNJ, 3ZPL, 3ZOP and 3ZNC (from Geelong Amateur Radio Club) were the gentlemen concerned and active on 6 and 2 mx a.m. and f.m. 800 contacts were made and all States were worked except VK7 and VK9. Exceptional contacts were: 3ZNJ to 5ZMJ Port Pirie, a distance of 470 miles; 3ZPL to 5ZDR Adelaide, 380 miles; 3ZOP to 5ZRO, Adelaide.

And now down to business. Hal 3ZOO has been busy working DX on 2 mx f.m. with very good success; it's that mighty tower and beam set-up. Peter 3ZPC has re-erected his antennae and running a new rig, details on the secret list. Graham 3ZMQ has QSYed to VK2. Kevin 3ARD has been heard on s.s.b. on 2 mx. Bob 3ZRD is busy constructing 432 Mc. gear and is heard on 2 mx occasionally. Peter 3XK is busy re-constructing gear. Harold 3AFQ has re-appeared after an absence of many months and is back on 2 mx. Graham 3ZIX still appears on 6 mx now and again, but is believed to be more interested in a new car. Ken 3ZNJ is constantly ear-bashing 3ZNC and anyone else who looks in. He believes in using the space. Ted 3XS is busy constructing s.s.b. gear. David 3ZOP is building a transistorised 2 mx transceiver. Val 3OT still holding his own amid the fierce opposition on the f.m. net. Lindsay 3ZNS is working on 432

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# QUEENSLAND

February was certainly a very quiet month, newswise in the Sunshine State. At this time of the year, Divisional Council elections are being held and it is pleasing to note that there were sufficient members interested enough in Council that an election had to be held. The names of the successful candidates will be known by early April.

Here is a final reminder about the Annual Divisional Convention. It will be held at Alexandra Park, Alexandra Headlands, on the week-end of 2nd, 3rd and 4th April. The organiser again this year is Bob 4ZRC. Both interstate and intrastate visitors will be most welcome. Arrangements are generally the same as last year. Registration is 2/6 per family, cost per head, three meals and teas, £1. School children half price, those too young for school—free. High frequency contests are being arranged by A1 4LT and v.h.f. contests by David 4ZDF. Finally, keep in mind the

auction of unwanted gear for the convention fund and the home constructors' contest.

The main news this month comes from the Ipswich and District Radio Club. Without a doubt this club would be the most progressive in VK4 at this moment. The Club's basket picnics are being attended so well that they are being held about every month now. Perhaps the usual seaweed fight is an attraction? All the picnics so far have been held on the Brisbane River. The next will be held at Redcliffe on Moreton Bay, but I doubt if there will be any seaweed there. Mobiles will be the order of the day—probably all will be on 53.032 Mc.

A point that springs to mind from this is a very likely explanation of why the club is so very strong. There is complete harmony between and intergration of efforts of h.f. Hams, v.h.f. Hams and S.w.l's in the club. There are none of these petty jealousies which do exist on the Ham bands today. (This is not necessarily the official view of this Division, but is included as a personal thought on writing these notes!)

An important item of news from the club is that the club is now offering a handsome 8 x 10 inch certificate printed in colour to all those who make contact with any TWO club members as well as the official club station VK4IO. Club members include 4GT, 4LI, 4BG, 4HW, 4ZBN and 3ZMB (soon to obtain a VK4 call). Club members may be worked on any band. Applications for the certificate should be forwarded together with details of the contacts made to Public Relations Officer, P.O. Box 61, Ipswich, Qld.

I can assure you that the certificate, which is suitable for framing, is both unusual and well worth trying for.

Finally, once again, don't forget the Easter Convention! 73, Bill 4ZBD.

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## SOUTH AUSTRALIA

The monthly general meeting and the annual general meeting of the VK5 Division were held on the same night in the club rooms to a very representative gathering of members and visitors, especially when one considers that such meetings are generally avoided like the plague. In VK5, however, the general membership line up in great gusto and seize every opportunity to give the Council members a run for their money, all taken in good part by both sides, and it has often been remarked that it is a pity that there could not be more annual general meetings in the year, because of their popularity.

The chairman (Phil 5NN) opened the monthly general meeting, which incidentally is treated by most of those present as a sort of a pipe-opener, or should I say as something of a preliminary bout. Most of the interjections and questions usually come from the younger section, with the veterans quietly flexing their muscles, vocal that is, in keen anticipation of what is to come later on in the night. With very little of interest happening, the general meeting is quickly brought to an end, and a flutter of interest and excitement is apparent in the body of the hall as Phil 5NN slightly battered, but still full of fighting, opens the annual general meeting.

Strangely enough, this year's meeting opened very quietly, and it looked as if the members were going to be deprived of even the slightest of excitement. The scrutineers for the Council ballot were Ses 5GP, John 5KO and Ray 5RK, and became the first unanimous vote for the evening, not that anybody was surprised, and left the room with the ballot papers, to the tune of hoots, jeers, catcalls, and rude suggestions as to the condition of their eyes and mentality, all of which cheered them up no end, and put them in the right mood for their arduous task.

Next came the back-scratching section, in which everybody patted everybody else on the back—the chairman's report, the treasurer's report—and then the lights were lowered for the main bout—amendments, etc., to the constitution. The first amendment fizzled out quickly due to it already being covered in the constitution, the second amendment concerning the matter of the trustees produced quite a flurry, with several having their two-pennorth of say back and for, without any visible signs of rising blood-pressure, and this round finished, I would say, with Council and chairman being well ahead on points.

Round three opened with the amendment concerning the fees and the decimal coinage and seemed likely to add a few more points to the score of Council, when out of the blue, Brian 5CA pointed out that no provision had been made in the amendment for the fees for country members, and at this point in the proceedings the tempo of the night quickened considerably. Everybody tried to get into the act, questions were asked, answers were given, matters of no importance were dragged into the discussion, in fact at one time Brian 5CA was addressing the assembled gathering on the merits and de-merits of fitting wire screens on to windows because of living in the country. Anyway, after quite a spirited discussion on the whole matter, the amendment was shelved for further discussion, possibly at the next monthly meeting or so, and the gong rang for the end of the round, with the official verdict being given as a draw, and the meeting closed ten minutes overtime, and then only because Phil 5NN drew a trump card from up his sleeve to the effect that the caretaker would soon be up with his alsatian.

A fair idea of the success of the night was the fact that not one member left the room to go home until the meeting was closed, and if this is not a good indication, well what is? Incidentally, during all this excitement and general hilarity, unwelcomed and unsung, the three scrutineers had returned to the meeting with the results of the ballot, but were given scant attention and before long were as vocal and noisy as anybody present. All in all, a jolly good night's entertainment, which is as it should be, if the interest and excitement dies, then so does the Division, and if this meeting can be taken as a guide, then the VK5 Division is well alive and kicking.

Now just in case the casual reader should get the impression that VK5 Divisional meetings are something in the nature of an Australian Rules final with a couple of Donnybrooks thrown in for good measure, may I say that several items of good news were read out by the chairman during the lull in the proceedings, such as the fact that the membership of the Division had risen by 6% during the year—that VK2 had been contacted re some Morse Code tapes, six in number, the same to be used by the VK5 Division—that agenda items for Federal should be checked with Geoff 5ZCQ, that t.v. type, just in case the said item was already included in the big black book—and last but by no means least, the fact that Phil 5NN and John 5JC had attended a recent meeting held to investigate the establishment of a Science Centre in Adelaide which would be affiliated with the Clunies Ross Foundation in Melbourne and other States.

Phil 5NN was roped in on a Science House committee formed to investigate the possibilities of establishing such a centre on behalf of about 20 scientific bodies, mostly of Amateur status, all of whom have been circularised as to their basic requirements. There is at the moment of writing nothing concrete, it is completely in the preliminary stages, but at last it would appear that we could, with a bit of luck, acquire our own rooms for all Divisional activities, in perhaps the not too distant future, and our building fund assets will come in handy to help us along the way. At the moment just a pipe dream perhaps, but knowing Phil and his cautious approach to all matters Divisional, a pipe dream with a chance of coming true.

Noticed Pete 5FM sitting with Ses 5GP at the meeting and could not help but notice that Ses appeared very restless all night. Now normally he is as calm and collected as it is possible to be, and upon making a few judicious enquiries I was told that he missed his pipe, having left it at the QTH of Dave 5DS on a recent visit, and Dave having forgotten to bring it along to the meeting. Further enquiries revealed the horrifying fact that Dave, true to his ancestors' teachings on the matter of mickles making muckles, or something, had been hiring out the said pipe to visitors at a special rate of course and the chance of Ses ever getting such a splendid source of income back was almost nil.

Brian 5BI, who is now domiciled at Cowell, decided to build a garage-cum-shack at the new QTH and solicited the assistance of his long suffering close relative, Vern 5VB, probably better known as "The Admiral". Everything comes to he who waits, so tis said, and Vern, remembering how Brian used to answer his many enquiries on building up radio gear or studying radio circuits, at last managed to get his own back every time Brian made an enquiry as to where he should put this or that, by loudly telling him to check the blueprint—study the drawing—etc., etc.—much to the annoyance of Brian, and much to the enjoyment of Vern, who was extremely sorry when the project was finished.

Len 5ZF is beginning to think that there is something in all those corny jokes about Scotchmen and the aforementioned mickles and muckles, especially when he received a QSL card from Dave 5DS minus even a suspicion of a stamp. Dave, when questioned on the matter by our correspondent, made a noise resembling a front tyre of a car rapidly going down, and stalked off into the night, but this did not help Len much, all he has at the moment is a very expensive QSL card and nothing else, not even a mickle, or should it be a muckle?

I don't usually give two paragraphs to one man, but I am given to understand that Brian 5BI has a kitten which he calls Fred. Owing to a mix-up in his Ohms Law and his Bi-Lateral Modular Theory, he now calls him Freda, and to make it more confusing Freda goes swimming with Brian as willing as willing can be. My espionage agent for that district is making enquiries as to whether Freda eats dog biscuits, or perhaps buries her bones in the garden!!

At considerable expense, and a good chance of being shot at sight, I reproduce the latest news from the Elizabeth area, although no responsibility will be taken for truth or accuracy!!

Ted 5ZE is in the throes of erecting a three element beam for 20 mx and rumour has it that the ground plane misfired, miscalculated, or it could even have been misquoted.

Clive 5PE is now sporting an exotic Yank Tank, the old Morris having become just a memory.

Cyril 5DY is quietly working away on the construction of an oscilloscope, after having returned from a motoring holiday which took him many thousand miles around the countryside.

Bill 5VE has moved his QTH to Salisbury and it should not be long now before a big signal is heard from that direction.

Ron 5FY has been in hiding for so long that I decided to put my ace espionage agent on the case. He cracked it quite easily, with the help of that interesting little journal "Info". Ron is engaged in laying concrete here, there, and everywhere around the house, and therefore air time has gone by the board. Get it? —gone by the board—you don't get it?—well you have never laid concrete! Okay, okay, I thought it was good—my apologies.

Dick 5DT has been busy chasing the bugs out of his sideband gear and is now busy chasing the DX on 20 mx and catching some of it too.

Hugo 5IB, after waiting almost 12 months for permission from the Council to erect his tower, no doubt feels that he will have to wait a further 12 months before he regains the incentive to do anything about it!

I notice in the journal v.h.f. notes—Oh yes, I read them, just in case I can pick up a libel action or two—anyway, I read that Garry 5ZK is likely to resume residence in VK5 again, probably in March. That's what I read anyway.

Bert 5BB is doing a swell job for the magazine as the DX scribe, and may his shadow never grow less. I have to lay it on with a trowel in this case, because he has probably woken up by now that quite a lot of his paragraphs mysteriously appear in the W.I.A. column in the local paper, "The Advertiser". I have no conscience where Amateur Radio is concerned Bert. Am I forgiven?

Met Nobby 5WK whilst Xmas shopping in the establishment where he reigns supreme. After exchanging several uncomplimentary remarks, he then did his best to brainwash me on the merits of s.s.b., and by the time he had finished I did not know whether to band my licence back there and then, or just continue in my ignorance and my lace-up boots and my hand-lantern. Why, he even suggested that I was going backwards instead of forward!

Ted 5JE not in the best of health at the moment of writing. He has been in Daws Road Hospital for some time now, and has been finding the going hard. I understand that when the portable library came around he was quite surprised to note that they had a copy of the A.R.R.L. Handbook on display, but was disgusted to be told that he was the first patient ever to ask for it!

There is an old saying "that the husband is always the last one to find out the truth," and I began to believe it the other evening when I heard my XYL on the telephone saying, with her voice dripping with romance, "Oh yes, Mr. Sullivan (5JK), I have always admired your teeth, etc., etc." However, there was nothing for me to worry about, it appears that she had become a little tired of the set of dentures that I had made her many years ago out of a couple of egg insulators and two i.f. trannys, 1900 kc., and wanted to know just who was Jim's dentist. I always thought they were a good set of teeth, although now and again when my XYL smiles rather broadly it is possible to read on the upper gums the word Aegis, or was it Klngsley, anyway it does not matter, one never expects gratitude in this world. "Oh yes, Mr. Sullivan, I have always admired your teeth"—all three of them! Wouldn't it??!!

Lelth 5LG a little quiet at the meeting, I thought, although he did manage to get into the act when it was announced that he would be sending Morse Code practice on a frequency of 3540 kc. Apparently this frequency does not meet with the approval of most members active on this band, and Johnny 5KO was given carte-blanche, or was it mabel, to do a little lobbying to have it altered, even if it turns out that he originally allocated that frequency many moons ago.

There was only one new addition to Council arising from the ballot, and the word new is something of a misnomer in this case, because too many years ago for me to want to remember, this new member was already on the VK5 Council, and acting as Treasurer at that. I refer to Uncle Tom 5TL, complete with cabin on the river. I was glad to see him get in, possibly in view of the fact that we now have two somewhat old timers on the Council, to wit, he and Harry 5MY, our respected and revered Treasurer. It would appear that the era of the "Youth Image" is somewhat on the wane these days, as very little is heard of the old catch phrase, "Too old—too old—no go—obstructive and bound up with the old traditions, etc., etc." Whenever I hear about old age, get rid of them, etc., etc., I always remember the old story of the Chinese gent who decided to get rid of his aged father because he no longer could keep up his production figures in the daily toll. Trussing the old man up and thrusting him in the basket, he was on his way to the river when he met his own son on the road. "What are you doing with Grandfather," he said. "I am going to toss him in the river, he has outlived his usefulness, my son," said the father. "Well you know best my father," said the son, "but be sure to bring the basket back with you." "Why should I do that, my son?" said the father. "Well the day will come, my father, when I will need the basket for you!!" Nice to see you on the Council, Tom, even if it does put you and I on opposite sides of the fence. You beaut!

Well, at this point I suppose I am duty bound to make passing reference to this year's winner of the Higginbotham Award for 1965. I think, with a little pruning here and there, and taking my natural modesty and reserve into consideration, I could manage to write about three pages about the winner—knowing him so intimately as I do—but also knowing the Ye Ed. so intimately as I do, I will not pursue this foolish line of thought, and simply say that I agree with the decision of the majority in VK that the choice of the Magazine Committee was quite beyond understanding, not logical, just favouritism, or any other choice of adjective that might appeal. However, I have won the award, and just you try and take it away from me!! Now speaking, seriously, for once, although it ill becomes me, I honestly feel that winning the award is really not a personal honour but a Divisional one, in other words a pat on the back for VK5, because without the help throughout the year of my army of spies in VK5, I would not be able to write anything for the magazine. I would like to mention each and every one by name, but to do so would be to court disaster by drying up my source of information, and all I can say in my defence is that I have enjoyed immensely being the VK5 scribe. I have made a lot of friends over the years, most of whom I have never met, and depending upon what is written on the wind, I am more than happy to continue to mutilate the King's English on behalf of the VK5 Division, because I have always firmly believed that one only gets back from a hobby just as much as one puts into it and believe me I have had plenty from our grand old hobby of Amateur Radio. I thangyou—I thangyou.

Determined to close on a much more cheerful note, Jim 5FO rang me to ask if it was true that I had a box of i.f. trannles, and following a discussion along these lines, his XYL Rae came on the line for her usual three-penny-worth of libel attack, but I set her back on her heels very smartly by telling her that she would have to line up in the queue to congratulate me! Well, you should have heard her—so much so, that the telephone exchange rang back to say that I would be reconnected with my caller when they could get a fuse to hold long enough to complete the circuit. Anyway, all of this flattery did not deter me from attending with my XYL (you know the one, "I have always admired your teeth, etc., etc., ad nauseam") the wedding of Jim and Rae's eldest daughter Kay to Colin. Everything went off very well, and I tried to snatch a few words with the groom, but was shepherded out in no gentle manner by the mother-in-law Rae. Therefore should Colin by any strange chance be permitted to read these notes, and wonder just what I wanted to say to him, I only wanted to tell him that if he has any trouble with his mother-in-law, just give me a ring on the telephone—and we will flee to the hills together!!!! Oh, go on, Rae—you don't mean that—after all, you did kiss me in front of the church—don't deny it—I have still got my broken arm to prove it!! 73 de VK5PS—PanSy to you.

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## WESTERN AUSTRALIA

Do you like to see these notes appearing in "A.R."? Then how about someone volunteering to write them as your present scribe will not be writing them very much longer. This job can well be carried out by a country member, so don't think that because you live away from the metropolitan area you can not volunteer.

Bill 6DX has been down from Kalgoorlie, holidaying at Safety Bay and has shown up at several QTHs. You had better slow down a little Bill or you may not be able to come and visit us in the city.

Rolo 6BO is going down to Albany for a few days in the near future and may take some gear with him.

Pat 6PH has been up from Narrogin and collected three two-way f.m. units, so this will make up a little net around this area and will result in 52.565 Mc. being used quite a deal.

The Youth Radio Co-ordinator would like any persons who are conducting groups to register them with the Institute Scheme so that he can know what is happening in this field.

Roy 6RY has been re-appointed as Federal Councillor for this Division and should you have any matters which you would like aired please let him know and the matter will be attended to.

6WI has once again moved QTH and is now being run by Bob 6BE from Kalamunda and should give a better coverage. Bob will, however, appreciate news items being passed along to him.

Well this seems to be all for this month, so please think about the first paragraph. 73, 6RY.

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## TASMANIA

By the time this is being read our Annual General Meeting and Dinner will be over, and our new Council will have been elected to carry on the business of the Division for the next 12 months. It is to be hoped that more help will be forthcoming from the members of the Division to assist with the many little jobs which crop up than there has been in the last year, and not just the same few helpers every time as is usually the case.

Our lecturer at the March general meeting was John 7ZOO, who dealt mainly with voltage dependant capacitors and their application, finishing with a description of a three-band v.h.f. co-axial r.f. amp. built round a DET22 which he is in the process of building. A most interesting and informative lecture, thoroughly enjoyed by all present.

Welcome to Dave 7DG (ex-2DG) from this Division. I should have done this last month, but somehow it slipped me, however better late than never, eh? Also congrats. to Brian 7TX (ex-7ZTX) who gained his c.w. at the January examinations.

This year's Athol Johnson Memorial V.h.f. Contest held on the last week-end of February (27-28) saw 18 stations participating. The winner looks like being Reg 7RL who scored over 5,000 points. The highlight of the contest was the 432 Mc. QSO between Mt. Barrow (Reg) and Mt. Wellington (Geoff 7ZAS), a distance of 107 miles according to my calculations. This is the first North-South QSO on this band and an intrastate record.

Several stations are on the 432 Mc. band in Northern Tasmania, but so far only Dave 7ZAI and myself are on in the South; no doubt more will follow. Dave and I worked mobile out as far as Dysart (about 30 miles) with 5 x 9 plus signals both ways, and at present have our own private link on this band (have to move higher when anyone else comes up there.)

Reg 7RL had quite a day on the Sunday (28th) for apart from the 432 Mc. contact south, he worked several VK5s on 144 Mc. (including a W7 portable VK5) at Mt. Gambier, one of the VK5s being a mobile with a whip antenna in the township. Kevin 7ZAH also worked into VK5 from Stanley, using a halo on his mobile.

One of our senior members, who started back in the spark coil-coherer days (somewhere about 1908 I'm told), and who has kept abreast of things ever since, has now moved on to s.s.b. with a Galaxy V. Understand one of his first contacts was into Europe with an S8 report. In case you have not guessed who I mean, it is Rupe 7RM. Good to hear you back on Rupe, and I trust we'll continue to hear you about for a long time yet.

Our old friend, Bill 7YY, has been transferred to VK4 (Rockhampton to be precise) and he will certainly be missed down this way. A one-time councillor, Bill has always been a good worker for the Institute and his practical jokes and natural poetic flair have caused many a good laugh. However, our loss is VK4's gain. We hope to see you about down this neck of the woods again some day Bill, the best wishes of the Division go with you and yours to the Tropic of Capricorn.

The John Moyle Memorial National Field Day this year clashed as usual with the Royal Hobart Regatta, and this, together with the dreadful band conditions, were responsible for the very poor participation from Southern VK7 at least.

Terry 7CT, who has been in ill health for some time now, is at last on the mend. Although from what he tells me, it will be a long time before his pocket recovers. Still a wise old sage once said, money isn't everything, but it's way ahead of whatever is in second place. Better to be rich in health, Terry!

Ian 7ZZ has at last got himself a new second hand receiver, so watch out chaps, he'll be able to hear you better than ever now.

One final thought. If you have not paid your sub. yet, you are unfinancial and have been for a month, and soon you won't be getting this magazine. So pay up quick. **Do not procrastinate!** 73, 7ZAS.

### NORTH-WEST ZONE

The field day held at Gravelly Beach on the River Tamar by the Northern Zone was voted a great success by all who attended. 80 mx whips and v.h.f. halos were everywhere. Among the N.W. Zone members noticed present (complete with XYLs and YLs) were: 7XL, 7SF, 7MX, 7KH, 7ZWN, 7ZAH and several associates. Two transmitter hunts were held on 144 Mc. and 80 mx and were enjoyed by all present. Who would have suspected that innocent-looking fisherman in the straw hat on the end of the pier was holding not a line, but an antenna. Nice work, Leigh. A good time was had by all.

The trophy for the annual cricket match was duly presented to the N.W. Zone and is at present being kept in safe custody by Syd 7SF.

Congratulations go to Bruce Kelly, who now has his ticket. Should not be long before Bruce is making his presence felt. Bob 7ZAA has worked into ZL on 6 mx and there has been considerable activity on v.h.f. here lately. Also a bit of 20 mx DX creeping through —heard and worked some Ws and CT1 station 5 x 9 on phone recently, so maybe the bands are picking up.

Don't forget to keep an ear out for Basil, ex-VK7BL, who is now VE3APO. He will be operating the university transmitter in a month's time, and will be anxiously looking for VK7s.

The Ladies' Night at the monthly meeting was voted a great success and the films and slides were appreciated. The ladies have been well catered for this month, so maybe we can get an extended leave pass into the shack without a guilty conscience. 73, 7KH.



# HAMADS

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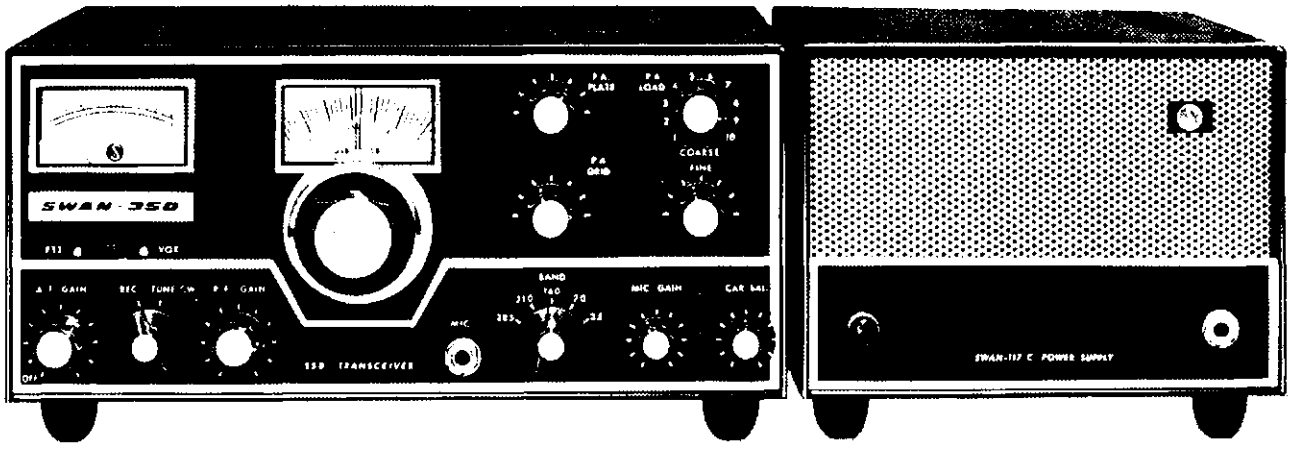


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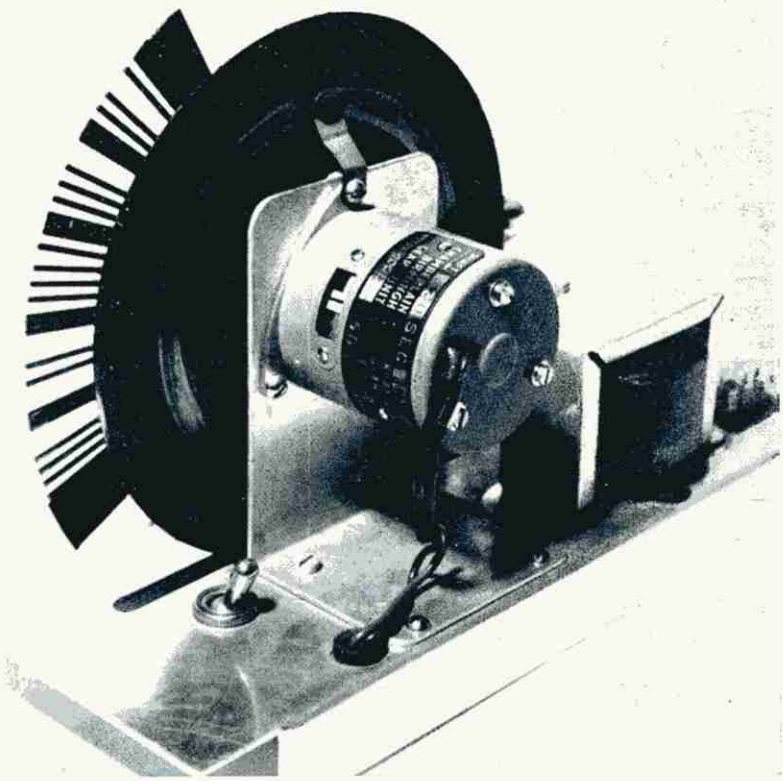

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| | |
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| MO65 | 50Ma.DC 35/- | MO65 | 30-0-30 Amp. D.C. 42/6 |
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| MO65 | 150Ma.DC 35/- | MO65 | 50 mV DC 37/6 |
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MR52 2½ in. Square Face, 2 in. Round Hole, Black Plastic Case.

| | | | |
|---|---|---|---|
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| MR52 | 1Ma.DC £2 | MR52 | 100Ma.DC £2 |
| MR52 | 5Ma.DC £2 | MR52 | 250Ma.DC £2 |
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# "AMATEUR RADIO"

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## OUR COVER

The Thing: This month's cover is a provocative photograph which is more fully explained in the article on page 3. As a matter of interest, can you identify it fully before you read the article?

## FEDERAL COMMENT

★

During the early part of March, the Wireless Institute Civil Emergency Network (W.I.C.E.N.) was critically tested in bush fires which ravaged eastern Victoria, New South Wales and to a lesser extent, parts of South Australia. Little is known at present on the bushfire emergencies in N.S.W. and South Australia. but a full report was given in last month's journal of the Victorian fires.

It is evident from this report and other information to hand, that the W.I.C.E.N. organisation operated efficiently and contributed largely to the success of the whole Disaster Plan. Despite the extent and severity of the fires, it is a great tribute to all those who took part that no lives were lost and the fires were contained and eventually subdued. The mobility of our present W.I.C.E.N. is a fairly recent innovation, brought about to some extent by the availability of suitable disposals equipment which has been modified and adapted with the usual Amateur ingenuity.

If one hearkens back to the fires of '38/39, the only similarity to the two operations is that Amateurs participated and formed the backbone of the communications network. The equipment used in '38/39 bore little resemblance to the present equipment—it was bulky and cumbersome because it was not designed for the task and lacked simple power supply equipment. The picture of a certain Amateur madly pedalling a Flying Doctor supply is still vividly etched in my mind!

The problem of erecting a suitable antenna when the trees were either burned up or fallen down posed some headaches, but was overcome. The transmitter was most likely the exciter of the home transmitter hastily unmounted and taken to the site which meant that the stations of that time were static and had to rely on local sources of information on the fires by means of runners. How easy it is at the moment to slip away to the fire in a car with the transceiver already set up and operable on the move; but despite the convenience of the bulk of modern equipments, these rigs are by no means the ultimate in such emergencies.

W.I.C.E.N. must not stagnate because at the moment this type of mobile equipment is generally available and readily convertible to Amateur requirements. Not only the organisation but the equipment used must be fluid and versatile. It should be possible to readily operate the equipment in the car, but just as easily dismount and carry it wherever necessary, and still maintain the same degree of communication or better than is demanded at present. There is undoubtedly a need for both h.f. and v.h.f. equipment, especially in thickly forested areas and the ability to maintain 24-hour communication.

These several points, and no doubt others, are the lessons to be learned from the recent emergencies. The W.I.C.E.N. organisation, on a Federal basis, should plan its equipment on semi-circuitry, h.f. and v.h.f. facilities, c.w. or phone and independent of external power sources. Is this too much to ask a body dedicated to experimentation and public service?

Federal Executive, W.I.A.

## CONTENTS

# V.H.F. REFLECTION FROM METEOR TRAILS

*LEN EDWARDS,* VK7LE*

IT has been estimated that approximately 100 **tons** of matter from outer space falls into the earth's atmosphere every twenty-four hours. The greater bulk of this is in the form of very small particles of the order of a few cms. to a few microns in size which, due to their velocities, are burned up by friction with the upper atmosphere, a small quantity actually reaching the earth's surface before completely burning away. In the burning process, high temperatures are generated which quite often result in the emission of visible light and the familiar meteor trail, while another unseen effect is a trail of ionised particles which may persist for relatively long periods. The visible trail may also persist for a long period under some conditions, one personally observed persisting for 8½ minutes before breaking up and drifting away in upper atmosphere winds.

A large number of ionisation trails reach sufficient density to reflect radio signals, and as most trails occur at an altitude of 80 to 120 kilometres, long distance communication by reflection is possible providing the trail lasts for sufficient time to permit two-way contact.

Although a great deal of research has been done in this field in various parts of the world, very little information has been found for latitudes as far south as Hobart at 43°, and it was therefore considered that here was an interesting field for investigation which could be useful to those interested in this type of propagation. The main points for investigation would be the density, duration and number of trails, and these points could be checked with relatively simple equipment.

## H.F. RANGE

Some observations of reflections from ionised clouds, apparently due to the passage of satellites, had previously been made by observing the signal strength in Hobart of Radio Australia and A.B.C. Inland Service short-wave transmitters located in Victoria.

These observations were commenced in 1958 when the U.S.S.R. successfully orbited Sputnik 1 and 2, and have been carried on at intervals up to the present time.

The frequencies monitored were 21.54 Mc. and 15.23 Mc. and as Hobart is normally in the skip zone (also off the back of the beam) the signal normally received is very weak. However, large signal increases of up to 50 db. above one microvolt were noted which could be classified into three characteristic types:

1. Those with durations up to 30 seconds with sudden increase and slow decrease.
2. Those with durations of three to four minutes with slow increase and decrease having a slow fading pattern superimposed.
3. Those with durations of one hour or more, increasing to a steady maximum over a period of several minutes with a slow deep fading pattern.

**The Type 1 bursts** are undoubtedly due to meteor trail reflection and at 15.23 Mc. do not appear very frequently. They are, however, more frequent on 21.54 Mc., typical count being 50 for the hours 9.30 a.m. to 6 p.m. when the transmitter was on the air.

**The Type 2 bursts** are unlikely to be due to meteor trail reflection because of their duration and regular pattern. They tend to appear in groups of two or three, separated by intervals corresponding to typical satellite orbit times and recur also over several days at slightly differing times. It is possible to graph the daily arrival times and predict the next day's appearance until the signal finally fails to appear on schedule.

It appears that they are due to satellite induced ionisation, as described by Doctor J. D. Krans (W8JK) in 1958, the exact mechanism being open to argument. It appears also that the occurrence and strength of the bursts depends to a large degree on satellite altitude and the condition of the ionosphere at the time. An attempt was made to correlate bursts with known objects in orbit, but this failed probably because of the large number of bits and pieces of hardware known to be orbiting (over 400 in early 1964). Only weak inconclusive results were obtained from the Echo 2 satellite at an approximate altitude of 600 miles.

**The Type 3 bursts** are almost certainly due to sporadic fast moving high ionisation density clouds, as good correlation was found between these bursts and the appearance of sporadic E on the records of the Ionospheric Prediction Service in Hobart.

Although these observations are interesting, they are of little value for meteor trail observation because of the limited observing hours and the frequencies involved normally supporting long-distance communication.

## LOWER V.H.F. RANGE

It was therefore decided to move to the lower v.h.f. range and the equipment was modified to receive on the frequency of a radio-telephone transmitter in Southern Victoria beamed to Tasmania and on the air continuously. The radiated power is 200 watts on a frequency in the 40 Mc. band. Hobart is only slightly off the aerial beam and from results obtained there appears to be a substantial signal radiated at a high angle. The direct path length is approximately 400 miles.

Receiving equipment for this frequency consists of a converter feeding a modified TR1143 i.f. strip on 9.5 Mc. with noise limiter and 2 kc. tuned audio amplifier.

A beat frequency oscillator is used to produce a 2 kc. beat with the received carrier, which is then passed to a pen recorder and a mechanical counting circuit. All oscillators are crystal controlled and the aerial is a horizontal dipole. A.c. line voltage is regulated.

Two sets of observations have so far been made, the first giving the strength and duration of meteor trail reflections and the second giving the total number and number per minute. In observing strengths and durations, it was found necessary to modify the equipment to respond to only those lasting five seconds or longer, as the large number of reflections received tended to obscure the picture. Indeed there seems to be little doubt that meteors contribute substantially to the background ionisation level of the ionosphere.

Typical received signals reach a strength equivalent to 20 microvolts average at the aerial terminal while some reach as high as 100 microvolts. The number of reflections having a duration of five seconds or longer is approximately 700 during a typical 24-hour period and approximately 30% of those should provide a workable circuit for 10 seconds or more. Reflection durations of 30 seconds or longer are rare, but occasionally appear.

For checking the actual number of reflections the 2 kc. beat note from the receiver is fed to a Schmitt trigger which operates a relay and mechanical counter each time the amplitude reaches a certain threshold value. Circuitry is arranged so that only one count is registered independent of signal duration and strength, and a fixed d.c. output pulse is given for each operation of the counter. The d.c. pulses are stored in a resistance capacity circuit which is mechanically discharged by a cam every minute, the charge on the condenser being recorded on the pen recorder at one minute intervals. The indications given are therefore total count and count per minute, and results indicate typical totals of over 5,000 per 24 hours with peak counting rates of 20 per minute at maximum and one every two to three minutes at minimum.

The theoretical diurnal change in numbers due to earth rotation and the orbital motion of the earth is quite marked, with the maximum number occurring between 0500 and 0700 hours, and a minimum at 1800 hours.

The maximum is quite broad but falls off rapidly after 1200 hours and builds up gradually after 2400 hours. There is also a very marked tendency for reflections to arrive in groups and this is most noticeable during the minimum period.

An interesting point is the shift in frequency observed on some reflections, apparently due to Doppler Shift because of the rapid motion of the reflecting point. In some cases the shift is quite spectacular, starting at a high note and rapidly moving to a fixed lower note with an overall shift of approximately 2 kc.

This indicates motion of the reflection point towards the observer, and although it is unlikely that the point

(Continued on Page 6)

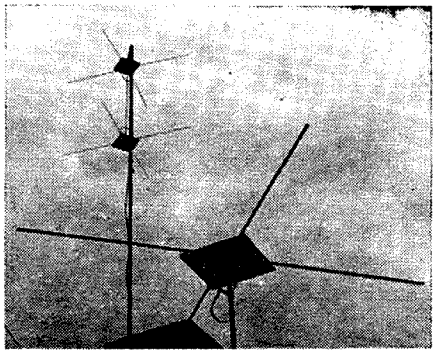
* 10 Musgrove Road, Lindisfarne, Tas.

# THE VK5 SIX & TWO METRE BEACON STORY

*BRIAN G. TIDEMAN,* VK5TN*

EARLY in 1963 the W.I.A., S.A. Division V.h.f. Section, appointed a committee of five to investigate the possibility of and the construction, if possible, of a six-metre beacon transmitting station.

We in VK5 had become aware of the advantages and the desirability of the W.A. V.h.f. Group Incorporated beacon VK6VF and so the VK5 beacon was soon under construction. The aim of the beacon transmitter was to provide data on propagation and band openings, and as a by-product, to provide a local signal of accurately known frequency and strength for local receiver adjustment.



Two-Metre (left) and Six-Metre Turnstile Antennae.

The major hurdle at the beginning was that of obtaining 24-hour operation. The P.M.G. Department would not agree to unattended operation under any circumstances, and insisted that all operations be in compliance with the "Regulations".

Fortunately we were able to use the ADS7 transmitting site where a resident engineer, who also holds the Amateur Licence, is in permanent attendance. To further cover the beacon operation, other members of ADS7 staff, who had Amateur Licences, were also co-opted. For the beacon transmitter to be fully effective, it was necessary to have it running for the maximum possible time, i.e. approaching continuous operation, and after negotiations to this end, proceedings continued.

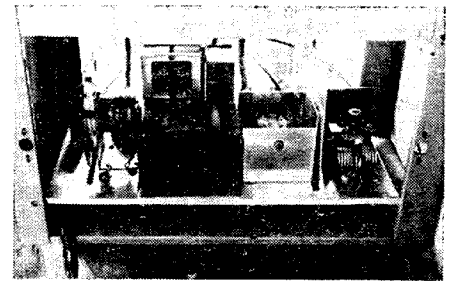
Eventually the transmitter and turnstile antenna were completed (with provision for a two-metre beacon to be installed at a later date) and put on the air in June 1963 and one month later, the two-metre beacon was installed together with its stacked turnstile antenna.

The call sign used was that of Mr. R. L. Paech, VK5LP, and the frequencies used were 50.500 Mc. and 144.500 Mc. (50.5 Mc. happens to be the frequency of JA1IGY and in fact the beacon caused some consternation at a government research station that monitors JA1IGY). In July 1963 the call sign was changed to the Section call sign, VK5VF (which falls into line with VK6VF).

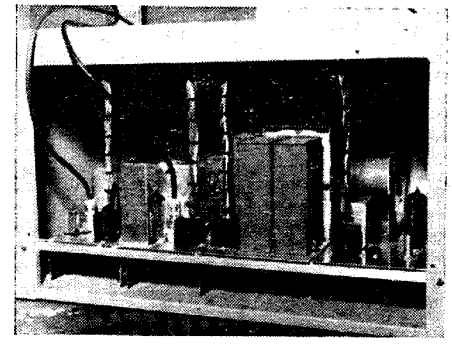
It was then that some problems arose. Firstly, the two-metre frequency happened to be uncomfortably close to that of VK3WI, and secondly, the fundamental type oscillators and exciters of the two transmitters were mixing and producing stray spots approximately ±1 Mc. from the two-metre frequency, and weaker spots at alarmingly frequent intervals across the two-metre band.

However, after many tense discussions and eventually some tests at the transmitters and at the receivers, the troubles in the two-metre band were

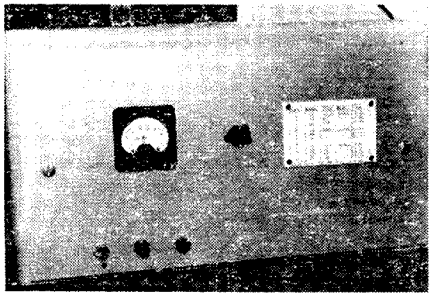
Front view—panel ajar.



Front view of Keyer, Power Supply, Two-Metre and Six-Metre Chassis.



Rear view of Six-Metre and Two-Metre Chassis, Power Supply and Keyer.



Beacons in operations—front panel view.

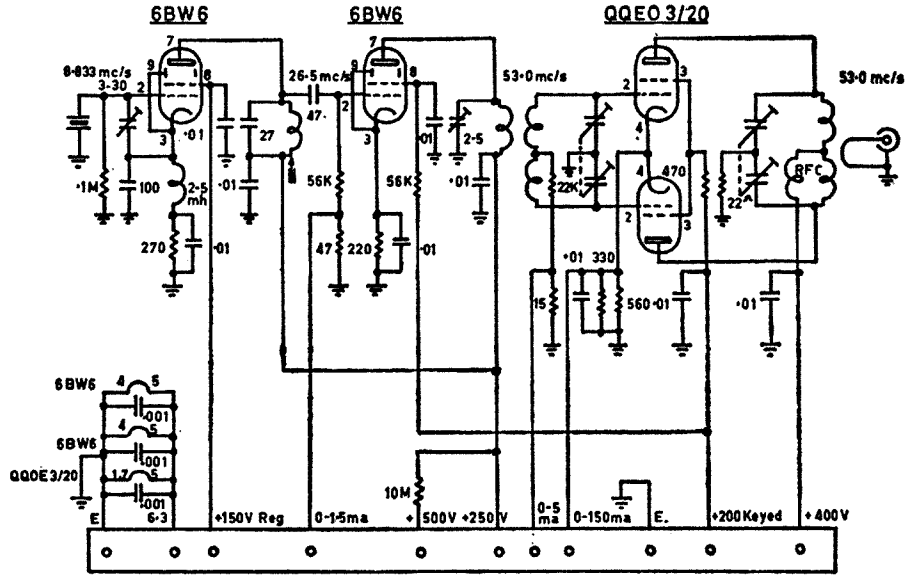



Fig. 1.—Circuit of the Six-Metre Transmitter. (The Two-Metre Transmitter has one extra 6BW6 multiplier stage and a QQE06/40 final instead of the QQE03/20.)

* Chairman V.h.f. Section, W.I.A., S.A. Div., 33 Ningana Ave., King's Park, South Aust.

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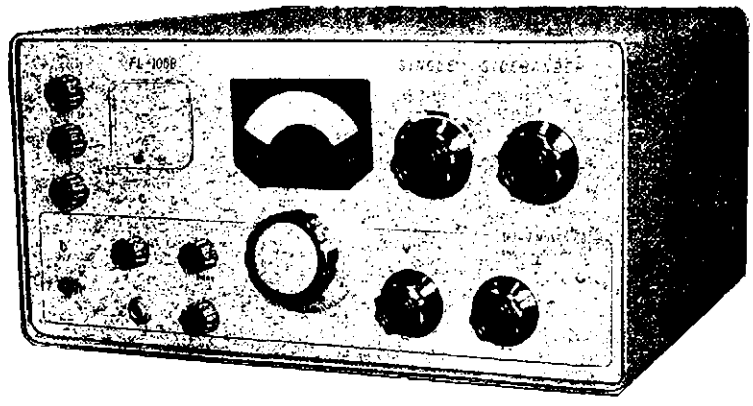

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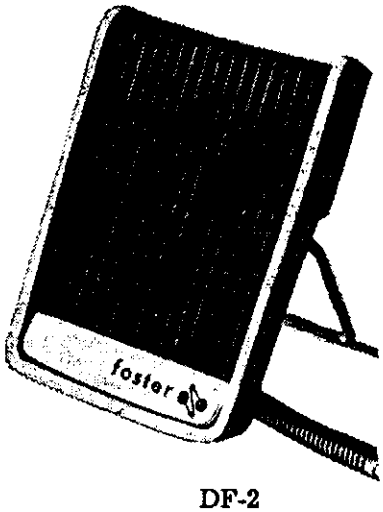


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Output Impedance .... .... .... .... .... 50 ohms or 50K ohms
Effective output level .... —55 db. [0 db. = (one) IV. Microbar]
Frequency response .... .... .... .... .... 200 to 10,000 c.p.s.

## OMNI-DIRECTIONAL DYNAMIC:

SIZE: 3" x 2-1/8" x 1".
Cable: 12 ft. of P.V.C.
Switch: on-off.
Desk Stand. Clip folds for hand use.
Colour: WHITE.
Plastic Diaphragm.

**Retail Price**
**50K ohms**
**£2/10/7**
**+ Sales Tax 5/3**

*A QUALITY PRODUCT OF EXCELLENT DESIGN*

*Marketed by* **ZEPHYR PRODUCTS PTY. LTD.**

**58 HIGH STREET, GLEN IRIS, S.E.6, VICTORIA** Phones: 25-1300, 25-4556

**Manufacturers of Radio and Electrical Equipment and Components**

**Agents:** D. K. Northover & Co.; Neil Muller Ltd.; Homecrafts (Tas.) P/L.; Jacoby, Mitchell & Co. P/L.; T. H. Martin P/L.

cured by improving the shielding and by-passing between the six and two-metre exciters. In August 1963, the two-metre frequency was changed to 144.800 Mc.

On April Fool's Day, 1st April, 1964, when VK Amateurs lost the 50-52 Mc. segment of the six-metre band, the six-metre beacon frequency was changed to 53.000 Mc. and both transmitters were adjusted accurately to frequency. Subsequent checks showed a daily frequencies shift of about +400 to —400 c.p.s. on both transmitters, the shift being due to the wide temperature excursions encountered at Pine Lodge, Mount Lofty.

## DESIGN

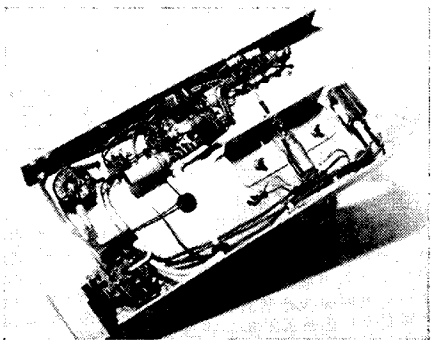
As can be seen by inspection of the circuit diagrams, the beacons have been made as reliable as possible (they have been running almost continuously now since June 1963 with only the initial teething troubles of a shorted power diode, an open-circuit RFC and moisture upsetting the operation of the then unsealed crystals) through the use of premium quality valves throughout, an optical keyer (the main initial worry until this was decided), protective cathode bias, and frequent voltage and current monitoring.

An important design feature was that of the antenna to be used. The final choice was a turnstile on six metres and a pair of turnstiles on two metres, both antennae being fed with UR70 co-axial cable.

The power input on both bands is approximately 30 watts, with the last two stages being screen keyed (there is some chirp noticeable on two metres only). The power supply uses an old 220 volts a side, 300 mA., power transformer to supply 250, 150 regulated and 400 volts.

The keying cycle consists of approximately 23 seconds of carrier, 6 seconds of the call sign VK5VF sent in type A1 emission, and 1 second of no carrier. Thus the call sign is transmitted once every 30 seconds, the carrier is on for a maximum length of time, and a period of no signal is left for receiver checking purposes.

The optical keyer employs a six-inch metal disc with the modulation consisting of pieces of wire soldered on to the circumference, the disc rotating between the light source (an automotive 12 volt 6 watt lamp running at half voltage—the original lamp is still in use) and an OAP12 light sensitive diode.



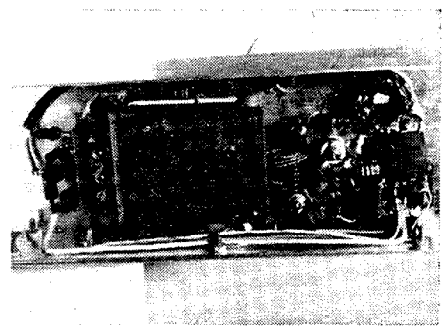
Keyer Chassis—underside view showing Keyer Optics.

## OPERATIONAL DATA

Due to a number of unfortunate circumstances, the existence of the beacon has not been publicised overseas and consequently no doubt, no reports of overseas reception (apart from New Zealand) have been received to March 1965.

In February and March 1964, Lance VK3AHL and David VK3AAU did some excellent work on meteor reflection of the 50.500 Mc. beacon, and one burst of the 23 seconds of continuous carrier and a few bursts of the full call sign were received. (The V.h.f. Section has a tape of these signals as received in Melbourne, if anyone is interested in hearing it.)

Six-Metre Transmitter—top view (xtal plugged into xtal oven holder—oven not in use due to unsuitability of xtal).



Six-Metre Transmitter—underside view.

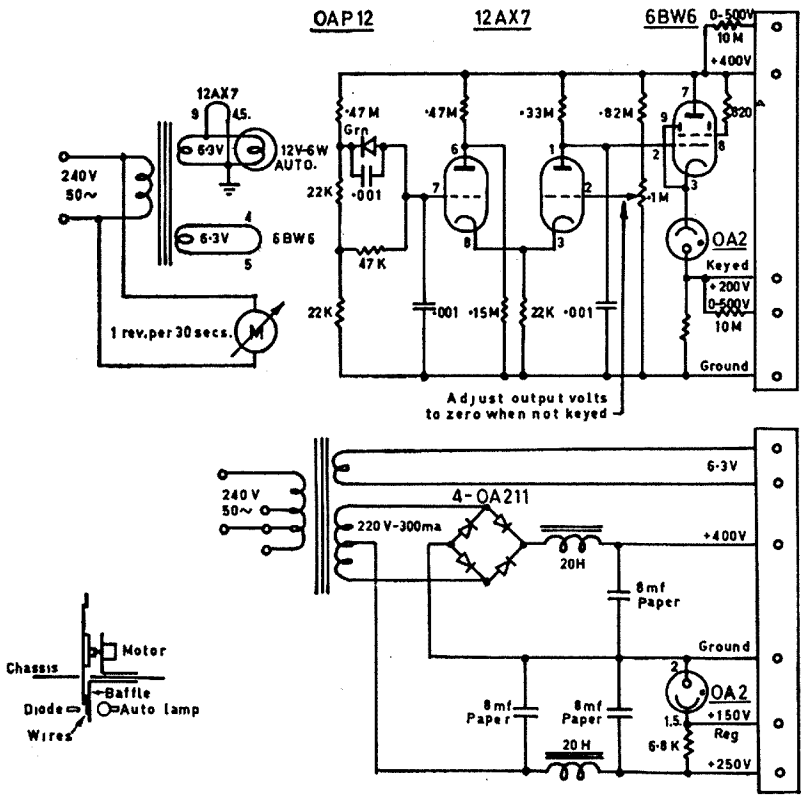



Fig. 2.—Above: Circuit of the Keyer. Below: Power Supply.
Note: Light on, Keyer on, 12v. auto parking lamp is used here on 6.3 volts. Light is passed through hacksaw slot in aluminium baffle. Narrow slot gives sharp keying. The monitor meter is 0-50 μA. used with multi-position switch.

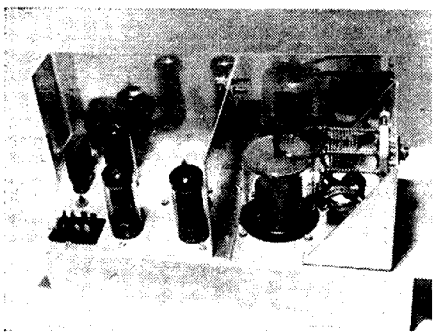
Also in March 1964, we received the first report of reception of the two-metre beacon in Hobart, Tasmania.

Perhaps one of the best uses to which the beacons have been put during this last season is that done by Colin Hurst (VK5ZHJ) in Gawler, S.A., and Andrew Martin (VK6ZCN), portable at Bunbury, W.A. (a distance of 1330.6 statute miles) when they worked two-way on two metres and two-way duplex six and two metres after a month or so of Andrew monitoring 144.800 Mc. and Colin monitoring Andrew's six metre frequency.

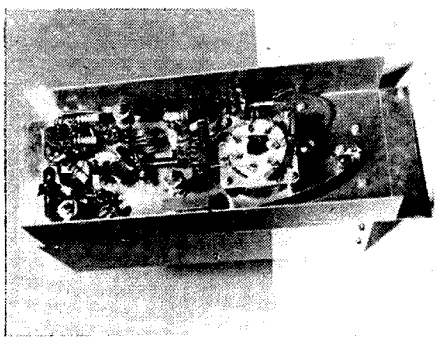
Investigation into the phenomena present at the time of this particular contact, and by reference to the other contacts between Eastern Australia and New Zealand on two metres in the same month, has brought to light the fact that it is extremely likely that these

1,000-mile or so paths now so commonly being worked on two metres are not only a result of very intense sporadic E layer ionisation being present, but also the fact that the weather conditions may have been conducive to tropospheric bending at several points on the paths, enabling a more oblique angle of incidence of the radio wave to be obtained on the Es sheets and therefore obtaining the extraordinarily high frequency of E layer reflection of 144 Mc.

It is understood also, that a VK2 Sydney v.h.f. enthusiast has a receiver fixed tuned to 53.000 Mc. and so connected to his two-metre transmitter that on receipt of the six-metre beacon signal from Adelaide, it will transmit a warning signal to the Sydney Amateurs on their most popular v.h.f. band. A Darwin station also has a fixed tuned receiver operating.



Two-Metre Transmitter—top view (using QQE06/40 p.a.).



Two-Metre Transmitter—underside view.

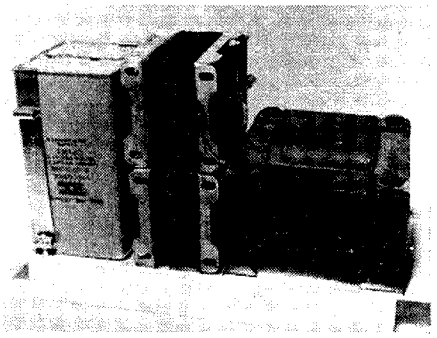
A 432 Mc. beacon transmitter may have to be re-considered, now that 432 Mc. signals have been exchanged between the Adelaide suburban area and Ballarat, Victoria.

## CONCLUSION

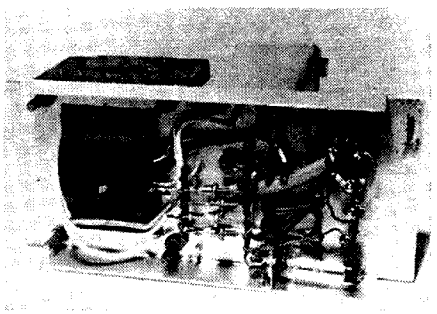
The South Australian beacon VK5VF has so far more than fulfilled the aims behind its conception.

It is to be hoped that in the event of publicity elsewhere, the beacons will be used to an even greater extent, to increase Amateur and other knowledge in the wide open field of electromagnetic propagation at v.h.f. and u.h.f.

The Australian Amateur has, in the last two years, heard a **reliable** beacon on both six and two metres and it is hoped that the other States of Australia will co-operate in this venture as they have already promised to do.



Power Supply—top view (note military components!!).



Power Supply—underside view.


### ACKNOWLEDGMENTS

This article would not be complete without thanking the various people who contributed to the project. Please accept my humble apologies if I have made any omissions. Those who must be thanked are:—

The Directors of Television Broadcasters Limited for their co-operation in making available the excellent site and facilities at a purely nominal annual cost.

The technical staff of ADS7 at Pine Lodge, Mount Lofty, for their assistance and also to Mr. Bob Broad (VK5ZYX) and his good wife, for putting up with "the grey box of spurious signals" (in addition to the t.v. QRM). (On the few occasions that the beacons are off the air, Bob VK5ZYX is operating.)

Mr. C. G. L. Tilbrook for the generous supply of crystals.

The Superintendent, Radio Branch, P.M.G's Department.

Mr. K. Horan and The Telecommunications Company of Australia for the supply of the two-metre final amplifier valve.

Mr. G. Herden for supplying the power transformer and other components.

Mr. A. McDonald, of Port Pirie, for expertly producing the photographs and the photographic album.

Mr. R. L. Paech for the initial use of his call sign.

Members of the committee responsible for the planning, construction and maintenance of the beacons, viz. Messrs. R. Fairweather (VK5ZFG), A. West (ex-VK5LA), B. Tideman (VK5TN), R. Matthews (VK5ZFQ), and R. Murphy (VK5ZDX).

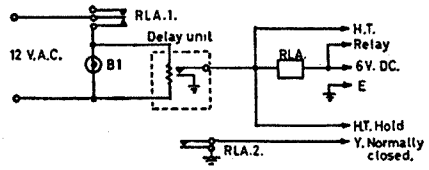
Finally, I would like to particularly thank the chairman of the beacon committee, Mr. A. L. West (ex-VK5LA), for the invaluable part that he played from the technical design standpoint, for his liaison with the Postmaster General's Department, and for the supply of components. ●


# H.T. DELAY CIRCUIT

Although mercury vapour rectifiers are fast being replaced by silicon diodes, some type of h.t. delay circuit is essential in a modern Amateur Radio station, even if only to reduce the numbers of control switches.

There are numerous delay methods and circuits available, three of which come to mind are: thermal types (e.g. type S), RC delay circuits with transistor or valve relay control, and circuits utilising the heater warm-up time of a vacuum tube.

Which ever delay method is employed, the circuit should be arranged so that the delay components are switched out, and allowed to revert back to the ready condition after they have operated.




A suitable circuit, incorporating a type S delay unit, is shown in the accompanying diagram.

At the same time as the equipment heaters are brought on, twelve volts a.c. is applied via the normal closed contacts RLA1 to the delay heater. After a pre-set time the micro-switch is actuated, closing relay A which holds closed through RLA2 contacts and the external control switch (may be l.f.-v.h.f. transmitter selector, if a common p.s. is used).

The delay is brought back into action by opening X-Y, or loss of a.c. or 6 v.d.c. supplies.

—R. N. Ferguson, VK3ZGZ.

☆

# V.H.F. REFLECTION FROM METEOR TRAILS

(Continued from Page 2)

would move away from the observer, resulting in a change from a low to a high note, this has actually been observed on several occasions. It is also interesting to note that reflections from "satellite induced ionisation" is evident at this frequency although appearances are less frequent and of shorter duration than on 15 and 21 Mc. By graphing these appearances from day to day it is again possible to predict the next day's appearance time with some certainty. Whereas on 15 and 21 Mc. appearance occurred in groups with intervals corresponding to successive satellite passages, on 40 Mc. only single appearances are evident.

Here perhaps are predictable openings which could be used for 50 Mc. long-distance communication and the chance for a "first"—by means of propagation via satellite induced ionisation. ●

# THE BRUCE ARRAY ON 7 Mc.

*AL SHAWSMITH,* VK4SS*

IT would be safe to say that the easily erected 7 Mc. g.p. or quarter wave vertical, is the most popular DX antenna, particularly for the city dwellers with their small yard space. For transmitting, its low angle of radiation makes it very efficient. (It would be necessary to have a horizontal antenna some 60 to 70 ft. high for the same fine angle of radiation.) However, the 7 Mc. g.p. is a poor receptor for DX, by virtue of the fact that it simply does not present enough "captive area" to any weak signal.

Those who live in city allotments cannot erect a rhombic, of course, but if there is reasonable room, a very efficient Bruce Array can be put up. Let me say before going any further, that this type of curtain is a one-band bi-directional affair; but just as effective for transmitting as receiving.

Fig. 1 shows a five-element vertically polarised with maximum radiation broadside to its length. Over 300 feet of wire is compressed, so as to make all the vertical elements carry current in the one direction. The top and bottom sections have current flowing in opposite directions, thus reducing radiation to a minimum. The overall length is not critical, so long as it is a foot or two of five wavelengths. The array can be lengthened to incorporate any number of vertical elements, but due to the concertina effect of the structure, wave-shift begins to appear after half a dozen vertical elements. This is easily correctable. It requires no appreciable height; the bottom wire can be a few inches above ground, or the array can be pulled off vertical (as mine is), so it is possible to walk or drive a car underneath.

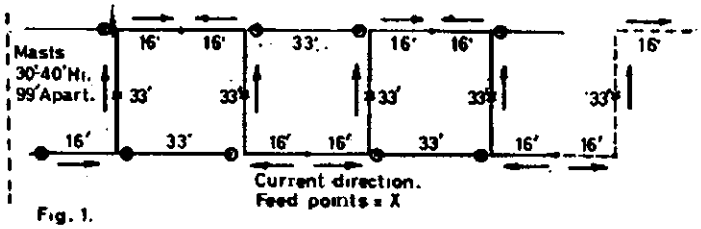



Fig. 1.

The 16 ft. wire length at each end can be strung away from antenna. For 80 metres all measurements are doubled.

If one is to have a chance of reading the really weak ones, it is necessary to receive off a directional array or a long wire. Those who have been fortunate enough to make an instant switch from a short vertical receptor to a long wire or rhombic, will know what I mean. Where no signals at all exist on the former, the band is crowded on the latter.

It is only important to remember that it must be fed at any of the points marked X (current fed) with tuned lines. Feed at the centre element is perhaps most desirable. It accepts current like most long wires. Over the entire 7 Mc. band, it has no frequency discrimination. Radiation resistance is not known, but possibly around 100 ohms—with tuned feeders a mismatch of three or four is not at all critical. Parallel or series tuning will depend on feeder length. Less than four vertical elements is not recommended if worthwhile gain both in transmitting and receiving is desired. Four elements can be erected in about 90 ft. yard space and five elements in 130 feet approx.

In the writer's case the bottom of the system has been pulled away so it is possible to drive underneath. It is orientated so that it covers Europe and Asia in the one direction, and South America and North Africa and Europe on the long route. My 7 Mc. ground plane stands on the roof; the five element Bruce Array runs between two houses, trees and other obstacles. On receive, to switch from the g.p. to the Bruce Array is a revelation—a dead band simply springs to life. It is better than one S point over the g.p. in its maximum radiation and off the ends a couple of points worse.

Anyone fortunate enough to have poles or supports in the vicinity of 50 to 60 feet and have a semi-rural environment would find such an array on 80 mx very efficient indeed.

Gain in db. depends on the number of elements used. ●

* 35 Whynot St., West End, Brisbane, Qld.

# Stabilising Oscilloscope Patterns Against Mains Variations

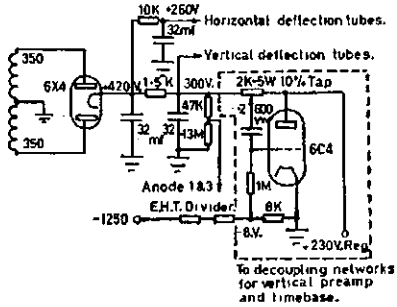
This annoying problem had been a challenge to the author for many years. It is overcome in the more expensive types of equipment with correspondingly complex circuitry too subtle and often too bulky to incorporate into regular service equipment.

The problem has now been simply solved once and for all with a 6C4 power triode in a negative feedback voltage regulating circuit. The triode works in effect as a gas regulator tube would. However, it is much more stable and corrects impulses instantly whereas the time constant of a gas regulator tube is just not good enough for oscilloscope work. The regulated voltage is not always convenient either.

The regulated voltage of the circuit described may be selected to suit the design value of the instrument concerned by adjusting the operating bias and the value of plate resistor.

The grid capacitor tap is 10% along the plate resistor from the plate end.

Bias for the triode is obtained from the e.h.t. divider by inserting the necessary resistor in the ground end. This has negligible effect on the intensity and focusing controls forming part of the divider. Bias values for 10 mA. 6C4 plate current at various plate voltages are given in Table 1. For other values of plate current, the tube curves should be consulted.




The author's presently modified oscilloscope is a ten-year-old, having a 6 Mc. vertical amplifier directly coupled to the deflection plates. The two vertical preamplifier stages were regulated and also the hard valve time base.

It was found that the 4 x 32 μF. high tension capacitive filter network was now partly redundant. Two of the capacitors and their accompanying resistors were removed. This allowed space for mounting the regulating components. It also provided a boosted high tension voltage allowing regulated output voltage to be maintained at manufacturer's design value.

| Regulated Voltage | Bias Voltage |
|---|---|
| 100 volts | —1.5 volts |
| 125 ,, | —2.5 ,, |
| 150 ,, | —4.0 ,, |
| 175 ,, | —5.0 ,, |
| 200 ,, | —6.0 ,, |
| 225 ,, | —7.5 ,, |
| 250 ,, | —9.0 ,, |
| 275 ,, | —10.5 ,, |

Table 1.

Although the circuit is not original, its simplicity and extraordinary effectiveness may be of benefit to many Amateurs.

—Clem Maloof, VK2AMA.

DEPARTMENT OF EXTERNAL AFFAIRS

## ANTARCTIC DIVISION

# RADIO TECHNICIANS & OPERATORS WANTED

### CONDITIONS OF EMPLOYMENT

Two to four months' preparatory work in Melbourne followed by approximately twelve months at the Station. Tentative sailing dates:—Macquarie Island — early December, Mawson and Wilkes — late December. Whilst absent from Australia, kitting and maintenance are provided free by the Commonwealth, and there is an allowance of 37½% of salary up to a maximum of £700 per annum, in addition to which a district allowance of £325 per annum for married men and £200 per annum for single men is paid. Recreation leave accrues at rate of five weeks per annum. Subject to the provisions of the Income Tax Assessment Act, Zone Allowance deduction of £270 may be allowable. Salaries commence within the appropriate range according to qualifications and experience. Employment will be in a temporary capacity under the Public Service Act 1922-1964.

### SUPERVISING TECHNICIAN: Mawson (1) and Wilkes (1)

Salary, including allowances*: Married man £2763 per annum; Single man, £2638.

Duties: Install and maintain HF transmitters up to 5 KW output, HF communication receivers, portable field equipment, ground aeradio communications and navigation equipment, radio teletype systems and fixed antenna systems and telephone lines and instruments.

Qualifications: Qualified Senior Radio Technician. Wide experience in the maintenance or installation and testing of radio communications transmitters and receivers and radio navigation equipment.

### TECHNICIAN (RADIO): Mawson (1) and Wilkes (1)

Salary, including allowances*: Married man £1858-£2070 per annum; Single man £1733-£1945.

Duties: Install and maintain radio and communications equipment under supervision.

Qualifications: Radio Tradesman with experience in the maintenance and installation of HF radio communications transmitters, receivers and associated equipment.

### RADIO SUPERVISOR: Macquarie Island (1)

Salary, including allowances*: Married man £2185-£2301 per annum; Single man £2060-£2176.

Duties: Install and maintain radio transmitting and receiving equipment, and act as Senior Radio Telegraphist.

Qualifications: Applicants should state any appropriate licence or technical diploma held by them. A thorough knowledge of theoretical and practical electronics plus a First Class Commercial Operator's Certificate of Proficiency or equivalent service experience.

### RADIO OFFICER: Macquarie Island (2), Mawson (4) and Wilkes (4)

Salary, including allowances*: Married man £1935-£2166 per annum; Single man £1810-£2041.

Duties: Radio Telegraphist.

Qualifications: Commercial Operator's Certificate of Proficiency or equivalent service experience, together with experience in operation and maintenance of ground installations.

### SENIOR OBSERVER (RADIO): Macquarie Island (1) and Wilkes (1)

Salary, including allowances*: Married man £2301-£2416 per annum; Single man £2176-£2291.

Duties: Maintenance and operation of radiosonde and radio/radar wind equipment and evaluation of instrumental records for reports.

Qualifications: Applicants must have educational qualifications to Intermediate Certificate standard and be trained as Radio Technicians. They should be experienced in:—

(i) UHF, VHF and microwave equipment.
(ii) pulse techniques.
(iii) frequency modulation.

Training: Successful applicants will be trained at a course in Melbourne commencing on 26th July, 1965.

### WEATHER OBSERVER (RADIO): Mawson (1)

Salary, including allowances*: Married man £2012-£2243 per annum; Single man £1887-£2118.

Duties: Taking of meteorological observations and the operation and maintenance of meteorological electronic equipment.

Qualifications: Applicants must have educational qualifications to Intermediate Certificate standard and be trained as Radio Technicians. They should be experienced in:—

(i) UHF, VHF and microwave equipment.
(ii) pulse techniques.
(iii) frequency modulation.

Training: Successful applicants will be trained at a course in Melbourne commencing on 26th July, 1965.

*Please note that all salaries quoted include allowances. These allowances are payable only whilst serving in Antarctica. Salary whilst on duty in Australia may be calculated by deducting allowances, e.g., a married man receiving £1897 whilst absent from Australia would receive salary of £1143 whilst in Australia, i.e., £1897 less £429 (37½% of salary) less £325 (district allowance). A single man would receive £125 less than the married man because of variation in district allowance payable.

Applicants for positions of Weather Observer and Weather Observer (Radio) should be at least 21 years of age.

Applicants must be in robust health. Ice or snow experience not required but history of outdoor activities is desirable.

Applications, which must be accompanied by a recent photograph and the names of at least three referees, should be lodged with the undermentioned addressee.

**The Director,**
**Antarctic Division,**
**Department of External Affairs,**
**568 St. Kilda Road,**
**Melbourne, S.C.3, Victoria.**

Please send me an application form for position of ..... with 1966 Australian National Antarctic Research Expeditions.

NAME .....

ADDRESS .....

..... STATE .....

(PLEASE COMPLETE IN BLOCK LETTERS.)

# The Historical Development of Radio Communication

## PART SIX—THE ADVENT OF THE EFFECTIVE ANTENNA

J. R. COX,* VK6NJ

### CHAPTER FIVE

### THE CONQUERING OF DIRECTIVITY

Directional transmission of electro-magnetic waves was known long before the phenomenon had any practical application to telegraphic wireless communication. Heinrich Hertz, in his original researches, had demonstrated that electro-magnetic wave radiation could be confined to form a beam. He achieved this with the use of parabolic mirrors which were about "two metres high and one metre in width."[86] Over a very short range he obtained successful results using a wavelength of about two-thirds of a metre.

With the advent of practical wireless telegraphy, its early pioneers realised that channelling radiation in certain directions held advantages. The problem was to adapt or evolve apparatus possessing directive properties for transmission over long ranges.

It was realised that only the radiation in the direction of the line between transmitter and receiver was of use. All other radiated power represented a loss. By confining radiation to a narrow beam the signal intensity would be increased in the desired line of transmission. A narrow band of transmission meant greater secrecy and the availability for other wireless stations of more spectrum space. Directivity was also acceptable economically as the effect of beaming was the same as increasing the apparent power output of the transmitting station without attendant increase in cost. A gain of directivity in transmission also meant a gain of directivity in reception with beneficial discrimination against interference because of the reduction of signal strength from the directions not favoured.

When Marconi first attacked the problem of practical wireless telegraphy he utilised the Hertzian mirror technique as a means of propagation. Using copper parabolic mirrors he projected a beam of radiation towards a certain point and was able to detect it at the maximum range of about two miles.

Marconi's initial experiments had indicated that the spark-gap transmitter was unsuitable for the production of short waves, but was suited to the generation of electro-magnetic waves of long length. This brought about the eclipse for a time of experiments on short wave propagation. The employment of long wavelengths in turn made the use of parabolic reflectors impracticable because they had to be large when compared with the length of the electro-magnetic wave itself.

Following the discovery that transmission range was immensely increased by the coupling of an elevated long wire antenna, Marconi centred his attention on that as the medium for propagation. His main aim from the outset had been the development of practical transmission and that target at first overrode the specialised task of directivity.

In 1896 the Marconi practical wireless telegraphy experiments had demonstrated the use of a long wire antenna upheld by a kite. His later tests included tin-foiled kites and insulated strips of wire mesh, one hundred and twenty feet long, suspended from vertical masts. These high aerials were omni-directional. It was experimental findings using this type of antenna which led to the enunciation of the Marconi rule postulating that transmission range increased proportionately with the square of the height of the antenna.[97] This arbitrary rule had a direct influence upon the development of early wireless antennae, as it clearly indicated the need to increase height for distance communication. This factor was apparent in antenna design for the first trans-Atlantic signalling venture. By then the wavelengths employed were in the vicinity of two miles long.

An attempt to achieve directive radiation was made by S. G. Brown in 1899. Brown explained that non-symmetrical radiation resulted from combination aerials. He specified that some directivity could be gained by connecting a pair of vertical antennae to one of the spark balls of a spark-gap oscillator. By spacing the antennae one half wavelength apart it was claimed that both reception and transmission were best in one given direction. Three years later Lee de Forest, of triode valve fame, patented an invention of a similar nature. These appear to be the first propositions for the combination of multi aerials, nowadays called aerial arrays. It is noteworthy to add that modifications of both these original schemes are utilised at the present time.

Attention was also given to directive antennae at receiving stations. Here the problem was to determine the direction of the transmitter. When this was done the receiving aerial could then be set to absorb the maximum energy radiated by the distant station. One interested in this work was F. Braun, who, in 1903, employed an upward sloping antenna inclined towards the incoming wave.[98] In the same year de Forest claimed that he could "locate within 10° the direction of a transmitting station".[99] The arrangement with which de Forest found direction is notable for its measure of portability. Shaped in the form of a letter "L" and made of metal plate, the whole arrangement could be swivelled around and orientated broadside on to the incoming waves. In this position the device collected most energy.

Thus for the first decade the propagation characteristics of antennae were a matter of speculation. As explained, directivity was claimed but no definite proof of it had been formulated. In 1906, however, a means of illustrating, graphically, the radiation pattern of various aerials was demonstrated by Guglielmo Marconi. Using a thermal ammeter to measure the value of current, it was shown to be possible by this means to plot the intensity of radiation at points equidistant around each antenna type under test. A decade after his original work Marconi returned to the problem. This was the first systematic survey made and forms the basis of today's methods for taking field strength tests. This initial work was paramount to the further development of wireless communication in general, because from then on the characteristics of each type of aerial could be discovered and hence the best antenna for a particular task could be selected. Apart from this, the fact that antennae differed in directivity, and indeed were capable of it, was established.

By using this systematic approach Marconi showed that "a horizontal aerial in which the length of the flat top largely exceeds the height will radiate more strongly in the direction opposite to the free end."[100] He also found that, as an obvious consequence of the Law of Exchanges which holds good for electro-magnetic radiation, as well as heat and light,[101] "any form of antenna which radiates better in one direction than another must best absorb radiation arriving from the direction towards which it radiates best."[102]

Taking advantage of his findings, Marconi then used a pair of bent antennae to fashion a practical, useful, directive, antenna system. For well over a decade after being patented in 1905,[103] the Marconi trans-Atlantic telegraphy stations employed these directional aerials. Soon after their initial success, their utility was improved by making the horizontal part capable of being swivelled around the vertical section. Independent investigations by Professor J. A. Fleming confirmed, in 1906, Marconi's earlier claims and for well over a decade after this the "bent antenna", as it came to be called, was used extensively in trans-oceanic wireless telegraphy.

Directed wireless telegraphy received further attention by F. Braun when, in 1906, he devised an entirely different method. He arranged three vertical masts to form the points of an equilateral triangle, thirty metres a side. Then, assisted by the methods suggested by two scientists, N. Papaleni and L. Mandellstam, he directly excited each antenna with oscillations differing in phase from one another. In this manner it was possible to cause the electro-magnetic waves emitted by the three aerials to combine and promote one another in a certain direction, but neutralise one another in other directions. The nett result of this arrange-

* Government School, Yornup, W.A.

[86] Institute of Radio Engineers (Aust.): op. cit.: p.4 of a paper entitled "Radio Navigation" by D. G. Lindsay.

[97] Fleming: op. cit., p.420.

[98] Ibid., p.652.

[99] Ibid., p.652.

[100] Bucher, Elmer: "Practical Wireless Telegraphy": Wireless Press, New York, 1918, revised edition, p.121.

[101] Lemon and Ference: op. cit., p.220.

[102] Fleming: op. cit., p.656.

[103] Ibid.

ment was a noticeable directivity in a certain direction. Braun's system laboured under the disadvantage of requiring three masts and extra equipment and, when compared with Marconi's bent antenna, was less simple yet only equally as effective. The main trouble with the Braun system was, not its complexity, but, the fact that it had to control long wave communication. It was, however, an ingenious development and well ahead of its time, since the principle of out-of-phase excitation is used with real success nowadays.

Another form of aerial which gave an insight into the possible construction of compound antennae, capable of maximum radiation in one direction, was that introduced in 1907 by E. Bellini and A. Tosi. Using a vertical mast they arranged two long wires in the form of an inverted V, which, when fed at the two legs and insulated at the apex, radiated in a field conforming to the figure "8". Greater directivity was achieved by later modification when one vertical and two inverted V aerials were inductively coupled to a spark-gap transmitter. The resultant radiation was confined to one side of the antenna. This system was to prove to be the forerunner of the movable beam. Bellini and Tosi so engineered the construction that the whole arrangement could rotate and very good results over distances extending up to 110 miles were obtained using a power expenditure of 500 watts.[104]

So it can be said, that by 1910, several aerial systems possessing some directive properties had been designed and of these the Bellini-Tosi arrangement approached nearest to the true beam effect. Already the foundations, phase opposition, multi aerials and reflectors, had been laid down for the evolution of the beam transmitting antenna. Unbeknown at the time, the massive stumbling block was the usage of long waves. Since it follows from the finding that antennae served best when cut to a resonant length,[105] all practical aerials were necessarily unwieldy.

Yet the advent of sure long range wireless communication was not to depend entirely upon the arrival of the beam antenna alone. Other factors were to prove important. When these factors were understood man was able to combine them with the properties of directional antennae to produce highly efficient beam wireless communication.

Effective long range directive wireless communication depends upon four factors:

1. The radiated power efficiency: calculated by comparing the amount of power generated with the amount of power radiated.
2. The frequency used: whether high frequency and short waves, or low frequency and long waves.
3. Characteristics of propagation of antenna used.
4. Properties of the medium of propagation.

As time progressed all four items received attention. It has been pointed out how various investigators worked at power efficiency and antenna radiation characteristics. The instance of frequency and wave length also received early consideration.

At first it had been assumed that only long waves could be used for long distance communication. This assumption, erroneous as it turned out to be, stemmed from Marconi's discovery that spark-gap apparatus was manipulated more easily during long wavelength generation. From this the wireless world followed the inference that long wavelengths were best. Indeed, the general viewpoint from the infancy of practical wireless until the early 1920's was that any wavelength below two hundred metres was useless for long range communication.[106]

For many years the utility of short waves was obscured by this opinion. They were not, in fact, used for wireless communication and, until they were, progress towards a convenient beam antenna was hardly practicable. Thus the discovery of the true directional or beam antenna hinged upon the discovery that short waves could be used for wireless communication.

Perhaps the one single factor which accelerated the discovery that short waves were ideal for communication was a resolution of the World Radio Congress held in London, 1912. This resolution, internationally agreed upon, limited the operation of amateur wireless stations to a frequency two hundred metres and below, official feeling being something like, "They'll never get out of their backyards with that!"[107]

So, while commercial interests concentrated upon long wave propagation with high power, the amateur, of necessity, experimented to achieve long range with waves "of less than two hundred metres, given to amateurs as one may give a toy to a child."[108]

Progress was made, and range developed from "the backyard" to five hundred miles and, by 1917, even one thousand miles. In 1921 two thousand miles had been covered. A demonstration of short wave communication was now planned. In this it was decided to span the Atlantic just as Marconi had done years before; only, this time, in the opposite direction.

An American, Paul Godley, arrived in the United Kingdom late in 1921 to try and detect amateur station signals emanating from the United States. Whilst in London he addressed the Wireless Society and ventured to say, "One has great hopes of being able to travel greater distances on shorter wavelengths."[109] His anticipation was fully rewarded when, at his receiving station in Scotland, between 8th and 17th December, 1921, he positively identified twenty-seven signals from America. Apart from the fact that these experiments opened up a new field of wireless communication research, they also served another purpose. This was to clearly show the advantage of valve oscillators generating continuous waves over the spark-gap transmitters. Thus these experimental transmissions heralded the approach of a new technique and the closure of another.

Further demonstrations of the utility of short wave propagation were forthcoming. In 1924 an English amateur operator made contact from his station 2OD with the United States, using only thirty-one watts power. This contrasted amazingly with the huge power expenditure necessary for long wave trans-Atlantic systems and commercial bodies began to take a keen interest in short wave techniques. This interest was heightened still more when in October 1924 the same amateur station was heard in New Zealand, a distance of 7,500 miles.

The short wave experiments had proved that whilst apparatus in the first place functioned better on long wavelength operation, this wavelength itself was not superior for long range wireless communication. It was realised from then on that previous trans-Atlantic wireless had succeeded in spite of the long wavelengths employed.

The development of the short wave technique of radio communication had a far-reaching repercussion on the development of the directional antenna, because "the shorter the wavelength and the higher the frequency, the smaller and cheaper the aerial and the more practical it is to direct its radiation."[110] It can be said that the opening of the short wave era was the first step towards finding the first really convenient highly efficient beam antenna.

Before the advent of the true beam antenna, however, divers uses were made of long wire aerials. The combination of long wire aerial and short wavelength, as used in the amateur test series, gave pronounced directivity in transmission.[111] Long wires can be combined to form various configurations that will increase directivity and apparent power gain. Such systems as the Bellini and Tosi were adaptable for short wave radiation with improved results. Indeed, the use of the said arrangement extended well into the 1950's. Modified forms were used on board European ships and the array was employed by American aviation for direction-finding purposes.[112] This last fact exemplifies the propensity of Bellini and Tosi's original research.

In 1928 the problem of directivity in wireless communication reached a further stage in its solution. The solution came in the form of a paper laid down by H. Yagi, of Japan, who postulated his theory on "Beam Transmission of Ultra Short Waves."[113] In the terms of

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[104] Ibid., p.666.

[105] In a resonant antenna the current flow is the largest possible and, as the field strength is directly proportional to current flow, greatest radiation occurs when the antenna is cut to a resonant length. The shortest resonant aerial is one half a wavelength long and this fundamental form is called a "dipole". When the antenna is more than one half wavelength long (but still an integral multiple of one half wavelength), it is usually termed a "long wire antenna".

[106] Norris, Roy C.: "Radio Engineering": Odhams Press, London, 1944, p.202.

[107] American Radio Relay League: "The Radio Amateur's Handbook": Concord, New Hampshire, U.S.A., 1959, 36th edition.

[108] Words spoken by Sir Ambrose Fleming. Radio Society of Great Britain: Journal, Vol. 39, No. 1, July 1963, p.27.

[109] Radio Society of Great Britain: op. cit., p.27.

[110] Scroggie, M. G.: "Foundations of Wireless": Iliffe and Sons Ltd., London, 1960, new impression, p.198.

[111] A long wire antenna is one which is long in terms of the transmitted wavelength and it does not exclusively mean a straight wire aerial.

[112] Nilson and Hornung: op. cit., p.378.

[113] Kraus: "Antennas": McGraw-Hill Book Company, New York, 1950, 1st edition.

his theory, which Yagi mathematically proved, radiation could be sharply beamed in the one direction by out-of-phase excitation of the various elements of a compound antenna.

Yagi's beam antenna centred around one element which was directly connected to the transmitter. In front of this element he placed a number of shorter elements called directors. Behind the driven element, that is, the one directly connected to the transmitter, he situated larger elements called reflectors. In such an array the current of the reflector and director aerials added up in phase in the desired direction and cancelled out in the undesired direction.

The operation of Yagi's system is akin to the principle of Braun's 1906 "out-of-phase" excitation of three vertical antennae, but the Yagi system is simpler, less unwieldly and relatively inexpensive. Today's adaptation of the Yagi idea forms the modern answer to beam transmission and reception. By increasing the number of driven elements and by suitably arranging them side by side, or, in stacks one on top of the other, radiation can be concentrated into an intense and very narrow beam indeed. In these days of multitudinous signals in a limited spectrum space this consideration is of ultimate importance.

The earlier investigators had been puzzled by the fact of long range wireless communication. They searched to answer the problem of how it was that electro-magnetic waves, which travel in straight lines, could be detected beyond the horizon of the earth's rounded surface. The quest for the answer has resulted in the gradual accumulation of knowledge about the propagation medium and its effect upon the emitted wave.

Admiral H. B. Jackson, R.N., made systematic observations on the effects of varying conditions of the atmosphere on the effective distance working of electric wave telegraphy in 1902.[114] In particular he dealt with transmission over the sea, and his findings included the phenomena of the gradual weakening and the occasional total cessation of a signal as the distance between two ships increased, and then its re-appearance as the distance between the ships still further increased.

It seems possible that Admiral Jackson was the first to record the "ground wave effect" noticeable when a receiver is within close range of the transmitter. It is very likely that the blank zone where no signals were detected corresponds to what is now termed the "skip zone", and that the signals received after this were "sky waves".[115] Admiral Jackson did not hint at the possibility of the conduction of emitted waves by the upper atmosphere but, in the same year, at almost the same time, such a suggestion was made. Kennelly, of America, and Oliver Heaviside, of the United Kingdom, were the two men concerned. Heaviside's words could speak for both: "There may possibly be a sufficient conductivity layer in the upper atmosphere. If so, the waves will, so to speak, catch on to it more or less."[116]

[114] Admiral Jackson's report is quoted in Fleming: op. cit., pp.813-822.

[115] These terms came into use long after Admiral Jackson's observations.

Marconi, in 1902, during his Atlantic voyage on board the S.S. Philadelphia, had noticed that signals could be received at night whereas they could not be detected by day. These events led him to propose that the shortening of range during the day was due to the weakening of the wave energy caused by the action of daylight upon the transmitting antenna.

As trans-Atlantic wireless telegraphy developed, hundreds of observations on day and night variance led to the analysis that regularly, for periods at sunrise and sunset, waves of 12,500 ft. were very strong whereas the longer regular wave of 14,700 ft. was near-undetectable. By 1909 it was a well-established concept that it was ionisation of the atmosphere by sunlight that was causing these variations. The explanation offered was that sunlight made turbid the conduction layer and so it absorbed the long wave. The weakening effect was at first overcome by simply increasing power for daylight transmissions. This solution was based on the belief that refraction alone accounted for the bending of long electro-magnetic waves around the earth's surface.

A departure from the acceptance of refraction as a total explanation for long distance wireless communication was advocated by Dr. J. W. Nicholson in 1910. He contended that other causes, "such as reflection from a layer of ionized air at high altitudes,"[117] must be the reason for the deflection of electro-magnetic waves around the global surface. Such reflection had been suggested by Marconi in his Nobel Prize lecture the year previous to this, and Professor J. A. Fleming also considered "that there is something of the nature of a reversed mirage effect, in virtue of which the waves are deflected round the earth by the reflective action of highly ionized layers of air in the upper atmosphere."[118]

The substantiation of the existence of a conductive layer came in 1925 upon the production of proof by Dr. E. V. Appleton. He showed that the conducting layer suggested by Kennelly and Heaviside consisted of several layers at various heights. One layer at 100 km. was named the Kennelly-Heaviside layer, and two others at 220 km. and 300 km. above the earth were called the Appleton layers.

It was found that these layers did indeed act as a mirror and reflect wireless waves back to earth. Furthermore, the waves may reflect between earth and layers many times and hence came the reason why long range wireless communication was possible.

The density and height of the layers alter from time to time because of the action of sunlight upon **them**, and not upon the **antenna** wire as Marconi had suggested. Due to alteration in height of the relevant reflecting layer, the radiated waves struck at differing angles and thus would be reflected and returned to earth at a different point, hence the evidence of variable conditions for reception near sunrise and sunset noticed since the beginning of long range wireless communication.

[116] Lee: op. cit., p.14.

[117] Fleming: op. cit., p.829.

[118] Ibid., p.830.

The long waves used in the early pioneering days were found to be especially susceptible to reflection by the lower layers with a high rate of absorption; hence when Marconi stepped up the power radiated, increased signal strength resulted. Short waves, it was discovered, penetrated the lower layer and rebounded from the higher layers where less absorption and height variation occurred; hence their strength when the long waves weakened due to alteration of layer.

Further research by two experimenters, Breit and Tuve, was made in 1926. This duo developed a system called the "pulse method" which proved a most useful means of determining the different heights of the various conduction layers surrounding the earth.[119]

Breit and Tuve's work initiated continuous investigation and, as techniques developed, automatic electronic equipment was placed at different parts of the world. As a result of this accumulation of experience over the years, it is possible to fairly accurately predict the condition of layers for some months ahead. Thus, if the height and density of the layer are known, the best frequency for beam transmission to a distant point can be selected. Then the beam from the directive antenna will radiate in a narrow beam and at the correct angle for reflection to the desired reception point. In other words, maximum benefit of power radiated will result.

(To be continued.)

[119] Breit and Tuve transmitted a short pulse of electro-magnetic energy which was received as a signal with an echo because of the difference in time of radiation over the sky and ground wave paths. From this data they calculated the equivalent height of the reflecting layer and the equivalent path of the sky wave.

## W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

### PHONE

| Call | Cer. No. | C'ntries | Call | Cer. No. | C'ntries |
|---|---|---|---|---|---|
| VK5MS | 24 | 314 | VK2ADE | 65 | 231 |
| VK5AB | 45 | 312 | VK2JZ | 61 | 227 |
| VK6RU | 2 | 307 | VK6KW | 4 | 211 |
| VK6MK | 43 | 303 | VK3WL | 14 | 211 |
| VK3AHO | 51 | 299 | VK4HR | 12 | 208 |
| VK4FJ | 21 | 283 | VK3ATN | 26 | 204 |
| **Amendments:** | | | | | |
| VK2AAK | 58 | 200 | VK3TG | 48 | 135 |

### C.W.

| Call | Cer. No. | C'ntries | Call | Cer. No. | C'ntries |
|---|---|---|---|---|---|
| VK3KB | 10 | 328 | VK2AGH | 71 | 274 |
| VK3CX | 28 | 305 | VK6RU | 18 | 262 |
| VK2QL | 5 | 301 | VK2EO | 2 | 255 |
| VK4FJ | 29 | 300 | VK3AHQ | 79 | 254 |
| VK2ADE | 81 | 298 | VK3ARX | 66 | 250 |
| VK3NC | 19 | 286 | VK3YL | 39 | 240 |
| **Amendment:** | | | **New Member:** | | |
| VK3RJ | 42 | 227 | VK3SR | 82 | 133 |

### OPEN

| Call | Cer. No. | C'ntries | Call | Cer. No. | C'ntries |
|---|---|---|---|---|---|
| VK2ADE | 28 | 322 | VK2ACX | 6 | 300 |
| VK6RU | 8 | 312 | VK3NC | 77 | 287 |
| VK4FJ | 32 | 308 | VK3JA | 43 | 271 |
| VK6MK | 74 | 305 | VK4HR | 7 | 254 |
| VK2AGH | 83 | 305 | VK2VN | 18 | 247 |
| VK3AHO | 76 | 303 | VK7LZ | 23 | 242 |
| **New Member:** | | | | | |
| VK2SG | 95 | 127 | | | |

# T PADS FOR R.F. CIRCUITS*

KEN "JUDGE" GLANZER, K7GCO

RADIO frequency T pads have many uses, particularly as attenuators between exciters and linear amplifiers. The amount of desired attenuation between the exciter and final depends on how much power is needed at the final grids, the efficiency of the grid circuit and the excess power of the driver. With a T pad in the line the exciter can be loaded at or near its full output while not overloading the final grids so that when the grid impedance changes (when the final goes from AB1 to AB2), the impedance change reflected back to the driver is reduced by the number of dbs. of loss inserted by the T pad. The driver then essentially sees a constant load.

The T pad has other uses such as between exciter and low power s.w.r. bridges, at the input to a field strength meter in case of strong fields, or on the output of signal generators.

## T PAD DESIGN

The circuit of a T pad is shown in Fig. 1. Also shown are the circuits of H pads which can be used for balanced lines. However, in most instances the T pad is usable and simpler.

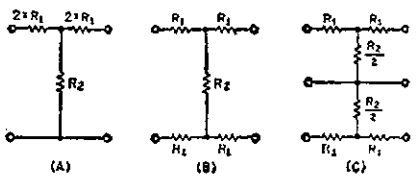



Fig. 1.—The T pad shown in (A) is suitable for most attenuation circuits, but the H pads in (B) and (C) are used for balanced lines.

A chart for determining the value of resistances needed for any particular value of db. attenuation is shown in Table 1. Since the chart values are for a 500 ohm impedance, to determine the resistance value for a 52 ohm pad each value must be multiplied by 52/500 or 0.104. For a 72 ohm pad the factor is 0.144.

For example, to calculate a 6 db. attenuator (which results in a power loss of 75%) look up the 6 db. loss on the chart which shows resistance value for R1 as 83.08 ohms and 669.4 ohms for R2. Now multiply each value by 0.104 to convert it to 52 ohm impedance values.

The value for R1 is now 8.64 ohms and R2 69.6 ohms. However, according to Fig. 1, the T pad configuration employs values of 2 × R1 and thus the values shown in Fig. 2 are required.

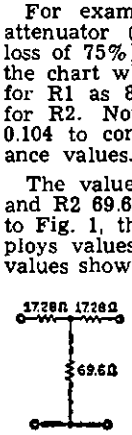



Fig. 2.—The 6 db. pad, calculated as an example in the text, is shown herewith.

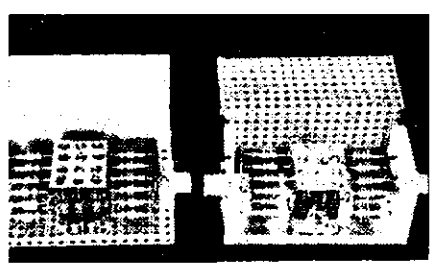
| Loss in db. | R1 | R2 |
|---|---|---|
| 0.1 | 1.440 | 43420.0 |
| 0.2 | 2.878 | 21720.0 |
| 0.3 | 4.318 | 14480.0 |
| 0.4 | 5.758 | 10850.0 |
| 0.5 | 7.193 | 8685.0 |
| 0.6 | 8.635 | 7232.0 |
| 0.7 | 10.07 | 6198.0 |
| 0.8 | 11.51 | 5421.0 |
| 0.9 | 12.95 | 4818.0 |
| 1.0 | 14.38 | 4333.0 |
| 2.0 | 28.65 | 2152.0 |
| 3.0 | 42.75 | 1420.0 |
| 4.0 | 56.58 | 1049.0 |
| 5.0 | 70.03 | 822.4 |
| 6.0 | 83.08 | 669.4 |
| 7.0 | 95.65 | 558.0 |
| 8.0 | 107.7 | 473.1 |
| 9.0 | 119.1 | 405.9 |
| 10.0 | 129.9 | 351.3 |
| 15.0 | 174.5 | 183.6 |
| 20.0 | 204.5 | 101.0 |
| 25.0 | 223.5 | 56.40 |
| 30.0 | 234.7 | 31.65 |
| 35.0 | 241.3 | 17.79 |
| 40.0 | 245.1 | 10.00 |

Table 1.—**Pad Resistor Values**

## PAD VALUES

The first problem in construction of the T pad is to find carbon resistors of sufficient power rating and of proper resistance value. The easy way out is to use 2 watt carbon resistors (10%) paralleled to develop the precision resistance values that will be required and at the same time to build up the power dissipation capabilities. The method of mounting the resistors to keep the T pad as resistive as possible was suggested by W7JNC and is shown in the photograph.

The first step is to determine how the desired values of resistance can be arrived at. In the example being discussed a value of 18 ohms can be obtained by paralleling ten 180 ohm resistors. The 69.6 ohm resistor bank was made up of ten 680 ohm resistors. (Eleven 750 ohm resistors would have given 2 watts more dissipation to that leg and left the twelfth hole for a parallel correcting resistor if it was necessary.) In actual practice, due to resistor tolerances, there will be some variation. Since the mounting plates will hold twelve resistors, this allows room for paralleling another resistor if final value is above 18 or 69.6. The actual values obtained were 18.1, 17.95, and 79.45. For all practical purposes this is close enough but if it is desired to have it exact, measure all three arms of T pad with an accurate resistance bridge or ohm-meter and add a correcting resistor.



View of the 6 and 3 db. T pad attenuators designed for 52 ohm co-axial cable.

The method of determining the required value of the correcting resistor $R_x$, for each branch, employs the parallel resistor formula:

$$R_T = \frac{R1 \times R_x}{R1 + R_x}$$

Solving for $R_x$, we get

$$R_x = \frac{R_T \times R1}{R1 - R_T}$$

where: $R_x$ = Unknown parallel resistor required.
$R_T$ = 17.28 ohms (desired value).
R1 = 18.1 ohms (actual value).

Thus—

$$R_x = \frac{17.28 \times 18.1}{18.1 - 17.28} = \frac{312.7}{0.82}$$

$R_x$ = 381 ohms.

Therefore a parallel resistor of 381 ohms would lower the final value of the 18.1 resistance to 17.28. The value needed in this case for the 17.95 branch was 462 ohms.

The resistance values required for a 3 db. pad are 8.9, 8.9, and 147.8 ohms. Eleven 100 ohm resistors connected in parallel should give 9.1 ohms and twelve 1,800 ohm resistors should give 150 ohms. The actual values obtained were 9, 9.1 and 161 ohms. The parallel correcting resistors are (in this case) 801, 396 and 1,800 ohms. The first two were installed in the 12th hole but the 1,800 ohm resistor had to be squeezed in as all 12 holes were used.

## T PAD HOUSING AND ASSEMBLY

The two T pads, the 6 and 3 db. units, are each made in one half a Bud box 2¼" x 2¼" x 5". This Bud enclosure was particularly suited for this application and as shown in the photo one half of the box contains the pad and the cover is made from perforated aluminium. The second pad ultilises the other half of the box and more perforated aluminium for ventilation.

The co-ax jacks are first mounted in the middle of the end pieces of the box. The four copper pieces are cut, drilled and bent, as shown in Fig. 3. The resistor leads are trimmed to ⅜" and are now soldered to the bottom plate as shown in Fig. 4. With the top leads trimmed to 5", the U sheet is soldered to the vertical resistors.

(Continued on Page 17)

* Reprinted from "CQ," July, 1964.

## RESULTS OF 1964 R.D. CONTEST

# SOUTH AUSTRALIA WINS CONTEST

HONOURS for the Remembrance Day Contest go to South Australia with a truly excellent score which put them well in front of their nearest rivals. It was generally agreed by the contestants that the band conditions were not as good as in previous years and most of the night time activity was confined to 80 metres and to a lesser extent to the 40 metre band.

Advice has been received from Federal Executive that VK1 and VK8 are to be shown as separate call areas in the future. Consequently the 1965 Contest rules will be amended accordingly.

Some correspondence has been received regarding the greater participation of Limited Licensees in the Contest as the v.h.f. bands are rarely open for Interstate contacts at this time. Therefore very few Limited Licensees are able to participate, the exception being those who are located close to neighbouring States. It is understood that in one State a v.h.f. Contest was held at the same time as the Remembrance Day Contest. We would like to hear any suggestions (apart from those who have already written) from Amateurs interested in this matter, in order that the 1965 Contest will see some changes in this direction.

Finally, our congratulations once again to South Australia for a splendid effort and hope that the coming Contest will receive the same support that the previous ones have had.

—Federal Contest Committee, W.I.A.

## DETAILS OF STATE SCORES

| | Total State Score | Aver. Top Logs | Licensees | Log Entry | Percentage. | State Log Aver. | Total State Points |
|---|---|---|---|---|---|---|---|
| New South Wales .... | 12,686 | 628 | 1,293 | 89 | 6.9 | 142.5 | 1,501 |
| Victoria .... .... .... .... | 13,819 | 684 | 1,078 | 66 | 6.1 | 209.2 | 1,530 |
| Queensland .... .... .... | 11,673 | 671 | 397 | 87 | 21.9 | 134.1 | 3,229 |
| South Australia .. .... | 19,521 | 914 | 452 | 111 | 24.5 | 175.8 | 5,707 |
| Western Australia .... | 8,767 | 455 | 255 | 82 | 32.1 | 106.9 | 3,274 |
| Tasmania .... .... .... .... | 4,519 | 384 | 120 | 38 | 31.6 | 119.0 | 1,815 |

### STATE TROPHY

South Australia .... .... .... 5,707 points

### Highest State Log Average

Victoria .... .... .... .... .... .... 209.2 points

### Highest Individual Score

VK5ZP .... .... .... .... .... .... 1,270 points

### Award Winners

**Open—**

VK1RD—R. Davis .... .... .... 373 pts.
2BO—E. L. Andrews .. .... 607 „
3ALZ—I. F. Berwick .. .... 843 „
4RH—A. L. Hoey .. .... .... 920 „
5ZP—J. McL. Vale .... .... 1,270 „
6CL—I. H. Clinch .... .... 560 „
7DK—D. H. Kelly .. .... .... 376 „
9XI—Rabaul Amateur Radio Club .. .... .... 131 „

**Phone—**

VK1QL—J. L. Weatherley .... 371 pts.
2AHM—R. J. Whyte .... .... 1,089 „
3MO—I. J. Williams .. .... 965 „
4DA—M. J. Swaby .... .... 678 „
5ZK—G. H. Herden .... .... 1,111 „
6LR—L. G. Rock .. .... .... 520 „
7KH—K. A. Hancock .. .... 402 „
8KK—D. A. McArthur .... 322 „
9AG—A. G. Nunn .... .... 35 „
0PK—P. King .. .... .... .... 516 „

**C.w.—**

VK2QL—F. T. Hine .... .... .... 519 pts.
3AXK—S. R. Coleston .... 383 „
4JF—J. Files .... .... .... .... 230 „
5ZC—A. J. Penney .... .... 347 „
6WT—D. Couch .... .... .... 374 „
7SM—S. G. Moore .... .... 485 „
8UX—L. W. Wallbridge .. 14 „
9GC—A. H. Sandilands .. 116 „

**Receiving—**

VK1—A. Davis .... .... .... .... 651 pts.
L2033—D. W. Shephard .. .... 420 „
L3138—G. N. Earl .... .... .... 832 „
VK4—W. Thorpe .... .... .... .... 662 „
L5065—A. F. Raftery .. .... .... 821 „
L6021—P. W. Drew .... .... .... 1,115 „
VK7—G. C. Johnston .... .... 908 „

### AUST. CAPITAL TERRITORY

**Open—**

| Call | Cont. | Pt. |
|---|---|---|
| VK1RD .. .. .. | 161 | 373 |
| 1GB .. .. .. | 86 | 190 |
| 1VK .. .. .. | 31 | 68 |

**Phone—**

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK1QL .. .. | 149 | 371 | VK1LF .. .. .. | 16 | 45 |
| 1VP .. .. .. | 69 | 170 | 1SB .. .. .. | 12 | 33 |
| 1KM .. .. | 40 | 83 | 1DR .. .. .. | 9 | 19 |
| 1ATR .. .. | 23 | 55 | 1CR .. .. .. | 8 | 14 |

### NEW SOUTH WALES

**Top Six Logs—**

VK2AHM .. .... .... .... 1,089 points
2BO .... .... .... .... 607 „
2TS .... .... .... .... 606 „
2QL .... .... .... .... 519 „
2DO .... .... .... .... 506 „
2VN .... .... .... .... 442 „

**Open—**

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK2BO .. .. .. | 232 | 607 | VK2HC .. .. .. | 54 | 122 |
| 2DO .. .. .. | 209 | 506 | 2CK .. .. .. | 62 | 121 |
| 2XU .. .. .. | 151 | 364 | 2EL .. .. .. | 51 | 113 |
| 2AGH .. .. | 117 | 332 | 2APO .. .. | 59 | 107 |
| 2SU .. .. .. | 103 | 274 | 2IC .. .. .. | 26 | 63 |
| 2OO .. .. .. | 95 | 218 | 2HZ .. .. .. | 20 | 52 |
| 2DR .. .. .. | 100 | 210 | 2AUC .. .. | 16 | 23 |
| 2PU .. .. .. | 78 | 169 | 2IV .. .. .. | 8 | 18 |
| 2AJQ .. .. | 62 | 122 | | | |

**Phone—**

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK2AHM .. .. | 399 | 1,089 | VK2AKX .. .. | 43 | 81 |
| 2TS .. .. .. | 263 | 606 | 2XA .. .. .. | 31 | 76 |
| 2AKF .. .. | 166 | 422 | 2AQJ .. .. | 35 | 72 |
| 2AFT .. .. | 171 | 416 | 2AIM .. .. | 22 | 61 |
| 2ACQ .. .. | 87 | 242 | 2VJ .. .. .. | 30 | 53 |
| 2ALV .. .. | 202 | 236 | 2SJ .. .. .. | 37 | 46 |
| 2BB .. .. .. | 102 | 227 | 2AKL .. .. | 17 | 33 |
| 2ZX .. .. .. | 100 | 224 | 2RU .. .. .. | 27 | 33 |
| 2XT .. .. .. | 59 | 197 | 2SG .. .. .. | 9 | 32 |
| 2ASI .. .. | 75 | 166 | 2CU .. .. .. | 6 | 27 |
| 2AOK .. .. | 70 | 161 | 2BJO/P .. | 16 | 26 |
| 2AXJ .. .. | 71 | 154 | 2ADL .. .. | 6 | 23 |
| 2ACZ .. .. | 62 | 152 | 2RJ .. .. .. | 10 | 23 |
| 2MR .. .. .. | 40 | 147 | 2GV .. .. .. | 10 | 20 |
| 2CM .. .. .. | 40 | 147 | 2ATZ .. .. | 11 | 18 |
| 2MW .. .. | 61 | 121 | 2UU .. .. .. | 6 | 15 |
| 2LA .. .. .. | 43 | 114 | 2APQ .. .. | 10 | 15 |
| 2AIA .. .. | 38 | 112 | 2EY .. .. .. | 9 | 15 |
| 2VH .. .. .. | 49 | 110 | 2AKV/M . | 8 | 14 |
| 2GI .. .. .. | 44 | 114 | 2AWX . .. | 9 | 14 |
| 2AZG .. .. | 42 | 97 | 2OE .. .. .. | 10 | 13 |
| 2OX .. .. .. | 43 | 87 | 2AND .. .. | 6 | 6 |

**C.w.—**

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK2QL .. .. .. | 189 | 519 | VK2QZ .. .. .. | 23 | 87 |
| 2VN .. .. .. | 150 | 442 | 2PQ .. .. .. | 40 | 78 |
| 2EO .. .. .. | 141 | 418 | 2JM .. .. .. | 20 | 48 |
| 2APK .. .. | 154 | 413 | 2AXK .. .. | 12 | 38 |
| 2QK .. .. .. | 117 | 334 | 2BGG .. .. | 11 | 34 |
| 2GT .. .. .. | 114 | 319 | 2GW .. .. .. | 12 | 31 |
| 2YB .. .. .. | 120 | 303 | 2ATQ .. .. | 11 | 25 |
| 2ZO .. .. .. | 47 | 106 | 2AAH/M . | 7 | 23 |

### VICTORIA

**Top Six Logs—**

VK3MO .. .... .... .... 965 points
3ALZ .. .... .... .... 843 „
3ATN .. .... .... .... 634 „
3ARD .. .... .... .... 611 „
3XY .... .... .... .... 583 „
3RV .... .... .... .... 469 „

**Open—**

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK3ALZ .. .. | 300 | 843 | VK3KC .. .. .. | 89 | 162 |
| 3QV .. .. .. | 120 | 363 | 3AIY .. .. | 51 | 94 |
| 3XB .. .. .. | 129 | 338 | 3KS .. .. .. | 18 | 74 |
| 3KB .. .. .. | 97 | 224 | 3PG .. .. .. | 13 | 23 |

**Phone—**

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK3MO .. .. .. | 353 | 965 | VK3GC .. .. .. | 84 | 217 |
| 3ATN .. .. | 200 | 636 | 3VZ .. .. .. | 82 | 203 |
| 3ARD .. .. | 234 | 611 | 3NN .. .. .. | 63 | 203 |
| 3XY .. .. .. | 230 | 583 | 3AHT .. .. | 86 | 200 |
| 3RV .. .. .. | 173 | 469 | 3WW .. .. | 86 | 181 |
| 3AIT .. .. | 201 | 424 | 3AMT .. .. | 92 | 179 |
| 3ACI .. .. | 188 | 375 | 3BA .. .. .. | 88 | 176 |
| 3ASN .. .. | 153 | 341 | 3ACD .. .. | 57 | 158 |
| 3EF .. .. .. | 127 | 311 | 3AUK .. .. | 69 | 140 |
| 3ARJ .. .. | 114 | 310 | 3AKZ .. .. | 54 | 133 |
| 3ZU .. .. .. | 134 | 296 | 3HC .. .. .. | 52 | 122 |
| 3WB .. .. .. | 129 | 294 | 3AZM .. .. | 42 | 120 |
| 3EG .. .. .. | 123 | 292 | 3AHA .. .. | 60 | 119 |
| 3AWT .. .. | 131 | 285 | 3AWD .. .. | 50 | 105 |
| 3ABP .. .. | 116 | 252 | 3YQ .. .. .. | 44 | 102 |
| 3SM .. .. .. | 115 | 245 | 3SX .. .. .. | 42 | 99 |
| 3ZX .. .. .. | 86 | 222 | 3WM .. .. | 31 | 98 |
| 3WK .. .. .. | 85 | 221 | 3QZ .. .. .. | 33 | 63 |

### Phone (cont.)—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK3DY | 30 | 59 | VK3RN | 21 | 39 |
| 3AKJ | 32 | 54 | 3OR | 19 | 38 |
| 3AWV | 21 | 52 | 3AFL | 11 | 33 |
| 3DU | 21 | 50 | 3AAC | 11 | 20 |
| 3AR | 24 | 41 | 3OH | 10 | 19 |

### C.w.—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK3AXK | 173 | 383 | VK3ZC | 41 | 100 |
| 3RJ | 111 | 271 | 3AWM | 39 | 82 |
| 3APJ | 105 | 233 | 3AND | 37 | 62 |
| 3ARX | 60 | 147 | 3HE | 20 | 48 |
| 3HP | 64 | 146 | 3AFQ | 22 | 42 |
| 3QP | 56 | 104 | 3YS | 9 | 17 |
| 3SR | 36 | 102 | 3NI—Check Log | | |

## QUEENSLAND

### Top Six Logs—

| | | |
|---|---|---|
| VK4RH | 920 | points |
| 4DP | 746 | ,, |
| 4DA | 678 | ,, |
| 4BQ | 669 | ,, |
| 4UX | 511 | ,, |
| 4MW | 506 | ,, |

### Open—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK4RH | 343 | 920 | VK4FJ | 22 | 65 |
| 4DP | 278 | 746 | 4RB | 21 | 55 |
| 4UX | 190 | 511 | 4RE | 27 | 45 |
| 4DB | 108 | 239 | 4GG | 18 | 22 |
| 4UC | 89 | 161 | 4QF | 14 | 19 |
| 4PX | 38 | 101 | | | |

### Phone—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK4DA | 292 | 678 | VK4PU | 18 | 50 |
| 4BQ | 219 | 669 | 4AV | 9 | 47 |
| 4MW | 201 | 506 | 4JW | 15 | 45 |
| 4OR | 160 | 482 | 4ZZ | 19 | 44 |
| 4LT | 180 | 478 | 4GS | 19 | 41 |
| 4RZ | 165 | 405 | 4ZB | 9 | 40 |
| 4XY | 142 | 404 | 4NS | 20 | 40 |
| 4WW | 152 | 390 | 4LW | 28 | 40 |
| 4ES | 128 | 302 | 4QC | 25 | 38 |
| 4FY | 117 | 259 | 4BA | 17 | 36 |
| 4PS | 89 | 257 | 4ZW | 20 | 36 |
| 4LN | 102 | 252 | 4LA | 27 | 33 |
| 4JI | 115 | 220 | 4KS | 10 | 30 |
| 4WP | 68 | 165 | 4LB | 9 | 29 |
| 4RO | 60 | 164 | 4RW | 12 | 29 |
| 4FE | 61 | 146 | 4CI | 14 | 28 |
| 4FK | 38 | 120 | 4JE | 7 | 26 |
| 4EH | 32 | 112 | 4JJ | 15 | 29 |
| 4JM | 56 | 103 | 4SF | 12 | 21 |
| 4HC | 56 | 102 | 4GT | 5 | 17 |
| 4HR | 31 | 99 | 4ZM | 6 | 17 |
| 4OF | 53 | 97 | 4BZ | 12 | 17 |
| 4AN | 44 | 89 | 4CW | 6 | 16 |
| 4LE | 33 | 80 | 4XN | 8 | 14 |
| 4QW | 36 | 73 | 4RG | 9 | 14 |
| 4UL | 25 | 65 | 4AF | 6 | 12 |
| 4OV | 26 | 63 | 4VS | 6 | 11 |
| 4DZ | 42 | 59 | 4NG | 6 | 9 |
| 4DO | 20 | 57 | 4HZ | 7 | 9 |
| 4PJ | 33 | 57 | 4PR | 6 | 7 |
| 4NE | 20 | 52 | 4FT | 6 | 6 |
| | | | 4UK | 6 | 6 |

### C.w.—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK4JF | 95 | 230 | VK4SD | 13 | 45 |
| 4XP | 73 | 179 | 4XJ | 10 | 39 |
| 4HH | 64 | 125 | 4CK | 21 | 38 |
| 4KU | 37 | 90 | 4ON | 11 | 19 |
| 4VR | 25 | 68 | 4CN | 7 | 9 |
| 4WO/P | 26 | 53 | 4UU | 5 | 6 |
| 4KX | 25 | 47 | | | |

## SOUTH AUSTRALIA

### Top Six Logs—

| | | |
|---|---|---|
| VK5ZP | 1,270 | points |
| 5ZK | 1,111 | ,, |
| 5BQ | 904 | ,, |
| 5RG | 791 | ,, |
| 5GZ | 771 | ,, |
| 5FT | 635 | ,, |

### Open—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK5ZP | 460 | 1,270 | VK5WV | 111 | 280 |
| 5RG | 315 | 791 | 5KI | 106 | 211 |
| 5CV | 162 | 517 | 5QR | 77 | 190 |
| 5WO | 133 | 449 | 5RK | 15 | 79 |
| 5TC | 154 | 395 | 5HM | 15 | 59 |
| 5EJ | 162 | 321 | 5NH | 28 | 50 |

### Phone—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK5ZK | 404 | 1,111 | VK5NY | 55 | 91 |
| 5BQ | 321 | 904 | 5JC | 24 | 86 |
| 5GZ | 302 | 771 | 5WL | 19 | 84 |
| 5FT | 223 | 635 | 5GX | 34 | 82 |
| 5GW | 202 | 549 | 5LN | 33 | 78 |
| 5MF | 181 | 459 | 5KE | 15 | 72 |
| 5EF | 154 | 416 | 5CJ | 29 | 71 |
| 5GV | 158 | 409 | 5LZ | 27 | 63 |
| 5NN | 157 | 357 | 5FO | 29 | 61 |
| 5BP | 126 | 299 | 5KS | 30 | 60 |
| 5KM | 124 | 296 | 5ZKR | 6 | 56 |
| 5CD | 112 | 286 | 5UF | 28 | 55 |
| 5OH | 110 | 280 | 5CH | 16 | 53 |
| 5IB | 91 | 270 | 5OK | 21 | 50 |
| 5EQ | 74 | 254 | 5OC | 15 | 49 |
| 5SX | 109 | 216 | 5KY | 12 | 45 |
| 5BG | 66 | 204 | 5CY | 31 | 44 |
| 5DF | 67 | 196 | 5ZQ | 13 | 44 |
| 5MC | 90 | 194 | 5IQ | 10 | 43 |
| 5TJ | 63 | 188 | 5PM | 30 | 42 |
| 5LC | 71 | 187 | 5FM | 14 | 42 |
| 5AX | 101 | 182 | 5GO | 17 | 39 |
| 5KC | 73 | 179 | 5TU | 23 | 38 |
| 5RR | 67 | 177 | 5DJ | 22 | 37 |
| 5TM | 67 | 163 | 5RT | 20 | 37 |
| 5SS | 77 | 162 | 5JK | 10 | 33 |
| 5ZE | 64 | 161 | 5DO | 12 | 31 |
| 5LQ | 39 | 161 | 5LO | 10 | 30 |
| 5FL | 39 | 152 | 5ZK/Log | | |
| 5ID | 58 | 132 | 5WI | 7 | 27 |
| 5ZZ/T | 61 | 115 | 5MS | 11 | 26 |
| 5BB | 28 | 113 | 5PS | 13 | 23 |
| 5WN | 39 | 110 | 5JA | 10 | 23 |
| 50B | 30 | 105 | 5GF | 11 | 16 |
| 5DA | 30 | 98 | 5BI | 12 | 14 |
| 5DC | 45 | 96 | 5JB | 6 | 13 |
| 5CO | 28 | 94 | 5WW | 10 | 11 |
| 5XL | 51 | 92 | 5NF | 8 | 10 |
| 5CL | 44 | 92 | | | |

### C.w.—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK5ZC | 143 | 347 | VK5KO | 22 | 59 |
| 5XK | 121 | 320 | 5MY | 19 | 47 |
| 5LD | 108 | 275 | 5FY | 16 | 47 |
| 5PC | 108 | 255 | 5TL | 20 | 43 |
| 5FE | 70 | 195 | 5BS | 20 | 41 |
| 5ZF/P | 54 | 154 | 5RX | 10 | 39 |
| 5OR | 63 | 135 | 5KU | 13 | 31 |
| 5GP | 38 | 91 | 5JG | 12 | 30 |
| 5MZ | 31 | 79 | 5RH | 9 | 25 |
| 5JT | 22 | 78 | 5BM | 6 | 8 |
| 5JE | 27 | 66 | | | |

Disqualified Log VK5NO/Port. VK2.

## WESTERN AUSTRALIA

### Top Six Logs—

| | | |
|---|---|---|
| VK6CL | 560 | points |
| 6LR | 520 | ,, |
| 6SM | 429 | ,, |
| 6RY | 427 | ,, |
| 6KN | 423 | ,, |
| 6WT | 374 | ,, |

### Open—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK6CL | 218 | 560 | VK6JK | 57 | 150 |
| 6SM | 164 | 429 | 6WI | 36 | 83 |
| 6WU | 89 | 276 | 6HK | 16 | 40 |
| 6VK | 75 | 185 | 6BA | 13 | 27 |
| 6RU | 60 | 177 | | | |

### Phone—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK6LR | 190 | 520 | VK6CW/Log | | |
| 6RY | 171 | 427 | 6CN | 20 | 57 |
| 6KN | 161 | 423 | 6NJ | 24 | 57 |
| 6XX | 134 | 340 | 6KJ | 23 | 54 |
| 6WL | 117 | 308 | 6LM | 17 | 51 |
| 6CW | 113 | 277 | 6CR | 20 | 50 |
| 6RX | 108 | 256 | 6RU/Log | | |
| 6AV | 91 | 240 | 6AE | 19 | 50 |
| 6WV | 65 | 176 | 6WY | 16 | 47 |
| 6CA | 61 | 173 | 6LR/Log | | |
| 6HH | 57 | 171 | 6LK | 15 | 47 |
| 6VF | 60 | 160 | 6BR | 17 | 45 |
| 6MM | 51 | 137 | 6CP | 16 | 45 |
| 6KH | 43 | 117 | 6DC | 16 | 44 |
| 6DX | 40 | 105 | 6XO | 16 | 40 |
| 6XG | 36 | 98 | 6TM | 17 | 39 |
| 6RW | 32 | 91 | 6JO | 16 | 38 |
| 6TB | 31 | 86 | 6GJ | 16 | 38 |
| 6AF | 32 | 81 | 6KW | 16 | 37 |
| 6RY/Log | | | 6GJ/Log | | |
| 6NN | 34 | 79 | 6CA | 12 | 36 |
| 6YL | 28 | 77 | 6VM | 15 | 36 |
| 6EZ | 21 | 73 | 6DP | 9 | 33 |
| 6MO | 27 | 71 | 6WG | 11 | 33 |
| 6DT | 26 | 68 | 6GL | 12 | 32 |
| 6KS | 24 | 65 | 6DC/Log | | |
| 6TK | 25 | 63 | 6LF | 10 | 29 |
| 6TY | 21 | 58 | 6MK | 12 | 28 |
| 6BU | 24 | 57 | 6FX | 12 | 28 |

### Phone (cont.)—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK6CD | 11 | 28 | VK6BS | 8 | 19 |
| 6ZW | 9 | 22 | 6TX | 6 | 18 |
| 6SN | 8 | 22 | 6AG | 7 | 15 |
| 6VW | 9 | 21 | 6MR | 7 | 14 |
| 6AW | 7 | 20 | 6GB | 5 | 12 |

### C.w.—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK6WT | 144 | 374 | VK6EB | 8 | 22 |
| 6RS | 89 | 230 | 6AS/Log | | |
| 6AS | 29 | 70 | 6GA | 6 | 16 |
| 6QJ | 27 | 54 | 6KV | 7 | 14 |
| 6UF | 12 | 28 | 6BF | 6 | 12 |
| 6ZO | 11 | 27 | 6WW | 6 | 11 |

## TASMANIA

### Top Six Logs—

| | | |
|---|---|---|
| VK7SM | 485 | points |
| 7KH | 402 | ,, |
| 7SF | 389 | ,, |
| 7DK | 376 | ,, |
| 7ZZ | 364 | ,, |
| 7JF | 287 | ,, |

### Open—

| Call | Cont. | Pt. |
|---|---|---|
| VK7DK | 191 | 376 |
| 7ZZ | 150 | 364 |

### Phone—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK7KH | 163 | 402 | VK7JD | 14 | 26 |
| 7SF | 165 | 389 | 7LE | 7 | 26 |
| 7JF | 112 | 287 | 7AL | 7 | 22 |
| 7BR | 122 | 267 | 7MC | 15 | 22 |
| 7IL | 131 | 255 | 7DR | 6 | 18 |
| 7AI | 58 | 185 | 7KS | 13 | 18 |
| 7XL | 55 | 133 | 7BT | 14 | 18 |
| 7EB | 38 | 84 | 7DS | 7 | 17 |
| 7ZW | 49 | 75 | 7NZ | 8 | 12 |
| 7TT | 33 | 66 | 7DA | 6 | 12 |
| 7BB | 27 | 57 | 7MX/Log | | |
| 7DW | 28 | 49 | 7MS | 7 | 12 |
| 7YL | 23 | 47 | 7BQ | 6 | 10 |
| 7MX | 26 | 44 | 7MX/Log | | |
| 7KC | 17 | 39 | 7LR | 7 | 7 |

### C.w.—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK7SM | 179 | 485 | VK7JB | 46 | 109 |
| 7GV | 99 | 217 | 7BJ | 10 | 27 |
| 7GK | 60 | 164 | 7KA | 10 | 22 |
| 7RY | 60 | 134 | 7LJ | 10 | 22 |

## NORTHERN TERRITORY

### C.w.—

| Call | Cont. | Pt. |
|---|---|---|
| VK8UX | 8 | 14 |

### Phone—

| Call | Cont. | Pt. |
|---|---|---|
| VK8KK | 119 | 322 |

## PAPUA/NEW GUINEA AND TERRITORIES

### Open—

| Call | Cont. | Pt. |
|---|---|---|
| VK9XI | 31 | 131 |

### Phone—

| Call | Cont. | Pt. |
|---|---|---|
| VK9AG | 11 | 35 |

### C.w.—

| Call | Cont. | Pt. | Call | Cont. | Pt. |
|---|---|---|---|---|---|
| VK9GC | 37 | 116 | VK9CJ | 29 | 60 |
| 9DR | 37 | 104 | 9NM | 10 | 21 |

Invalid Log VK9MV

## ANTARCTICA

### Phone—

| Call | Cont. | Pt. |
|---|---|---|
| VK0PK | 86 | 516 |

## RECEIVING SECTION

**Australian Capital Territory**

A. Davis ..... 651 points

(Continued on Page 18)

# Book Review

**RADIO AMATEUR'S HANDBOOK**
**1965 Edition**

This handbook is known the world over as "The standard manual of Amateur communication." For a number of years the annual revisions appear to have been carried out with a minimum of new material. Perhaps this was due to a temporary lull in technical progress.

Techniques, in the communications field, have been relatively stable and only detailed improvements were possible in many areas. Remember the claims for receiver sensitivity, 1 μV. during the '30's and '40's, the latest ½ μV. There have, of course, been many other developments and far too few of those old receivers are usable on sideband without extensive modification.

C.w., s.s.b., r.t.t.y. Phone (a.m., f.m.) or whatever you need, they are all there.

A number of new transmitters and receivers are described in this edition, breaking the receiver description drought.

It is noticeable that the Americans now admit that components are made outside the U.S.A., for they have discovered Eddystone dials and Jackson variable capacitors—both from the U.K.

Solid state devices are steadily moving into the Amateur field—and all others also. Amateurs first described transistor receivers some years ago, but they are apparently not yet capable of a standard of performance warranting their inclusion in "the handbook."

Semi-conductor devices have now been reduced in price to such an extent that transistor equipment is being offered by a number of makers. National recently announced their HRO-500 "all solid state receiver" at $1295, with 45% duty and 25% sales tax—you must expect to pay over £1,200 for this receiver in Australia.

There are places where semi-conductors have even been used successfully for years and no doubt it will not be long before all solid state h.f. and even v.h.f. and u.h.f. gear will be available to Amateurs. Commercial s.s.b. equipment is available with solid state receivers, s.s.b. transmitters with only two tube stages and one American maker recently announced a 75 watt p.e.p. (output) transceiver using solid state devices only. I have no doubt that when transistors and other solid state devices become so reliable and circuits reproducible under Ham conditions then, I feel sure, that you will find the A.R.R.L. Handbook and "QST" will give them as much space as they warrant.

Published by the American Radio Relay League, Newington, Connecticut, U.S.A. Australian price, 58/6 (postage 2/6). Our copies, McGill's Authorised Newsagency, 183-5 Elizabeth Street, Melbourne, C.1, and Technical Book & Magazine Co., Swanston Street, Melbourne, C.1.

# YOUTH RADIO CLUBS

Encouraging news from VK3 comes in the Newsletter from Ken 3TL (of DX-peditlon fame). A total of 18 clubs are already moving — Australian Postal Institute, Burwood Teachers' College, Caulfield Grammar, Edmund Rice College, Geelong Grammar, Gowrie Park, Greythorne, Korumburra, Macleod, Institute for the Blind, Scotch College, St. Anne's, Strathmore, Warrnambool Tech., Wonthaggi Tech., Yallourn Tech. Two Junior Certificates at Wonthaggi Tech.—Graeme Atkinson and Peter Bond. Front page publicity for the girls at St. Anne's in "A.R." should encourage more girls. Ken Stone at Korumburra reports present projects include a Geiger Counter, Electronic Stroboscope, and a 4-valve Rx, that Barry Douglas is to carry on as Instructor, and that Robert Stewart is attending the Technician-in-Training Course with the P.M.G. Caulfield Grammar have some boys ready for Junior Certificate. K. Phillips and Robert Stewart of A.P.I. have become Associate Members of W.I.A., and three past members of the club, John Liversy, David Jones and John Lyle, have passed A.O.L.C.P. Harry 3HC of Aegis Manufacturing has donated about 1000 knobs for YRS equipment. Finally, Ken makes a good point by enclosing a card on Mouth-to-Mouth Resuscitation. Club leaders should be specially conscious of safety. There should be rigorous training on avoidance of danger and just as rigorous training on correct treatment in case an accident does occur. Nothing in your work is more important than this.

Loads of news from VK2 as usual. Main item is the award of the I.R.E.E. Pennant for 1964 to Westlakes Club under Keith 2AKX and well deserved. Keith also gets the first Radio Instructor's Certificate (Grade 2). He has helped 17 Elementaries, 4 Juniors, 5 full A.O.C.P., one Limited A.O.C.P., and one still to do Regulations. Westlakes has a modern air-conditioned studio in the club and handles the Newcastle Zone broadcast. They have six lady members. A Field Day will be held during Queen's Birthday week-end, night lamp signalling is practised (up to five miles!) and they intend carrying on with "Electronics by Radio" in June. The Dunrossil Memorial Lecture by the Duke of Edinburgh to the I.R.E.E. was attended by Roger 1RD, Jim, 1JR and Joe 2ZMM. The boys conversed briefly with the Duke and enjoyed this well-organised professional affair. The boys were introduced among the V.I.P. visitors and rightly. Thanks for donations are due to Mrs. J. Moyle, Roger 1RD, Reg 2AI, Pearce 2APQ, Barry Harword, R. Jakimov. R.A.A.F. proposes to absorb two intakes of Radio Apprentices during 1965 for installations and maintenance connected with the new American aircraft—club instructors please note and pass on. Doug Williamson (in charge of Elementary Certificate matters) has been transferred to Miller High (near Liverpool). The I.S.C.F. Camp Technology at Mt. Victoria was a great success. Boys came from all over N.S.W. to a camp well staffed with technicians and the Electronics group engaged in projects ranging from Amateur Radio contact through Tom 2AWM and Bruce 2BG to the construction of amplifiers and transistorised flip-flop circuits, etc. Why not more of this everywhere? Bruce Mitchell, Club Leader at Y.M.C.A. in 1964, has moved on to Teachers' College after a successful year. This leaves Y.M.C.A. without a leader for 1965 on Saturday mornings. What a pity if this steady group has to fold up—is there a volunteer?

Sorry I can't mention other Divisions. I know 4 Uncle Charlie will be on the job and I can only hope 5, 6 and 7 are building their future. 73, de IKM.

☆

# YLs IN SYDNEY

We recently had a visit from Aleen VK6YL and her OM Bill VK6RX. The Sydney YL's—VK2AOK, VK2AXS and VK2AIA—entertained them for lunch at the QTH of VK2AIA and everyone had a most enjoyable time. It is always interesting to meet "voices" face to face and we hope to have the same pleasure with other YL's and their OM's.

All YL's are advised that an open invitation is extended to anyone visiting Sydney to contact Hebe VK2AOK when arrangements will be made for a get-together.

# T PADS FOR R.F. CIRCUITS

(Continued from Page 13)

Next, solder two resistors in the right and left corner of one side with the resistor leads trimmed to about 3/16". Then slip on the end sheet and note where the centre post of the co-ax touches. Be sure the resistors are horizontal and then mark the contact point. Drill the co-ax connector hole and mount and solder the rest of the resistors and also the connector pin.

Repeat the procedure for the other end of the T pad.

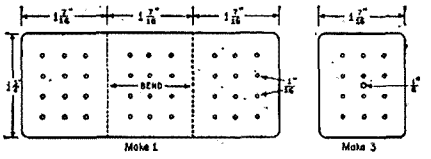



Fig. 3.—Dimensions for the copper sheet end, bottom and centre connectors. The bottom and the two end plates are identical.

**GENERAL**

When using the 6 db. pad with 100 watts input (25 watts output) to drive the grids of a final amplifier there is about 33 watts dissipated in the input 17 ohm section and 8 watts in the other. About 34 watts will be dissipated in the 69 ohm branch. Since the power dissipated is not continuous for a.m. and even less on c.w. and s.s.b., the pads handle 100 watts s.s.b. or a.m. input quite well.

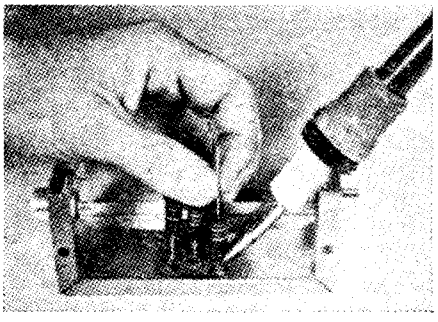


Fig. 4.—Method used to solder the resistors to the bottom plate. The shorter the resistor leads the better.

Six db. is about the maximum for a 100 watt output rig driving tetrodes with multiband tuners. The inefficiency of the grid circuit on 10 metres is the maximum db. design consideration. The unique construction of the pads makes them almost purely resistive even at 10 metres.

The copper plates also act as heat sinks. For even greater dissipation capabilities the T pad can be mounted in a sealed can of oil.

The pads can also be used for audio work and the 500 ohm impedance of the design chart given in Table 1 can be shifted by calculating the multiplying factor required in the exact same manner. ●

# NEW CALL SIGNS

JANUARY, 1965

VK1BE—E. B. Britton, 27 Galway Place, Deakin.
VK1DD—D. R. L. Davies, 4 Westgareth St., O'Connor.
VK1EP/T—E. Piraner, 4 Steel St., Hackett.
VK1GI—I. Grant, 12 Selwyn St., Hackett.
VK1ZJL—J. Lauten, 28 Atherton St., Downer.
VK1NC—J. D. Blalock, 7 Dawson St., Curtin.
VK2UO—A. L. Steward, 58 Myall St., Oatley.
VK2BAS—E. W. Bastow, 33 Essilia St., Collaroy Plateau.
VK2BDM—D. A. McCansh, C/o. Yarrawonga Station, Cobar.
VK2BHK—A. E. Clarke, 114 Acacia Ave., Greenacre.
VK2BKT—J. R. Foldl, 15 The Outlook, Avalon.
VK2BSK—M. S. Kirby, 8 Cherry St., Turramurra.
VK2ZBD—J. Boyd, 29 Morgan St., Islington, Newcastle.
VK2ZCY—W. E. Bray, 4 Elizabeth St., Carlton.
VK2ZEY—A. A. Campbell, 179 Wardell Rd., Dulwich Hill.
VK2ZLG—B. R. Leslie, 13 Reuss St., Leichbardt.
VK2ZRJ—R. J. Alford, 154 Moulder St., Orange.
VK2ZSF—W. H. W. Shand, Unit 20, 704 Victoria Rd., Ryde.
VK3AJX—G. J. Marcon, 28 Darling St., Moonee Ponds.
VK3AWI—W.I.A., Victorian Division, Station: 9 Bayview Rd., Frankston; Postal: P.O. Box 36, East Melbourne.
VK3AXL—J. A. Ferguson, 594 Plenty Rd., Preston East.
VK3AZL—P. J. Gibson, 5 Florence Court, Dandenong.
VK3ZFR—Christian Brothers, Edmund Rice College Radio Club, Plenty Rd., Bundoora.
VK3ZFU—R. J. Padula, 404 Mont Albert Rd., Mont Albert.
VK3ZFY—R. G. Russ, 30 Clarks Rd., East Keilor.
VK3ZGU—J. F. Sutcliffe, 115 Magnolia Ave., Mildura.
VK3ZQA—M. L. Brane, 24 Ernest St., Broadmeadows.
VK4AD—A. D'Arcey, 20 Kitson St., Morningside.
VK4DX—Dutton Park Scout Radio Club, Station: Scout Den, Cameron Park, Fairfield; Postal: C/o. P. Wilkins, 90 Brisbane Corso, Fairfield.
VK4JQ—J. W. Morris, Fellnaw Private Hotel, 594 Ipswich Rd., Annerley.
VK4NH—N. S. Hill, Prince Henry Drive, Toowoomba.
VK4TB—T. H. Barber, Carowell St., Acacia Ridge.
VK4XC—J. R. Morgan, Station: 2 McKewen St., Bundaberg; Postal: P.O. Box 18, Bundaberg.
VK4ZDK—D. Kraatz, 168 Kerrigan St., North Rockhampton.
VK4ZRN—R. L. Neilson, 17 Shaw St., Bardon.
VK5IZ—I. K. Carmichael, Yorketown.
VK5ZCN—C. Neaylon, 14 Manse Tce., St. Mary's.
VK5ZLP—L. N. Porter, John Dallwitz Ave., Angaston.
VK6HP—H. R. Pride, 26 Lockhart St., Como.
VK6PY—P. Yates, 12 Robins Rd., Kalamunda.
VK6RI—R. D. Cobby, 89 Halvorson Rd., Morley.
VK6ZBF—R. B. Burge, 150 Boulder Rd., Kalgoorlie.
VK6ZCC—M. L. O'Rourke, Broadcast Station 6CI, Collie.
VK6ZFM—M. L. Faulkner, 37 Nanson St., Wembley.
VK7DG—D. R. Gothard, James Ave., Kingston Beach.
VK8ZBB—A. H. B. Brodrick, Station: 51 Nightcliff Rd., Nightcliff, Darwin, N.T.; Postal: P.O. Box 576, Darwin, N.T.

☆

# R.D. CONTEST RESULTS

(Continued from Page 15)

New South Wales

| | | | |
|---|---|---|---|
| WIA-L2033— | D. W. Shephard | 420 | points |
| L2258— | C. S. Shaw | 394 | ,, |
| | F. B. Kupljenik | 311 | ,, |
| L2259— | P. Vernon | 304 | ,, |
| L2211— | C. Aberneathy | 138 | ,, |
| L2283— | R. Mackintosh | 116 | ,, |
| | B. Mitchell | 116 | ,, |
| | (Y.M.C.A. Youth Radio Club.) | | |
| L3074/VK2— | J. M. Hillard | 76 | ,, |

Victoria

| | | | |
|---|---|---|---|
| WIA-L3138— | G. N. Earl | 832 | points |
| L3125— | D. James | 723 | ,, |
| L3188— | C. R. Christiansen | 533 | ,, |
| L3185— | B. J. Hannan | 426 | ,, |
| L3183— | P. W. Duddy | 369 | ,, |
| L3101— | N. G. Harrison | 352 | ,, |
| L3190— | G. Orr | 312 | ,, |
| L3042— | E. W. Trebilcock | 297 | ,, |
| | D. H. Jenkin | 213 | ,, |
| | N. D. Mifsud | 173 | ,, |
| | R. Lemke | 120 | ,, |
| L3203— | G. Wallis | 103 | ,, |

Queensland

| | | | |
|---|---|---|---|
| | W. Thorpe | 662 | points |
| WIA-L4071— | R. Tedaldi | 309 | ,, |
| | K. D. Cunningham | 209 | ,, |
| L4010— | G. V. Franks | 169 | ,, |
| L4053— | L. O. Tully | 156 | ,, |
| | L. Davies | 119 | ,, |
| L4015— | R. W. Howe | 112 | ,, |
| L4018— | C. H. Thorpe | 95 | ,, |
| | H. G. Clinton | 55 | ,, |
| L4011— | G. Milner | 51 | ,, |

South Australia

| | | | |
|---|---|---|---|
| WIA-L5065— | A. F. Raftery | 821 | points |
| L5015— | W. J. Clayton | 713 | ,, |
| L5020— | F. W. Aslin | 452 | ,, |
| L5069— | B. F. Brockhouse | 445 | ,, |
| | D. Clegg | 350 | ,, |
| | G. W. Douglas | 338 | ,, |
| L5067— | T. C. Corbin | 290 | ,, |
| | R. G. Edmeades | 252 | ,, |
| | K. Rendell | 212 | ,, |
| L5070— | D. Beale | 208 | ,, |
| | N. I. Smith | 187 | ,, |
| L5066— | C. R. Welke | 104 | ,, |

Western Australia

| | | | |
|---|---|---|---|
| WIA-L6021— | P. W. Drew | 1,115 | points |

Tasmania

| | | | |
|---|---|---|---|
| | G. C. Johnston | 908 | points |
| | L. Pretty | 716 | ,, |
| | G. Power | 456 | ,, |
| WIA-L7033— | B. M. Muir | 313 | ,, |
| L7031— | R. J. Mutton | 308 | ,, |
| L7022— | R. L. Hurwood | 127 | ,, |
| | P. Chalk | 81 | ,, |

Disqualified Log VK7ZAH

# V H F

## 52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

The month of March saw the launching of the long-awaited OSCAR III. Unfortunately it was not as effective as hoped and though many tried we have no positive proof of a *two-way* contact being made via Oscar. The grapevine suggests that OSCAR IV may be launched later in the year and the lessons learnt by OSCAR III will be used to some advantage then.

The month of March saw the introduction of Channel 0 in Brisbane and no doubt will see the struggle for survival of keen 6 m. operators in the Brisbane area. So far only occasional traces of the sound has been heard in Melbourne by those listening for it. We trust that the introduction of Channel 0 in VK4 will not thin the ranks of the 6 m. operators as it has done in Melbourne. While low power and net frequency operation has helped considerably in Melbourne, it has not entirely eliminated T.V.I. I.T.V. is another source of trouble. With such a colossal signal just outside the band cross modulation and other problems keep a lot off during T.V. hours—others appear to be completely overcome by the threat. Quite a few T.V. receivers cannot discriminate the amateur from the T.V. signal which makes it well nigh impossible to exist alongside T.V. The only time one operates with complete immunity is when the T.V. is off the air. Any increase in T.V. hours appears to see a further decrease in amateur activity on 6 m. No one appears to be able to solve the problem—can anyone come up with a worthwhile solution to keep operation on 6 alive and live with T.V.

Apologies for the non-appearance of the VK4 notes last month. In the rush to get the notes in after the W.I.C.E.N. business the VK4 notes were overlooked. Sorry. Peter, 3ZGP.

### NEW SOUTH WALES

At the April meeting of the Group held at Wireless Institute Centre on the 2nd of April was the annual meeting of the Group. Following the lecture given by Les VK2ZBJ, which dealt with many aspects of the recent Oscar III project, the elections were held. Ten members offered themselves for the election and the winning six were: Pres., Paul VK2ZPJ; Vice-Pres., Tim VK2ZTM; Secretary, Mal VK2ZML, and Committee, David VK2ZVW, Phil VK2ZPI and Stephen VK2ZSK.

Past President Mac VK2ZH delivered his report which outlined the many achievements of the Group in its activities over the past year. David VK2ZVW received his cup for winning the Chairman's Trophy for events for the year.

On the 5th April Sydney's 4th T.V. station, Channel 10, took the air. While putting out a good signal it has added new problems to the 2 metre operator. The difference in frequency between Channel 2 and Channel 10 is 145 Mc. Many receivers have spots on and about 145 Mc. Channel 2 plus a 2 metre signal produces a slight herringbone pattern on Channel 10. No doubt these problems will soon be overcome by the local operators.

The first 6 metre fox hunt held for a long time in Sydney was a change for the many 2 metre hounds when it was held in March. By the time the fox called a halt the field had been spread over 20 miles, from the coast at Botany Bay to past Parramatta. A good evening, no doubt the start of many more.

The first Channel in this State is due to start at the end of April as the National station—ABMN—for the Wagga area. Located on Mt. Ulandra.

The Convention Week-end was very successful, even it it were the second hottest March week-end on record. Apart from the regular 6 and 2 metre fox hunts future events will include a contest in June to warm the operator up again for the R.D. Contest. While I believe it is an agenda item for the Easter F.E. Convention the contest committee is again ready to run our own version of the R.D. contest if it is not included. We suggest that other States might do likewise.

Activity in general is again quiet, just the regulars on 6, 2 and above. Well, I hope I make the deadline this month. 73, Tim 2ZTM.

### VICTORIA

Other than some attempts at working Oscar III, the V.H.F. bands have been relatively inactive over the past month.

**6 Metres.** This band shows some activity, mainly at week-ends, most of this being on the 53.032 Mc. A.M. net. In some parts of Melbourne a G.D.O. running on 53 Mc. in an unshielded shack can cause T.V.I. on Channel 0 up to ¼ mile away, on a 20 w. transmitter completely obliterates the picture *and* plays *havoc* with the sound. A 20 w. F.M. transmitter on 52.525 does not affect the picture as much as an A.M. transmitter but virtually takes over the sound to the extent that receivers of Channel 0 can identify the voices of operators using the equipment. Most of this can be cured by fitting traps to the T.V. set, but can anyone suggest a cheaper way of keeping out of Channel 0 with traps costing about 4/- each, which is expensive when up to 20 T.V. sets have to be trapped. The traps in use in Melbourne which have proved effective are 2 ft. of 300 ohm ribbon shortened at one end and fitted with a 3-30 or 5-50 pF trimmer at the other. The traps are taped to the T.V. feeder close to the antenna terminal on the T.V. set. The trimmers are adjusted for minimum interference at your operation frequency. The width of the traps is about plus or minus 200 Kc.

**2 Metres.** Activity on this band is poor but was very active during the period 5th March until the 11th March, when some 100 Amateurs set up communication in the bush fire areas of Gippsland. Most activity was on F.M. Channel A 145.854 and Channel B 146 Mc. A little use was made of 6 metre for link purposes.

OSCAR III. Many Melbourne and VK3 country stations have been monitoring Oscar III but no confirmed reports of two-way contacts have been received from VK at the time of writing. Oscar III is still orbiting and sending out telemetry signals but the translator has ceased to function.

The only other activity on 2 metres is the 2 metre scramble when some 20-30 stations appear for a one-night stand in the half-hour battle to be control station for the next scramble.

2 metre fox hunts, which are held on the 4th Wednesday of the month are still popular with about four hounds showing up on the average —we would like to see more hounds in the future.

**432 Mc.** From reports received there is only one active station on this band and he is busy trying out transistor conversion with low noise figures. His best yet is 4 db. of noise. More from this station in future "A.R's."

The VK3 Div. V.H.F. Group is now an associated group within the VK3 W.I.A. Division. Its management committee is as follows: President, Cyril Edmonds VK3AEE; Vice-President, Jack Taylor VK3ZJF; Secretary, Len Poynter VK3ZGP; Treasurer, Peter Cohn VK3ZPC; Publicity Officer, Cyril Maude VK3ZCK; QSL Manager, Bill Rice VK3ABP; Equipment, Jim Force VK3ZJF, Ken Jewell VK3ZNJ.

The last two are assisted by a large team of volunteers who have to be dragged from their one-eyed monster with a tow truck. This shows they are keen (on what?).

**Channel 0 Brisbane.** The sound and picture have been received in Melbourne a few times over the past couple of weeks but not at T.V.I. strength, but have been told that it has caused T.V.I. in some country areas. I wonder if there will be any T.V.I. from TVQO next summer? I hope so, so do many others. Well cheers. 73, Cyril VK3ZCK.

### QUEENSLAND

The month of March here in VK4 began with a bang and certainly has ended with a bang! Early in the month, Tuesday the 9th to be exact, no less than 22 stations were working during evening on 6 metres. Those known to have been around that evening were: 4MW, 4HW, 4ZLG, 4ZAV, 4ZKP, 4ZNK, 4AC, 4AB, 4ZEP, 4ZAL, 4VX, 4ZRM, 4ZDF, 4ZJR, 4ZLL, 4ZRC, 4ZBD, 4ZGN, 4ZLT, 4ZAT, 9ZBV, 4UL and myself.

John 4AC and Ramsey 4AB came to town from the South Coast and John was able to establish that his mobile did in fact work very well. Ramsey was his usual self talking about "the station that is live in '65."

During the middle of the month Oscar III went into orbit and the instant information service from John 4RZ was very impressive. John is to be congratulated for his fine efforts in feeding up-to-date information on Oscar predictions to those who needed them. Many stations here in VK4 did hear the low side beacon but to date that is all that I know of that has been heard. There has been some disappointment that no signals were heard from the translator and some have said that the signal from the beacon was weaker than those from previous Oscars. Nevertheless it was *certainly* a worthy project and perhaps if there is an Oscar IV we here in VK4 will have more success.

March 22nd was the big day for the VK4 doughnut factory to open. Its signals across the 6 metre band are very impressive and Victor 4ZBT tells me he can hear all 27 transmitters at Channel 0! Activity has slowed somewhat but has not died at all. Many contacts are being made from mobiles in the mornings. Some stations have been working on the low end of the band while the station has been transmitting. There are lots of ideas going around at the moment as how best to overcome the problem. Let's hope that some of these ideas bear fruit.

Within the first few days of TVQ coming on the air reception reports were received from Townsville and from both Mildura and Donald. If this type of propagation is occurring at this time of year why haven't we heard any 6 metre DX? Surely Channel 0's groundwave does not extend a thousand miles! Incidentally, the reference to 25 Kw. towards Melbourne in the March "A.R" was, of course, of humorous value only. In actual fact only about 700 watts is going in the direction of Melbourne and vice versa.

One Saturday I did work 4ZEL and 4ZDJ, using a 48 element phased array, 650 feet above ground level. The TX only cost a tenner but my—was the antenna expensive!

Finally, some short, disjointed bits and pieces of news. Frank 4ZAS, who has been very silent lately, is believed to be learning dits and dahs. Reg 4VX is wondering what next to try to load into. Best signal yet comes from his 40 metre long wire! What is going up in 4ZAA's yard? In closing, remember "Dial 'Oh' for nought." 73, Peter 4ZPL.

### SOUTH AUSTRALIA

Activity within VK5 at the moment is most feverish, with the main front of activity directed at the Oscar III satellite.

Unfortunately, to date no VK5 station has worked via the translating satellite, which is most disappointing when related to the king size beacon and telemetry signals recorded by various partakers within VK5. Many rumours regarding contacts overseas are circulating, whereas official confirmation of these reports will take time to eventuate.

Stations who have been actively engaged in tracking and recording the passes of Oscar III have been VK5EF, 5WV, 5ZDX, 5ZBR, 5ZKA, 5ZKY, 5ZMJ, 5ZTM, 5ZHJ and 5ZDR.

VK5 attention to Oscar III has been most invigorating and it appears that if and when Oscar IV is launched a more sophisticated approach to the problems associated will be attempted by a larger number of Amateurs than presently engaged in Oscar III experimentation.

Apart from active 2 metre activity, the other VHF bands have been temporarily neglected, but will no doubt resume to normal when Oscar III has met its "fiery end."

The art of "SSB-manship" is being tackled by the VK5 VHF group as a group project, and should enable a few SSB stations to be "quacking" interstate during the next 6 metre DX season. Colin VK5ZHJ.

### WESTERN AUSTRALIA

Oscar III was first heard in our State by 6ZAZ. 6ZCN, 6HK, 6ZAA, 6ZCB and 6BO who have been listening constantly. Many feet of tape recording has been made. No DX contacts, however, as the translator had a malfunction after the first few orbits.

6VV and 6ZCN were in Perth recently. Brian is moving to Quairading soon. 6ZFM is moving to Bridgetown and may not be heard in Perth. 6ZDS is off to Carnarvon for a holiday and hopes to see the tracking station. 6MM is looking for some 4-250 A's for a 600 w. pep 52 Mc. rig. All donations welcome. 6ZCM has not been heard for some time. What's brewing in your shack, Viv? 6HK

(Continued on Page 22)

# SWL

Sub-Editor: Chas. Aberneathy, WIA-L2211
30 Urunga Parade, Miranda, N.S.W.

I am sorry to have to start our page in the following manner, but feel justified in so doing, as letters such as I quote will let our members see just what is going on, and by reading these excerpts will realise why their cards are not confirmed.

The following is an extract from a letter received from Jock White ZL2GX, awards manager for the N.Z.A.R.T., which contains a message that all SWL's should read and thoroughly digest. I quote: "I have just filled in two ZL4JF QSL's for VK listeners, and on each I have written, 'your report was valueless,' a bare report and much guff about their length of listening experience, but no comparisons with other signals or comment on conditions. I have a bundle of cards from VK3AEF, a Boy Scout Club, for a bunch of ZL's. All are quite valueless, and I have a mind to send them over to you as an example of what is happening.

"Much worse happens in Europe, without fail when European QSO's with ZL4JF or ZL1ABZ are reported in DX Bulletins, I get a flood of SWL reports, coincidence is too obvious to completely overlook. For years I have championed SWL's, coached, coaxed and encouraged, but the worm is turning. The situation is, I feel, quite serious, as valueless reports, and bogus reports, will hurt the genuine fellow."

Recently I forwarded a QSL card for a JA SWL to VK5KO, who replied in the following manner, I quote, "I do not believe that your JA friend did in fact hear me as reported. Several first-class JA stations did hear me on this night on 1.8 Mc., and each reported on the abnormal nature of my calls. The fact that I was heard on the night in question was reported in the Jap. radio and straight press during December. A JA SWL sent an air mail report within a week, but it was obvious to even an apprentice at this game that he had heard JA3JM, and JA3AA calling me on 1880. My frequency had been published at 1832 Kc., and this was named. Actually, I was not within co-ee of 1832 Kc."

Members have been instructed from time to time on QSLing, it is so easy to send a good, honest report containing something of value to the chap at the other end. The above extracts may be the reason why so many SWL's complain of no returns.

### AUTOMATIC VOLUME CONTROL (AVC)

In a modern radio receiver a gain or volume control is provided in the output of the detector to permit varying the volume of the incoming signal. Once the volume control has been set, the output of the receiver should remain constant regardless of variations in signal strength, fading, etc. These signal variations can overload the RF, IF, or detecror stages and lead to distortion in the signal in addition to volume variations. The Automatic Volume Control (AVC) circuit overcomes these deficiencies and maintains approximately constant loud-speaker volume.

Automatic volume control can be achieved by very simple means. The RF and IF stages of a superheterodyne receiver utilise variable-mu pentodes, whose gain can be controlled by varying the grid bias. If we make the grid bias of these RF and IF stages more negative when the signal strength increases, thus cutting down the gain and less negative when the signal strength is fading, we will attain more or less constant output volume, regardless of signal strength. All that is needed, therefore, is a negative voltage bias whose value is controlled by the signal strength. The load resistor of a diode detector is an excellent source of this variable voltage, since the rectified signal voltage will increase and decrease with variations in signal strength.

The AVC diode is usually combined with the regular diode detector in the envelope of a single duo-diode, and sometimes the first audio amplifier is thrown in also by using a duo-diode-triode tube. Since some AVC bias is developed even for weak input signals where maximum amplification is desired, a special delayed AVC circuit is occasionally used, which prevents the application of the AVC bias until the signal strength exceeds a predetermined value. This necessitates another diode.

I would like members' reaction to the idea of making our page in the December issue of A.R. an article from each State effort. You may think that it is a bit early for such a thought, but it will give those who wish to co-operate plenty of time to write a short article on some aspect of our hobby.

### NEW SOUTH WALES

At the annual general meeting held in March the following members were elected to office for the ensuing year; President, Ross Erwin; Vice-President, Brian Hutchinson; Secretary and Treasurer, Tom Harding; Liaison Officer, Allan Chatto; Publicity and QSL, Chas. Aberneathy. We extend thanks to the committee of the past twelve months for a job well done, also a welcome to the new group, and trust that they can continue with the standard set by those of last year.

Ray L2287. Congratulations on passing your second class morse, and regulations, and I hope that you can do the same with the theory and marine practical. It sure is hard to reach that 100 confirmed.

Jerry L2229 is down in the Wagga area, and reports hearing KP6, KS6, KJ6, KW6, KH6, KX6, KG6, JA2, HM2, DL6 and LA7. I trust by now that you have an aerial to suit your roving job.

Colin L2188 is now the proud owner of an HCR C2 rx. I trust that it will give you many hours of good listening. Very good on your points in the NFD Contest also on your 2 metre activity.

Bruce L2283. Those chaps who have 200 countries have been listening for quite a considerable time, so keep at it OM, and one of these days you could reach that tally.

Arnold L2291 recorded on tape the launching of Gemini project as broadcast by VOA. All the best with your AOPC course. I guess that you welcome the cooler weather out in that area.

Doug L2047. Nice to hear from you OM. Thanks for those cards which I will certainly pass on to our members, and use their QTH's for the card swappers.

### VICTORIA

The monthly meetings now have an average attendance of 40 members, and you have to be early to get a chair. Attendance at the radio constructional nights is also at a high level. The Victorian S.W.L. convention will be held towards the end of the year, and all members will be informed as more information becomes available. The group now has an official constitution stating the aims and operation of the group. Ian L3006.

Roger L3158. I trust that your lecture on your home-brew rx was a success. How about sending me a description for publication as I feel that our members would appreciate such an article?

Warwick L3211. You are certainly creeping up the ladder, but with plenty of study ahead it will curtail your S.W.L. activities. Latest cards to hand, XS7, KG6, VE1, LA5, OE1, 5M5, GD3, F9, MP4 and K2/JY.

Lloyd L3141. That tower project sounds very interesting, especially the rotating mechanism. O.K. on the QSL cards, you will be able to catch up on your reports now Hi. Don't forget that study O.M.

Greg. L3138. Thanks for the copies of the Club call signs, also for the W SWL cards, as I can certainly use their QTH for card swappers. Cards received SP9, KB6 and W9, whilst 40 cards have been sent this year. Very good on the 21 Mc. opening. Mac sends his regards.

Harry L3102. You must have quite a variety and varied stack of radio matter. I think time was well spent in filing same for reference. Thanks for your offer, which I may call upon in the near future.

Maurie L3055. Thanks for your letter Y.M., always pleased to hear of your doings, radio or otherwise. Maybe when your studies end you will come back to the page in earnest. Sorry re the antenna booklet, but will look forward to that article for our page.

Eric L3042. Another one on holidays, I don't know how you do it down there as we only get them once a year Hi. As usual, too much to print, but a few of the cards received were: HP1, UL7, VR2, VS6, VU2, 9M2 and W3/MM. Heard 3.5 C.w., KH6, W3, W6, W8. 7 Mc., BY9, HM1, EP2, F8, UA3, UB5, VE2, LZ2, YO9, YU5. 14 Mc., C.w., FK8, JT1, HM1, UL7, VS6, ZP7, 9M4, 9M6 and SM7/MM. I hope that you both had a nice trip to VK5.

### QUEENSLAND

Conditions are greatly improving on 20 metres with excellent openings to W over the long path on Sunday afternoons. At night I have had mediocre openings to Europe over the long path 1700 to 2100 hours E.S.T., after which there is a no man's land till around 0002 hours, when the VS9 Maldive areas come in, and 9NI and an odd African State such as 9U5. Over the long path the DL's are the most consistent.

Afton L2136/VK4. At long last a letter. Well it was a pleasant surprise. Congratulations on reaching 100 confirmed. Yes, it is sure a struggle to reach that mark. I will be pleased to give you back a rung on the ladder. I do hope that your health keeps improving.

### SOUTH AUSTRALIA

Allan L5065 has heard on 14 Mc. C.w. UR2, HA7 and OK3. QSL's received MP4BCC. No doubt you had an enjoyable time in the shack of VK5RD, and I hope that all those confirmations come your way.

Tim L5067. Sorry to hear about the tower situation, still you never know, Hi. Thanks for that award piece as one of these days I shall get around to that article. Heard recently, VU2, CE2, VS9, MP4 and KS6, and QSL'S from I1, K6 and VK3.

Kuno L5072. Welcome to the page O.M., and I hope that you can send me something each month. Kuno uses an AR88 rx with a Geloso preamp, while his antenna is a folded dipole on 20 metres. Maybe when you get your own cards your returns may be better. Keep SWLing and forget about that knitting Hi.

### WESTERN AUSTRALIA

Bryan L6068. That idea of getting a club started in your area is certainly a good one, and I do wish you every success. If at any time I can be of assistance just pen your request. Recently heard on 20 metres, KS6, W0, SM7, AP2, LU7. 15 metres, W1, W6, ZS8 and SM5. Pleased to hear that your beam for 52 Mc. was to your satisfaction.

Alan 6030. I do hope that you are on the mend and will soon be out of hospital as I have missed your letters. So hurry up and get back to those dials.

Geoff L6029 reports that the W's are coming in well on 20 metres, and thinks that the bands in general are opening at his location. Heard on 20 metres, HK1, W4, K5, CR8, KZ5, WB6 and WA4, whilst on 15 metres, LA1, W2, ZS2 and KR8.

Peter L6021. It appears by your letter that you have been relaxing a little SWLwise. I think most of us get that way from time to time. Those QSL's from OA4, 7GI, 5N2, K7/3W8 and W9/XU were a very welcome bunch I guess. I doubt if many of our members have 90 SW BC confirmations to their credit, which is a very good effort O.M.

### TASMANIA

Greg Johnson reports that during February he managed some 35 countries, and that 20 metres seems to be going downhill slowly, and like 15 is getting very noisy. Thanks for your offer of assistance, which I will mention later in this page.

### GENERAL

If any SWL in Tasmania has a problem, Greg Johnson, 3 Inglis Street, Newtown, Hobart, Phone No. 82416, will be only too pleased to assist in any aspect of our hobby.

For the card swappers a few more addresses: KDD-4121, R. Murray, Route 2-28040, Ellenboro, N.C., U.S.A.; WPE3EGI, Ed. Barkowski, 1911 Freeport Road, Arnald, Pennsylvania; KHJ8203, R. Hittle, P.O. Box 523, Defiance, Ohio, 43512, U.S.A.; ZL190 Dave Thomson, 8 Wallace St., Whangaui, Northland, N.2, New Zealand, and his son, ZL149 Barry, Freyberg Rd., Ruawui, Northland, would welcome VK SWL's to drop them a line on their doings.

Kuno Hoehle L5072, c/o Junior Staff Club, Woomera, S.A., is seeking advice or a publication concerning modifications to his AR88. Also re a mechanical filter for same.

Well, that is it once again. So until next month, cheers, and remember, "DON'T go home early by ACCIDENT." Chas. L2211.

### S.W.L. DX LADDER

| | Countries Conf. | Countries Hrd. | Zones Conf. | W States |
|---|---|---|---|---|
| E. Trebilcock .... | 285 | 293 | 40 | 50 |
| P. Drew .... .... | 160 | 258 | 35 | 34 |
| A. Westcott .... | 100 | 159 | 34 | 11 |
| M. Hilliard .. ..... | 91 | 241 | 33 | 14 |
| M. Cox .. .... .... | 89 | 225 | 33 | 23 |
| G. Earl .. .... .... | 85 | 163 | 33 | 14 |
| R. Kearney .. .... | 79 | 147 | 32 | — |
| L. James .... .... | 76 | 174 | 30 | 14 |
| W. Smith .... .... | 67 | 177 | 28 | 7 |
| N. Harrison .... | 63 | 177 | 32 | 38 |
| A. Raftery .. .... | 31 | 148 | 20 | 9 |
| R. Harrison .... | 20 | 70 | 17 | 5 |
| B. Prosser .. .... | 17 | 136 | 8 | 2 |
| B. Mackintosh .. | 15 | 58 | 15 | 3 |

# Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

### CONTESTS

Editor, "A.R.," Dear Sir,—I was interested to read in March "A.R:" of the experiences of your correspondent L. H. Vale, VK5NO, in trying to reach the Contest Committee through the "correct channels."

I, too, in years gone by had similar troubles, and finally, assuming that I was probably the only Ham in Australia who wanted a change in contest rules, I lost my missionary zeal and retired from the field. VK5NO's letter has provided the necessary spark to fire up my enthusiasm again.

My interest is c.w. only, but my suggested rules can be used for all modes—they are based on the A.R.R.L. sweepstakes and the B.E.R.U. rules. With a view to their eventual adoption as R.D. rules, I suggested that we might try them out on a couple of single-band contests such as 80 metre, 80 metre low power (6 w. max.) or 160 metre, held on a Saturday night from, say, 2000 to 0200 E.S.T. (to put VK6 on an equal footing). With only a 4 to 6 hour duration, we should get enough starters to keep everyone busy, to show up the smartest operators and to still leave some stations unworked because they couldn't be contacted in the time available. Maybe we won't get 500 entrants like in the R.D., but even 100 should make for an interesting few hours of activity.

Basically the rules are:—

(a) Contacts, instead of being interstate only, to be between all Amateurs in the Commonwealth and Territories irrespective of location.

(b) Areas, Federal Electoral Divisions and named Territorial areas. There are 128 Divisions (including Northern Territory and A.C.T.) and Territories, Papua, New Guinea, Norfolk, Cocos, Nauru, Christmas and Antarctica.

(c) Emissions, c.w. v. c.w., Phone v. Phone. not an open section.

No logs would be submitted to the Contest Committee, only the claimed number of contacts, areas contacted and total score. The Committee would then just collate the information received into a form for publication in "A.R." No certificates, no prizes.

If the experience of these "QSO Parties" shows that the rules are satisfactory, maybe they could later be incorporated in the rules for the R.D. What about giving this idea a go in an 80 metre c.w. contest this winter?

I consider that this scheme of "everyone working everyone" would solve the problem of team contests. Just add the scores of the first 6 or 10 leading stations in a State, and you have a team score—no need to apply factors derived from some obscure algebraic function of active and inactive Hams. The more in the contest the better will be the scores all round.

—John Tutton, VK3ZC.

P.S.—The detailed rules are ready and waiting for publication in "A.R" ! ! !

### SEMI-CONDUCTORS

Editor, "A.R.," Dear Sir,—It is gratifying to observe that capacitative transient suppression is being given more attention in power supply designs employing semi-conductor rectifier diodes, particularly for articles appearing in "Amature Radio." There is, however, still a tendency to use OA210 (or equivalent) for all purposes, even though diodes of lower voltage rating are available. For example in the article "Semi-conductor Power Supply for Transceivers," in the February, 1965, issue of "A.R.", Mr. Collett uses an OA210 to rectify 12 v. (r.m.s) in a half wave configuration. The peak voltage from the secondary would be 17 v., and the peak reverse voltage across the diode would be about 34 v. Allowing 50 p.c. safety factor for overvoltages, a 50 v. diode would suffice, such as the OA605, or equivalent. This could be a valid consideration for a constructor who does not necessarily have a junk box full of the 400 v. diodes.

I might mention, however, that the 50 p.c. safety factor would only apply if the circuit were adequately suppressed for transient overvoltages. This could easily be accomplished by placing a 0.01$\mu$F. condenser across the primary of the power transformer.

—R. L. Gunther.

### THE BALL IS IN YOUR COURT

Editor, "A.R.," Dear Sir,—The article in the March edition under the heading "Are you in the groove?" was certainly thought provoking.

However, due probably to Lindsay Douglas' good breeding (or manners) he did not lay it on the line, he pulled his punches in fact. I won't. Try this on for size . . .

Australian Amateur Radio is slowly sliding into an ooze of apathy and negative thinking seldom, if ever, seen before.

While overseas Amateurs are supported by their Governments, and still enjoy full operating privileges and frequency limits, Aussies lose a large hunk of 80 and half of 40 and say nothing. The 7 Mc. band is now so full of commercials and others that it is becoming virtually useless. The 3.5 Mc. band is rapidly following suit. Our last hope, the 14 Mc. band, is already prostituted with several regular commercial users. Still we do nothing. There's your apathy — now for the negative thinking.

Let's look at the opening lines in Lindsay's article. "Australian stations using s.s.b. equipment at 30th June, 1959 (were), 50." This is in itself an indictment of Australian Amateur Radio, when we consider that foreign Amateurs had been using suppressed carrier techniques for TEN YEARS at that stage. While hundreds of U.S. Amateurs were enjoying the immense benefits of this great new mode, backward "die-hards" in VK land were still extolling the virtues of a system ALREADY ten years out of date, and making sick jokes about that "duck talk." This was six years ago.

Now look at the last line of Lindsay's table. Certainly it is encouraging to see the great progress that sideband has made—but it is sickening to see that some 90% of the nation's Amateur operators still favour a system that went out with button-up boots.

We should be proud of the fact that suppressed carried systems were perfected by Hams, and their first wide use has been by Amateurs. S.s.b. is here to stay, the benefits are well known, and simple construction details have been published in most Amateur Radio journals since those first startling articles appeared in "CQ" and "QST" magazines in 1948.

Nearly twenty years later there is no earthly reason why anyone should persist in radiating a carrier in our already crowded bands, THUS CAUSING NEEDLESS INTERFERENCE TO OTHER USERS.

What then is the remedy? First find your cause. The only two I can think of are (1) "This sideband rig will cost me real money"; (2) "I don't think I can build one anyway." I refuse to concede that ANY Aussie Ham lacks enthusiasm or a progressive outlook.

As far as item one is concerned, the cost of getting started need not be very much at all. First practise receiving sideband stations with your present receiver, practise until you can resolve sideband signals instantly and instinctively. If your oscillator drifts, fix it. In the meantime use your b.f.o. pitch control for fine adjustment. Add a product detector if necessary. Answer s.s.b. stations, tell them you're thinking of "going sideband." You will be delighted at the response—fire away with your queries.

Next take stock of your a.m. rig. Is your v.f.o. stable? If not, make it stable, then send the undersigned a circuit or block diagram of your transmitter with a stamped-addresed envelope.

I will send you back another showing you how to convert your present transmitter to sideband using as few new parts as possible. My first sideband rig in 1957 cost about a tenner, yours could cost less. It costs only 5d. to find out.

This also answers problem number two. Of course you can get it going—and soon. Now what about it you a.m. chaps? The ball is in your court. Are you in the groove?

—Steve Grimsley, VK1VK, etc.

[Have a quack boys—it costs fivepence.—Ed.]

### NATIONAL FIELD DAY

Editor, "A.R.," Dear Sir,—We would like to comment on this year's National Field Day Contest. Although we did not enter the contest as a club team, there were two teams of club members in the contest and these teams have made observations that we would like to bring to the attention of all concerned.

The first point was the number of contacts made where the operator was unaware that there was a contest in progress. We would, therefore, like to see much more publicity given to this event by "Amateur Radio" and other radio journals. To this end we intend to publicise the event much more through our own journal "Info" and hope that other clubs will do the same.

The second observation was that the number of stations in the field was very small. In this regard we would appeal for many more operators to enter as a portable station in future contests.

In closing we would like to thank all competitors for their contacts with our two teams, VK5TM/P and VK5VE/P, during the contest.

—W. A. Thomas, Secretary, E.A.R.C.

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# Publications Committee Reports That . . .

Correspondence was received from the following, which includes all inwards mail up to the 12th April: VK's 1VK, 4VX, 2AXS, 2HA, and Messrs.: R. L. Gunther, H. M. Schroeder, D. Buck, N. Burton, together with technical articles from: 3KG, 3ZCK, and P. Ward in addition to letters from SWL L4018 and L5067.

As explained in the March issue of "A.R" no committee meeting took place that month, hence various matters were held over until this meeting and your committee regrets that this delay occurred.

The question of matters likely to arise at the Federal Convention regarding "A.R." were discussed and our report was tabled for all members' agreement. In addition, the question of future advertising rates was raised and it was agreed to proceed with an advertising campaign to increase our income. This matter will be more fully discussed at the next meeting.

The question of all Notes was raised and in view of the changes at our printers it was considered that, rather than put forward the deadline for receipt of Notes, it would be better to have a standard form for presenting all notes to the printer. Copies of these sheets will be forwarded direct to all contributors. It is emphasised that if contributors do not use the correct forms their notes may not appear in "A.R." This is a policy matter by the printer and this committee must comply with it. A more detailed explanation has been forwarded to each correspondent.

Many "A.R.'s" are being returned marked "UNKNOWN AT THIS ADDRESS." Readers are again reminded to notify their Divisional Secretary in advance of any change of address, and direct subscribers should notify the Victorian Division. Attention to this matter will help both the reader and your committee.

Due to some misunderstanding by all concerned, no Call Books were forwarded to VK6. Readers may obtain supplies from McGill's Newsagency, whose address appears in their current advertisement. No supplies are available from Victorian Division.

The Committee discussed the question of the changed arrangements regarding no booksellers being able to accept subscriptions to "QST," and decided that as Federal Executive had this matter in hand no action would be taken by the Publications Committee.

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# VHF NOTES

(Continued from Page 19)

has built up a new 2 mx converter after dismal results on Oscar with the old one. 6VR lost a couple of mikes in his car recently. Warmth is good for old batteries Peter not microphones. If anybody wants to hire a tape or get one recorded with morse, the address is Mr. F. A. Pearson, 79 Birdwood Ave., Umina Beach, N.S.W. Perth Modern School has a YRS tx going on 6 mx, thanks to 6ZBY. The last fox hunt was publicised incorrectly due to an error in the minutes. However, one car turned up and found the fox 6ZAY in Lesmurdie. The fox was not audible on Greenmount as the beam was only 2 ft. high. People won't come on fox hunts any more if this happens again, so be more careful next time chaps. 6ZDW is up in Kalgoorlie. You will have to try for that morse test again Doug, as you ought to be on the 7 Mc. mobile up there. 73, 6ZAG.

# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL

### I.A.R.C.

The International Amateur Radio Club in Geneva announces that to celebrate the Centenary of the I.T.U. there will be six I.A.R.C. stations with calls from 4U1ITU to 4U6ITU operating "round the clock" for 48 hours on the 16th to 17th May on the following frequencies:

1,810 and 1,830 Kc., 3,503 and 3,797 Kc., 7,003 and 7,045 Kc., 14,113 and 14,292 Kc., 21,050 and 21,400 Kc., 28,050 and 28,625 Kc. and 145.1 Mc.

Special commemorative operator certificates and QSL cards will be issued. All Amateurs interested should keep an ear out for any of these six stations.

### OSCAR III

On March 9 OSCAR III was launched into a successful orbit around the earth. During the first two weeks of its life hundreds of satellite-repeated QSO's between Amateurs were achieved including trans-Atlantic contacts. The coherent beacon on 145.95 Mc. failed to operate but good telemetry was received from the 145.85 Mc. transmitter. The translator portion has been reported as inoperative since orbit 206 (1311 G.M.T. orbital crossing on 24th March). It is not expected that the translator portion will function again. The telemetry beacon (145.85 Mc.) continued to operate normally until orbit 244 on 27th March. It became intermittent after this orbit and was not heard by ground observers on orbits 248, 249 and 262. Signals re-appeared on orbit 263 and have been regularly received since that date.

It is requested that all interested Amateurs continue to monitor the 145.85 Mc. beacon channel following current orbital predictions and reporting reception and telemetry information to Project Oscar Headquarters. The March issue of QST (pages 16 to 18) clarifies the observation and interpretation techniques for the telemetry beacon. Equipment required for observations is the v.h.f. receiver, an oscilloscope and an audio oscillator. Project Oscar requests that all data, log reports and newspaper or magazine articles on OSCAR III be forwarded to: Project Oscar, Foothill College, Los Altos Hills, California, U.S.A. Please send all telemetry data (battery voltages and temperatures) airmail to the above QTH as it is urgently required during this critical phase of OSCAR III.

### RADIO BEACONS IN RHODESIA

Early in 1964 a team of experimenters established a radio beacon transmitter operating on 50.046 Mc. at a prominent point near Mazoe in Rhodesia. This beacon has since been heard in Cyprus, Scotland, Germany, U.S.A. and many places in Africa and is still running continuously. A new beacon has since been set up at a more favourable site and operates 24 hours per day on a frequency of 1801.5 Kc. and sends "de ZE1AZD" with F1 modulation (FSK). The carrier is interrupted for 18 secs. every 7¼ mins. to allow no-signal conditions to be observed.

The transmitter, built by ZE2JV, has an input of 10 watts and is situated at the top of a range of hills 52 miles N.N.W. of Salisbury. The antenna is a centre-fed dipole, the upper quarter wave to a mast and the lower quarter wave from the beacon over the edge of a cliff. It is anticipated the beacon will be in operation for the entire period of the I.Q.S.Y. (International Year of the Quiet Sun) and reports of its reception, which will be acknowledged, should be sent to Ivan Wood, ZE3JJ, c/o E.S.C., P.O. Box 377, Salisbury, Rhodesia.

The team wished to thank the Southern Rhodesian Electricity Supply Commission at whose site the beacon is situated.

### 8th JAMBOREE-ON-THE-AIR

Mr. Noel Lynch, Commissioner and National Organiser of the Jamboree-on-the-Air, announces the 8th Jambore-on-the-Air for the week-end of 16/17th October, commencing at 10 a.m. on the Saturday. In addition to the usual Scout Groups that took part last year, it is possible that Girl Guides will also be taking part this next time. All Amateurs who participated last year are again asked to co-operate with the Scouting movement and to encourage other Amateurs to take part in this annual event. Your Federal President, Bill Mitchell, VK3UM, had the pleasure of meeting Noel during the 7th Jamboree at Rowville and of discussing matters of mutual interest. Further information, as it comes to hand, will be published in this column.

### I.T.U. FUND

As at 10th April, contributions to the fund, as a percentage of the target set at the Sydney Convention in 1963, are as follows:

| | | | |
|---|---|---|---|
| VK2 .... .... | Nil | VK5 .... .... | 33% |
| VK3 .... .... | 50% | VK6 .... .... | 97% |
| VK4 .... .... | 50% | VK7 .... .... | 100% |

These figures do not necessarily represent the amounts received by Divisions, but only as received by Federal Executive. Congratulations to VK7, the first to fill their quota. Please continue to send your contributions to your Division.

### AMATEUR BAND SUB-DIVISIONS

| Cw. Only | C.w.and Phone |
|---|---|
| 3,500- 3,535 Kc. | 3,535- 3,700 Kc. |
| 7,000- 7,030 ,, | 7,030- 7,150 ,, |
| 14,000-14,100 ,, | 14,100-14,350 ,, |
| 21,000-21,150 ,, | 21,150-21,450 ,, |
| 28,000-28,200 ,, | 28,200-29,700 ,, |

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## NEW SOUTH WALES

### HUNTER BRANCH

"But all the v.h.f. men were there." This is what I was told following the April meeting of the Branch held at the Tech. College. Due to a slight gastronomical indiscretion I was unable to be in attendance but it was my worthy off-sider and highly paid spy who told me about the activities. Des Mills VK2ZDN, that intrepid v.h.f. man, was the centre of attraction and he chose to describe in great detail his now famous two and six metre transceivers using transistors. Forty-four were present to hear all about the construction and, as you might expert, fully seven-eighths of them went away muttering, "I must have a go at one of those. They look pretty easy." Which one of us is going to count the heads of those who complete the task? Despite all this prophecy talk, a good time was had by all and many worthwhile clues gained in the "mag" session following the meeting. I hope that the current rumour of Des leaving the friendly domicile of the smoky city and sojourning in the far outpost of Kurri does not mean that we will lose his attendance at meetings. For my money, I'll back him against anyone in the soldering iron and tinsnips stakes. So please don't go away and leave us now Des!

One man who has left the Branch for greener T.V. screens is Bill 2ZCV, the Cessnock villain, although he really used this call sign to disguise the fact that Kurri was his home. Watch out you good Tamworth people and unsuspecting Televiewers, Bill is already there. Following long years of practice, aerial masts are old hat to Bill and, during a recent visit to the *Cessnock* club, he gave a demonstration of just how a mast should be raised. Some of the boys and my athletic self tried out this method later, out of sight of the crowd, of course. The result was absolute chaos! I won't say who finished up in the middle of all the guy ropes but he sat on one of the heavy steel aerial rods and bent it—the clumsy oaf! Sorry, Chris.

These chaps at Cessnock have either a small light or a big bushel because they certainly have been hiding it. On this same visit spoken of earlier, we all entered the old Town Hall in the black diamond city, because it was here, we are told, that the Radio Club might be found. But nobody could be seen! By careful listening, some sounds closely resembling morse could be heard "from afar" as Bill the Bard used to say. Following our ears, which is a quite difficult task, we came upon a scene which would have left the Mayor gasping, I'm sure. Seated in a very large throne-type chair was Chris (2PZ you know) while all his "councillors" sat around a huge (about 40 by 100) table listening to the rhythmical oscillations of the thousand cycles. The reason they gave, of course, was that it was the quietest room they could find. Putting all these witticisms aside, Chris, Nev (and even Sherwood) and all the others are doing a very worthwhile job both for Amateur radio and the Civil Defence signals section. After all this revelry Mrs. Chris invited us all to supper. Of course, I just had a small coffee and one biscuit but the others! Some had to be forcibly restrained such was the delicious array of good things spread before us. Helen and Mrs. Chris did all the hard preparation work, and made charming hostesses, ably assisted by Sherwood. (After this write up, I'm sure to be invited again.) Bones, of course, spoiled the whole night by driving home at a snail's pace.

Did you see that handsome face alongside a locomotive the other day? No it wasn't in the railway timetable. Our old friend Shannon (Bill 2ZL to those who don't know) hit the headlines on the magazine page. So great was the impact of all this that the Phenyle Bay railway is once again in business, and the profits are pouring in, as may be expected. Another well-known headliner of late was Harold 2AHA, who must have told the reporter lady a big fib about his activities on the air, because I've listened and listened and I can't hear him. It must be the skip. But remember all you who would chuckle about us celebrities getting our most handsome and flattering photographs in the paper—your turn will come. I am told that Mac 2ZMO ,our S.W.L., is in the running.

S.W.L. by the way means Sitting, Waiting and Listening. Whether or not he was S.W.L. for the television show which featured strawboard Oscar the other day we'll never know. But as it hapened many people were involved in this escapade. Max McLachlan made the model, Bill 2XT supplied the QSL cards for display, John 2ZJG kindly lent a genuine W6EE QSL and a good friend, Spencer Cotton, did the talking. All told it was a good bit of publicity for the Amateur Service. Bill 2XT did another remarkable thing during that week. It involved lashing out and re-equipping with a Drake transceiver for the car. I bought a Drake, too, but I ate mine at Easter—last year, or was it the one before.

A new character appeared on the local scene just recenly—one Two bob Maschetti alias VK6ZDM and hailing from Nollamara. Anyway Alyn, for that is his name, has agreed to speak about swindles in VK6 at the next branch meeting, which is at the usual place, Room 6, Clegg Building, at the Tech. on Friday, 7th May. We'll be starting at about 8 p.m., so I'll see you there. 73, 2AKX.

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## VICTORIA

### WESTERN ZONE

Your scribe has very little to report owing to lack of activity during the past few weeks. All spare time being taken up with the paintbrush. Yes, even the shack, after everything had been removed.

John 3AFU and David 3ADS, two of our members, made the trip to Gippsland to help out with the fires. To you both we congratulate you on a job very well done.

with the *colder* weather *coming* on and 80 improving, we should have a good muster on our Wednesday night hook-ups once again. Pleased to hear Gordon 3NX back on the air after an absence of about two years.

Murray 3AMP is on the bands now and again and enjoys a QSO. Trev. 3ATR have not seen or heard for months, the last I heard of him he was on a cross country flight to VK4. My spies tell me he has a quad ready to be put up. What about those vee beams? It's time you came on and gave us the GG. Merv. 3AFO still comes on when

## SILENT KEY

It is with deep regret that we record the passing of:—

VK3HG—N. Templeton.

VK4ST—S. H. Tumbridge.

possible. Congratulations on the promotion but the sad part is we may be losing him before very long.

Bill 3AKW on long service leave, hope you enjoy it and catch up on that rebuilding you have spoken of for months.

Herb. 3NN, one of our committee members, still finds time to work the VHF bands with fair results.

Bob 3ARM, Neil 3AQD, Roy 3AOS come on now and again, the same goes for the VK5 boys, but on most nights conditions have been against them.

The rest of the members, some of you we have not heard for years, well, if you don't come on and let us know what you are doing how do you expect to see your name and call in print. We ask you to do the right thing. 73, Bert 3EF.

**MOORABBIN AND DISTRICT RADIO CLUB**

After the excitement of last month, members appear to be resting on their laurels. This was not so for our March general meeting, however, as a record number of members and visitors attended this gathering. All seats were occupied and the air was soon thick with smoke signals. General business was quickly dealt with and followed by an interesting talk by Ken 3ACS on the uses of a v.t.v.m. Whilst this talk was proceeding, a number of club members excused themselves to install gear at the Haileybury College at Brighton, for the purpose of an exhibit of Amateur Radio at its Fete, per the generosity of the Moorabbin and District Radio Club.

The Club exhibited various pieces of gear constructed by members and operated 3APC/P during the day. Harold 3AFQ's h.f. equipment was used for operations on 40 metres and Peter 3XK's 2 metre f.m. equipment. A very successful day resulted from the point of view of the Fete Committee, Amateur Radio interest, and the number of contacts. We were fortunate this year of not being plagued by interference from the model train exhibit. The previous year, h.f. conditions were marred by local, boy-made interference.

A natter night was again held at the clubroom during the latter part of the month. This enabled name tags of members to be brought up to date, and also operation of the Club station 3APC. The latter has not been operated in recent months due to a fault in the modulator. After our transmitting officer, Kevin 3ARD, was acquainted of this fact it was quickly rectified. We are not saying how, we may become embarrassed.

Activities during the month appeared to be fairly quiet, with construction again to the fore. Eddie 3EM is continually on the go with mods. and experimentation, and the latest, my spies tell me, is a beam for 2 metres f.m. Ken 3ZNJ has quietened down considerably, latest work assignment could be likened to that of a travelling man. Ken 3AFJ has been experimenting with a five-eighths whip for 2 metres f.m., and with very good success. A demonstration recently convinced me of its superior performances over a quarter wave whip. The only problem appears to be that garages are not built high enough to accommodate the extra length. After last month's rundown on activities this month's effort appears to be very meagre, but I suppose that's just how the cookie crumbles.

S.W.I.'s should now be aware the Club is now awarding certificates for their group, details of this appeared in the April issue of "A.R."

Club activities for May will be commencing with a social evening at the QTH of Wally 3AHZ, to be held on Saturday, the 1st May. A Club natter night will be held on 7th May with the strong possibility of someone being dobbed to demonstrate some equipment. Our usual monthly general meeting will be held on the 21st May. Unfortunately, the April general meeting was cancelled, due to this falling on Good Friday. A second social evening will be held during the month at the QTH of Eddie 3EM on the 29th May. Our social evenings are proving very successful, plenty of ear bash time and the opportunity for XYL's to study their menfolk in action, eye-balling.

Club members are again reminded of the present effort of paper collecting. At our May meeting it is expected that there will be available a fairly large quantity of valves at give-away prices—so be in it, we want to dispose of the lot in one go. Whilst on the subject of disposals, members should be aware that if they possess gear which is desired to either sell or swop, or wish to purchase, by contacting the Club Secretary, Harold 3AFQ, these items can be listed in our monthly newsletter absolutely free of charge. 73, 3XK.

## OBITUARY

**NEIL TEMPLETON VK3HG**

It is with deep regret that we record the passing of Neil Templeton VK3HG. First licensed in 1930, Neil's interest in Ham radio never waned and he was active on various bands until shortly before his passing. Although a keen DX-er he was frequently to be heard rag-chewing with the "locals." During the war he served with the Royal Australian Air Force and for many years had operated a base station for the bush fire net in his area.

To his sorrowing wife, son and daughter we extend our deepest sympathy.

**STANLEY H. TUMBRIDGE, VK4ST**

The Queensland Division of the W.I.A. sincerely regrets the passing of Stanley H. Tumbridge VK4ST on the 18th March after a brief illness.

Stan was first licensed in the early 'thirties and at Ipswich operated his station which became well known in Australia.

About this time he assisted in the forming of an Ipswich Radio Club.

For a number of years Stan also operated his station at Broadwater in the Stanthorpe District. The last 15 years or so Stan was at Woody Point.

In all areas where Stan resided he became very popular and well known, this being due to his many sterling qualities, chief among which was his being a fountain of help in many ways to those who needed assistance in any form.

To his sorrowing relatives we extend our sincere sympathy.

# QUEENSLAND

**NOTES FROM DIVISIONAL COUNCIL**

At the monthly Council Meeting held at the Institute of Social Services, Berwick Street, Valley, on Thursday, April 1st, there was a full attendance of all newly elected Council members and the main business of the evening was to elect officers to fill the many and varied positions required to ensure smooth and efficient running of the Queensland Division of W.I.A.

Laurie VK4ZGL was elected as Chairman, and Peter VK4ZPL as Secretary. A full list of all appointments will appear in next issue of Q.T.C., the Official Bulletin of the Queensland Division.

The disposals position at the moment is very grim, and all sources of supply seem to have dried up. I do, however, hear rumours of a couple of pretty good deals that could come up shortly.

Could be quite a few new call signs in VK4 land shortly, Channel "O" seems to be making its presence felt and many six metre boys are talking of concentrating on morse.

Our Hon. Treasurer reports that there are still quite a few subscriptions outstanding, so come on fellows. How about it . . . and make at least one of our councillors happy by mailing that cheque NOW ! Thanks.

Would all readers please note call sign of your new scribe and send along any choice pieces of gossip that can be taken down, altered and used in evidence against you. 73, VK4VX.

**1965 CONVENTION**

Undoubtedly the highlight of Amateur Radio in Queensland is the Queensland Division of the Wireless Institute of Australia's Annual Convention held at Alexandra Headlands in April of each year, and the one held on the week-end of April 3rd-4th proved no exception.

Attendance rose to 117 this year, against 100 last year and Bob VK4ZRC is to be congratulated on the fine job he is doing each year, not so much in organising the convention, but in organising the right fellows to assist him. Hi !

Alf VK4WO, the W.I.A. Station operator, had our new Galaxy V. transmitter set up, and everyone was impressed with its appearance and operation. A Swan 400 brought along by VK4TN also aroused much interest.

Max VK4DA won the first all band scramble operating mobile with one of his famous mini-whips. Max set himself up in a good position and went to town in making contacts. Result a flat battery and Max had to toddle back two miles to HQ. Hi !

The first All-Band Scramble was won by Bob VK4ZRC. On Sunday the VHF Scramble was won by VK4ZEK (David). The C.W. contest, receiving from tapes and sending back was won by Max VK4DA. C.w. on tape by Rick VK4VR. The second all-band scramble was won by VK9ZBV/4 and VK4TN. The scramble was organised by the VHF boys to give a possible 39 contacts. Hi ! But something came unstuck.

The best home brew gear contest was won by Vince VK4VJ for a very fine version of the Delta het type front-end receiver. Brisbane trade houses donated some very handsome prizes, which were presented to winners by our Vice-President Pat VK4KB. John VK4RZ gave a very useful and informative talk on OSCAR III.

Joyce VK4JJ did a sterling job as receptionist, secretary, etc., etc., and was elected the best trained XYL of the year. Hi !

David VK4ZDF had his six meter home station set up and it really performed well.

Everyone had just one whale of a time and voted the convention a must for next year. So how about you?

Council has asked me to pass on to you Bob VK4ZRC their thanks for a good job well done.

**CENTRAL QUEENSLAND BRANCH**

The C.Q. Branch has an active and respectable membership. Much interest being shown in the proposed convention at Tannum Sands, via Gladstone, for the Queen's Birthday Holiday week-end in June, when the W.B. and B. Branch and the C.Q. Branch members and others hope to get together. Arrangements are in hand by the C.Q. gang for a float in the Capricorna Festival procession later in the year and for a main street window display of Amateur gear used through the years. The morse class is well under way and well attended under the care of Joe VK4CL. President Frank VK4FN active in keeping things moving. Bob VK4NG and Lance VK4ZAZ had success with OSCAR and keep 6 metres represented. Newcomer Lyle VK4ZLD also made his debut on 6 with Dick VK4ZCK and Charles VK4ZBG, our very keen secretary. Should not be long before we hear VK4SC Silas putting out a signal. Geoff VK4FK and Hal VK4DO regularly on the HF bands, the latter amongst the DX with SSB. Chilla VK4SD has a new QTH at Yeppoon and with his Swan 350 keeps the beach resort on the map. Looks like being a good year for the C.Q. chaps with interest at a good level and many trying for their ticket. Hal VK4DO.

**TOWNSVILLE AND DISTRICT**

Wonder if anyone else has noticed this peculiarity on 14 Mc, that when the lower end of the band is open the top end is practically dead. Have noticed this for a long period, then it reverses. Seldom do I hear now that the band is open for its entire width. Arcund the bewitching hour of midnight the Europeans are starting to break through and do not hold in very long at this QTH. Heard a rumour that efforts are being made to form a radio club once again. It is to be hoped that this eventuates. It is hard to believe a city of this population cannot have a club when there are many small country towns that have one where the boys can meet and swap tales of the old days when D.X. was plentiful and it was no trouble to get a W.A.C. in five or six consecutive calls. Those were the days the present newcomers hope to return. Never mind, the orbiting satellites may make tihs possible on the V.H.F.

Ted 4EJ is giving the tower a new look with a coat of paint ere he gets the Quad back up again. Charlie's 4BQ tall tower awaits the 40 metre Quad to put on top. Merv 4ZMD hopes to break the sound barrier next time he faces the barrier in the Morse Stakes. Best of luck. Basil 4ZM endeavouring to establish a VHF link with the boys in Atherton. Why not try T.V. link while about it? Nothing more has been heard about the Secondary School Radio Project. Bob 4RW is busy trying to punch holes down in the rock at the new QTH to support the tower, which already sports a new coat of paint. Ere this appears in print he hopes to have the beam working so that the boys can copy his signal with little difficulty. Never hear any word from the boys in Ingham or Innisfail. What about a line, only requires a postage stamp if not on the air. The Lower Burdekin gang seem to have gone into early hibernation now that Claud 4UX has left the district. 73, Bob VK4RW.

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# SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division for March was held in the clubrooms to a near capacity audience of members and visitors—Scoffers and doubters from over the border (east or west) may have the exact number present by sending a stamped and

self-addressed envelope with postal notes to the value of £3 to cover expenses, addressed to the Publicity Officer, a gentleman of the highest integrity, who will personally attend to the spending of all money received. What's that? Who is the Publicity Officer? Never you mind—don't be nosey!

Anyway, the meeting took the form of a jumble sale, and as one jumble sale is just like another jumble sale, even I, experienced padder that I am, cannot write much about such a meeting, so even though it hurts me to do so, I will dismiss the meeting with the simple statement that everybody present enjoyed themselves no end. Ye Ed. and the entire Publications Committee having now recovered from the shock, I would like to say that Ross 5KF was in the chair for the first time as the new President and conducted himself with all the aplomb of a veteran, and his handling of the meeting augurs well for the coming year.

Brian 5CA and Phil 5NN alternated as auctioneers, and both helped to keep the tempo of the night moving at a fast rate, including the shekels. The meeting closed at 10.20 p.m. officially, but unofficially was continued until the caretaker came along accompanied by his faithful Alsatian dog. Nice doggie—good doggie. See you later chaps!

That nifty toe-tapper Frank 5MZ will be flitting hither and thither about the Apple Isle (VK7 to you) early in May with a team of ballet girls, and his XYL, the XYL being mentioned only to save Frank's reputation. There is no doubt about this joker, as long as I have known him he has been bobbing up once a year in places like Ballarat, Melbourne, etc., etc., accompanied by a team of ballet girls, and now it is VK7. What has he got that I haven't? Don't answer that! Anyway, I understand all interviews with him are by appointment only. Yum-yum—and other expressions of jealousy.

Carl 5SS who is usually around whenever Frank's name is mentioned apparently did not make the ballet team (I did hear something about two left legs or something) and will try and carry on during the above-mentioned trip to VK7 by doing a spot of painting. He is on annual leave at present, and has gallons and gallons of paint at the ready, but is said to be waiting for a cool spell and when that comes will be waiting for a warm spell. This spell business will go on for a while and then the XYL will start weaving a spell of a different nature and Carl will start wielding a wicked brush—and how!

Clem 5WG is another to mix goldfish with Amateur radio and is reported to have a fine set-up in the hills. He puts a fine signal out from his QTH when he is not up on the farm at "Mount Lonesome."

Joe 5JO is in theatrical parlance "resting" at the moment of wriitng, and quite enjoying the life of leisure. I got the impression that it could go on for ever as far as he is concerned, but his XYL has other ideas and I feel that Joe's resting is about to come to an abrupt end.

Vern 5VB, otherwise known as the "Admiral," is off to Cowell for a holiday over the Easter period, and of course will be found at the QTH of his son-in-law Brian 5BI. Just imagine, whilst I am selling pies and pasties up at the Oakbank races, these two jokers will be living on a diet of fish and Amateur radio. No wonder communism has such an appeal to peasants such as myself. The scales never seem to balance!

Among the many letters received this month campiaining of the lack of judgment on the part of the Publications Committee was one from Launce 5LD, "Pop" to you, and addressing me as "My Dear Hoary Headed Old So and So." Flattery, flattery, that is all I seem to get these days, even if he did have the audacity to suggest that he never gets a mention in these notes.

March has always been a good month for me with respect to paragraphs for the magazine. So many exciting and unpredictable events usually taking place, one in particular, of course, was the fact that my Amateur licence falls due, and for many years my hazards and exploits in trying to pay the said licence were, without fail, good for at least two or three paragraphs concerning it, and with any luck possibly a couple of follow-ups. Last year all this came to an end, the P.M.G., without consulting me in any way, decided to permit me to pay my licence fee at any post office, in fact, they made it so easy that I sulked in the corner for almost three months at the loss of my easy paragraphs.

This year I perked up a little, instead of receiving the usual commonplace request for payment I received instead two accounts in the one envelope, one a duplicate to be apparently retained after payment by me.. The more I studied them, the more promising they looked, and it was with high spirits that I salied forth and lined up at the counter at the suburban post office. The female representative of the P.M.G. took the two accounts and the money, looked blankly at them, looked blankly at me, and without a word disappeared behind the Holy of Holies and went into an earnest huddle with the male representative of Paddy McGinty's Goat. Barely able to control myself with excitement at the thought of the coming encounter, and best of all, the thought of the return of all my lost paragraphs, I waited patiently for her return, determined to treat her as gently as possible, but at the same time to be as difficult as I could, in the hope that I might secure enough material for perhaps twelve monthly paragraphs. Imagine my shock and disappointment when she at last returned, handed me my duplicate receipt fully made out, practically kissed me on the forehead, and politely opened the front door and ushered me out with a beaming goodbye smile. How low can they get? How unco-operative can they be? However, don't dismay, there is a happy ending to this rather sad story. Three weeks later along came an official-looking letter, which, when opened by my trembling fingers, bluntly told me that as no records showed any payment of my Amateur licence, if they did not hear from me within one month they proposed to cancel my licence without any more ado. Well, need I say more? I nearly fell over in my haste to get to the telephone, and waving my duplicate receipt in the air as a sort of martial banner, I was transferred from department to department, finally finishing up of all places in the Radio Inspector's Department Flushed and apparently drunk with success by this time I was quite prepared to do battle with even the Postmaster-General himself, and lost no time in telling the whole story to the gentleman who answered the telephone, only to fall flat on my fallen chest as he gently replied: "O.K. Pansy. I know you must have your paragraphs somehow or other—far be it from me to stop you, and good luck to you—see you on Single Sideband some time!!!" Then he gently but firmly hung up the receiver in my ear. Wouldn't it? How unlucky can one be? I wonder just who it could have been? Is my face red? The curtain will now be lowered on the hardy annual: "How I could not pay my Amateur licence." Diplomacy is my middle name!

Jim 5JK at the moment of writing is on annual leave and has just returned from Port Vincent after a pleasant time spent relaxing in the noonday sun. He intends to try out several gadgets in the shack for the next week or so, although he is still twitching a bit from the shock he received when his experiments on his first gadget caused his multimeter to give forth a loud and agonising boi-oi-oi-oing and the meter stick hard over! He now is a firm believer in the fundamental law that high tension is high tension, and low tension is low tension, and never the twain shall mix—on the multimeter anyway!!!

Tom 5TL, the new addition to the VK5 Council, is now the bearer of the high-sounding title, Publications Officer, and as nobody seems very happy with this title, there is a rumour that it will be changed. Anyway, the main thing is that he is on the Council and has been given a job, and if I might be permitted to speak out of my turn, I would have liked to have seen him made country members' representative because he has been a country member himself and fully realises just how such a member in the country needs representation at times in Council.

Bumped into Jack 5JS the other day and when I had picked myself up we had quite a chat on matters of Amateur radio. He tells me that he is working down Edwardstown way in a big building that is air-conditioned in the winter, so much so, that in the middle of winter they are bothered all day by repeated knockings on the front door from Polar bears who want to come inside and get cold. That's what he told me, anyway, and Jack has never been one to pull anybody's leg.

Preparing for my Easter expedition to Oakbank, I decided to give the Type 3-Mark 2 a try-out in the hills on a recent week-end. Setting up station at Longwood, in the vicinity of Mount Lofty, my first contact was with none other than Gordon 3XU and on SSB at that, may I be forgiven for so slipping down the social scale, and if ever a contact was nostalgic this one was. Gordon is an ex-VK5 of many years ago, and a one-time buddy of mine in my early days of radio, and nothing suited him better than to gallop around

the countryside, in the true Don Quixote style, looking for windmills to do battle with, being closely followed by me in awe-struck servility. We used to retire to my baronial mansion of those days each night and discuss our several lost causes, and whilst we have both matured somewhat now, we still think that "those were the days". Remember how you did battle with the P.M.G. Department over those telephone wires that crossed under your aerial? We never did find out how they always managed to be on the ground each morning, did we? Tickled pink to meet you again, Don, ahem. I mean Gordon.

Also had contact with Ray 3WO, who proudly told me that I was his first for almost twelve months. His absence from the bands had not caused his hearing to deteriorate in any way, because he discovered some hum in my signal, and when I came back on the air some hours or so after the contact, having performed some internal surgery with an axe and a crowbar, he was still sitting right on the frequency waitng to tell me that the operation was a success, and the hum had disappeared. How's that for service? Hope to meet you again sometime, Ray.

Charlie 5ON noticed by one of my spies trotting around the city streets with the speed and agility of a two-year-old, and looking the picture of perfect health. There is no doubt about these veterans, they can take it. He has been in and out of hospital over the past two or so years, more times than he cares to remember, so much so, that every time he comes within half a mile of the Blackwood Hospital they rush into the ward and prepare a bed.

The new VK5 President and Chairman is Ross 5KF and he has wasted no time in getting into action. In a telephone conversation with me recently he gave me all the news and details of the new Council, and the plans for the coming year, and believe it or not, he rang me, I did not have to ring him. He looks and sounds like a good bloke, although he did say, in telling me that I was again Publicity Officer, and I quote: "I don't know what that title means." When I said, trying to be humorous, "Oh, that means that I am a general nuisance," he very smartly said, "Yes, that's what I have been told." Now who has been talking? Surely not the Past President Phil 5NN, you know, the one with the iron hand in the velvet glove!

Geoff 5ZCQ besides being the Federal Councillor is now the Vice-President, and I suppose, being often referred to in the Journal as "The T.V. Type," we can expect cameras, video tapes, etc., etc., every time he stands in for Ross!

John 5JC, our genial secretary, was an absentee from the meeting, his XYL is at the moment of writing in hospital recovering from an operation, and naturally John's thoughts were far from general meetings and such. Hope all is now well, Betty.

A welcome visitor to the meeting was John 3ZCO, and judging by the number of times he marched up to the tables to collect his purchases, he must have robbed a bank on his way over. Nice to see you John, but don't take any notice of the fact that I went white when they introduced you as a VK3, it was just something that I ate for tea!

Noticed Ralph 5OL sitting up in the front rows at the meeting, and he appeared to be quite at home with the gang. Before he came to VK5 he was K6OOL, and he tells me that this call is still current but they will not let him use it—I wonder why? Anyway Ralph, make yourself at home, good to have you among us, we are quite a good bunch, even if we say so ourselves.

An old-timer in the W.I.A., Marshall Hider, was noticed sitting next to Pete 5FM and Ses 5GP at the meeting, and appeared to be enjoying himself. No doubt about this fellow, he does not look a day older than when he used to sit up at the executive table himself—and that's not a couple of years ago either.

Bruce 5MC was down from Port Pirie for the meeting and passed on 73 from Bill 6DX. Thanks Bill, good to hear from you, and I will QSP that message to Mrs. Buckerfield—I can quite understand you were upset at the news of Buck's passing. Keep up the old spirit, William.

Bruce 5MC incidentally is no longer the secretary of the Port Pirie Boys' Club, having resigned because of the uncertainty as to whether he would be staying at Port Pirie or not. He tells me that Brian 5CO is now the president, with Alan 5ZC the vice-president, and Jim 5ZMJ having assumed the reins as secretary. What has happened to the budding authoress, Bruce? Has she gone into smoke?

Les 5NJ chased me up at the meeting, and with his voice almost choked with excitement and emotion, thanked me for my efforts in putting him on to the Divisional frequency meter after two years of waiting. I thanked him for his expressions of gratitude, but explained to him that it was nothing of consequence, after all I am known in some circles as "Get things done quickly Parsons." As a matter of fact I have a member waiting for the RF oscillator, and he is in his fourth year of waiting. He mutters and splutters a bit whenever he bumps into me, but after all, we must not travel too fast. Ho-hum, what it is to be efficient!

I am still trying to find out just how the photo of me on the front page was spirited across the border, and who was the mastermind who planned it all. The photo was an old one; almost 10 years old, and to my knowledge never left the house, where it is at present sitting on top of a china cabinet in the sitting room. The field has narrowed down to Pincott 3AFJ, or my XYL. Time will tell.

Incidentally, several S.W.L.'s have written to me pointing out that in the photo I am reading a S.W.L. magazine, and where could the magazine be bought these days? Sorry chaps, I can't help you, it was just a magazine I idly picked up at the Council meeting held at Gordon's place 5XU and as that was 10 years ago—your guess is as good as mine.

Noticed Comps 5EF at the meeting with a look on his face like the cat who ate the canary. It had me worried all night. The answer is now common property of course. He will write the notes for the magazine during my coming vacation, and of course you all realise just what that means—you will be fed a diet of SSB, and then some SSB, and then for luck, some more SSB. You all have my entire sympathy. However, should he by some remote possibility deign to mention my name, and I strongly doubt It, just treat it with ignor, remember, that now he is retired and living the life of luxury on his estates at Gawler, he is completely out of touch with Amateur radio in VK5 and thus will have to descend to insults and libel to fill the column. It goes without saying that he will be aided and abetted by Ye Ed., and the Magazine Committee, so take out 150 per cent. of what he says, and then forget the rest. Remember, my modesty, my purity of thought, and last but by no means least, my lily-white innocent nature will surely triumph in the end. Which end? Don't be coarse!

73 de 5PS—PanSy (H.A.) to you.

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# TASMANIA

One of our best ever dinners followed the Annual General Meeting held in Hobart on March 27th last. About 45 members attended the meeting where your Council for the year was elected and other official positions filled.

Quite a few members came from the North and North-western Zones, including 7OK, 7ZLP, 7ZAY, 7ZAA, 75F, 7ZBE, 7CH, 7ZAH, 7XL (apologies to any left out), many of whom brought XYL's to the dinner, where about 60 were seated to a most enjoyable three-course meal. Our guests were Mr. and Mrs. Munro and Mr. and Mrs. Melling, of the Radio Branch of the department. Mr. Munro in his address mentioned the growing shortage of C.w. operators and suggested that limited licence holders should not be content to rest with that licence but should persevere and get that elusive C.w. and gain a full ticket.

Your VK7 Council for the year consists of Tom 7AL, Tiny 7JD, Ian 7ZZ, Terry 7CT, Charlie 7K5, Ted 7EB and Geoff 7ZAS. Might I take this opportunity to thank all voters for their show of confidence in the previous Council by electing them all for a further 12 months. That does not mean we would not like to see a few more members nominate next year, and a few more members helping out with those extra little jobs that have to be done to keep things running smoothly. Just think for a moment, if for some reason or other, most of your Council failed to turn up at a meeting one night. What would you do to help out?

Now that our I.T.V. commitments have been met, Council reckons it is high time we got going again on our clubroom fund, with a few social evenings, outings, raffles, etc. So give any functions your full support, make up a party and bring your friends with you.

Last month I mentioned that we were losing Bill 7YY to VK4, however, he has been given a month's reprieve, as he pulled a cartilage in his knee, and has been hospitalised for repair. However, at time of writing I am pleased to report he is home again. Let's hope you have no more trouble from that source, Bill!

Another new call heard in the south is Mike 7ZMK, who lives in Hobart, been heard with a F.B. sig. by most of the locals on 2, haven't hard you on 432 megs. yet Mike, but no doubt we'll have a QSO when you get organised properly on that band.

Ken 7LL is keenly interested in Amateur T.V. and would be pleased to hear from any other local boys with similar interest, as he is anxious to get things going. Understand he has quite an amount of bits collected, only got to get them in the right order and we will have another channel to watch—no commercials either. What about putting a medical series on, Ken? A suitable title would not be hard to find. How would "Doc's Diagnosis" or "Medico Melville" go? Or you might try "Kuttin' with Ken" or "Kelly's Komplaints."

Our thanks to Bill VK3ABP, who has provided nightly info. on OSCAR III. This has been very much appreciated in VK7, Bill. Understand VK3ATN was heard in Hobart via the satellite, although no 2-way contact was made. Several locals have heard OSCAR, 7ZAO, 7ZAI, 7ZJG, 7LL, 7ZZ to name some. Cannot speak for the North and N.W. Zones, although 7PF and 7LZ I believe did work via the little fellow.

Lee 7KC now has his SSB transceiver working satisfactorily, and installed in his vehicle, and Ted 7EJ has his rig going also, although not on all bands as yet. Incidentally, Ted will have been to VK3 and back by the time you read this. Another member who certainly does his bit; hasn't spent Easter with his family for some years now. As your VK7 Federal Councillor he will be attending the Federal Convention in Melbourne this year.

Snowy 7CH has been Mobile Marine lately, says there's some good DX on 7 megs. when you get away from the man-made QRM found inshore.

Now I must have my usual grumble. I maintain, and always will, that a contest does not finish till you have put your log in the post, and posting your log is just as important, if not more so, than working a swag of stations. What I'm leading up to is this: Our recently held Athol Johnson Memorial Contest saw about 20 stations participating, yet as log checker, with logs to be in my possession by 31st March, I have 3 logs (and one of those is mine). One chap is still carrying his in his pocket. Makes my job easy, only three to check but it means there are only 1st, 2nd and 3rd to be declared. If you went to the Melbourne Cup or any other race for that matter, and 20 horses started, and 17 of them pulled up short of the post, you would reckon it was a pretty poor show. Well, that's the way I feel as I write this, and it doesn't only apply to this contest, so think it over. If you don't like writing your log out again for posting, then buy or borrow a bit of carbon paper. Now after that let me congratulate on behalf of all, Reg 7RL on a very fine effort in winning this year's A. J. Memorial Trophy with a score of 5,070 points. Reg made it 5,027 but he took part miles instead of the next nearest mile in his calculations. Yours truly 7ZAS runs second with 4,851 points, whilst in 3rd place comes Wolf 7ZAG with 124 points.

Enough for this month or we will have to have another page. 73, Geoff 7ZAS.

### NORTH ZONE

March brought with it (as usual) the Annual General Meeting to the zone. A new band of officers was elected and they are: President, Bevan 7ZBW; Vice-President and Treasurer, Peter 7PF; Secretary and zone correspondent, Leigh 7ZLP; and QSL Manager, Col 7LZ.

Notable by his absence from any of these positions is Den 7DK. For the past three years Den has been President, and I would like to thank him on behalf of the zone for all the work he did so ably and willingly over this period.

While on the subject of Annual General Meetings the Divisional Meeting and Dinner was held in Hobart recently. Although only four members of this zone attended we all enjoyed ourselves thoroughly. Congratulations and thanks to those responsible for this most successful function.

While in Hobart I had my notebook and spy camera at the ready at all times, as usual. Seems there was a painting spree on that week-end and one member even brought some visible signs to the meeting just to prove it.

Only other unusual thing I noticed was that our devoted broadcast officer did not sound his usual cheery self the next morning. Of course, this had nothing to do with the night before, did it, Ted?

However, returning to the north, very little social activity has been noted lately. The zone now has a T.V. star in its midst, who, for various reasons wishes to remain anonymous, but I hope everyone watches him regularly, and sees the Institute badge displayed on his lapel. What better publicity could be asked for?

Norm 7ZRG has taken the plunge lately, and at the time of writing is still on his honeymoon. Best of luck and future happiness to you and your XYL, Norm.

Congratulations to Peter Dowde, who passed the ticket at the last exam. Hope to hear a signal from you soon.

OSCAB III brought considerable 2mx activity to the north with very pleasing results. Three contacts were made via Oscar by two zone members, Den 7DK and Col 7LZ (and there are tapes to prove it !). A good job well done by both these C.w. operators. Incidentally I think these were the only three Australian contacts via Oscar. Have I any takers on this point?

Another item of V.H.F. interest is that some weeks ago Col 7LZ worked 3AEE on 432 Mc. for 50 minutes with signals never falling below S7. Quite an achievement for this band.

While on the subject of our T.V. star I should have mentioned that we also have a star of the stage. It's that man in the tartan shirt, Greg 7ZGP, who was thrilling the audience of a recent local production of a Scottish musical with some really swinging laments and reels. Sounds as if some bagpipe noises have crept into his modulator of late, too.

Activity on the H.F. bands has been on the increase lately. Still the only starter of 20 is Den 7DK, who also occasionally pops up on the other bands with his "duck talk."

Constant 80 mx activity has been supplied by Harry 7BR, who does not come on, apparently, until fairly late in the evening. I know he's only doing this to avoid my snooping, but one of these days I'll catch up with him.

I was very pleased to hear the news of another northerner on 80, Ted 7BB, operating from Poatina. Ted is only on during the week, so keep a look-out for him and give him a shout.

To complete this round of happenings on the D.C. bands, Len 7BQ now has his new H.F. transmitter going and is getting good reports with it.

Now before I close a word of warning to the Southerners. I will be moving south for several days in the middle of May on an espionage trip and will be accompanied by one of my agents, that aforementioned character in the tartan shirt. You won't be able to complain, you've had fair warning. 73, 7ZLP.

### NORTH-WEST ZONE

Once again there was a good turn-up for our monthly meeting at Ulverstone. Doug VK7AB, who is on holidays and now resident at Oatlands, was welcomed to the meeting by our President, Syd VK7SF. Doug. now has his S.S.B. rig working and we should soon hear more of him on the bands.

The main topic of interest was the W.I.C.E.N. project and our secretary, George 7XL, now has a complete list of all mobile and fixed stations which could be used in an emergency. When the taxi-phones are available there will be much more activity on the V.H.F. bands.

After the meeting Winston 7ZWN showed us how to get free electricity. "Look dad, no wires." Surprising just how much R.F. is put out by a mobile station.

Wonder what happened to the results of last year's "R.D." Contest?

The Annual Meeting and Dinner held at Hobart was voted a great success by members who attended from this zone and a good time was had by all. Remember chaps, subs. and zone fees are now due. Have you paid yours yet?

Not much activity to report this month, so will see you on the bands. 73, VK7KH.



## HAMADS

**Minimum 5/-, for thirty words. Extra words, 2d. each.**

Advertisements under this heading will be accepted only from Amateurs and S.w.l's. The Publishers reserve the right to reject any advertising which, in their opinion, is of a commercial nature. Copy must be received at P.O. Box 36, East Melbourne, C.2, Vic., by 8th of the month and remittance should accompany the advertisement.

**A.W.A.** Carphone Senior, converted 146 Mc. F.M., 20w. input, £15. 12v. power supply for above, £5. 6 mx Mobile Transceiver, converted Pye; receiver tuneable 52-53.5, at best 1uV., Tx 4w.; 12v. power supply and mike, completely overhauled and resprayed with mounts, £16. S.s.b. Transceiver, 3 band, xtal filter, 6CD6 p.a. in-built speaker and mike, complete with power supply, commercial appearance, 19 valves, £100. 12v. transistor power supply, suit above, £40. 40 mx xtal locked Converter, new, £5. Heathkit sweep/marker Generator, hardly used, £20. Mobile Transmitter (or home), Geloso to 6DQ6 p.a. 80 through 10, 30 to 60 watts, includes separate 2 mx transmitter QQE03/12 p.a., common modulator QQE03/12 switched between transmitters, a.m.-c.w.-m.c.w. all bands, 12v. transistor power supply and mike, fully metered and p.t.t., case size 15 x 6 x 7, good appearance, £50. 40 mx "Master Mobile" whip with extra 20 mx loading coil, £5. ASB8 Receiver, converted 432 Mc., £6. Genemotor 12v. in 365v./275mA. out, £2/10/0. VK2ASZ, Lot 27, Rusden Rd., Blaxland, N.S.W.

**FOR SALE:** Bendix Freq. Meter, 221m., cal. book, spare valves and crystal, vol. reg. power supply, new condition, £40. 128 Transceiever, mike, phones, spare valves, 1200 Kc. i.f. crystal, clean cond., £12/10/0. R. Campbell, 6 Watson St., Sorrento, Vic.

**FOR SALE:** Communication Receiver Lafayette HE8O, 14 tubes, receives a.m., f.m., s.s.b., c.w. and all Ham bands, including 6 metres. Brand new and unpacked, complete with speaker and transformer, £98. Phone: 44-3181 (Sydney).

**FOR SALE:** G2DAF Com. Rx, prof. built, brand new parts including coils from Electoniques (U.K.), also commercial xtals, etched front panel, 160-10 mx u./l. sidebands, a.m./c.w./s.s.b., motor tuning, aerial attenuator, xtal calib., n./lim., etc., complete with handbook. Cost £180. Would consider part exchange Mosley TA33 beam or Galaxy V.F.O. Offers and particulars, D. M. Slowan, Spreyton, Tas. (VK7MS) 72117 (phone).

**FOR SALE:** National NC-300 Receiver, in excellent condition, £150; Murphy B40 Receiver, £40; AT14A Transmitter, £65; 150w. r.f. deck with geloso v.f.o., £25. VK3WK, W. Bell, Wangoom, Vic.

**FOR SALE:** Three element rotary Beam; 35 ft. steel Windmill Tower (standing); Prop Pitch Motor, £30 the lot. Buyer to remove from 29 Clyde St., Oakleigh. Also AR7 Receiver, very good condition, bandspread, 20 mx, £25. Gear, Ex-late VK3SB. Cheap for quick sale. For inspection write or phone VK3HJ, V. H. George, 34 Inga Parade, Mt. Martha, Vic. (Phone Mt. Martha 4-1487.)

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**TWO** Meter Gear—Tx and power supply with QQE04/20 final, AB1 mod., spare QQE04/20. Converter with 4 tubes out at 4 Mc. Other Gear—two power supplies, one with tapped h.t. to 1,000 volts and separate 400 volt on same chassis, other 550 volts and 400 volts on same chassis, P.M.G. type 5½-foot rack. Apply A. W. Chandler, 1536 High St., Glen Iris. Phone 50-2556 (Vic.).

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**WANTED:** Gill Cowl Motor or other Beam Rotating Device. H. Webber, VK3PW, 3 Khartoum St., Caulfield, S.E.7, Vic. (Phone 50-6023.)

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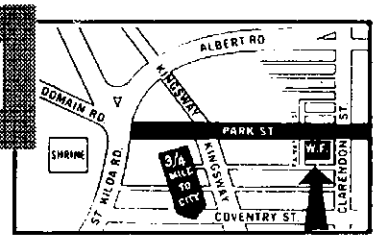


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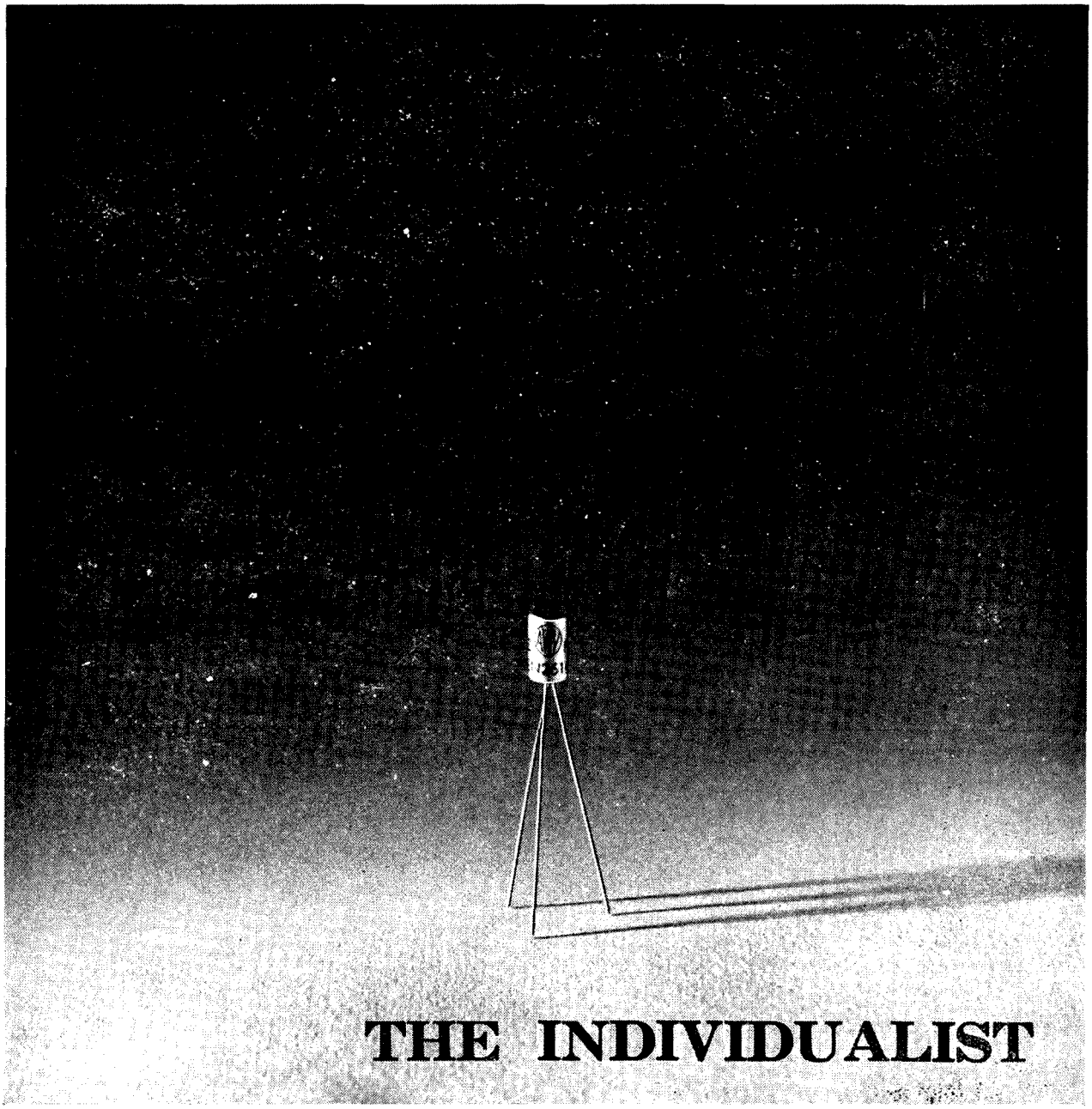


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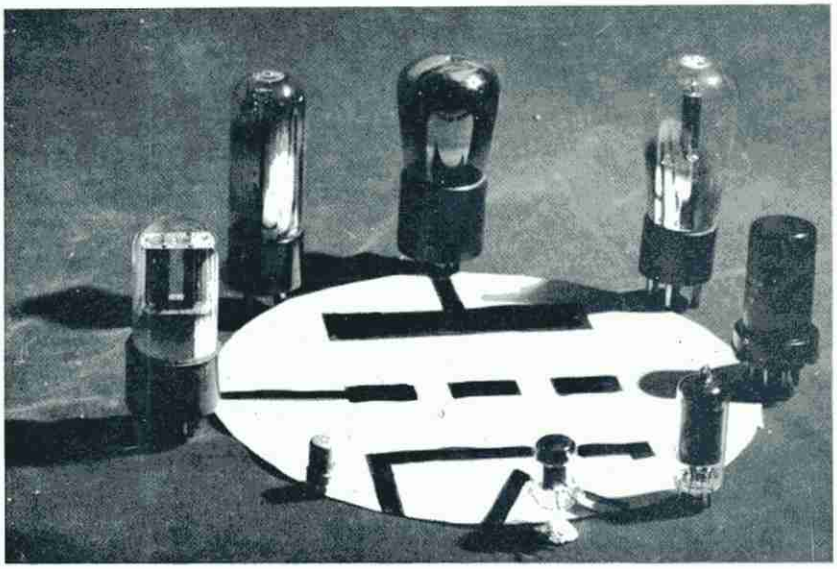

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2/6

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MC52 2 ⅜ in. Round Face, 2 in. Hole, Black Plastic Case.

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JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA. FOUNDED 1910.

JUNE 1965
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Acknowledgments will be sent following the Committee meeting on the second Monday of each month. All Sub-Editors should forward their articles to reach "A.R." before the 8th of each month. Any item received after the Committee meeting will be held over until the next month. Publication of any item is dependent upon space availability, but in general about two months may elapse before a technical article is published after consideration by the Publications Committee.

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Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Non members of the W.I.A. should write to the Victorian Division, C/o. P.O. Box 36, East Melbourne. Two months' notice is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must, by P.M.G. regulation, be notified to the P.M.G. in the State of residence, in addition "A.R." should also be notified. A convenient form is provided in the "Call Book".

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## OUR COVER

Around the symbolic figure for a triode has been arranged a series of triode valves covering the period from 1930 until 1965. Reading clockwise from the cathode symbol, the valves are: 6CW4, 6SN7GT/G, 30, A415, 27, 6C5, 6C4, and a 954. How many readers can remember when each valve was first marketed and used in Amateur equipment?

## FEDERAL COMMENT

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## W.I.A. ADMINISTRATION

The Wirelsss Institute of Australia is well known as the organisation within the Commonwealth which represents the Amateur Radio Service but it is also true to say that many amateurs are ignorant both as to how it functions and what it does for the Amateur. Although over 5,000 strong, the membership is spread over a comparatively vast area requiring administration from a central organisation which at the same time must encompass liaison with local and State administration. This is achieved by the Federal Council composed of a member elected in each Division of the Institute whose special function is to act as the representative of his Division on behalf of its Council and members, the requirements being carried out by the Federal Council's ex-officio office—the Federal Executive. The Federal Executive, therefore, becomes the central organisation empowered under a Federal Constitution to carry out the work of the Federal Council on behalf of the Divisional Councils which in turn act on behalf of their members.

If you, as a member, have a complaint which affects Amateur radio in general and not a complaint of a purely domestic nature, then you need to know who holds the office of Federal Councillor in your State or Division. For the period 1965-66 the following are the people you should contact:

| | | |
|---|---|---|
| VK2 Division (N.S.W.) | Pierce J. Healy | VK2APQ |
| VK3 Division (Vic.) | Michael J. Owen | VK3ZEO |
| VK4 Division (Qd.) | Laurie Blagborough | VK4ZGL |
| VK5 Division (S.A.) | Geoffrey M. Taylor | VK5ZCQ |
| VK6 Division (W.A.) | Roy Chamberlain | VK6RY |
| VK7 Division (Tas.) | Ted J. Cruise | VK7EJ |

Knowing your Federal Councillor, you can then make contact with him direct (or through any member of your Division's Council) and place your problem before him. From his experience he will know whether the problem is one which can be attended by your local Council or whether it should be referred to the Federal Executive.

If your problem is one requiring Federal Executive action then your Federal Councillor will see that it is directed to the Executive in a manner prescribed for him under the Federal Constitution and you can expect to hear the result of this action in due course. The Executive for 1965-66 is composed of the following members:

| | | |
|---|---|---|
| Federal President | G. Maxwell Hull | VK3ZS |
| Federal Vice-President | Harold Hepburn | VK3AFQ |
| Federal Secretary | Peter D. Williams | VK3IZ |
| Federal Treasurer | Kevin Connolly | VK3ARD |
| Federal Communications | William T. S. Mitchell | VK3UM |
| Federal Business Manager | Alfred Seedsman | VK3IE |
| Federal Contest Manager | David Rankin | VK3QV |

For your information the Federal Executive has the power to co-opt people to carry out specific tasks and the following are so co-opted for 1965-1966 to do just this:

| | | |
|---|---|---|
| Federal QSL Manager | Ray E. Jones | VK3RJ |
| Federal Awards Manager | Alfred Kissick | VK3KB |
| Federal Historian | George Glover | VK3AG |
| Federal Contest Committee Manager | Jim Rumble | VK6RU |

If you know who runs your Institute you can talk to them on the air because they are all active Amateurs, dedicated to their tasks on your behalf and on behalf of the Amateur Radio Service in the Commonwealth of Australia and its Mandated Territories. They want to help you and your hobby and look forward to your co-operation during the next 12 months to make their term of office a fruitful one for the Institute and the Amateur Service in general.

—G. MAXWELL HULL, Federal President.

## CONTENTS

# AN EFFECTIVE LOW-COST TRANSMITTER

*HAROLD L. HEPBURN,* VK3AFQ*

THE transmitter described in this article is the outcome of some experiments on efficiency modulation carried out by the writer during a search for a modulation system for a low cost, low drain, rig that might have application in the portable sphere.

Results over the 18-month period it has been on the air have been most satisfactory and it was felt that a brief description of the rig might be of interest to other readers of this magazine.

Whilst the unit described operates only on 160 and 80 metres, there is no reason why the frequency range could not be extended by using, say, the Geloso v.f.o. in the exciter section.

The more widely used methods of "efficiency" modulation where the modulating voltage is applied to electrodes other than the plate, normally call for a resting carrier which is about half of the full c.w. carrier level. Valve efficiency is low and in most cases the depth of modulation leaves much to be desired.

A screen modulation circuit described in the R.S.G.B. Handbook and known as the "gated screen" method appeared to be an improvement since the resting carrier is only one-fifth to one-eighth of the full c.w. level and claims were made that full modulation is obtained at all carrier levels. In addition, it is claimed that no over modulation could occur.

Allowing that their claims are correct—and experience with this transmitter has indicated that they are—then it appeared that considerable economies could be effected in the section of the transmitter which is normally the most expensive—the power supply.

## DESIGN CONSIDERATIONS

Taking as an example the old familiar 807 and looking at its plate power requirements under several conditions, some interesting facts emerged.

Let us suppose we have 600 volts of h.t. available, then if we decide to operate the 807 as a plate and screen modulated class C amplifier, a la handbook, we have to allow for a steady current drain in the p.a. of 100 mA. or 60 watts. If we decide phone is not required and we will be working c.w. only, we can reduce this requirement on the power supply by assuming that the transmitter has a 40% duty cycle—that is the "dit" and "dahs' only occupy 40% of the transmitter "on" tune. This really does mean that we could use a 600v. 40 mA. power transformer to supply the p.a. plate provided we make the filter condensers large enough to cope with the peak current requirement.

If we go further and assume we are going to use the 807 for speech only and that we are going to use normal screen modulation, then we have to provide a **steady** current of 50 mA. (half the c.w. maximum) and a bit more for the periods when we are actually modulating. If we assume that the speech duty cycle is 20% (a bit high, but a nice round figure), then this is equivalent to saying that we have to provide for 50 mA. steady drain plus the equivalent of another 10 mA. to cope with the speech variation. Provided once again we provide good dynamic voltage regulation by making the filter condensers large enough we can get away with a 60 mA. rating on the transformer.

Using "gated screen" we can do even better. Since the resting plate current is only one-fifth of the full current then we have only to supply 20 mA. average steady current plus the equivalent of another 20 mA. to deal with the speech power. Total is only 40 mA. or two-thirds of other efficiency methods. Note that this average current requirement is the same as the c.w. example, so that we can use either mode.

If we want to squeeze some more efficiency out of the p.a. tube we can run at higher voltages. The 807 is rated at a plate voltage of 600 under plate and screen modulation conditions. This means it has to withstand a peak voltage of 1,200. Provided you keep the average plate dissipation within specifications, you can, in fact, run an 807 with 1,200 volts on the plate and still not over run the tube. Both R.S.G.B. and A.R.R.L. Handbooks publish design data for 807 and 1625 linear s.s.b. amplifiers at these voltage levels.

Bearing in mind the foregoing, it was felt that normal broadcast transformers might well be able to provide the power for a 70-watt c.w./peak a.m. rig. The schematic of the completed transmitter is given in Figs. 1 and 2. Change-over switching is shown in Fig. 3, and meter switching in Fig. 4.

## THE TRANSMITTER

The r.f. section of the transmitter consists of a 12AT7 v.f.o., a 6AM6 untuned buffer amplifier, a 6V6 buffer/doubler/driver, and an 807 final.

The 12AT7 oscillator is in a Franklin configuration since it enables the use of a two-terminal tank with one end earthed and because its output is constant over its tuning range of 1.75-1.90 Mc. The more popular Clapp circuit suffers from the disadvantage of giving less output at the h.f. end of its range. The lower, but more constant, output of the Franklin is overcome by the use of a 6AM6 buffer amplifier.

The 6V6 buffer/doubler provides ample drive on both bands; this drive being adjusted by the potentiometer in the screen circuit.

The 807 final uses a pi-tank output and the additional capacities required on 160 metres are brought into operation by a separate section of the band switch S3.

For netting purposes, h.t. is applied to the whole transmitter, but the p.a. is prevented from radiating by applying 105 volts negative to the screen. Since the negative supply is required

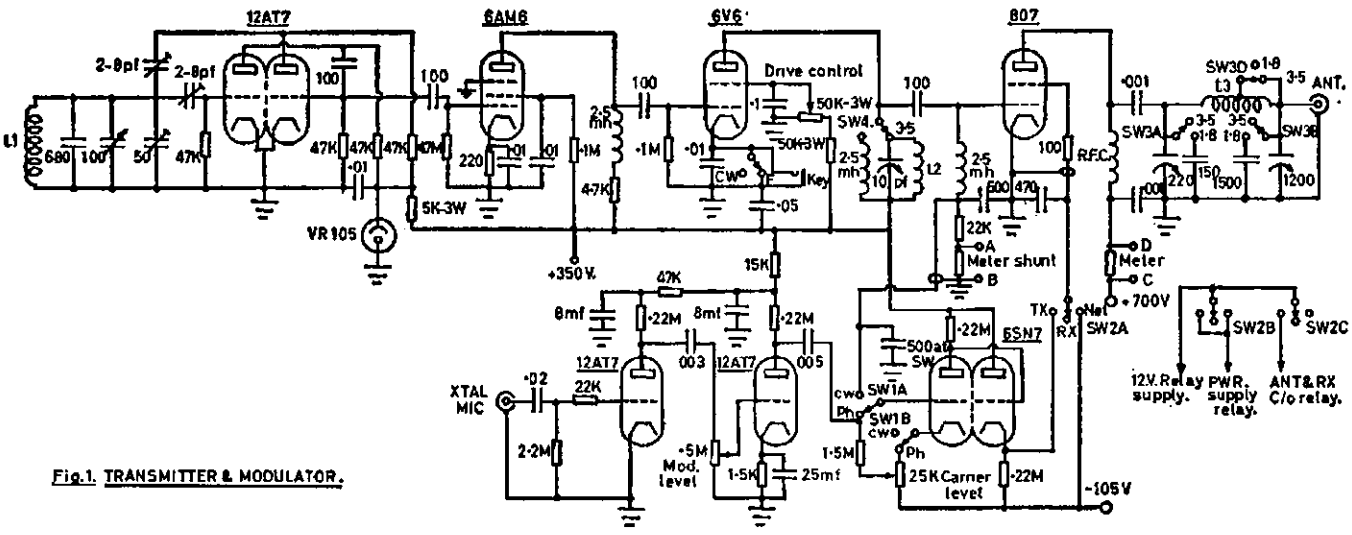



Fig.1. TRANSMITTER & MODULATOR.

* 4 Elizabeth St., East Brighton, Vic.

in any case for the modulator, this method of netting allows the use of a very simple control switching arrangement.

A meter is provided to read the grid and plate currents of the final.

**THE MODULATOR**

The modulator is particularly simple and consists of a 12AX7 speech amplifier driving the 6SN7 gating tube.

The first half of the 12AX7 uses contact potential bias (thus saving a couple of components), whilst the potentiometer in the grid of the second half acts as a modulation level control.

The 6SN7, connected in effect between the h.t. supply and the screen of the 807, "gates" voltage to the 807 screen at a rate and amount which is a function of the frequency and amplitude of the applied speech voltages from the 12AX7. For a more detailed explanation of the method of operation, the reader is referred to the R.S.G.B. Handbook.

The potentiometer in the cathode of the first half of the 6SN7 acts as a carrier level control, whilst the switching arrangement shown allows either phone or c.w. operation to be chosen.

The 100 ohm stopper resistance and the 470 pF. decoupler should be mounted directly at the screen pin of the 807. Any higher value of decoupler than the 470 pF. shown will cause some loss of "highs" in the speech and it may well be that a value of 330 pF. would give a crisper flavour to the audio.

**POWER SUPPLY**

The main h.t. for the final plate is provided by an old 385-0-385 volt 100 mA. transformer connected in a bridge circuit with secondary h.t. for the exciter and modulator being obtained from the original centre tap. The filament windings on this transformer were of the 2.5 volt variety and were used only to light a small "Tx on" pilot bulb. The filament power for all tubes was provided from a separate transformer, whilst a third small filament transformer, connected back to back, was used to provide the —105 volts bias supply.

The bridge rectifiers consist of a 5U4G and two 6AX4s, the latter tubes being t.v. booster diodes rated at 4,000 p.i.v. between heater and cathode. This high rating allows them to be run from the common filament supply with one leg earthed.

Some additional simplification could be achieved by using four of these tubes in the bridge and so eliminating the need for a 5-volt transformer.

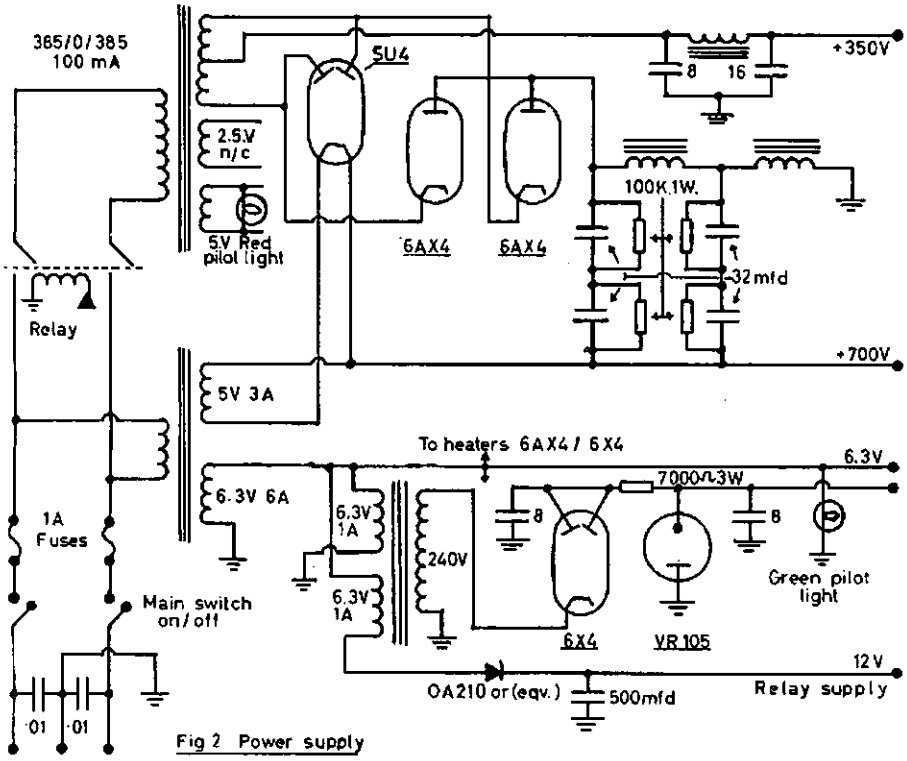



Fig 2 Power supply

In order to use broadcast-type smoothing chokes (which are not normally rated at much above 400 volts to frame) those used in the supply described are placed on the earthy side of the chain.

On load, the supply gave slightly over 700 volts main h.t. and about 340 volts of secondary h.t.

A simple supply is included to operate the antenna change-over and receiver muting relays.

**CONSTRUCTION**

The whole transmitter is constructed on two 17" x 8" x 2½" aluminium chassis. The front panels are standard 19" x 10½" rack mounting types.

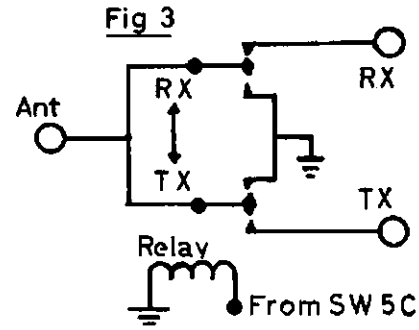
Triangular side pieces are used in the power supply to provide the necessary rigidity, whilst partitions made of 24-gauge galvanised iron are used on the transmitter chassis for the same purpose. These latter supports also serve as the side walls of screened compartments, one containing the v.f.o. tuning components, the other the final tube and its associated plate circuitry, including the pi-tank. When covers of 24-gauge galvanised iron are placed over these shields and fixed with PK screws, the whole unit is extremely rigid.

Fig. 5 shows the layout with the 12AT7, 6AM6 and the 6V6 in the space between the v.f.o. and final compartments. A 1½" space on the right hand side of the chassis contains the modulator and VR tubes. The octal socket on the right hand of the rear apron of the chassis is an outlet for supplying the receiver muting relay, whilst the small hole in the centre of the rear apron allows access to L2 in the plate circuit of the 6V6 driver.

Controls on the front panel, left to right, are (at the bottom) the microphone input socket, the carrier level adjustment control (this is a pre-set pot for safety), the key jack, SW4 and the net/rx/tx switch S2. Just above these controls and right at the bottom of the panel proper are (from left to right) the microphone level control and the c.w./phone switch S1 with the drive level potentiometer in the centre. The three large knobs are the v.f.o. tune and pi-tank controls. Between these last two is located SW3.

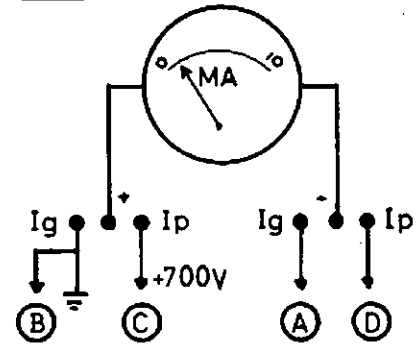
The Amphenol socket at the top left hand corner is the antenna input socket while the Belling Lee socket just below it is the off-take to the receiver. The antenna co-ax relay is mounted just behind these two sockets. The knob just below the meter is the range switch.

Fig 3




Note: Relay is ex SCR522 "SW5C" above should read SW2C.

Fig 4 Meter switching arrang.




Note: Switch to be break-before-make type. Two positions of SCR522 meter switch used.

# YAESU MUSEN FL-100B S.S.B. TRANSMITTER

*A Compact High Quality Mechanical Filter Rig*

**COMPLETELY SELF CONTAINED** **NEW MODEL**

## FEATURES

Satin finish panel with black engraving, large instrument-type knobs, variable ant. loading, built-in ant. relay, V.O.X. keying for bk.-in c.w.

Mechanical filter—still acknowledged as the best method of S.S.B. generation.

Five bands, 80-10 mx., illuminated v.f.o. dial, reads 10 Kc. and 1 Kc., with precision vernier gear drive, P.T.T. control via net-operate switch or push-button mic. A.L.C., V.O.X., selectable sidebands. 230v. and 110v. a.c. operation. 120w. P.E.P. to 6DQ5 p.a. All in one neat metal case, 15" x 7" x 11¾" deep, colour dark driftwood. Wt. 35 lb. Nothing else to buy. All necessary plugs, inst. manual, and matching p.b. mic. are included. Introductory trade-in offer this shipment.

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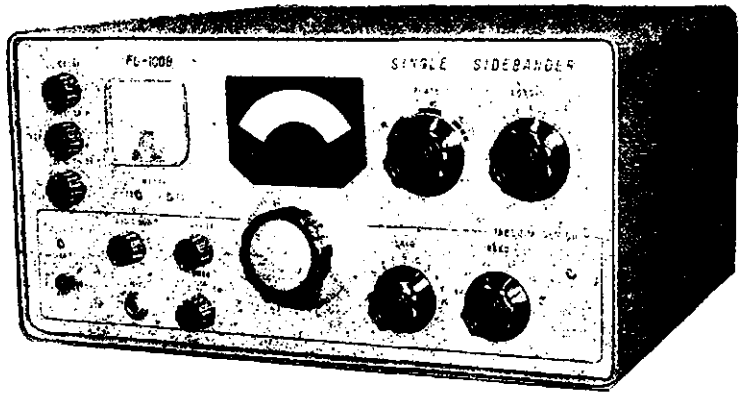


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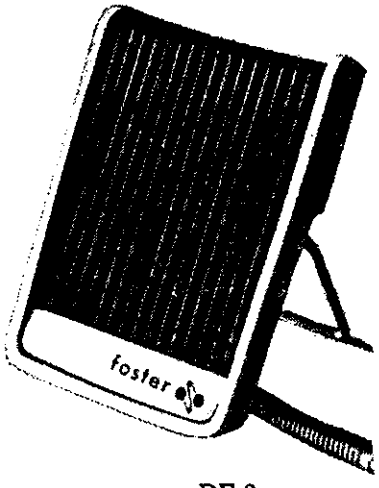


DF-2

# FOSTER DYNAMIC MICROPHONES

*FOR HAND-DESK USE*

## SPECIFICATIONS:

Output Impedance .... .... .... .... .... 50 ohms or 50K ohms
Effective output level .... —55 db. [0 db. = (one) 1V. Microbar]
Frequency response .... .... .... .... .... 200 to 10,000 c.p.s.

## OMNI-DIRECTIONAL DYNAMIC:

SIZE: 3" x 2-1/8" x 1".
Cable: 12 ft. of P.V.C.
Switch: on-off.
Desk Stand. Clip folds for hand use.
Colour: WHITE.
Plastic Diaphragm.

**Retail Price**
**50K ohms**
**£2/10/7**
**+ Sales Tax 5/3**

*A QUALITY PRODUCT OF EXCELLENT DESIGN*

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**58 HIGH STREET, GLEN IRIS, S.E.6, VICTORIA** **Phones: 25-1300, 25-4556**

**Manufacturers of Radio and Electrical Equipment and Components**

**Agents:** D. K. Northover & Co.; Neil Muller Ltd.; Homecrafts (Tas.) P/L.; Jacoby, Mitchell & Co. P/L.; T. H. Martin P/L.

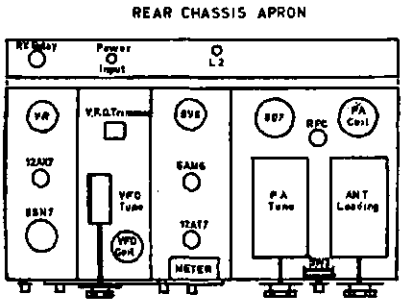
**COIL DATA**

L1—**V.f.o. oscillator coil.** 32 turns 20 s.w.g. enamelled wire on 1" diam. ceramic former, 2" long. Wound under tension.

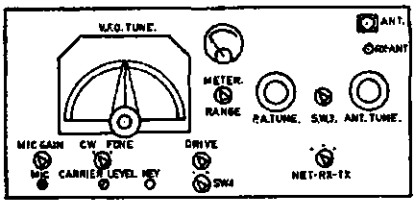
L2—**80 metre coil,** 6V6 doubler stage. Approximately 70 turns 36 s.w.g. enamelled pile wound on ½" diam. slug tuned former. Since this is mainly tuned by valve capacitances and circuit strays, some adjustment of the number of turns may be needed.

L3—**Pi-tank coil,** 807 plate. 28 μH., tapped at 17 μH.
44 turns 16 s.w.g., 1½" diam. spread over 3 inches. Tap at 23 turns for 80 metres.

The above coil assumes a plate voltage of 700, a maximum plate current of 100 mA. and a Q of 12. For other plate circuit constants, it is advisable to re-calculate the coil size using the A.R.R.L. or R.S.G.B. pi coupler design data.




CHASSIS-TOP VIEW.




FRONT PANEL.

Fig. 5.

**OPERATION**

The initial steps of checking wiring, setting the v.f.o. range and setting up the various plate tanks are normal to any transmitter and will not be described in detail.

At least 1 mA. of grid current should be available at the 6V6 on both bands and far more than the 2½-3 mA. drive for the 807 is available at the maximum setting of the drive potentiometer.

With the phone/c.w. switch in the c.w. position, the final is tuned to resonance and quickly loaded to 100 mA. Speed is essential here since under these conditions the power supply is overloaded. Then switch to the phone position and adjust the carrier level to 20 mA. plate current in the 807 by means of the 6SN7 cathode potentiometer. Speaking into the microphone will cause the meter to kick up to around 60-80 mA. while a sustained whistle should get you up to nearly 100 mA.

Like any screen modulated rig, the plate loading should be as heavy as you can get it since light coupling to the antenna (and resultant low plate current) does detract from speech quality. There is also strong evidence that low loading leads to splatter.

**GENERAL COMMENTS**

As the plate current of this transmitter varies between 20 and 100 mA. (i.e. between approximately 16 and 70 watts input), it is not surprising that the received signal will show a similar (but less pronounced) tendency to do the same. If the receiver has a good a.v.c. system the effect may not be a problem but if the a.v.c. system is not good, then distortion will occur in the receiver and may lead to adverse reports. Ideally, the short attack, slow decay characteristics of the better sideband a.v.c. systems are to be preferred.

Tests conducted with local Amateurs appear to indicate that the speech quality improves slightly as the resting carrier is raised, but whether this improvement was inherent or due to the a.v.c. characteristics of the receiver is still obscure. Let it be emphasised that these changes in audio quality were very small and over many months the author has used a resting carrier of 8 mA. without comment.

In conjunction with an inverted vee antenna on 80 and a 200 ft. long wire (with a.t.u. of course) on 160 metres, this rig has given an excellent account of itself and appears to have more "penetrating" power than a conventional plate and screen modulated rig of equivalent peak power (i.e. about 20 watts d.c. input to the final).

As a final comment—and perhaps the most important one—the 807 is acting as a class C linear amplifier.

With minor adjustments to the operating angle and a slightly more complex arrangement of the gating tube, the final would accept and amplify sideband signals. In addition, the efficiency of the tube would approximate to 70% rather than the lower levels associated with class AB1 or AB2. For further details on this interesting possibility, readers are referred to the March 1964 issue of "CQ". ●

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## AND SO ON AD LIB

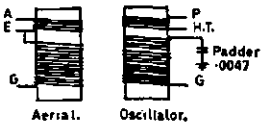
If you want to be "with-it" these days you have to know a tremendous amount about radio that is not technical at all. For instance, a few thousand valve and transistor designations; innumerable abbreviations and manufacturers' labels for equipment (such as TA-33, KW-77, HX-50, DX-40 and so on); and then you run into the fanciful regions of Marauders, Apaches, Valiants, Vikings, Topbanders, Joysticks, Mohicans, Couriers, and so on ad lib. All these you have to memorise to keep up to date, with new ones arriving every month. It is quite a feat of memory, judged by any standard.

—"The Short Wave Magazine," May, 1964

## SIMPLE RECEIVER FOR 80 MX

Not having a receiver capable of tuning the 80 metre band, I decided the easiest way was to wind a pair of coils for the band and replace the aerial and oscillator coils in a small mantel set I had no use for. The whole change-over took a little more than an hour and very little adjustment was necessary.

A three-plate midget tuning condenser was added to the aerial tuning condenser to provide bandspread for easier station separation.




Primary 8T-30SWG.E.
Secondary 28T-22SWG.E.
Osc.
Primary 8T-30SWG.E.
Secondary 24T-22SWG.E.

80 metres comes in on the top of the range and lower down quite a large number of other interesting stations can be tuned in.

The coils were wound on ¾" diam. pill containers, having holes drilled in the correct places to secure the wires and then coated with nail lacquer. All coils are wound in the same direction and ⅛" is left between the primary and secondary coils.

—Harry Major, WIA-L3102.

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**A . . . LONG . . . WIRE**

One of the I.Q.S.Y. projects is concerned with "whistlers"—the particular type of QRN observed on Very Low Frequencies. A co-operative effort in Antarctica, it is said, involves the use of a long wire—one hundred miles long. Although the connection between this and the short waves, with which we normally deal, may seem a little tenuous, it is quite possible that some energetic amateur type will be on the spot to try it out on DX! That should finally kill off the fable about using a 67-foot long wire.

—"The Short Wave Magazine," April, 1964

# WHY A BLACK BORDER ALL AROUND THIS PAGE OF "A.R."

Last month the Publication Committee reported that certain changes had to be made in the manner in which all notes for "A.R." were presented and by actually showing a full-scale layout it should assist all correspondents.

Our Printer has advised certain changes at his works, the result of which is that all correspondents must present their notes in a standard form. This means using quarto size paper, allowing a one-inch margin at the top, both sides and the bottom. Each page must be numbered and if typewritten use double spacing please. If your notes are handwritten please leave a space equal to the depth of your handwriting between each line. If this is not done it is most difficult to edit your notes, and if they cannot be edited they may have to be omitted, something neither you nor your Committee wish to have happen. You may well ask why the need for such a wide margin, particularly at the top and bottom. The reason is quite logical: if this margin is omitted then your notes cannot be properly read when they are being set for the magazine, in fact, certain items at the margin edges (if not used) are obliterated by the typesetting machine. So please use a margin on all edges of your paper.

If you desire to have a hamad or a special item inserted in "A.R." please put it on a separate piece of quarto paper so that this piece of paper can be passed on to our printer. If your special item is included in the body of a letter it does make it difficult to pass this on to the printer.

Please help your Committee by (1) using quarto size paper only for all correspondence; (2) allow one inch wide margin around all sides of the paper; (3) if typewritten use double spacing; (4) or if handwritten allow adequate space between each line.

The rest of this space is used to feature the Publications Committee Reports (by so doing you can see exactly how a perfect copy for "A.R." should look. Compare it with your notes and see how much easier this layout is to read).

All inwards correspondence received up to the last mail on 10/5/65 has been published in this issue of "A.R." Technical articles were received from VK's: 2ADE, 3TD, P. Ward and ZL2APC. Letters were from: 9M2DQ and VK5BB.

The Committee were very sorry to learn that 5BB has to resign as DX sub-editor due to ill-health. We gratefully acknowledge his past help and wish him a speedy recovery. The question of the front cover design was actively discussed and it was agreed to proceed with idea of a new layout. The report regarding the Federal Convention was discussed and matters affecting "A.R." noted.

Advertising charges were considered and it was agreed that the current charges would be increased. It was furthermore agreed to issue a special edition of "A.R." in order that potential advertisers could be acquainted with the magazine.

Future operating costs were considered and it was agreed that as finances now permitted, your Committee would commence using a better quality paper for "A.R.," all readers will welcome this change.

The next "Call Book" is scheduled for issue the first week in September, and as far as practicable this date will be held for all future editions of this publication. Further advice will appear in future issues of "A.R." The Committee were pleased to note the increased co-ordination with Federal Executive who have issued their report. In addition a full report has been received from the Youth Radio Scheme.

You may judge your space needs by realising that this page, as set, would normally occupy one page of "A.R."

• P.S.—Please never address publications matters direct to individual members of the Publications Committee as they may be away, hence your notes, etc., are then delayed even further.

# THE ARC-PORT*

## A Portable 80-Mx Transmitter-Receiver using the ARC-5 Receiver

*E. H. MARRINER, W6BLZ*

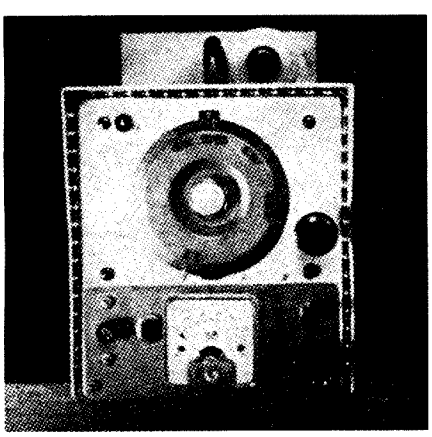
**● Using an 80 metre ARC-5 as a base, the author has added a small transmitter with 18 watts input. The receiver is modified and is bandspread to cover only the C.w. portion of the band. Included is a special time delay keying circuit and an antenna tuner to help match those nondescript vacation antennas.**

FEELING dull, tired and wheezy after hours of yakking on that smoking sideband ring? Why not a change and so some building before you forget what the parts symbols mean. Get ready for your vacation or a field day. Here is a compact 18 watt c.w. transmitter on the back of an 80 meter ARC-5 receiver, which is a lot of fun to build. The receiver is modified a bit by replacing the old mica capacitors, bandspreading the c.w. band and putting in a crystal controlled b.f.o. These modifications give you all kinds of room under the chassis to vent your imagination on compacting a rig into one package, including the power supply.

### ABOUT THE RIG

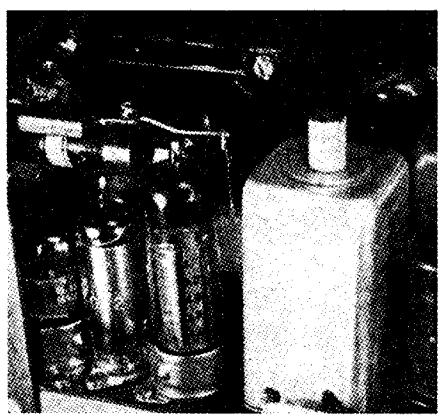
Mounting the transformer on the back apron of the ARC-5 just left room for three tube sockets. Searching around for tubes in the transmitter, this combination seemed to be the only logical choice: The pentode section of a 6U8 was used for the v.f.o. driving an Amperex 6360 final amplifier. This tube is not a baby, it will handle 100mA. plate current, fully loaded. It is a rugged tube and you don't have to worry about the plates getting red. The other socket was used for a voltage regulator.

Being pushed for room, the v.f.o. coil and tuning capacitor was mounted up in the front compartment away from the heat. It just fits, and with the bottom cover plate on the chassis, enough room is left around the coil. This Hartley oscillator is solid both mechanically and in frequency stability. The stability is increased by leaving the grid circuit on 1.7 Mc. and doubling in the plate circuit to 3.5 Mc. Small coaxial RG-174/U is used to connect the coil to the v.f.o. tube.



Front view of the Arc Port an 80 metre transmitter-receiver. The knob to the lower right of the meter is the v.f.o. frequency. Above this is the volume control. The p.b. to the left of the meter is the cal. switch.

* Reprinted from "CQ," December, 1964.



Side view of the rear section shows the three added tubes that comprise the transmitter. The power transformer is visible in the rear. The output coil, L3, and the link winding, L4, can be seen above the tubes and the compression trimmer is just visible behind the coil.

The voltage for the transmitter and receiver is switched with a relay to reduce the drain on the transformer. Using the triode half of the 6U8 as a keyer tube, voltage is supplied to the v.f.o. tube all of the time the 6360 cathode is being keyed. When you let go of the key, the voltages automatically switch to the receive position and the release time can be set for any interval of hold-in. In other words, to send, all you have to do is press the key. There are no switches to turn; the oscillator is on while you are keying, but goes off automatically when you stop.

The final amplifier, the 6360, is tuned using a combination compression type capacitor and varying the slug on the XR-50 coil, to cover the whole 3.5 Mc. to 3.7 Mc. band. The compression type capacitor can be obtained with a shaft and knob and is the only tuning capacitor that will fit in the tight space at the back of the chassis. Everything seems to really fit snugly and in an orderly fashion on the chassis.

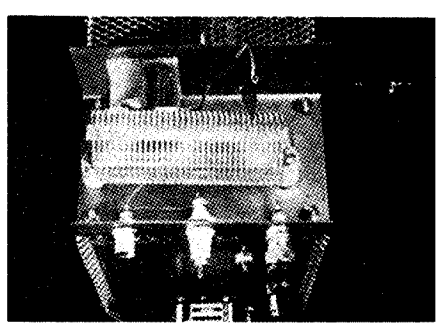
The receiver portion is essentially the same old ARC-5 except that it has been bandspread to cover the 3.5-3.7 range and a crystal b.f.o. has been added. All of the old mica capacitors were taken out and replaced with 0.02 m.f. micas. The process of removing all of these parts, especially the old b.f.o. can, leaves an amazing amount of space underneath the chassis for new parts.

### RECEIVER CONSTRUCTION

Before starting, haywire a power supply together on the bench and check out the receiver to make sure that it is working. When you make changes modifying the wiring, check it from time to time to see if it still works. Without going into too much detail, the first things to change are the large mica capacitors. The wires can be traced back to their source, clipped and a 0.02 m.f. ceramic soldered in its place. The output transformer can be changed and the new one mounted on the side of the chassis and at the same time make sure to put a 0.005 ceramic capacitor from the plate of the 6V6 (or 12A6) audio output to ground to replace the one removed. This prevents transients from breaking down the transformer insulation and also prevents audio oscillation.

Now after all of this modification and the receiver still says "A OK," you can try to bandspread the receiver. Leaving three rotor plates in the tuning capacitor will spread the band from 3.5 to 4.0 Mc. If you are strictly a c.w. nut, just one plate on the rotor is all that is needed. This is not too hard to do but just don't lose the 80 metre band in the process. A signal generator will help but is not absolutely necessary; a 3.5 Kc. crystal marker is just about needed. One plate will spread the band from 3.5 Mc. to 3.7 Mc. and a slight change in capacity will shift the dial. The final check should be made with the cover over the tuning capacitor.

Here's how to go about the change. First remove the slotted plate on each of the sections. Next unsolder the brace on top holding all of the rotors together. To get the plates out here is the magic formula. Wiggle each plate back and forth 50 times with long nose pliers and then give a downward push and it will roll right out. Keep your left hand on the shaft to prevent it



Rear view of the Arc Port shows the antenna tuner mounted on top. Note the keyer circuit battery on the bottom of the rear apron.

from moving or the ball bearings will come out and it is fun to get them back in place. Now put a 82 m.m.f. silver mica capacitor across the oscillator and mixer coils. Across the antenna coil section put a 62 m.m.f. silver mica. This one has to be a little less because it has the small variable plus any capacity of the antenna.

Somewhere along the line the b.f.o. transformer can be removed and a crystal b.f.o. wired in. See Fig. 1.

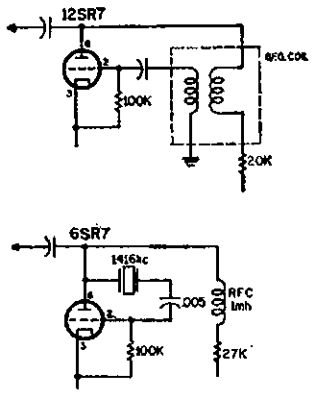


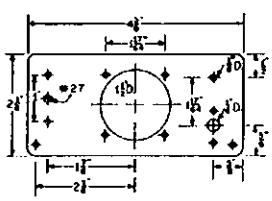

Fig. 1. Original ARC-5 b.f.o. circuit and the modified crystal controlled version. The r.f.c. is a Miller gauge 4652 and the crystal is an International FA-9 pigtail type cut to 1416 Kc.

## POWER SUPPLY

After you are satisfied with the performance of the receiver based on its operation with a temporary supply, we can proceed with the rear deck work. A plate, shown in Fig. 2, can be made to cover the rear deck after the deck has been nibbled out to within ⅛ in. of the chassis edge.

The supply voltage to the receiver section was reduced to 250 volts through a 3.5 k., 10 watt resistor. This is shown in Fig. 3. The screen voltage is reduced to 100 volts through a 25 k. series resistor. Since the 6K8 triode section (receiver local oscillator) was hooked up to the regulator tube for a steady voltage, the variation on the screens due to plate current drain at various gain settings was not stabilised with a bleeder arrangement.

A small loudspeaker of the type used in transistor radios was mounted over the 6SK7 tube. Its rating of 0.25 watts doesn't seem to be a problem. It is loud and sharp for c.w. with its limited frequency response. An output transformer, 5 k. to 4 ohms, is mounted below chassis as shown in the photographs.



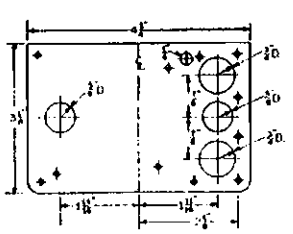


Fig. 2. Dimensions of the front and back plates for the ARC-Port.

## TRANSMITTER SECTION

First wind the v.f.o. coil, tapping it six turns up from the bottom end. I scraped the wire and twisted it together and then brought the pigtail over to a terminal which was made by tapping a 4-40 screw into the base of the form. Coaxial cable (RG-174) was used to connect the coil to the tube socket. A 410-20 m.m.f. silver mica capacitor was used as a padder across the 100 m.m.f. variable tuning capacitor. With this combination the tuned circuit should hit 1.7 Mc. with the bottom cover in place. The coil can be mounted an equal distance between the chassis and the cover.

It is probably easier to wire the v.f.o. and 6360 amplifier tube before tackling the keying circuit and it leaves more room to work under the chassis. The plate circuit of the 6360 is mounted topside, and a compression type capacitor is used for plate tuning. This capacitor can be obtained with a shaft if desired, or if you have to use the screw slot type a washer can be glued on for a knob. Using the combination of the compression type capacitor and the slug adjustment, the range wil cover 3.5 Mc. to 3.7 Mc., doubling in the plate circuit.

I find the keying circuit handy although many may want to use either a small toggle switch or a relay to change the voltages from transmit to receive. Using the keyer circuit, the relay is energised in the receive position to make a more foolproof circuit. The advantage of the keying circuit is there is no switch to flip when you transmit. Just press the key and send; when you let go, the receiver comes back on after a delay determined by the setting of the 1 meg. delay control which is mounted at the back of the chassis. It is a subminiature type potentiometer. The small 15 volt battery mounts on the back of the rig in modified fuse clips for easy replacement. The drain is very light and should last the shelf life of the battery; ours has been in for months.

There is no trouble with the keying circuit once it is built. The value of the series plate resistor was set at 18K as this permitted enough current to flow to close the 10K d.c. relay. Relay coils other than 10K might need a different value series resistor. Also the keying 1N539 diode was used because of its high back resistance and low leakage to prevent the charge from draining away on the 0.2 m.f. holding capacitor. There may be other diodes that will work just as well but of the several tried, this one seemed to do the job best. A Mylar 0.2 m.f. should be used here as it has low leakage and worked out right. Other types might have more leakage. I set my delay to hold the v.f.o. on between words.

## TESTING

Most of the adjustments probably were made by the constructor as he went along but here is how I did it. When the v.f.o. and 6360 were wired up and finished I temporarily put on the bottom cover and set the dial to 3.5 Mc. The slug was tuned for zero adjustment on the v.f.o. coil and then shifted to about 3550 Kc. where the

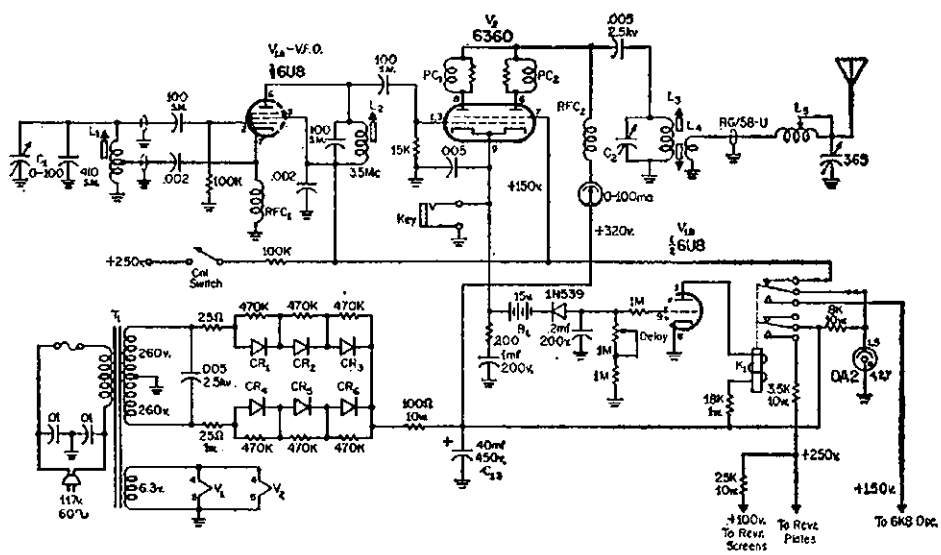



Fig. 3. Circuit of the transmitter, power supply and keyer that, when added to the ARC-5 receiver, makes up a neat 80 metre vacation portable. All resistors are ½ watt unless otherwise noted; all capacitors greater than one are silver micas in m.m.f. and less than one are disc ceramics in m.f. unless otherwise noted. The 1 m.f. and 0.2 m.f. in the keyer circuit should be low loss Mylar types.

B1—15 v. battery Burgess type Y10.
C1—100 m.m.f., A.P.C. type with ¼ in. shaft.
C2—65-340 m.m.f. E! Menco L-30 compression trimmer.
CR1-CR2—0.25 amp. 400 v. p.i.v. diodes.
L1—38 turns 26 gauge e. tapped 6 turns up from ground, wound on National XR-50 form.
L2, L3—38 turns, 26 gauge e. wound on National XR-50 forms.
L4—5-turn link of hook-up wire wound on cold end of L3.
L5—3½ in. length of Airdux 1010 gauge. (1¼ in. dia. 10 t.p.i.).
PC1, PC2—5 turns 20 gauge tinned wire on a 47 ohm ¼ watt resistor.
RFC1—2.5 mhy ferrite choke, Miller 6302 gauge or equivalent.
RFC2—0.62 mby ferrite choke. Miller 4650 gauge or equivalent.
K1—D.p.d.t. relay with 10K coil.
T1—260-0-260 at 90 mA., 6.3 v. at 3 a. Stancar PC-8404 or equivalent.

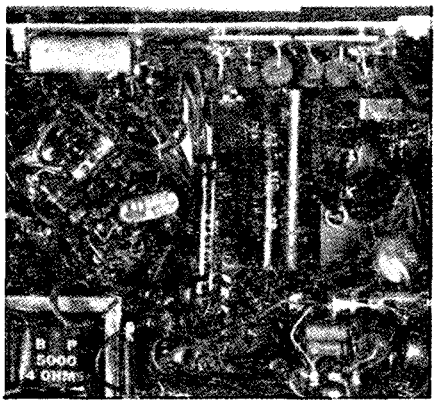
plate coil was peaked up for maximum drive and output. The final tank circuit was link coupled direct into a 50 ohm carbon resistor for this adjustment and field strength meter watched for maximum indication at this frequency.

The grid circuit of the 6360 should draw about 2 mA. which is all that could be obtained from the v.f.o. Normally the 6360 uses 3 mA. of drive to obtain 100 mA. plate current. We could get 65 mA. with 2 mA. drive. More could be obtained by experimenting with the tap on the v.f.o. coil in conjunction with varying the grid resistor in the v.f.o. and 6360. Increasing the screen to its normal 200 volts does not seem to improve anything. A little more could be squeezed out by using capacitor input filter but the difference in signal strength does not seem worth the regulation trouble.

The output of the final is coupled to an L network on top of the chassis. The idea is that any length of wire might be used when on vacation. In a motel, a 25 foot length is about all you can hang in the room while in a mountain cabin you could get quite a long run. You will have to experiment for the number of turns for your particular installation. Using 60 feet of wire strung out the window, I found the coil, tapped six turns from the coaxial input end, loaded it up to 65 mA. when the capacitor was peaked. This is 18 watts input.

This is enough power, on 80 metres to really get out. We have worked Arizona, Nevada and stations to the north of San Francisco with S9 reports on the 60 ft of wire.

The Gas regulator tube should never have more than 25 mA. flowing through it and the 8K series may have to be adjusted. As long as the VR tube was there, we decided to use it on the local oscillator of the 6K8, to help stabilise signal drift. The pin connection on the oscillator coil is number five and the 150 volts regulated can be fed here when the wire is cut and another outed to the relay.

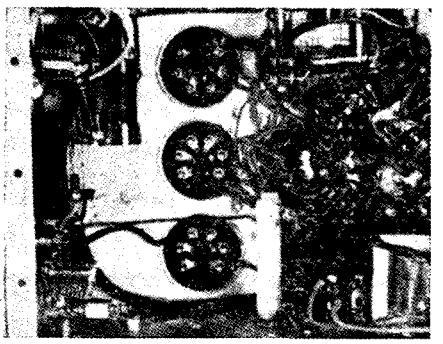


Bottom view of the front section of the modified ARC-5 with the coil bank removed shows the v.f.o. tuning capacitor in the upper left corner with its XR-50 coil form to the right of it. The relay, K1, may be seen in the upper right corner.

### THE CABINET

This nice looking cabinet is just a piece of do-it-yourself from the local hardware store. It was bent and slipped over the whole chassis. What could be simpler? The bezel was added for looks, and is one inch wide, and tapered at the bottom.

The total weight, with key and antenna, checks out on my bathroom scales at 10 lb., and easily going by air. Either way, driving or flying, on a trip this little rig will give you many enjoyable QRM free QSO's on the 80 metre band!



Bottom view of the rear section of the 80 metre portable transmitter-receiver. The upper right corner is occupied by the power supply with the diodes mounted on a board against the chassis flange. The key jack is located in the upper right corner also. The bottom right hand corner contains L2, and the miniature delay pot for the keyer circuit. The new receiver output transformer is in the lower left of the chassis.

# The Historical Development of Radio Communication

## PART SEVEN—THE PRESENT SITUATION AND FUTURE TRENDS

*J. R. COX,* VK6NJ*

### CHAPTER SIX

Wireless communication advanced technically under the auspices of three main contrivances; the spark-gap transmitter, the thermionic valve and, recently, the transistor. Within the framework of this trio other developments eventuated, amongst which were improvements in valve design, circuitry design, antenna effectiveness, the propagation characteristics of wave radiation, wireless telephony and broadcasting techniques. All combined, meant the advancement of radio as a whole. Wireless circuitry progressed from detection without amplification to Tuned Radio Frequency reception, which gave amplification at the frequency at which the signals were transmitted. Another innovation was the Armstrong regenerative circuit which made loudspeaker reception possible. Superheterodyne circuits gave higher amplification and greater selectivity, with the added facility of automatic volume control.

Mention of the system called frequency modulation has been made in Chapter Three,[120] and another modification to methods of transmission was introduced in the 1930's. The technique, called single sideband transmission, is finding increased use at the present time. It was realised that a fully modulated, amplitude modulated signal carried two-thirds of its power in the carrier and only one-third in the sidebands. This represents a waste as only "The sidebands carry the intelligence to be sent; the carrier goes along for the ride."[121] As a means of using the transmitted power to greater advantage, it was decided to eliminate the carrier and transmit either one sideband or both (called suppressed carrier system). The carrier is easily reinserted by a heterodyne-type receiver for normal demodulation and it is claimed that the single sideband system can give an effective gain equivalent to increasing the transmitter power eight times. The system also has the advantages of conserving spectrum space and eliminating phase distortion.

So far this thesis has outlined the course of development through which wireless communication has passed to enable man to hear and speak at a distance. There is yet another opening of wireless communication which enables man to see at a distance. This is, of course, called Television.

Television, strangely enough, was envisaged before the advent of practical wireless communication, it being proposed as an adjunct of wire telephony. The history of television can be traced back to a Mr. Joseph May, a telegraphist in Ireland, during 1873.[122] He noticed that sunlight shining on selenium resistors varied the current flow in a circuit of which they were part. May reported this phenomenon and from subsequent investigations came the "selenium cell" which has the ability to transform light impulses into electrical impulses. Then arose a query. Could such a cell form an electrical "eye" for transmission of different shades of light? After all, Bell's microphone was an electrical "ear" which changed the voice into a varying electric current. Why not use the same principle to send pictures composed of varying shades of light?

A number of inventors accepted the challenge and amongst them was Maurice Le Blanc who, in 1880, proposed a system of mechanical scanning. He contended that mechanical scanning would break down the picture into many parts for transmission one at a time. Four years later, a German, Paul Nipkow, put the idea into practice by fabricating a perforated disc, the holes of which were arranged in the form of a spiral. When an image of the object to be transmitted was focussed on the disc, light from every part of the object fell successively on a selenium cell placed behind the revolving disc. The varying current was then to be sent to the receiving point where a device described by Michael Faraday and another spiral-punched revolving disc combined in action to return the incoming electrical impulses into the impulses of light which made up the original image. The arrangement failed because the selenium cell was not capable of producing sufficiently strong electrical currents. Amplification was possible after the arrival of the three-element valve and in 1909 Hans Knudsen used mechanical scanning to transmit photographs by wireless. For some years afterwards the Nipkow method was experimented with, but the mechanics of the device prevented progress to a really satisfactory standard of viewing. To achieve this the picture needed detail, contrast and no flicker, and it was realised that some means of electronic scanning was needed to produce this result.

As early as 1907 Mr. A. A. Campbell Swinton extolled the use of cathode ray tubes as a transmitter and receiver of television pictures, but it was not until 1923 that his idea was implemented. John L. Baird, sometimes referred to as the Marconi of television, successfully applied cathode ray tubes in that year to transmission and reception of shadows.

The first demonstration of true television occurred in 1926 when Baird transmitted the picture of an office boy named William Taynton. Television even reached across the Atlantic in February 1928 to a vessel S.S. Berengaria. Long wave transmission was used and the picture was not sharp or clear.

All-electronic scanning was made possible by the development of television cathode ray tubes in 1929 and these were the direct result of Campbell Swinton's earlier investigations. They were produced for television by an English company, Electrical and Musical Industries Ltd., and marketed under the name of "Emitron".[123] In America around the same time, Dr. V. K. Zworykin, of the Radio Corporation of America, developed a similar device with which the first public demonstration of an all-electronic television was made in 1929.

The use of ultra short waves[124] from about 1930 onwards paved the way for transmission of more detail in pictures, and from 1932 television emerged from the experimental stage to that of public use. Television was installed in 5,030,000 homes in the United States of America in 1950 and by 1960 this figure stood at 46,200,000.[125]

Public broadcasting has not been superseded by television. In fact it is claimed that radio has more listeners than ever before! This could be because of the increased accessibility of wireless. Transistor receivers are small, convenient and can be taken anywhere. Radio broadcasting has changed its role to suit the new-style audience of beachgoers, sportsmen, travellers and the teenage population. For the most part there is not so much emphasis on quality of programme format as before television when radio was the home entertainment. The light juke-box type of programme now predominates.

There seems little doubt that television and radio will continue to exist side by side. With the extension of experiments in using satellites as reflectors, inter-continental transmission of television could well become as common as short wave public broadcasts are now.

At the present time wireless communication serves four main purposes; those of television, medium wave broadcasting, long range telephony and specialised communication such as teleprinter and picturegram services. Research now going on aims at the continued use of radio in at least these four divisions. The indications are, however, that the physical form of wireless equipment will become smaller and smaller. This trend is not unique to radio, as other useful objects have undergone a similar pattern of diminishing size as they were developed. The grandfather clock to ring-sized watch is but one example of this.

The trend towards miniaturisation is especially noticeable in field and domestic radio appliances and this move to smallness really started with the advent of the 1.5 volt sub-miniature thermionic valve. Reduction in valve

* Government School, Yornup, W.A.

[120] See Appendix 4, The Process of Modulation.

[121] American Radio Relay League: "The Radio Amateur's Handbook," 1959, 36th edition, p.304.

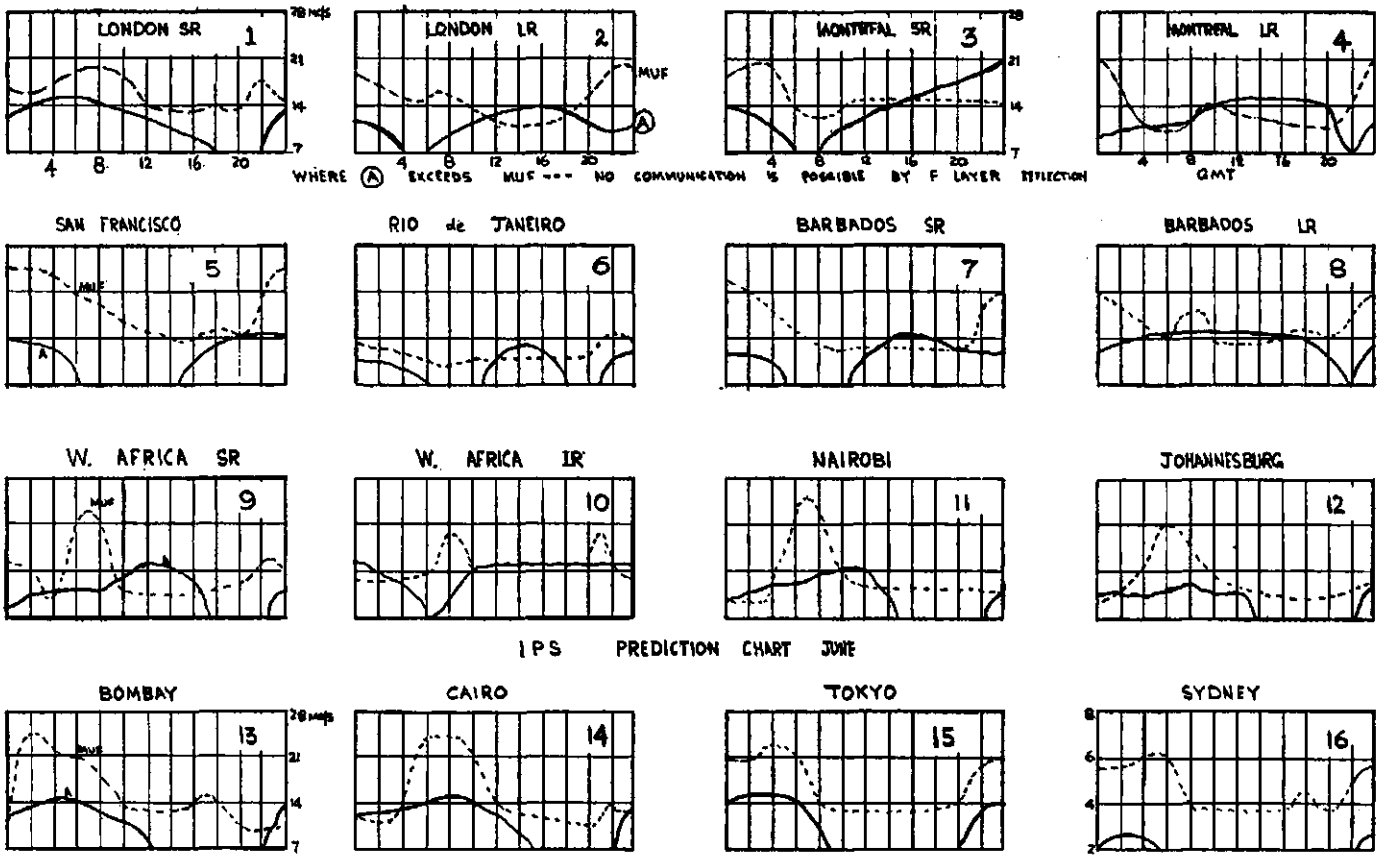
[122] From a fifteen-page paper, "Television—A General Survey" by John L. Baird, addressed to the World Radio Convention, Sydney, April 1938, Institute of Radio Engineers (Aust.), op. cit.

[123] From a twenty-two-page paper, "The Development of High Definition Television in Great Britain" by J. D. McGee, addressed to the World Radio Convention, Sydney, April 1938, Institute of Radio Engineers (Aust.), op. cit.

[124] Radio waves with a wavelength ten metres or under.

[125] United States Bureau of the Census and from a letter ex State Library, James Street, Perth, 2nd July, 1963.

# PREDICTION CHARTS FOR JUNE 1965

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Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

Manuscripts should preferably be typewritten but if handwritten please double space the writing. Drawings will be done by "A.R." staff.

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size made overall size diminishment possible and by 1948 the reduction in equipment extent was quite noticeable.

Shockley, Bardeen and Brattain opened up the next stage of miniaturisation with their discovery of the transistor. The miracle of the transistor is that, despite its smallness, it can do better just about anything that the subminiature valve can do. Requiring only low voltages, this device has brought about a remarkable decrease in size and weight of communication equipment because these two factors are proportional to the voltage used, power handling capacity and heat dissipation. Transistor usage in communication equipment gave rise to associated techniques such as dip soldering and printed circuits, both of which facilitate simple assembly and reduction in volume. In addition, new lines of components in the form of miniature capacitators, resistors and switches made possible further reduction in size and weight when compared with subminiature valve equipment.

Thus transistors, themselves minute, together with associated components and construction techniques, have produced a remarkable shrinkage in overall size of equipment. The parts placement density of transistorised equipment is said to be capable of achieving 50,000 parts per cubic foot. By comparison, the "handie talkie" transceiver which is regarded as the ultimate in miniature valve designed equipment, achieves a parts density rating of 8,000 parts per cubic foot.[125]

A military demand for greater miniaturisation than 50,000 parts per cubic foot has launched a programme with the aim of microminiaturisation in field-type equipment. This need arises from the foreseen requirements of wireless sets to be minute in the event of nuclear blasts. The fufilment of a programme in micro-miniaturisation depends upon a new concept in radio equipment called the modular concept, which has a minimum aim of 500,000 parts per cubic foot and the possibility of a further tenfold reduction.

The modular concept in electronics centres around the evolution of microminiature components of uniform shape and size which combine to form tiny modules. Each module is assembled as a micro-circuit capable of complete function such as an oscillator, modulator or any other block section of a receiver or transmitter circuit. There is a variety of assemblies and any number of interconnections of modular circuits is envisaged possible.

Modular circuits are constructed in wafer-like forms 0.310 inch square and 0.010 inch thick. Shapes of components as we now know them disappear. Resistors, for instance, are made by depositing metal or a metal oxide film, and fixed capacitators use ceramics, while inductors use toroids between two micro-wafers. Variable tuning condensers are replaced by highly sensitive, low voltage, semi-conductor diodes which exhibit variable capacity. Since the programme began in 1958, it has been found that all electronic parts now used in wireless equipment can be reproduced in the modular concept. It seems very likely that the transistor set now considered small may soon be bulky by comparison with its modular counterpart.

The call for miniaturisation has brought about a change in the radio industry itself. In the past a designer could alone work to create new equipment, but now, because of the great complexity of the factors involved, the days of the sole planner are going. The modern designer has to consult with many specialists from many departments of science and industry to get the overall picture; the chemist, engineer, physicist and mathematician all have something to contribute. The transistor heralded the opening of the miniaturisation era in 1948 and this has now extended to a period of micro-miniaturisation. It is also the era of the specialist because, now, "the maximum amount of knowledge is the minimum required"[127] before new designs can be created and the minimum amount of knowledge is beyond the capacity of a single mind.

Small equipment needs a ready, reliable source of power and here specialised development in primary cells has assisted the fullest exploitation of miniaturisation possibilities. As well as a demand for size reduction in wireless batteries, there is an insistence upon a reasonably long life. Miniaturisation of the standard torch-type battery does not lend itself to this requirement, but new techniques have evolved tiny batteries which, in themselves, amount to a scientific breakthrough.

Later development of the electrochemical cell, using zinc and mercury, devised by Dr. Samuel Ruben during the Second World War, has proved of tremendous assistance. The advantage of the mercury-type cell is that it has a capacity something like seven times as much as the Leclanche torch-type cell. This means less bulk without loss of power availability.

An announcement of a major breakthrough in the actual conveyance of intelligence from one place to another was made in May 1963.[128] This concerned the Pseudo Random Intelligent Noise Transmission System. Labelled "P.R.I.N.T.," it is a completely new concept in wireless communication although it does still use the electromagnetic spectrum and some conventional transmitting components. The system revolves around a new thought in tuning and modulation. Tuning depends upon time and not frequency as we now normally expect, whilst the modulator converts intelligence into a pulse code which is emitted by the transmitter. To receive the information the receiving set must start at the same time and remain in phase with the transmission. In this manner the pulse code is converted to our natural means of reading and hearing. Many such transmissions using different time starting points and different codes may be accommodated in the spectrum space of one conventional transmission. This system is very much in its infancy, but it does present a picture of overcoming the problem of overcrowding as more and more stations come on the air.

Another new concept called "Laser" is currently under intense research. The Laser is a new electronic device which has the ability to amplify light waves and intensify them into a single powerful beam. American scientists prophesy the use of such a beam in a communication system. This system could, in theory, use "a beam of light to carry all the radio, television and telephone broadcasts currently transmitted throughout the world."[129]

Since practical wireless began, its progress has been motivated by the need to improve on what has already been discovered. Each step forward has brought with it a new challenge. This is so today. From the turn of the century the challenge has been found in the need to perfect techniques and equipment, but it does appear that the zenith of technical perfection, with present modes of transmission, may be reached by the current programme of micro-miniaturisation. What, then, of the period beyond? Wherein lies its challenge? The answer seems to be in the problem posed by the future need to accommodate many more wireless stations and their operation without mutual interference. This problem is becoming increasingly apparent and the time could arise where there will not be sufficient band space available. The wider use of single sideband transmissions will help overcome the question, but the real solution may only be found in a new mode of conveying intelligence from one place to another. The indications are that the radical P.R.I.N.T. and Laser systems may one day prove suitable for this purpose.

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(Continued on Page 22.)

[125] Gilbert, H. D.: "Miniaturisation," Rheinhold Publishing Company, New York, 1961, p.106.

[127] Ibid.

[128] "Amateur Radio," Journal of the Wireless Institute of Australia, May 1963, Melbourne, p.1.

[129] Laser is derived from a phrase that describes the device's function: Light Amplification by Stimulated Emission of Radiation. Two-page article by Bruce Shore in "Radio, Television and Hobbies," February 1963.

# W.I.A. Federal President's Annual Report, 1964-65

It once again gives me pleasure to present to Federal Council the activities of the Institute in general and the Federal Executive in particular for the past 12 months.

This year has been a quiet one for the W.I.A. in which it has had a chance to stabilise itself and take stock of its current and future prospects. In other respects it has been an upsetting year. On the 29th August, 1964, the Institute lost one of its most loyal stalwarts—I refer to the late Jim Corbin, M.B.E., VK2YC, who died after a short illness. Jim was responsible in no small way for strengthening the N.S.W. Division, and although a "stormy petrel" he always had the Institute's interest at heart in everything he did. It was his great drive and enthusiasm that enabled N.S.W. to install and maintain the property at Dural and obtain a permanent home at Aitchison Street, Crow's Nest. He will be missed by all, especially Convention members, but particularly his own Division. The Executive also lost the services of the Secretary through ill-health for some three months during the year. This could not have occurred at a worse time in that the last Convention minutes had to be prepared and the Secretary's job had to be shared between the Vice-president and myself.

On a brighter note, the Executive were asked to once again co-operate with the Boy Scout movement in providing a station at the 7th Australian Jamboree, which was held at Rowville, near Dandenong in Victoria. Due to a sudden illness of Mr. Glover who was to organise the various facilities, Mr. David Rankin and myself at short notice made the necessary arrangements. The station, VK3WIA, the Federal station of the Institute, was eventually set up in a portable army hut on the site and the equipment installed. The station was in operation for the whole period of the Jamboree and I believe it was an outstanding success. I personally wish to record my thanks for the great assistance to David and myself of those providers of equipment, both commercial firms and Amateurs, and also to all the operators, erection teams and others too numerous to mention by name, who gave of their time and energies over the Christmas/New Year period. Cards are now being prepared to acknowledge QSO's with those local, interstate and overseas stations who contacted VK3WIA during the period. I am sure that the effort was well worth the trouble as judged by the continuing interest of Scouts and their parents who visited the station. Personal letters of thanks have been sent to all those firms and Amateurs who assisted.

Whilst speaking of VK3W1A I wish to report that further smaller items of equipment have been added during the year to the basic Geloso transmitter. The old transmitters bought at disposals from the Air Force have now been sold, and one of the receivers also. I believe it is essential that the Federal station should have modern sideband equipment if the W.I.A. is to maintain liaison with overseas stations. I hope that VK3WIA will be on the air more regularly during the next 12 months.

In dealing with I.T.U. matters I wish to say that the official Government report on the results of the recent space services conference in Geneva has not yet been released, although basically the details stated in my last report to you are valid. No I.T.U. conference of interest to the Amateur has been held during the last year nor, at present, is the date of any forthcoming conference known. However, I trust all those Divisions who have not yet filled their quota of subscriptions, set in Sydney in 1963, should continue to encourage further subscriptions. Only VK7 and VK6 have filled or nearly fulfilled their promises.

The activities of W.I.C.E.N., the Institute Emergency organisation, received a severe test during February and March, when bush fires ravaged large areas of eastern Victoria, New South Wales and to lesser extent South Australia. At the time of preparing this report little news is available from New South Wales or South Australia, but regarding Victoria, the network operated most effectively with many mobile stations taking part and performing a most useful service to the community. VK3WI was on the air for most of the period, as was the control station at Lucknow. I understand the authorities were most lavish in their praise for W.I.C.E.N. and very good T.V. and newspaper publicity was obtained for the Institute. I trust other Divisions will take note and ensure they also have effective nets which can go in operation at short notice. Those who took part are to be congratulated on a sterling effort which has undoubtedly enhanced the Amateur image with the general public.

Membership figures for the W.I.A. show gradual increases as licensee figures continue to rise. I would like to be assured that Divisions are doing everything possible to bolster their membership particularly with the new licensees. A sound, progressive programme of recruitment is the only way to achieve greater status in the eyes of the authorities. Again, I must repeat that our ultimate aim should be to represent every Amateur in Australia. The membership figures (which include all grades of membership) and licensees are shown below for the last three years:—

| | 1963 | | 1964 | | 1965 | |
|---|---|---|---|---|---|---|
| | M | L | M | L | M | L |
| N.S.W. .. .... | 1,263 | 1,427 | 1,172 | 1,485 | *1,228 | 1,564 |
| Victoria .... .... | 766 | 1,392 | 728 | 1,421 | 858 | 1,487 |
| Queensland .... | 395 | 469 | 423 | 501 | 511 | 540 |
| S. Australia .. | 541 | 545 | 547 | 585 | 514 | 623 |
| W.A. .... .... | 216 | 317 | 216 | 324 | *246 | 339 |
| Tasmania .... | 174 | 164 | 184 | 154 | 208 | 170 |
| VK1, 9, 0 .. .... | — | 130 | — | 132 | — | 146 |
| Total .. .... | 3,355 | 4,314 | 3,270 | 4,602 | 3,565 | 4,869 |

*Estimated.

I must once more express disappointment at the failure of some Divisions to forward their monthly membership returns. I ask all Federal Councillors to impress on their Divisional secretaries the importance of regularly forwarding these figures. The Federal Treasurer must have correct figures on which to apportion financial payments and they are also required from time to time for official purposes.

The Youth Radio Club Scheme still continues to grow and new clubs have been formed during the year. The separate report from the Federal Y.R.C. orgainser, Mr. Rex Black, VK2YA, gives a detailed account of the activities. I take this opportunity to thank all those who are helping with the clubs and Mr. Ken Mattei, who regularly presents the activities with his notes in "A.R." I urge Divisions where the scheme is at present not functioning or only just starting to give this aspect of Institute activities every assistance possible, for the recruitments in this field will eventually make itself felt in added membership apart from the better public relations it creates.

We have continued to liaise with overseas societies, principally the A.R.R.L., R.S.G.B. and N.Z.A.R.T., in regard in regulations, publications and contests. The A.R.L., through I.A.R.U. channels, is proposing to run a series of articles on each member society in regard to their regulations, operating procedures and various society matters. Mr. John Huntoon, the general secretary of A.R.R.L. and secretary of the I.A.R.U., has assured me that one of the first societies to be written up in QST will be the W.I.A. He has also informed me that it is most likely he will be visiting Australia in the near future. I hope that during the next 12 months we may be able to enjoy even closer liaison with these and other societies per medium of regular radio contacts. The sub-committee formed to enquire into the F.C.C. organisation, comprising the Victorian Federal Councillor, the Vice-president and myself, has also received valuable information and assistance from the A.R.R.L. A final report will be issued when all the facts have been sorted and examined.

The Executive has communicated with the P.M.G.'s Department in relation to regulatory matters raised at the last Convention, and all Divisions have been notified of the results. Some of the replies have not been in our favour, and I consider these matters could be reopened during the next 12 months. Mr. Len Pearson, contrary to my last report, has not yet retired and his time has been extended untill the latter part of this year. His likely successor is not known at this stage. On the few occasions of liaison with the local Victorian Administration, their co-operation has been most helpful and cordial.

The Publication Committee has continued its onerous task of preparing "Amateur Radio" each month for printing, and I still consider Divisions could give more assistance with articles and in seeking advertising. The delay in printing the Callbook this year cannot be laid at the door of the Publications Committee for it was due to lateness of checking by the various State controllers. The Ceneral Administration personally apologised to me for the delay and I believe it will not occur again. Incidentally, our contract with the Department has been renewed for another five years for the publication of the Callbook. The detailed report by the Editor of "Amateur Radio" wil give you a better idea of the problems involved. I wish to thank the Editor and his able assistants for the way in which they continue to give a lot of time and energy but receive very little outside help.

The usual Institute contests were held during the year and were conducted by the Contest Committee located in Queensland. Unfortunately for most of the year, only one member could devote time to this sphere resulting in lateness in publishing results, particularly the R.D. Contest which I understand will be in the May issue. Congratulations to South Australia who once again has won this contest. All of the Federal Contests were well patronised and interest maintained. The Ross Hull trophy has been repaired and refurbished and it is proposed to also refurbish the R.D. trophy if necessary. The issue of awards has continued under the direction of the awards officer, Mr. Alf Kissick. The production of the new N.F.D. certificate has been delayed due to the lack of a suitable design and motif. A draft is expected in the near future. I have signed over a thousand membership certificates this year and all Divisions should now have had their first issues—more will follow as time permits. A draft of each of the S.W.L. certificates has been produced and these, together with the rules, will be printed during the next year.

Activities on the various Amateur bands has been spasmodic depending on contests and conditions for the largest amount of local activity. Conditions have been against continuous activity but it is becoming more and more evident that Amateur A.M. is on the way out. There are always some s.s.b. stations operating when the bands are otherwise deserted. The voluntary sub-division of the h.f. bands has now been promulgated and I trust Divisional broadcasts will regularly publicise these frequencies. On the v.h.f. and higher frequency bands activity is as great as ever and distance records continue to be broken. VK2ZMR has taken the 144 Mc. record with a distance of 1,410 miles to New Zealand. VK3AEE and VK7LZ have been active on the 432 Mc. and their record stands at 282 miles. Congratulations to these and many others who continue to pioneer these frequencies.

The work of the co-opted officers has continued with little worry or fuss, and Messrs. Kissick (Awards), Jones (QSL), Straughair (Certificates and Contests), Glover (Historical), Black (Y.R.C.) carry on their important jobs in the usual efficient way. I thank them all for their continued devotion to their jobs.

Regarding the financial state of Federal Council, I refer to the audited statement pre-

(Continued on Page 22.)

## WIRELESS INSTITUTE OF AUSTRALIA — FEDERAL EXECUTIVE

**Balance Sheet as at 28th February, 1965**

| | | | | |
|---|---|---|---|---|
| **Liabilities—** | | | **Current Assets—** | | |
| Trust Fund .... .... .... .... .... | £321 | | Commonwealth Savings Bank | £2,421 | |
| I.T.U. Fund .... .... .... .... .... | 1,164 | | Trade Debtors .... .... .... .... .... | 92 | |
| | | £1,485 | Stock on Hand—at lower of cost or market value .... .... | 173 | |
| **Accumulated Funds—** | | | | | £2,686 |
| Balance 1st March, 1964 .... .... | £1,089 | | **Fixed Assets—** | | |
| Add— | | | (At cost less depreciation) | | |
| Surplus of Income over Expenditure for Year .... .... .... | 443 | | Furniture and Fittings .... .... | 12 | |
| Surplus on Revaluation of Equipment .... .... .... .... .... .... | 21 | | Typewriter (No. 1) .... .... .... | 72 | |
| | | 1,553 | Typewriter (No. 2) .... .... .... | 10 | |
| | | | Duplicator .... .... .... .... .... .... | 95 | |
| | | | Trophies .... .... .... .... .... .... .... | 14 | |
| | | | (At valuation) | | |
| | | | Equipment .... .... .... .... .... .... | 149 | |
| | | | | | 352 |
| | | £3,038 | | | £3,038 |

# Book Review

**SHOP AND SHACK SHORT CUTS**
**By Donald L. Stoner, W6TNS**

You could also call this publication the "Encyclopaedia of Hints and Kinks."

When this volume first came into my hands I began to wonder who would consider spending 50/- on such a book? As the pages were turned many old tricks were again revealed. Some of them with a new twist added to make them topical. Again I asked myself the question: Who would buy?

Yes, even after 30 years' experience in Amateur Radio and Electronics, in general I would say that this publication is a "gold mine" . . . It could save its purchase price the first time it is used and it will never go out of fashion, as so many books do.

The book is divided into 13 chapters, grouping tips under the following broad headings:

(1) Improve your Shop Technique; (2) Tips on Crystals and Holders; (3) Coil and Condenser Hints; (4) Ideas for the Shack; (5) Improve your phone rig; (6) Hints for improved c.w. operation; (7) Receiver improvements; (8) Transmitter improvements; (9) Antenna improvements; (10) Power supply ideas; (11) V.H.F. hints; (12) For the mobileer; (13) Test equipment.

There is something for everyone interested in construction projects. S.W.L.'s . . . The younger generation of new Amateurs and the "old hand." There is something for all, grouped neatly into one volume.

Publisher: Cowan Publishing Corp., Port Washington, N.Y., U.S.A. Australian Retail Price 49/9, plus postage 1/9. Available from Technical Book & Magazine Co. Pty. Ltd., 295-299 Swanston Street, Melbourne, C.1, and McGill's Agency, 183-185 Elizabeth Street, Melbourne, C.1.

☆

**WORLD RADIO T.V. HANDBOOK, 1965. 19th Edition.**

This latest edition of the "Who's Who" of the radio and T.V. world has been completely revised and brought up to date in every respect—not only as an extremely comprehensive guide to the radio and T.V. stations in the world, but also in regard to the editorial content.

To anyone even remotely interested in short-wave listening, this book should be a must. Not only does it provide full information about the broadcasting and T.V. stations in each country of the world, including frequencies, power, QSL addresses and other relevant data, but a table at the back of the publication lists in order of frequency short wave stations in the world between 2160 Kc. and 26,080 Kc.

For the serious S.W.L. the book would be worth obtaining for this information alone.

Some of the best-known international personalities within radio and T.V. have provided interesting articles on such subjects as Interference, Jamming and You, Solar Activity in 1965, Inter-continental Television, Short Wave Reception Conditions expected during 1965. "Where to Listen for Satellite Signals," lists all satellites and their frequencies and also those expected to be launched during 1965.

Tables of interest include: The Most Suitable Metre Bands for 1965, Standard Frequency and Time Signal Stations, DX Programmes, Radio Stations Broadcasting in Your Language, World Time in All Countries, and Call Sign Allocations.

The book is a soft cover publication 6½ in. by 8½ in., containing 302 pages, and is available from most leading booksellers.

# OSCAR III

After delays amounting to nearly 12 months, Oscar III was finally launched on 9th March, 1965, into a near polar orbit at a height of nearly 600 miles, just as hoped for.

Unfortunately, it was soon obvious that it was not working as well as expected, in that the c.w. beacon did not function; the telemetry beacon, although at fair strength, did not give data on the two temperatures, but only one (which one?); and the overall translator gain was down by about 20db. This meant that whereas a 30 watt transmitter and average type of aerial should have been sufficient to relay signals through the translator, in actual fact the only QSO's made over transcontinental distances were by stations running near a kilowatt into high gain aerials tracked in elevation as well as azimuth.

It is suspected that the poor performance may have been because of damage to the satellite aerials which may have occurred during the launch or injection into orbit. In the VK-ZL area the only signals relayed over any distance were on c.w. and heard only for seconds. They included VK3ATN, VK7PF, VK7DK, VK7LZ, ZL3AR (running 500 watts under special permit), and a ZL1 (believed to be ZL1DE), who was heard briefly by VK1VP. There may have been others; we apologise for any omissions.

Overseas DX included W1 to HB9, DL3 to W6 also W6 to KH6, KL7 and LU3. Many of these QSO's were on s.s.b. and powers of over 500 watts were the rule.

At the time of writing (12th April, 1965) the telemetry is still in operation, having switched over to solar cells, when the main battery failed on 27th or 28th March. Although the telemetered voltage fluctuates between 11 and 13 compared with the original 20 volts soon after launch, it is quite possible that the beacon will continue to function indefinitely. If so, it is to be hoped that its orbits do not clash with Oscar IV and cause QRM.

Oscar IV, identical to Oscar III, but (we hope) fully serviceable, may be launched in September. Here's hoping we make those 4,000-mile 2-metre contacts yet.

—Bill Rice, VK3ABP.

# YOUTH RADIO CLUBS

The big news this months comes from Sydney Teachers' College where a newly formed club (with leaders Mr. M. Henderson and Mr. Dick Smith) has 25 members. This is one of the most important breakthroughs we could have, and all Division Councils with any more than token interest in the Y.R.S. should make it a priority matter to achieve the same result. I'll be surprised if this doesn't mean 25 new Y.R.C.'s in 1966 in VK2. The president of the S.T.C. Club is Maurice Coleman, graduate B.Sc. and a Dip.Ed. student, who hopes to have his A.O.C.P. early next year. Also, judging by the number of lady members, it looks as though some girls' high schools in N.S.W. will compete with St. Anne's and Melbourne Girls' Grammar. This likely expansion is great news. Would Publicity Officer Pansy please not copy—it may give your uncountable meetings the cold horrors!

Another important matter is the education of our political leaders in the possibilities of the Y.R.C. Any day now there will be screaming in high places about the scarcity of capable technicians to look after the flying electronic laboratories now being purchased as our bomber-fighters. If you care to educate an M.H.R. or two, Mrs. Betty Gerdes, secretary of the VK2 Division, has duplicated copies of the R.T.V.H. article detailing features of the amazing Soviet Youth Training Scheme. If you send her a stamped addressed envelope marked "U.S.S.R. Info.," you will at least have material to be sent to a M.H.R. with a covering letter explaining that the W.I.A. organises a valuable voluntary scheme but the W.I.A. cannot match the U.S.S.R. by itself. All States should join in.

The two regular stalwarts, Jim Webster and Ken Matchett, keep their bulletins going from VK2 and VK3. This is an important activity because it makes all the club leaders feel that they are part of a brotherhood instead of isolated units. Ken has included his 1964 Annual Report. In VK3 in 1964, 53 Elementary and seven Junior Certificates were awarded, including the first at a Primary School, Gowrie Park. Two new clubs are welcomed—Australian Air League Squadron and Melbourne High.

In VK2 there are more clubs registered than in 1964 at this date. Full count is not available yet. Much club news is available though. At Gosford Gary Tippett has received call-sign 2UX and is designing and constructing with the aid of Lindsay 2ON. At Arthur Phillip High Mr. Pearson (Manual Arts Master) has introduced a Y.R.S. course for 2nd year pupils as a craft (all high schools please note and suggest similar). North Strathfield Scouts are still active with call-sign 2BHA, helped by Len 2AFS. Epping Boys' High is being organised by teacher Jack 2BS. Hunters' Hill High has a club led by Science Master Mr. L. MacKenzie. Westlakes goes on to greater strength under Keith 2AKX. Kiama High under Roger 2AIV has 18 members and meets every week. Birrong Boys' High with Jim Webster is helping the Cadet Unit with some transceivers and designing antennae. Punchbowl Boys' High is still organised by Secretary Warren Donald. Kingsgrove North High has a predominantly junior group that keeps Rex 2YA late home. Inverell High is still organised despite the transfer of Roger 2AIV. Kyogle Scouts with Graeme 2GJ are working on a transmitter. Peak Hill Central is a new club led by a Science Teacher, Mr. A. Tooke. Port Street High is again led by Mr. Weir. Waverley College has formed a club led by Brother P. Anderson. Dorrigo High is a new club, too, led by Science Master Mr. R. Brown.

In Canberra, the Y.R.C. types had a lot of fun at the Canberra Radio Society's Easter Convention. Roger 1RD was first to locate the Hidden 7 Mc. Tx. against Inter-State competition and Jim 1JR won second prize in a Receiving Contest. Andrew Davis turns 16 next month and may be on the air (VK1AD) with his 7 Mc. transceiver (home-brew) when you read this.

There is news also from both VK6 and VK4 of L.A.O.C.P. passes. In Wesley College Club, Perth, Laurie 6ZEA has four members who obtained Commonweatlh Scholarships. They are Peter Pemberton 6ZEP, Ray Godley 6ZEG, Terry Broom and Mervin Wellnagel, the last two of whom have passed L.A.O.C.P. and are waiting for call-signs. In VK4 a De La Salle Club member and one from Grammar School (aged 15½) have L.A.O.C.P., but no details of names are available. New clubs projected are Maryborough State, Rockhampton Christian Brothers, Gladstone State, Cairns Boy Scouts and St. Patrick's (Mackay). 1KM.

# VHF

## 52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Elsewhere on this page appear the latest details of v.h.f. records actually claimed up to April, 1965. There are a number of State sections without claimants. Surely someone holds a record for the particular band. How about dropping a line to David Rankin 3QV and making a claim for your State.

The activity reports appear to reflect the time of year—autumn going to winter and the usual hibernation taking place. The Amateur bands are taking a thrashing from the "one-eyed monster." More channels coming into operation mean more viewers and of course more T.V.I., etc.

It was a pleasant surprise to have 6-metre DX over Easter, much to the surprise of many VK4's. That base station had a mighty signal in Melbourne. Have been making regular checks as time permits of the audibility of inter-State Channel 0's here in Melbourne. Much to my surprise out of 40 checks made over a period of four weeks have heard signals from the other stations. I'm not sure whether Wagga is on the air but on May 2, around 1130, a religious service was copied with great ease until the critical time to hear the location of such service when the signal dived and we missed out. The signal is never below the noise usually running S2-3 peaking at times well over the S9 mark. Refer to VK2 notes for news of their little problems.

Would be interested in reports of Channel 0 reception and from where in the divisional reports. Cannot wait until good sporadic E conditions to see what happens. VK3ZGP.

### NEW SOUTH WALES

- Six-metre fox hunts have all the makings of becoming popular in Sydney. No doubt they are providing something different from the now very routine 2-metre event. Beams are a problem and everything from loops to full-sized two elements are being used. These beams mounted on a roof rack are not so bad but a two-element on the side of the car of one hound caused amusement. At one stage the only place he could swing it to take a bearing was in the middle of a bus depot.
- The Group is expected to again run its own section to the Remembrance Day contest to allow v.h.f. operators to take part if there is no inclusion of such a section in the next rules. Last year this was most successful for a long time. It would be a good thing if groups in other States were to do likewise.
- There are four v.h.f. activities each month in VK2. On the first Friday the meeting is held at Wireless Institute Centre, 14 Atchison Street, Crow's Nest. The 6-metre fox hunt is held on the second Wednesday of the month and the 2-metre usually on the fourth Wednesday. Usually on the second Sunday or week-end an event or contest is held.
- During April Sydney's fourth T.V. station took the air. Channel 10 was new, so the ads. went. To the v.h.f. operator all it was doing was more T.V.I. Harmonics of 6 metres, beats with Channel 2 and 2 metres and other mixing produced herring-bone T.V.I. and spots in converters. Most cases were not too bad and were soon cleared up. 2ZTM.

Some of the v.h.f. fixtures and events in Sydney for the next few months will include meetings at Wireless Institute Centre, Crow's Nest, on June 4, July 2 and August 6. Intended lectures are June, Transmissions Lines; July, the combined Channel 10 and Channel 7 antenna system; August, Mobile Forum 65, a panel discussion on portable and mobile operation as against home station operation.

The Mobile events will include 6-metre fox hunts on 9th June, 7th July and 11th August. The 2-metre fox hunts will be on 23rd June, 28th July and 25th August. The week-end events will be on 13th June, a four-hour message handling contest between 7 p.m. and 11 p.m. on Sunday evening. In July most likely a mobile event on the 11th. The August event will again we the v.h.f. groups' section to the R.D. Contest.

To keep v.h.f. operators informed a News Letter is produced and the weekly broadcast is at 7.30 on Sunday evening.

Fixed frequency net operation is slight at the moment. The 146 Mc. has lost some of its former support. Some of the 6-metre operators have three channels towards the high end of the band. de Tim 2ZTM.

### VICTORIA

Band News. Six metres opened to VK4 and North VK2 over Easter week-end, 2 metres has had some openings to Western VK3, Eastern VK5 and Southern VK2. Activity on the whole has been rather spasmodic on all bands, the only news from 432 being that Cyril VK3AEE now has a 124-element antenna on 432 and can be heard some nights operating C.w. on this band.

There are some 60-70 stations on the 6-metre a.m. net frequency 53,032 Mc. in Melbourne, also some stations in Albury, N.S.W., Mt. Gambier, S.A. and Ipswich, Qld. The 6-metre f.m. net on the international 8-metre f.m. net frequency of 52.525 has about 10 stations and more are appearing as fast as they can procure equipment. Crystals for these nets are available from the VK3 Crystal Bureau, c/o Leo Fowler, VK3ZGF.

Two States have been linked by the engagement of Mary, daughter of Bob VK4NG to Jim VK3ZHF.

The 2-metre scrambles and fox hunts are still very popular in Melbourne, the scrambles on the second Sunday night of each month at 2045 hrs. attracting some 20-30 stations, the fox hunts on the fourth Wednesday seeing the attendance of six to eight car-loads of people. The fox hunts start around 2000 hrs. and finish between 2300 and 2400 hrs. after six to eight hunts have been completed. See you again next month, chaps. VK3ZCK.

### QUEENSLAND

During April three newsworthy events took place. They were a successful mobile night, some unexpected DX and the Annual Easter Scout Venture. Early in the month a mobile night was held in the city. Those present were 4ZLL, 4ZAX, 4ZEK, 4ZDJ, 4UL, 4ZFF and myself. After the evening 4ZFF earned himself the title "Fred Flintstone"! John 4ZDJ was voted the best fox for the evening. I think that perhaps every car passed within 50 feet of his location without finding him. The evening concluded with a visit to a "Ham-wise" well-known coffee lounge.

On Sunday, 18th April, the 6-metre band was open to VK3 for a short while around 1400 hrs. VK3ZMS was the only consistent signal heard. On Monday, 19th, the band was open from 0800 to 1200 hrs. VK's 2, 3 and 5 stations were heard. Roy VK4ZRM worked 15 stations. Roy was just about the only VK4 station apart from Lance 4ZAZ, who was able to work the DX stations. Unfortunately there were at least 15 VK4 v.h.f. stations on the band at this time handling traffic of an emergency nature at the 1965 Scout Venture. Consequently although many DX stations were heard, none were worked. If you called VK4QH but received no reply this is the reason. VK4QH was the headquarters station operating portable from the Beenleigh Show Grounds running about 60 w. to a 6-element vertically polarised beam. (David, take a bow!).

The Scout Venture this year was a notable success. Most scouters agreed that the course was the hardest for some years. Many patrols turned up in unexpected places didn't they? Thanks to Bruce 4BZ, who remembered that good things come in glass!

During the past few nights Neil 4ZNL and Stew. 4ZSP have been heard battling away during Channel 0 hours. Trevor 4ZTT and Walter 4ZPW are expected to get together to put a good signal on the air in the near future from St. Lucia way. Most activity on 6 metres lately has been from mobiles on the way to work in the morning. Everyone knows that if George 4ZLG is not on the bands, then he has run for the train and therefore it must be after 8 a.m.

Two well-known v.h.f. boys have taken the step and now have XYL's. They are Graham 4ZGN and Roy 4ZRM. George 4ZLG was the recording engineer at both weddings. Who was heard calling CQ during Roy's wedding?

Ken VK3OI has come to join us here in VK4 and is at the moment in charge of the local 100 kw. 6-metre transmitter for some nights of the week. He says he cannot hear a signal on 2 metres up here. Why?

**VK4 144 Mc. Beacon.** The latest report from the Darling Downs indicates that the beacon transmitter is completely operational. The rig is at the QTH of John 4ZWB, who is giving it a real work-out.

An official call-sign is now awaited and once it has been obtained the automatic keyer will be constructed.

Following the request made by the group concerned for a number of odd type number tubes to be used as spares for the TX, a number of donors came forward. Many thanks to 4DA, 4TN, 4AW and 2ASA for contributing to the spares of the unit.

### VHF/UHF STATE RECORDS
### April, 1965

| | | | | | | |
|---|---|---|---|---|---|---|
| **NEW SOUTH WALES:** | | | | | | |
| 50 Mcs. | VK2ADE | to | VE7AQQ | 8/4/59 | 7,320 | miles |
| 144 ,, | VK2ZMR | to | ZL2AAH | 8/1/65 | 1,410 | ,, |
| 432 ,, | No claim | | | | | |
| 576 ,, | No claim | | | | | |
| 1,215 ,, | VK2ZAC | to | VK2ZCF/2 | 4/3/63 | 46.8 | ,, |
| **VICTORIA:** | | | | | | |
| 50 Mcs. | VK3ALZ | to | XE1FU | 1/5/59 | 8,418 | ,, |
| 144 ,, | VK3ZEA | to | VK4HD | 27/12/61 | 954 | ,, |
| 432 ,, | VK3AEE | to | VK7LZ | 15/1/65 | 282 | ,, |
| 576 ,, | VK3AKE | to | VK3ANW | 11/12/49 | 80.7 | ,, |
| 2,300 ,, | VK3XA | to | VK3ANW | 18/2/50 | 9.0 | ,, |
| 3,300 ,, | VK3ZGT/ZGK/3 | to | VK3ZDQ/3 | 14/12/63 | 63.5 | ,, |
| **QUEENSLAND:** | | | | | | |
| 50 Mcs. | VK4ZAZ | to | K6ERG | 16/3/58 | 5,305 | ,, |
| 144 ,, | VK4ZAX | to | VK7ZAO | 27/12/61 | 1,107 | ,, |
| | No other claims. | | | | | |
| **SOUTH AUSTRALIA:** | | | | | | |
| 50 Mcs. | VK5KL | to | W7ACS/KH6 | 26/8/47 | 5,361 | ,, |
| 144 ,, | VK5ZHJ | to | VK6ZCN | 8/1/65 | 1,330 | ,, |
| 432 ,, | VK5AW | to | VK3AEE | 13/11/64 | 226.5 | ,, |
| 576 ,, | No claims | | | | | |
| 1,215 ,, | VK5LA/5 | to | VK5ZCR/5 | 4/1/62 | 1.0 | ,, |
| **WESTERN AUSTRALIA:** | | | | | | |
| 50 Mcs. | VK6BE | to | JA8BP | 30/10/58 | 5,490 | ,, |
| 144 ,, | VK6ZCN | to | VK5ZHJ | 8/1/65 | 1,330 | ,, |
| 432 ,, | No claims | | | | | |
| 576 ,, | VK6ZDS/6 | to | VK6LK/6 | 15/12/63 | 101.2 | ,, |
| 1,215 ,, | No claims | | | | | |
| **TASMANIA:** | | | | | | |
| 50 Mcs. | VK7LZ | to | JA9IL | 3/12/59 | 5,426 | ,, |
| 144 ,, | VK7ZAO | to | VK4ZAX | 27/12/61 | 1,107 | ,, |
| 432 ,, | VK7LZ | to | VK3AEE | 15/1/65 | 282 | ,, |
| | No other claims. | | | | | |
| **PAPUA TERRITORY:** | | | | | | |
| 50 Mcs. | VK9AU | to | | | | |
| | No other claims. | | KH6DBY | 30/4/60 | 4,312 | ,, |

A complete spare kit of valves is now in hand except for Type No. CV187. A further two of these tubes are required to ensure reliable operation of the TX at all times. Therefore, chaps, dig deep and check your junk boxes—you may be able to help the project. VK4ZPL.

**SOUTH AUSTRALIA**

Now that Oscar III has ceased to emit its characteristic H.I. and telemetry signals, activity in VK5 has again assumed its usual winter doldrums. It could be assumed, however, that perhaps this acute lack of activity may be due to increased constructional incentive instilled to a large number at the most recent v.h.f. group meeting. This meeting, held on 2nd April, was most ably handled by Rob VK5RG and Bob VK5ZDX. The lecture delivered by Rob dealt with the pro's and con's of s.s.b., both theoretically and practically. A practical s.s.b. v.h.f. sideband transmitter was also outlined, and it is anticipated that the mass production of this unit will be undertaken by the majority as a group project. Bob's subject for the evening was centred on the reception of s.s.b. transmissions. His contribution for the evening was emphasised by displaying a receiver that he had modified especially for s.s.b. reception.

Apparently the urge by many to operate on the "gentlemen's" bands accounts for the increased slow morse transmissions available in VK5 to limited licensees. Heads down and tails up, chaps. It appears that VK5 has declared war upon the list of v.h.f. records. Official confirmation has been received on the VK6-VK5 2-metre contact between Andrew 6ZCN and Colin 5ZHJ to establish a record of 1,330 miles. Two other v.h.f. contacts by VK5 types are at this moment also awaiting official notification. These are the VK3-VK5 432 Mc. contact between John 3ZDM and Mick 5ZDR. This contact was made on 19th March at 0658 S.A.S.T. Signal reports of R5 and S3-5 were exchanged. It is anticipated that this contact will constitute an Australasian v.h.f. record. The remaining contact awaiting confirmation made by Trevor 5ZIS and John 5ZJH to Trevor 5ZTM and Rick 5ZFQ on 31st January.

Garry 5ZK and Al. 5EK having exploited what the low bands have to offer are reported to be considering a hasty return to the v.h.f. bands. 5ZHJ.

**WESTERN AUSTRALIA**

The field day on 3rd-4th April kept a few brave Hams quite busy. There were three field stations set up and two cars were operating at different positions in the evening and again next morning. They couldn't stand the cold or the mozzies. The latter were 6ZDO and 6ZAZ. The former were 6ZBD, 6ZAG and 6ZDB, who finished in that order with approximate points 6,200, 4,500 and 4,100. 6ZAG scored 960 points for four possible contacts with 6ZCN over 120 miles. Andrew was not very active due to T.V.I., and this is one reason for the scores being half as big as last time.

Six metres is very quiet nowadays, most of the guys are having an earful of 20 metres in the shape of VK5CD where a YL runs a most refreshing drop of ancient modulation. Now if we had somebody like that on 6 mx the band would liven up considerably. After me, Charlie!

Viv 6ZCM is having trouble with his 2 mx. rig. He can only be worked for the first half of any over and then he disappears. This trouble is not at all easy to fix. There may be a gremlin getting fiendish glee by disconnecting the other bloke's receiver after a certain interval. I'd try timing him, Viv.

6ZAG.

# Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

Editor, "A.R," Dear Sir,—May I please request space in your letters column to explain to my many Australian Amateur friends that the sudden disappearance of 9M2DQ from the bands is not due to any calamity up here but because I have now been granted six months' leave and am off to the old country.

I would like to acknowledge the hundreds of QSO's which I have had and enjoyed immensely with the VK Amateurs. These are troubled times but I have only to get on the Amateur bands and feel the sympathy and support from you chaps "down under."

I had hoped on this leave to be able to see Australia and New Zealand but I have to return to England on business and hope later to be able to visit your wonderful country.

Hope to be back as 9M2DQ by October and in the meantime if my VK friends hear a weak signal filtering through from G3KPY in a bad location, then please don't forget that is

Yours truly,

Jimmy 9M2DQ.

South-western Zone Convention will be held in Warrnambool. Final arrangements will be given over VK3WI broadcasts.

VK3WK President.
VK3ARJ Secretary.

# SWL

Sub-Editor, Chas. Aberneathy, WIA-L2211,
30 Urunga Parade, Miranda, N.S.W.

For those members interested in the Moorabbin Radio Club awards the following is a list of member stations of VK3APC: VK3's ABO, ACS, ADO, AFJ, AFQ, AGZ, AHZ, AKB, AKN, APC, APD, ARD, AUL, AVU, AWO, AXC, BM, CB, CN, CW, EM, FF, JI, JL, KE, KV, LC, LZ, MX, OF, OT, PW, RN, SK, TE, TG, VT, XK, XS, XV, ZE, ZCB, ZCM, ZIP, ZIQ, ZIX, XMQ, ZNJ, ZNS, ZOO, ZOP, ZPC, ZPR, ZRD. Any member who requires further information please write to Greg. Earl, 7 Gordon Crescent, Black Rock, S.9, Victoria, who is handling the SWL section of the Award.

During the past 12 months it has been my pleasure to reply to all mail received at this QTH. Now, owing to the big increase each month, I find that it has become rather costly. As from the 1st June I would ask members who require a reply to please include in their letter a stamped addressed envelope.

### SUPERHETERODYNE RECEIVERS

The superheterodyne receiver, invented during the first world war by Major Armstrong, achieves its unique advantages over the TRF receiver by converting all incoming carrier frequencies to a fixed, lower value (the intermediate frequency). At a fixed intermediate frequency the amplifier circuits can operate with maximum stability, selectivity and sensitivity and are not subject to the variable amplification and instability of the TRF circuit. The conversion of the received signal frequency to the lower IF frequency is achieved by heterodyning or beating the carrier frequency against a locally generated frequency.

As in the TRF receiver the modulated RF carrier signals intercepted by the antenna are coupled to a tuned RF stage, where the initial signal selection and amplification takes place. Because of the high gain and selectivity of the superhet circuit the input RF stage is someimes untuned, and occasionally it is omitted altogether.

The amplified RF signal is coupled to the input of the mixer stage, where it is combined with the output of a local oscillator. The two frequencies beat together in the mixer and generate an IF equal to the difference between the RF signal and the local oscillator frequency.

The frequency of the local oscillator may be either above or below the RF frequency (in practice it is usually above the signal frequency). The IF signal from the mixer is then amplified by several stages of fixed tuned IF amplification, and is coupled to the input of a detector stage, where it is demodulated. Since the circut has plenty of gain, a diode detector is usually used because of its low distortion and excellent audio fidelity. The audio signal from the detector is amplified by one or more stages of audio amplification until it is sufficiently strong to drive a loudspeaker. The loudspeaker converts the audio signal into sound waves corresponding to the original sound of the transmitter.

### NEW SOUTH WALES

During April excellent signals were present on the 15-metre band, in fact, they reminded one of the conditions that prevailed some years ago. As the weeks go by we may experience increased activity on all the frequencies, well, let's hope so, for at least it may revive the interest that is lacking among the VK2 S.W.L.'s.

It is with deep regret that we record the passing of L2201 Barny Smyth. Barney was an ardent worker for the VK2 group, being one of the oldest members, and was always ready to assist with the knowledge that he acquired over the years. To all his relatives we extend our deepest sympathy.

Mac L2074: Thanks for the S.A.S.E. Latest cards to hand PY2 and YO3/MM.

Don L2022 has moved from Albury and now resides on the Blue Mountains.

Sid L2258 is busily studying for the A.O.P.C.

Jerry L2229: How about a word or two from down in the south-west.

Allan L2185: Thanks for compiling that letter. I do hope that it bears fruit.

Ray L2278: During April logged UA's, UB5, UT5 and YO8, and received cards from OH2, KW6, VE7, LU5, VQ8, KG6 and HM. Thanks for your interest in the card swapping section.

### VICTORIA

From reports by VK, SWL's band conditions seem to have been most favourable on 15 and 20 metres, whilst a few openings on the 10-metre band were present on several occasions.

At each general meeting of the group there is a prize being given for the best log book submitted, the first of these prizes was won by G. Armstrong. The group had an inspection of a Melbourne newspaper office and a broadcasting station for early in May. We hope that all members enjoyed this technical visit. The monthly radio construction evening has been producing some interesting receiving sets ranging from expensive commercial types to the simple two-valve regenerative type. One of our female members was noted at one of these evenings with a newly acquired receiver.—Ian L3006.

How many readers of "A.R." are aware that VK3AHF is a famous entertainer who now associates himself with a leading circus, which operates between Melbourne and north Queensland. Bob operates almost daily from a caravan, look for the 30-ft. bamboo mast atop a caravan next time the circus visits your town.—Eric L3042.

Warwick L3211 spent the Easter period at Echuca, where using a dipole at 8 ft. managed to log two new countries, i.e., ZS6BBB/ZS9, and CT2AM. Cards received during April, OKI, MP4, PY2, GC2, KB6, SM5, OE1 and CT1.

Greg. L3139: Cards to hand, OA4 and JA9.

Eric L3042: Latest cards to hand, CR4, DU7, EP2, FO8, K2/JY, PY1, VK4 Willis, VK0, VS9, 4X4, 5B4, 9M4 and YO3/MM. Heard recently, 1.8 Mc., VK5KO, ZL3OX; 3.5 Mc., WA6, KV4; 7 Mc., UI8, G3; 14 Mc., VK9 Norfolk, VK9 NG.

Noel L3101: Heard VQ6, 6YA, JA7, OH4, W4, DO1, ZS8 and BV1, with a QSL from PY2.

Lloyd L3141, whilst at Echuca during the Easter week-end used a 5-ft. vertical and heard 80 countries. Recent cards to hand, PY2, VQ8, OA4, G16 and ZS2.

### QUEENSLAND.

With the cooler weather approaching 20 metres usually folds up, and by July is useless. On the other hand, 3.5 Mc. is coming up fast with the easing of QRN, but no DX other than VK and ZL with an odd W. By June we shall have the W6's in on 3.5 Mc. A very good opening on the 10-metre band was experienced with all and sundry being heard. It was a real old-fashioned opening, no surge, good and clean, like old times. The 21 Mc. band is coming up, but weakens after lunch. Antarctica have been strong on a Sunday afternoon. After three or more years it is pleasing to once again hear VE and KL.—Afton L2136/VK4.

Afton L2136/VK4: Latest QSL's to hand, FO8AG, whilst those heard are VQ8, TG9, UA9, UN7, TI3, CP5, LA7, CR8, KM6, KL7, UL7, VJ8 and JA's.

### SOUTH AUSTRALIA

Although a band condition report is not to hand from VK5, I would say that by the stations heard by L5's, the openings on the 15 and 20 metre were fairly good, whilst a few stations were heard on the 10-metre band also.

Alan L5065: Latest QSL's, KR6, UM8 and WN3.

Tony L5073: Heard recently FK8, CR8, OA4, TI2, JA3, SM3, UE3, YJ8 and W's.

### WESTERN AUSTRALIA

Early in May the bands fluctuated somewhat with Europeans way down on 31 metres whereas they are usually very strong. Around 0300 G.M.T., when 20 metres is quiet, there was a number of W's, with the majority practically on the same frequency calling ZL4JF. During the afternoons 15 metres was good. It is sure strange what can happen when the sun starts playing up.—Peter L6021.

Bryan L6028: Heard recently ZE2, K8, CR7, JA6, W2, W3, K2, WB2, OA4 and YV5.

Allan L6029: Heard YJ8, JA8, JA3, SM4, IS1, YV5 and CR8.

Geoff L6030: Logged recently YA1, 9M4, VQ8, WA4, II, OA4, KH6 and W2.

Peter L6021: Still getting among the DX by hearing JA1, UA0, JA8, 9J2, VQ8, ZE2, UL7, ZE1, CR7, 7Q7 and ZS6. QSL's received, CR9, DM, EP, GW, JA, LA, MP4, OZ, SP, UA2, UF6, UT5 and many others.

### TASMANIA

During the past month 20 metres has been very noisy, and after 2000 hrs. virtually dead, whilst 15 metres showed promise of good openings with JA's and W's being heard around 1600/1700 hrs. Anonymous heterodynes appeared on the 15-metre band, fading from S9 to S2 at irregular intervals, and peaked from a N.N.W. direction from Hobart, no CQ's or contacts were heard.

### GENERAL

QSL cards from VK0GS, 1964 operation in Antarctica should be in circulation by June, whilst VK2AGH has been busy mailing out QSL's for VK4TE, 1964 Willis Island operation.

From WIA-IQ comes news that the 20-metre band has improved considerably, with VK2 and VK3 signals coming in at a very good strength.

Gillies Wylie, 82 Glenpatrick Road, Elderslie, Renfrewshire, Scotland, would like pen friends, who must be keen S.W.L.'s.

Wanted, the QTH of ZD5R by L3211, Warwick Smith, 180 Princess Street, Kew, Victoria, and L5065, Alan Raftery, 22 Princes Street, Croydon, S.A.

For the card swappers, JA8-1412, Hiromitu Chohno, Niwa Kitahiyama-ato, Setana-gun, Hokkaido, Japan; JA1-2845, Isao Numa, 1-281 Setagaya, Setagaya-Ku, Tokyo, Japan; WPE2KOR, George Hall, 18 Miller Street, Saddle Brook, New Jersey, U.S.A.

I would like to thank all the regular contributors for their letters, bits and pieces that are all necessary to make this page possible. Be with you next month, but remember, add courtesy and consideration for other people's rights and everyone will be better off.

### S.W.L. DX LADDER

| | Countries Conf. | Countries Hrd. | Zones Conf. | W States |
|---|---|---|---|---|
| E. Trebilcock .... | 285 | 293 | 40 | 50 |
| P. Drew .... .... | 165 | 258 | 36 | 38 |
| A. Westcott .. .... | 101 | 159 | 34 | 11 |
| M. Hilliard .. | 91 | 241 | 33 | 14 |
| M. Cox .. .... .... | 89 | 225 | 33 | 23 |
| G. Earl .. .... .... | 85 | 164 | 33 | 14 |
| L. James .... .... | 83 | 181 | 32 | 15 |
| R. Kearney .. .... | 79 | 147 | 32 | — |
| W. Smith .... .... | 72 | 180 | 29 | 7 |
| N. Harrison .... | 62 | 181 | 32 | 38 |
| A. Raftery .... | 33 | 154 | 21 | 9 |
| R. Harrison .... | 20 | 70 | 17 | 5 |
| B. Prosser .. .... | 17 | 136 | 8 | 2 |
| B. Mackintosh .. | 15 | 58 | 15 | 3 |
| T. Corbin .. .... | 12 | 34 | 9 | — |

## Westlakes—Hunter Branch

Field Day. Queen's Birthday Week-end. Sunday, 13th June, at the Westlakes Radio Club, Teralba, N.S.W. Right at Teralba Railway Station.

40 and 2 metre Transmitter Hunts for Pedestrians. Competitions. Hot food available at the canteen.

Admission 5/- (to aid Youth Radio Scheme Funds).

## W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

### PHONE

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK5MS | 24 | 316 | VK2ADE | 65 | 231 |
| VK5AB | 45 | 312 | VK2JZ | 61 | 229 |
| VK6RU | 2 | 307 | VK6KW | 4 | 211 |
| VK6MK | 43 | 304 | VK3WL | 14 | 211 |
| VK3AHO | 51 | 300 | VK4HR | 12 | 208 |
| VK4FJ | 21 | 283 | VK3ATN | 26 | 204 |

### C.W.

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK3KB | 10 | 330 | VK2AGH | 71 | 274 |
| VK3CX | 26 | 306 | VK6RU | 18 | 262 |
| VK2QL | 5 | 305 | VK2EO | 2 | 260 |
| VK4FJ | 29 | 300 | VK3AHQ | 79 | 260 |
| VK2ADE | 81 | 298 | VK3ARX | 66 | 250 |
| VK3NC | 19 | 286 | VK3YL | 39 | 240 |

**Amendment:**
VK3RJ 42 228

### OPEN

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK2ADE | 28 | 322 | VK2ACX | 6 | 300 |
| VK6RU | 8 | 312 | VK3NC | 77 | 287 |
| VK4FJ | 32 | 308 | VK3JA | 43 | 271 |
| VK6MK | 74 | 306 | VK4HR | 7 | 254 |
| VK2AGH | 83 | 305 | VK2VN | 18 | 247 |
| VK3AHO | 76 | 304 | VK7LZ | 23 | 242 |

## W.I.A. FEDERAL PRESIDENT'S ANNUAL REPORT, 1964-65

(Continued from Page 15.)

sented by the Treasurer. Although the surplus for the year may appear large, the three certificates outstanding would have very nearly consumed this amount had they been printed as expected. There is a tidy sum in the Trust Fund, and I must thank the Treasurer for his great business acumen in continuing to bolster this with various F.E. trading transactions. It is with regret that I have to announce that the Treasurer can no longer carry on because of his private vocation. I feel the Institute will have lost a great deal by his retirement and I can only thank him for his years of endeavour and it is due to his efforts that the Federal Council is in a healthy position today.

During the year Executive held 12 meetings and attendances were as follows: W. Mitchell 12, M. Hull 12, D. Rankin 9, A. Seedsman 9, J. Lancaster 4, A. Tinkler 3, P. Williams 3, R. Boase 2.

Mr. Peter Williams, VK3IZ, at very short notice, assumed the duties of Federal Secretary due to the early retirement of Mr. Jay Lancaster from ill-health. I thank him sincerely for the easy way he has taken an onerous job in his stride and I personally am very pleased to welcome him to Executive. I am very sorry that Jay has had to retire but his health is paramount, and I know that all Councillors who have had the pleasure of working with him will also join me in wishing him better health in the future and thank him for four years' service in what I consider the most difficult job in the Institute. I cannot let this opportunity pass without expressing my wholehearted thanks to the Vice-president, who helped me through a difficult period when the Secretary was ill. I also wish to thank the remaining members of Executive for their assistance during the year and some of them will again be serving the Institute during the next 12 months.

I wish to conclude this report by thanking all Federal Councillors for their continued support and loyalty during my three years of office. This year has been a quiet one in some respects but from a public relations aspect I feel we have made considerable progress in relationg to bush fire communications and installing a station during the Scout Jamboree. The effect of even these two events will raise the Amateur image in the public eye. Next year will see some new faces on Executive and I wish the new members every success. I trust next year will see the introduction of the Federal Constitution without which I feel the Institute can not make further headway. With a new Federal Constitution and the fruition of some other ideas on improving the Administration, I feel the Institute will progress and attain a status worthy of our long history.

—W. T. S. Mitchell.

## HISTORY OF RADIO

(Continued from Page 13.)

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"The Transistor—Miracle Tool of Electronics": United States Information Service, 1959.
"Transistor Fundamentals and Applications": Radio Corporation of America, 1958.
"Twelve Inventions That Changed the World": United States Information Service, 1960.

### APPENDIX FOUR

### The Process of Modulation

Modulation refers to the process whereby the carrier wave is varied in accordance with the speech or music to be transmitted. There are two ways of modulating a carrier wave; by amplitude modulation and by frequency modulation.

In amplitude modulation the carrier wave consists of a series of waves of constant amplitude. When speech or music is to be transmitted the amplitudes of successive cycles are varied in accordance with the instantaneous value of an audio frequency voltage derived from the sounds by means of a microphone and amplifier.

With frequency modulation the amplitude of the carrier wave remains constant and the frequency varies in accordance with output received from an audio frequency source such as microphone and amplifier.

(The End)

☆

## NEW CALL SIGNS

**FEBRUARY, 1965**

VK2ADI—J. A. Stewart, 10 Gore St., Arncliffe.
VK2BCI—G. Kempton, 44 Robinson St., Kogarah.
VK2BCR—J. K. Ridgway, 7 Massey Place, St. Ives.
VK2BJD/T—B. J. Dwyer, 38 Highgate St., Bexley.
VK2BKM—K. J. Kozlik, 21 Leichhardt St., Leichhardt.
VK2BWP—P. V. Inglis, 13 Knapsack St., Glenbrook.
VK2BWI—W.I.A. N.S.W. Division, V.h.f. and T.v. Group, 14 Atchison St., Crows Nest.
VK2ZJM—J. P. G. Mack, 78 The Crescent, Cheltenham.
VK2ZKL—L. G. Moffatt, 86 Bathurst Rd., Orange.
VK3GL—T. J. Dearn, Block 21, Stanley St., The Basin.
VK3PB—D. J. Kenner, 22 Clarence St., Elsternwick.
VK3AAK—J. F. Westley, Lot 12, Cuthbert St., Heathmont.
VK3ZBH—L. A. Grant, 12 Stott St., Box Hill South.
VK3ZGA—A. D. Swinton, 760 Waverley Rd., Glen Waverley.
VK3ZHI—J. G. Finlay, 84 Carpenter St., Brighton.
VK3ZPT—A. R. Thomas, 47 Elphinstone St., West Footscray.
VK3ZTV—A. G. Lyall, 616 Bell St., Preston.
VK3ZWT—G. A. Wallis, 19 Corby St., North Balwyn.
VK4HI—F. A. Herrmann, 30 Jellicoe St., Toowoomba.
VK4JS—J. A. J. Gravlna, Flat 1, "Dorelle," 13 Dorchester St., Highgate Hill.
VK4ZDP—D. Parker, C/o. 1 Farrington St., Alderley.
VK4ZMC—C. W. McCamley, Main Rd., Maroochydore.
VK4ZNL—N. G. Loury, 61 Prout St., Camp Hill.
VK4ZSP—S. J. Pratt, 83 Chamberlain St., Tarragindi.
VK5GQ—D. G. Quarrington, 11 Lassie Ave., Windsor Gardens.
VK5LO—R. K. Westbrook, 42 Chillingworth Rd., Elizabeth East.
VK5ZEP—J. C. Hilditch, 7 Galloway Rd., Christies Beach.
VK5ZJA—J. A. White, 3 Brookman Court, Blair Athol.
VK5ZMM—M. J. W. Mitchell, Park Drive, Lucindale.
VK5ZSH—S. G. Hill, 19a West St., Brompton.
VK6GO—D. A. Goddland, 175 Weaponess Rd., Wembley Downs.
VK6OB—D. B. O'Brien, 2/744 Beaufort St., Mt. Lawley.
VK6SW—W. Stevens, 134 Hillview Tce., Bentley.
VK7TX—B. M. Muir, 126 Montagu St., New Town.
VK7ZLD—W. G. L. Dowl, 33 Jubilee St., Young Town.
VK7ZUW—R. B. Trollope, 69 Federal St., North Hobart.

# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL

### FEDERAL EXECUTIVE, 1905/66

The following appointments have been made for the Federal Executive for the year 1965/1966:

Federal President: Max Hull, VK3ZS
Federal Vice-President: Harold Hepburn, VK3AFQ
Federal Secretary: Peter Williams, VK3IZ.
Federal Treasurer: Kevin Connolly, VK3ARD.
Fed. Activities Manager: Dave Rankin, VK3QV.
Fed. Business Manager: Alf Seedsman, VK3IE.
Fed. Communications Manager: Bill Mitchell, VK3UM.

The following officers have been co-opted to assist the Federal Executive:

QSL Officer: Ray Jones, VK3RJ.
Awards Officer: Alf Kissick, VK3KB.
Historical Officer: George Glover, VK3AG.
Y.R.S. Officer: Rex Black, VK2YA.
Contests Officer: Jim Rumble, VK6RU.

### ANNUAL SUBSCRIPTIONS TO A.R.R.L.

The A.R.R.L. has announced that as from 1st January, 1965, no further membership subscriptions to the A.R.R.L. will be accepted through news agencies or booksellers in Australia or other countries of the world. Normal subscription rates to QST through booksellers and news agencies will, however, continue to be accepted at a rate of $7.00 per annum. The W.I.A. has concluded an agreement with the A.R.R.L. whereby it will handle any membership subscriptions to the A.R.R.L. (which of course includes their magazine "QST") at a rate of $6.00 per annum, and direct subscriptions for QST at a rate of $7.00 per annum. All existing subscribers in Australia are being circulated and notified of these changes, and elsewhere in this issue details are given. Direct membership subscriptions by money order, bankers' draft and cheque may still be directed to the A.R.R.L. However, it is hoped a large number of subscribers will now find it more convenient to renew either membership subscriptions or QST subscriptions through the W.I.A. All renewals should be addressed to the Federal Business Manager at his home or c/o Box 2611W, G.P.O., Melbourne.

### OFFICIAL W.I.A. NET

At the recent Convention in Melbourne it was agreed to re-open the old W.I.A. net. This network operated for several years very successfully but was dropped when the then Traffic Officer was unable to carry on. The re-opening of the net will be largely dependent on Divisions appointing Traffic Officers in their Division to make contact with H.Q. station, VK3WIA. It is intended that the Federal Communications Manager will be available at the H.Q. end when this net is re-opened.

### SPACE GOALS 1971-1985

The Space Science Board of the National Academy of Sciences in the U.S.A. has announced a concentrated programme for the unmanned exploration of Mars over the next 10 to 15 years from 1970. Judging by the rapid advances made recently in the space programme it is feasible that by 1985 Mars will be "manned" for exploration rather than "unmanned." This being so, one does not exclude the possibility of the inclusion of an Amateur in this space DXpedition—so DXers high up on the Countries List may soon have a near endeavour—W.A.S.P.—Worked All Sun's Planets!

### OZ-CCA 1964 RESULTS

Only two VK's are mentioned in the results of this Danish Contest for 1964.

| | | | | | |
|---|---|---|---|---|---|
| VK2APK | 161 | 486 | 59 | 28,674 pts. | C.w. section |
| VK3TL | 76 | 219 | 49 | 10,731 pts. | C.w. section |

No VK station apparently took part in the Phone section of this contest.

The 1965 Contest took place during the first week-end (C.w.) and third week-end (Ph.) in May, 1965, and the rules arrived too late for publication.

### S.W.L.'s IN NORWAY

A complete list of Norwegian S.W.L.'s with addresses has been received from the N.R.R.L. Any S.W.L.'s in Australia who wish to may obtain information on any address by applying through the official box number.

### I.T.U. FUND

As at 8th May contributions to the fund as a percentage of the target set for each Division at the Sydney Convention, 1963, are as follows:

| | | | |
|---|---|---|---|
| VK2 | 20% | VK5 | 54% |
| VK3 | 50% | VK6 | 100% |
| VK4 | 50% | VK7 | 100% |

These figures do not necessarily represent the amounts received by Divisions but only those forwarded to Federal Executive. Congratulations to VK7 and VK6, the first to fill their quotas. Please continue to send your subscriptions through your Division.

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## FEDERAL QSL BUREAU

V.E.R.O.N., the official Amateur body in the Netherlands, points out that the QSL Bureau address shown in a recent issue of the Callbook is that of a minority group and its use will entail delay or loss of QSL's. They stress that the official QSL address for PA is:

QSL Bureau, V.E.R.O.N., Postbox 400, Rotterdam Netherlands.

The Radio Club Veneuzalano forwards details of a contest to be held 1000 G.M.T., Saturday, July 3, to 2400 G.M.T., Monday, July 5. While it is not specifically stated that the contest is phone only examples of log details seems to indicate that such is the case. Further details can be had from this Bureau.

An interesting homecomer to VK during March/April was Ivan Thomas, VE8NT, now located around Yellowknife, N.W.T. Ivan, who is ex-VK0IT of Macquarie Island, and later at Wilkes, plans to remain in the N.W.T. for a further three years before returning to permanently settle down again in Australia. He married in Sydney during his present visit and his bride has accompanied him back to the N.W.T.

Interesting QSL statistics were revealed in the annual compilation to the end of the W.I.A. year—February, 1965. Cards handled at this Bureau in the period totalled 53,249. Comparative figures are:

| | |
|---|---|
| 1960 | 43,524 |
| 1962 | 47,578 |
| 1962 | 47,573 |
| 1963 | 49,986 |

Peak year was 1947, with 65,469 cards. Each 100 cards represents one hours' labour overall and I do not think the time and motion study cranks could effect any reduction therein.

—Ray Jones, VK3RJ, Manager.

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## NEW SOUTH WALES

### OFFICE-BEARERS FOR 1965

President and Chairman of Council: I. M. Agar (VK2AIM).
Senior Vice-President: W. J. Lewis (VK2YB).
Junior Vice-President: J. C. Young (VK2OY).
Secretary/Treasurer: Mrs. Betty Gerdes (Assoc.).
Registrar and Minute Secretary: W. Johnston (Assoc.).
Hon. Solicitor: W. Clark (Assoc.).
Auditor: H. Isherwood.
Communications Officer: D. Duff (VK2EO).
Education Officer: H. Burtoft (VK2AAH).
Supervisor, Y.R.S.: R. Black (VK2YA).
A.O.C.P. Supervisor: C. E. Bardwell (VK2IR).
Bulletin Editors: G. Sabin (VK2AGS) and W. Johnston (Assoc.).
QSL Officers: S. Molen (VK2SG) and E. Whiting (VK2ACD).
Morse Practice Training: F. Pearson (VK2ACQ).
Disposals Committee: K. Squires (VK2SD), W. Kuhl (Assoc.), S. Kuhl (VK2ZSK).
W.I.C.E.N. Supervisor: V. L. Cole (VK2VL).

### SILENT KEY

It is with deep regret that we record the passing of:

VK2AXH—W. H. Hannam.
VK2APJ—A. Simmonds
L2201—B. Smyth.

O.C., Dural Property: D. Duff (VK2EO), assisted by L. Cartwright (VK2ZJC).
Librarians: Mrs. Hebe Grouse (VK2AOK) and C. De Haan (VK2UE).

### SYDNEY Y.L. GROUP

During March the Sydney Y.L's had a very interesting and instructive visit to the Amalgamated Wireless Valve Factory. As the group is so small the O.M.'s of the C.C.A.R. Club were invited to join us, so we had a group of about 12.

The factory employs about 900 people making everything from T.V. picture tubes to transistors. Our guide was VK2FO.

The visit was part of our regular quarterly meeting and after leaving the factory we adjourned to the shores of Parramatta Lake for a picnic lunch. It was a very pleasant finale and gave us a chance to hear about the activities of Hebe VK2AQK with the South-East Asia net and her contacts with the Australian bases in the Antarctic.

Muriel VK2AIA is probably the best-known Y.L. in Australia and makes many interesting DX contacts. Verle VK2MR is confined to 20 metres. I hear a whisper that she and O.M. VK2CM are going on a personal inspection of Europe next year. Mona VK2AXS has been getting a bit of practice on C.w. lately.

### CENTRAL COAST AMATEUR RADIO CLUB

The annual meeting of the Central Coast Amateur Radio Club was held recently and the following executive was elected for this year:

President: E. Hodgkins, VK2EH.
V.-Presidents: A. Swinton, VK2AAK and F. Adams, VK2ALA.
Secretary: G. Mann, VK2XA.
(All correspondence to be sent to G. Mann, Descombe Road, Wyongah. Phone Wyong 5-1140.)
Treasurer: P. Day.
Publicity: F. Pearson, VK2ACQ and M. Swinton, VK2AXS.
Official Greeter: Gary Tibbett, VK2UX.

Our new prisident has a very long history in the Amateur radio field and held the position of president of the Lakemba Radio Cub for a period of five years during the 1930's. He also served as vice-president and councillor for the Wireless Institute of Australia VK2 Division for a year during this same time. He also donates one night a week to the Slow Morse session, his night being Tuesday, and has become as keen on the subject at Frank Pearson, VK2ACQ, whom everyone knows as the brains behind this valuable service to all Amateurs and those interested in getting their A.O.C.P.

Ernie has lived in the Central Coast district since 1945 and is very well known as a teacher at Gosford and Wyong, and many far-flung parts of our State.

Gary Tibbett is the youngest member of the group, having just turned 16. Already he has chalked up quite a few countries and seems to be a keen C.w. operator.

The week-end before Easter a trip was made to inspect the Overseas Telecommunications Centre at Bringelly. In spite of rather gray skies it proved to be a most enjoyable and interesting trip. Geoff. Warner, VK2CK, was our host for the day, which accounts for everyone having such a good time. Geoff. was indefatigable in his efforts to answer all questions and to see that we inspected all corners of the station. There are 36 rhombics at O.T.C. covering 620 acres of land—not all of it taken up with the aerials but it seemed like it. We saw a lot of beautiful equipment which any Amateur would give his eye-teeth to possess. Bringelly also has an historical background and at one stage of its early years was a resting place for convicts en route to the Blue Mountains. The original homestead is still there and being used as a home. Sixteen people travelled down from Gosford and we wish to express our thanks once again to Geoff.

The Canberra Convention proved a lure for half a dozen Amateurs from the Central Coast Club and from the looks of things, next year will see more attending. The week-end was full of interest and pleasure and the Canberra Club did a magnificent job in arranging such a variety of visits covering the scientific field as well as radio. One of the highlights was the visit to Tidbinbilla Space Tracking Station so recently opened. The antenna is a dish 85 feet in diameter and placed 120 feet in the air but as it was so perfect in its proportions

it was hard to realise its tremendous size. This station is one of six scattered around the world which makes one raise how important Australia is in the development of future space vehicles.

Apart from the radio side of the visit to Canberra, there are many other visits to be made—to the War Memorial, Parliament House, sightseeing in general, etc. All of this makes Canberra an ideal spot for a convention as it caters for the Xyls and harmonics as well as the O.M.'s.

Alec VK2AAK is to have a two-week spell in Gloucester House, beginning April 28, for general repairs. He will have a phone beside his bed and will welcome a ring. —VK2AXS.

### HUNTER BRANCH

Don't some people go to diabolical ends to make fox hunts "different." Well, it seems that way after hearing the talk given by Alyn 6ZDM at the May meeting of the branch. The countenances varied from shocked to wildly amused as Alyn unfolded his story of the Institute activities in VK6. It seems that the organisers of these contests, with whom he was closely allied, went to great lengths to make the finding of the fox a feat like that of discovering the New World. However, Columbuses were found among the residents of "the West" and the radio source was always found, even though many evil tricks were used in the hiding. Imagine, if you can, the workings of the mind of someone who puts on two C.w. transmitters 1000 cycles apart and half a mile apart so that hunters think they are hearing a tone. Apparently sorcery and black magic are illegal in VK6—perhaps just as well!

The president was unable to be at the meeting and guess who stood in for him? He, the pres. that is, said that he had just returned from a long car journey, but by the hat he was wearing, I'd say he was just back from the Canal Zone—blue ribbon and all; However, many of the well-known locals were in attendance. Mac 2XMO had brought along his mascot, Stan 2AYL was playing patience with QSL cards and we were fortunate to have four visitors—Graham Huntriss of NCR, Bill 2ZAJ and two students from the Tech. High Radio Club, Neil Kilgour and Frank Cottrell. While thinking about NCR, I was delighted to receive recently a letter all the way from the U.S.A. from Roy W8LUZ—especially as he said he enjoyed reading "A.R." Ron 2ADA has been visiting Ohio and was staying with W8LUZ when the letter was written. According to Roy, the local boys had been having quite a field day working VK stations and some calls mentioned were 2AAT, 2AVA, 2ADK and 3AC. The only question which I have to ask is, when are Tony and Graham being sent across the pond by the old firm—or is that sub judice (a term I learned at the Federal Convention!).

Have you listened on 160 metres lately? The signals are coming good now that the winter is here and some of the VK3 boys are having a good deal of success with DX. How about some more branch members for this excellent cold weather band? Stan 2AYL has a very good signal, Bill 2ZK is on quite often and Jan 2BJO now has the modulator complete and is testing the transmitter. Of course, 2AWX is a reliable signal on Monday nights and should be even more so now that the half wave folded dipole is in operation. Even Bill 2ZL has the equipment—an AT21—but when he turns it on the street lights go dim, so I am told. Actually, the railway track in the back garden is really a hula hoop antenna —but I'm sure you knew that already.

Two members of the newly formed Y.M.C.A. Radio Club in Maitland, Harry Sinclair and Dick Brownell, visited the Westlakes Club on the Governor-General's holiday and things look like going ahead as far as YRS is concerned. If any of you Maitland chaps feel like giving them a hand, I'm sure they'll appreciate it. A visit has also been promised by Chris 2PZ and his merry men from 2AXC in Cessnock and the Westlakes boys are looking forward to meeting the representatives of that northern city. Just now there is feverish activity in preparation for the Westlakes-Hunter Branch Field Day, which is to be held on Sunday, 13th June, at the club. There will be transmitter hunts and the usual competitions but most of the hunts—and it is hoped there may be eight all told—will be for pedestrians. A short-wave transistor portable makes an excellent DF receiver for 40-metre hunting. If your choice is for two metres then the excellent "sniffer" designed by the v.h.f. group is a must. All the details are available from the group or you will find the circuit in the April Newsletter. Even if you have no equipment, come along and we'll lend you some. Since it is quite likely to be cold, hot food will be available from the canteen and there will be tea and coffee as well as Fanta and the like.

The June meeting on the 4th in Room 8, Clegg Building, at the Tighes Hill Tech., will be a "standing room only" affair I am sure because Keith Jeffcoat 2BK will be there to talk about the "Amateur Band Ten" and a new s.s.b. transceiver. You should not miss this meeting so drag yourselves away from the cosy T.V. set and come along. We'll even arrange for a larger room if it is necessary.

I must give you a riddle to conclude this month's notes. The question is, who is the "baby doll" on two metres? I was told that this station had only 33 contacts in the log, but I'm sure that it has been multiplied many times by now. Have you guessed yet? I'll let you into the secret at the meeting, or the field day, and the subject in question will be there, too. —2AKX

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## VICTORIA

After a long lapse it is hoped to find time each month to compile a few notes to cover VK3 Council and general meetings for the benefit of those who may miss hearing the weekly broadcasts.

May 5th saw a full house for the annual general meeting of the Division. The president's report gave full coverage to all activities for the past 12 months. It will, as usual, be printed and circulated to all members, so it will not be covered here. The treasurer's report shows our finances to be in a healthy condition, and apart from a couple of very minor queries everybody appears satisfied with the position.

Only 10 nominations were received for Council and after some confusion and good natured banter they were declared elected. The 10 include eight of the old Council, namely VK3OR, 3YQ, 3AFJ, 3ACS, 3ZEL, 3ZEO, 3ZIQ and 3ZJF plus our two new members, 3ARV and 3ARZ.

As John 3OR is unable to continue as president, the meeting made a recommendation to Council for the new president, which will upset a certain publicity officer who boasts of how his divisional meetings fill a public phone booth every month.

After closing the annual meeting we moved to the general meeting, which gave us the opportunity of admitting 22 new members, a most satisfying state of affairs. Michael, our Federal Councillor, gave a short (?) report on the Easter Convention. It is expected that F.E. will shortly have a report ready for "A.R."

To round off the evening, Ken 3TL spoke on his recent DX-pedition to Norfolk Island, illustrating his talk with some very fine photographs.

The last meeting of the old council was held on 26th April, with Pierce 2APQ as a visitor. Among the many matters discussed were Sunday broadcasts on s.s.b., the Kinnear Trophy, the use of the room for F.E. meetings, the Federal Convention, provision of equipment for A.O.C.P. classes, the library, and problems confronting the Publications Committee.

It was decided that initially s.s.b. will be used on 80 metres although this may prove a problem to some S.W.L. members who rely on domestic dual wave receivers.

The Kinnear Trophy goes to the Eastern Zone for their outstanding efforts during the recent emergency. The trophy is at present being reconditioned, but will be presented in the near future.

Council agreed that F.E. should use the rooms, both for their meetings and storage of their records. It is felt that a central location will enable them to work more efficiently, especially if we can give them some secretarial assistance.

Now that other teaching organisations have discontinued their A.O.C.P. classes we are getting full enrolments, in fact, have a waiting list. The class instructor is preparing a list of suggested equipment to be acquired for these classes, the list to be considered at the next council meeting.

Certain magazines are in heavy demand and to ease the load duplicate copies of some will be purchased. It would help if those taking magazines and books from the library would return them in the shortest possible time.

### MOORABBIN AND DISTRICT RADIO CLUB

This month I cannot write that this column will contain very little news of the month as I have been assisted in my task with the dobbed in services of Ken ZNJ. The Club's usual monthly meetings were well attended. For interested persons, the Club's monthly general meetings are held the third Friday in each month at the clubhouse, found at the rear of 17 College Grove, Black Rock. On alternate Friday nights a practical evening is held. The practical evening during May consisted of a White Elephant Night. This was very successful both from the members' point of view and of course the treasurer's. A wide variety of "things" passed hands and junior members were to the fore procuring cheapies by the dozen. Old B.C. sets, rich in parts, were purchased and given away. It is hoped that these budding hams will put the parts to good use, and who knows, become the basis of a good communications set. An 80 mx. transmitter hunt was held in May. Lindsay ZNS was in charge of the party to plant the gear. And what a cunning-type possie was chosen. The antenna consisted of a vertical attached to a steel tower approximately 60 feet in height. The tower was in turn attached to some power lines which in turn worked as an excellent radiator. Much to the dismay of the occupiers of a certain tail light alley adjacent to a drive-in theatre, the transmitter was finally hunted down by Colin XV and Peter XK. Last but not least were Ken ACS, Joan (Mrs. ACS) and Harold AFQ. Of course, Joan always accompanies Ken on these hunts—for moral support. The June social evening will be held at the QTH of Harold AFQ, on Saturday, 25th June. At recent socials it has been noticed that a few new faces have been appearing. All members or visitors are welcome and a good time is always assured. Now on to the monthly guff—my XYL, Ruth, a keen listener (you have to be in our household) tells me that Keith AKB is working on a new antenna to replace or repair the damaged beam. Keith is frequently heard on 2 fm from Upper Beaconsfield. Stan ZE is knocking them back by the dozen on sideband and is seen each meeting sporting a fist-full of QSL cards. Don ZGQ is on 2 metres using s.s.b. and my spies tell me that he is at present gaining the superior knowledge of c.w., ready to take the step. Another member of the s.s.b. club is Alf LC, who is frequently heard on 40. The two-metre crew are wondering when they can expect to hear your melodious voice on this band again. Peter ZPC is in the midst of constructing a linear final for the 2 a.m. rig. Merv LL and XYL Val were in town recently and entertained at the home of Ken ACS. Merv. now sports an f.m. rig and it is suggested that anyone with similar gear, switch on near Bairnsdale and you may be rewarded with that rare bit of DX. Merv. has been heard around the city on recent visits. Kevin ARD was noted for his fine opening remarks on Mothers' Day at the commencement of the 3WI weekly broadcast, and to top it all off, it was equally noted that another feminine note was introduced into the haven of men, a YL, SWL, Elizabeth was allowed to read the notes for this section.

We must congratulate Kevin on his recent appointment as a member of the Federal Executive of the WIA. Whilst on the subject of the latter, Ken ACS has been appointed Secretary of the Victorian Division of the WIA. Harold AFQ has been appointed to the Federal Council of the WIA. There is no truth in the rumour that the Moorabbin Club is infiltrating and about to take over the WIA. Harold AFQ, in between times, is working on s.s.b. gear and it is believed that the exciter is producing duck type emission. Lindsay ZNS can vouch that this is true. Bob ZRD has not been heard on 2 a.m. He has, however, been heard consistently on 2 fm, always at the rather late hour on mornings of approximately 0915. I should know because I hear him. One morning recently after Val OT accused him of being late, he informed the Net that his boss was a kind gentleman, and in fact a few days prior to the morning in question, Bob's car broke down and his boss picked him up, at his QTH at some time considerably after the time when they were both supposed to be at work. Looks like someone will have to check up on the boss. Bob has been pretty busy down at the Brighton Scout Hall keeping the Cubs, etc., in order. Off the record, I believe that Harold AFQ is going to sell his bug at the next White Elephant night, key thumping will be a thing of the past when the new rig is bugged. He auctioned three keys at the last White Elephant night, maybe one came from the QTH of Harold—they were on the suspected list. Wally AHZ has been involved in scouting activities with very little time for Amateur Radio. Wally and XYL Shirley entertained club members at their QTH recently when a Social Evening was held at their home. Jack VT was seen at the club's auction, and after everyone departed for their homes and the room locked up, he reappeared at the QTH of Hal ZOO. An eyeball continued and after partaking in the hospitality of ZOO and his coffee pot, the party was finally broken up at 0230 hours. Jack must be making up for lost time on the air—hi. I missed out on this one earlier on in these notes—Ken AFJ was recently elected to the chair of President of the Victorian Division of the WIA. Congratulations Ken, now this should

upset PanSy. David ZOP has been having trouble with his FM rig. Those rosy red plates of his 3/12 really keep the car warm, or is it the heart of Geraldine. I believe the trouble (of the gear) has been overcome and we should now hear the Zoppy call sign again. Incidentally, we must record our thanks to David for presenting the club with the disposal valves and warn the fortunate finder of a 3/12, which was contained in one bag of valves, to be wary of this "goody." Hal ZOO was recently kidnapped and ended up working portable on the May 2-metre scramble. He claims that he was taken for a ride by a couple of scruffy looking individuals, by the names of Ken ZNJ and Darrel ZNC. They deny this. He came along for the ride. And Hal is pleased to announce that he will be making a fresh appearance on 2 a.m. A certain Beaumaris station was heard to mumble under his beard "not before time either." In fact, the club was about to organise a practical evening at the QTH of Hal for the purpose of instruction in the construction of a suitable power supply to work the ZOO 2 a.m. rig. Col XV did the right thing at Easter, painted. Who invented that horrible word. Tom ZIQ up to recently was heard on 2 F.M. with the 0900 gang. Tom has been appointed to Council of the Victorian Division of the WIA, we know Tom will live up to the reputation of the Moorabbin Club. Fred ARK is heard frequently on the 2 F.M. net frequency. Neil ZRT, I have been informed, is a member of the midnight brigade, too late for me. Max DF is in the process of repairing his antenna, it would have been fixed earlier, excepting for a certain wet Sunday. Max is heard frequently mobile. Max did a sterling job at the barbeque held at Ferny Creek during the Federal Convention, providing the portable gas rig to cook the sizzling steaks and snagaroos. Whilst on the subject of Ferny Creek, we must mention that Hal ZOO and XYL Kay were first in when the F.M. caper was held at the picnic, organised by John ZCB. That is all for this month. 73, 3XK.

### SOUTH-WEST ZONE

The zone is very active again with 3HF Harry having regular contacts with VK7IL Bob on King Island. 3WK Bill has returned from a trip to VK2 land having seen VK3ZKL Lindsay Moffatt, who passes on his best 73's to all his old zone mates. Bill also called on VK2AKF John, whom he works regularly. 3AKN Don is always active and passed on a lot of notes to me. We were visited in our area by 3ZER Ron from Ballarat, who had had a holiday at Portland, also 3ZL Eric from Ballarat who spent a holiday recently at Warrnambool with a very nice home-made s.s.b. rig from which he enjoyed a lot of very good QSO's. He was also 3FX's guest whilst here, both Peter and his mother enjoyed their company.

Peter has a new Galaxy s.s.b. rig which is a real flame-thrower, he also has his quads up again. 3EQ Norm also has his quads back up and working. 3JA Jack has returned after a trip to Fiji. 3ANQ Eric has been active at regular times. 3AGD John has regular skeds with 3ARL Lin, of Mitcham. VK3AAW Y.M.C.A. Radio Club is active on 80 metres. 3SE Stan of Ballarat has donated an SCR 522 transceiver to us for which we are extremely grateful.

The zone convention is due any day now so keep your ears to the receiver.

### WESTERN ZONE

News from way out west and beyond. Have not been on zone hook-up for weeks so have not been able to ask for news. The regulars come on 80 at 8 p.m. on Wednesday to keep zone on the air.

Bill 3AKW still enjoying long-service leave. You do not seem old enough for that Bill, but the years roll by don't they? Heard Bill say that he was getting a new Getterarounder. Cannot find that one in my dictionary, but the mobile gear is to be altered to suit the new monster. Bill thought he was going to get all the odd jobs done around the farm during this leave, but he soon gave that idea away.

Lyle 3ASA has been doing some coaching to help some others to get on the air. For relaxation he spends his time sky-diving. We all take our pleasures differently.

Bert 3EF spends a lot of time racing around the countryside to attend meetings but so far has managed to keep Wednesday evenings free.

Roy 3AOS hopes to be on 80 soon. Has been working with John 3AFU on 2mx. fm. John has been active with mobile gear on various frequencies. At the moment is experimenting with 160 mx. whips. Like the rest of the farming and grazing fraternity he would like to see about two inches of rain.

Herb 3NN had some trouble with the gales. 80 mx. dipole and 2 mx. beams were damaged. The main tower is being altered so that it will pivot 25 feet above the ground in order that beams can be repaired more easily. One T.V. tower in the district works on that principle Herb, and it has a 44-gallon drum of water and a bag of oats as a counterweight.

Harry 3ZX has been active on 20 mx. and passed on the news that Chas. will be home from the Gilberts in July.

No sign of George 3ZEA on 2 mx. lately. Heard that George is concentrating on C.w. Good luck, George, sorry that no one is able to offer you any short cuts.

Merv. 3AFO may be shifting Albury. We will miss you if you do Merv.

Oscar III created some activity in the zone. Those most active were Ray 3ATN using some sort of parabolic antenna, Herb 3NN and Garry 3ZOS using a 40 element phased array and Tony 5ZAI using a twin Helix with a 12 ft. x 6 ft. reflector. As an offsider, Tony had the help of Colin 5ZEV who travelled 100 miles every fortnight to help with the tracking. Colin is now on the way to VK9 so we hope to hear from you on 6 mx. Colin. Tony expects to have a remote controlled transmitter running higher power by the time Oscar IV is launched later in the year.

Bill 3ZAX, Graham 5ZOF and Tony are working hard to get 2 mx. mobile gear ready for the convention at Mt. Gambier on Queen's Birthday week-end.

Barry 5YB has moved from Keith.

Rodney 3UG settled down to married life in Sale. He had a flying trip home recently to inspect damage caused by the fire which went through his father's property.

Roy and Bob from South Kaniva, with assistance from XYL's, have done an excellent job on fire network.

Bob 3ARM mainly active on 2 mx. Getting much better results now that the beam is up 45 feet. Will have new h.f. rig with Geloso VFO when the ship comes in (literally that is—have given up hope of the other one).

—VK3ARM.

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## SOUTH AUSTRALIA

"A funny thing happened to me on the way to the forum this morning." I received a letter from Divisional Secretary John, asking if I would fill in for Higginbotham Award winner Pansy Parsons, and do the notes for him for a month, whilst that rotund little man went on a dubiously earned rest. This is too good a chance to miss, and is an opportunity to pick up some threads that he has left dangling, pursue some subjects that he ignores, and possibly for this Division to make friends with VK4, and a certain VK3 type who has kept Pansy on the run for many years.

Just before leaving him alone, and who could ever do just that, it may not be generally known, but Pansy takes himself off at Easter each year to rough it in the country up in the Hills District somewhere where races or some such athletic activities are engaged in, and as a result of being so close to nature, and being fed on the fat of the land, returns to work (what a horrible word) all fattened up and brown, not unlike a well-roasted duck—now talking about ducks . . . No, let's leave that for later.

One year he included almond picking in the itinerary, the final outcome of which provided even more Pansy amusement than he bargained for or would have planned. The whole story is a long and painful one, but if you try and picture this round little figure on the top of a ladder, with arms upstretched to extend his reach with a stock to get the last elusive nut, and the consequent girth reduction such a posture would produce, then figure what happened to his belt-supported Fletcher-Jones and how his feet became "locked" on the ladder top. Just add a most unsympathetic female audience, which included his long-suffering XYL, who is not behind in a sense of humour, and you have a situation where even 5PS was stuck for words, and that is saying something. Have a good time this year Warwick and do please come back with at least a product detector.

Now to business. The Divisional April meeting was held to a slightly lower than normal attendance, who heard an able lecture by Mr. Don Thompson on colour television. Don gave the rundown on the number of sciences involved in development of equipment needed to put colour into the picture. A bit ahead of time for this country, but then isn't VK5 always ahead of things? A most informative talk, to an appreciative audience of a most complex subject.

Other business at the meeting included a brief report on the Federal Convention by Federal Councillor Geoff Taylor, who had some rather pithy comments on the tenure of

office of the State Councillor, and the advantages that would result from a longer term than that now provided by the policy of the VK5 Division. Maybe we will hear more of this in due course, and at the right place, when things can be finally thrashed out, and ample time given to debate. We all look forward to a full report of Convention and the actions that will result from it, particularly in regard to the new Federal body. It has been noted that our president has called for anyone with company law or company secretarial experience to come forward and assist in the sorting out of matters where the new Uniform Companies Act applies. Surely, there are a few members with company experience who have gone through these matters for their own organisations, who can now assist, so don't stand back fellows, come forward, for your assistance will be greatly appreciated.

Then oddly enough the announcement was made that VK5 had won the RD contest, nothing odd about us winning it of course, we have done that before, but to coincide with a VK5 v.h.f. man winning the Ross Hull trophy, gave us the full ticket for the year, no mean feat.

The Divisional Council thanks all those who worked for, and submitted logs for the RD contest, for in spite of any high individual score it is the Division as a whole which contribute to the success and finally the win. The same gentlemen also thank Mick 5ZDR for his effort in personally working for, and bringing the v.h.f. trophy to this State for the second time in a row. It is understood that Mick now has the actual trophy on display at his QTH.

Recently, for those of you who will admit watching the goggle box, you will have seen a series of ads. quoting "Get with the strengths"—well, have you done this? By strength I mean s.s.b., whether it is by h.f. or v.h.f. At the time of writing these notes, and the figures are rising very rapidly, there has been recorded at this QTH 610 active s.b. stations on VK call areas, 67 of which are in VK5, and they represent the most active group on the bands, so if you want to be in it, home station of the first call, or mobile if you do that, then go s.s.b. and join the strength.

The growth of use of this method of phone has been quoted recently by Lindsay 2ON, and needs no further comment here, beyond that it is snowballing into the v.h.f. bands as well.

Some years ago we used to hear about "Ham happy Woodville." But have you heard about "Ham happy Gawler"? Where there are no less than seven active types within a mile of each other, sharing the various bands from 80 through 2 metres, and using gear all as distinct from each other as it is possible to get. Do they get in each other's hair? Of course they do, but they get out of it without having to save stamps, except when competitions are on, then the bands are left to the competing members.

According to the good books, if you want to avoid T.V.I., and get the best out of your rig, the best DX reports, etc., then you must use antennas cut to exact frequency, feed them with a balanced line, or a balun (a la VK2JR) and make sure everything you do leads to an s.w.r. of unity, and of course in the best circles have separate antennas and feed lines for each band.

One of the Gawler boys, none other than Les 5AX, after a frustrated effort to do all these things, and finding that the nearer the s.w.r. got to unity the greater was the T.V.I., finally came to use an antenna of unknown title that consists of a Vee, come dipole, neither horizontal nor vertical, out for 80 metres according to the formula and fed with a 50 ohm line (coaxial) that loads beautifully on 80, 40 and 20, with an s.w.r. of anything above 10 to 1, yet causes no T.V.I., enables him to work DX or local on any of the three bands with as good a report as anyone working at the same time. If anyone can tell Les why it works, then they will be in the big prize category. Of course he is on s.b. so perhaps that is the answer. He is now engaged in the construction of a 20-beam to end all beams, none other than a full-sized semi-wide spaced affair with more DB per ounce than you could poke a stick at.

Another strange antenna graces the sky in Gawler, but this time it is much more scientific, for it is on 2 metres and at the QTH of Col 5ZHJ. Maybe it has a name, Col has probably called it plenty, but is is a vertical cum horizontal cum circular polarised affair, completed with a special harness that enables phasing, stacking, extending, and when finished will be rotatable in both horizontal and vertical planes to keep tab on the moon for bounce experiments. He is going s.b. for the project and his pal 5ZP, who can't read phone, will do the C.w. end of it. Best of luck fellows, for there is a mighty lot of work ahead of them in this job, but they are going about it in the way of leaving nothing to chance, and certainly no guesswork.

Tubby 5NO and Jeff 5ZP, who share a QTH on the hill, continue to make a name for themselves, but mostly contest and DX wise as you mostly know, congratulations to both of them on their recent successes in this regard.

Brian 5ZBR has been a little quieter lately, his mighty v.h.f. arrays just gently floating in the breeze and perhaps waiting for the next Ross Hull contests, or has the Cortina something to do with it? Looks like a mobile on 6 coming up, no excuse Brian.

Kev 5ZGC has been busy housebuilding, and with business recently but we expect to hear more of him before long, whilst the 7th local member, well, the less said about him the better. So much for Gawler.

While I think of it, slow morse, and not so slow morse transmissions for those wanting to learn or brush up on this, are available among others from VK5LG on 3504 Mondays, 1900 to 2000 hurs, and from VK2AWI on 3550 each night of the week including Sundays, 1900 to 2000 hours, and from VK2AWI on 3550 sions, and for those who would like more concentrated practice some very good tapes are available from the secretary for copying at a very small cost.

Visits to this QTH lately have included Dudley 2DQ, that eminent receiver constructor (Deltahet I think he mentioned a few times), who now has that receiver functioning on some of its 200-yard dial, and generally speaking is very satisfied with the many hours he put into its construction. If anyone is trying out the same work Dud. would be pleased to help hammer out any of the snags he met up with, he can be found on the air most nights on 3575 s.s.b., and usually puts in a heavy signal to VK5.

Ron 5KS dropped in the other day for a few minutes to have a look at a few things and was checking up on receiver filters and the like, he is playing with a mechanical filter to improve his already excellent signal and receiver. There is an example of what can be done the hard way, for every bit of gear in the Riverton shack is home-brew, receivers, transmitters, test instruments and so on, and if you have worked him on any of the bands think you will agree that there is not much room for improvement. Ron gives that mode of transmission you have to go the lie to so many critics of s.b. that to go to "Commercial," he has shown that it is not so.

Of course there are others of the gang who have done the same, and among them are, for instance, Reg 5QR, who has constructed from the ground up, an all band, selectable sideband transmitter, a complete mobile transceiver on 7 megs, and just for luck another all-band, all-convenience transmitter that finished up a perfect match for a 32S3. Al. 5MF has an all home constructed station, all band and so on, crystal grinding and all, and if you want to see how it can be done, then their rigs are an example for anyone to follow. Ken 5KC must not be overlooked either,, for he has done his share of this same kind of work, as has Lee 5BH, who sports an excellent transmission from a home-brew rig. Ted 5MO was not happy until he made up an outfit tbat could only be described as an improved HT32, Ron 5MK went about a crystal filter rig and came up with a signal that anyone could be proud of, whilst Phil 5NN scorned all commercial gear and rolled his own, which with a much publicised linear has become a standard for comparison.

Allan 5OH copied a well-known transceiver to excellent result, Chas. 5ON went ahead and produced an outstanding phasing rig, whilst Nobby 5WH has made up so many that it is hard to know what his latest is, but think it to be a crystal filter job by the sound of it.

All of this adds up to the fact that it can be done, and done well, all these fellows have demonstrated that the constructive art is not a lost cause in this State anyway, and is further encouragement to many others that must follow "in the rush to join the strength."

So there you are Pansy let that be a lesson to you, and don't let it ever be said again that you can't read sideband, for if you keep going that way you will "read nothing."

Mobile s.s.b. operation seems to have scooped the pool, too, for at any week-end or holiday the many mobile signals on 40 or 80, and on DX on 20 comprises a good proportion of signals heard. With the recent successful introduction of the mini-whips (helical wound) thus providing a more flexible and easier carried set of aerials, there has been quite an upsurge of mobile work, which, with the added power or resulting (talk) power of s.b., has made even DX whilst mobile a piece of cake. So if you are not already in that gang, don't overlook that extension of your operating activities.

And of course an easy extension to your activities, if you have s.b. on 14 or 28 megs, is to make up the transverter, and there are many designs to follow if you don't want to work it out for yourself and go v.h.f. George 5GD is the latest one heard of who is doing just that, and it is understood a very snappy final is to be included.

Just how economical can you get? Heard the other night that Phil 5NN disposed of

## OBITUARY

### BERNARD (BARNY) SMYTH

The VK2 Division lost a very keen supporter when Barny Smyth passed away suddenly on 27th April, at the age of 51 years.

An Associate member of the Institute, Barny was a member of the S.W.L. group. In recent years he gave considerable assistance to the Disposals Committee and when the official station (VK2WI) was being erected at Dural, he was one of those who erected the antennas.

The Institute was represented at the funeral on 29th April by the Divisional President, who tendered the sympathy of all members to Mrs. Smyth and the family. A floral tribute was also forwarded on behalf of Council and members of the Division.

### WALTER H. HANNAM (VK2AXH)

It is with sincere regret that we record the death of Wal Hannam, VK2AXH, who passed away at his home at Terrigal, N.S.W., on March 15 last. He was one of the best known and most colourful oldtimers of Amateur Radio, both in this country and in New Zealand.

Wal had not enjoyed good health for some time prior to his death, but remained active on the air, and when we last saw him he appeared to be enjoying himself at the Gosford Field Day in February last. However, he suffered a heart attack and passed away just two months short of the 80th anniversary of his birth.

From another old-timer, Joe Reed, VK2JR, we learn that such early experimenters as Wal Hannam, Charlie McClurcan, Jack Pike and others were active around 1908, and on 12th March, 1910, at the instigation of George Taylor, organised themselves into what was then called the Wireless Institute of N.S.W., the forerunner of the present Wireless Institute of Australia.

As many readers have probably heard, Wal Hannam was the first secretary appointed to this organisation. In 1911 he joined Douglas (later Sir Douglas) Mawson's expedition to the Antarctic as a radio operator, the transmitter used being a 2 kw. Telefunken. Messages were transmitted from Mawson to Macquarie Island, where they were relayed to Hobart. On returning from the Antarctic, Wal enlisted in the 1st A.I.F., and served overseas with the Divisional Engineers, again in radio.

His funeral at the Sydney Northern Suburbs Crematorium was well attended by members of the N.S.W. Division, among those present being representatives from Sydney, Central Coast and Hunter Branches, while Council was represented by the President and Vice-president. The sympathy of all members was expressed to the relatives. By a strange coincidence, Wal's funeral took place exactly three years to the day from when he unveiled a plaque at the opening of VK2 Divisional Headquarters at Crow's Nest, a suburb of Sydney.

## SOUTH AUSTRALIA

The S.E. Radio Group will hold a Convention on the Queen's Birthday week-end in June. Registration is to close on May 24th with the Secretary, Box 542, Mount Gambier. Accommodation will be arranged providing a deposit is forwarded. A tent will be erected at the Lake for those who wish to look after themselves. Indications are that quite a large number of VK3 boys will be making the trip, and whilst this information may be a bit beyond the stated registration date, it will act as a reminder and for those not already booked, enable them to make their own arrangements. A really good action-packed and interesting week-end is assured.

one of his dray-load of receivers, and when delivery was taken found that the screen supply for his linear was also gone. So now he has to operate like the rest of us peasants with no linear, or at least until he makes up an alternate supply. What is Phil using for a hearing aid at present? None other than a 1942 job that was dug out of the box, and having a b.f.o. but no control for it, found that his hot breath was enough to vary its frequency across the pass band!! Mr. Larson E. Rapp please note.

Heard Bill 5XB the other day describing his outfit to some glamorous DX call, when he included the antenna as "a horizontal-vertical piece of wire so high." More details of this would be appreciated, for it could even be used as a Funny World subject. Or don't you know what Funny World is Bill? Anyway Kingston has a worthy member in Bill who usually livens up any net he enters.

—Comps 5EF (Pro. 5PS).

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## TASMANIA

Our May general meeting was very well attended with about 40 members and several visitors present. Ted 7EJ gave us a rundown on the Easter Federal Convention which by all accounts was very well organised. Our lecturer was Mr. Max Burn, of D.C.A., who talked on Aircraft Radio Navigational Aids and followed with two excellent films on navigational aids. The subject was very well received by all, and as our worthy president, Tom, said in his "thank you" speech, "One cannot help marvelling at 'Smithy,' his contemporaries, who flew vast unknown areas by the seat of their pants and the grace of God." Watch out, Max, you may be trapped for another go in the not too distant future.

Your VK7 Council this year is the same as last year, as you read last month (that is if you read these notes), and so are the offices they hold. Their jobs were sorted out at the April council meeting, and I am happy to report "no changes." Although President Tom 7AL was issued with an ultimatum—"Get an aerial up or there'll be a no confidence vote"—I think he is going to co-operate—we frightened him!

W.I.C.E.N. is getting under way in VK7 in a big way now, there are about 15 stations mobile on the 6-metre net in the south of the island, mainly in the Hobart area, and the Northern and North-western Zones are getting themselves organised and we hope will soon have their 6-metre mobile rigs in operation. H.Q. Zone has an ex-taxi co. a.c. base station which should be installed in the clubrooms before long, once the conversion is completed.

Now for the winge session, short and to the point this time. Not all the subs. are in yet. If you have paid yours then thank you for your co-operation. If your dues are still outstanding, then what about it, don't you think it is high time you did the right thing?

Associate member Mike Hooper (soon to have his call we hope) has "volunteered" (after some urging from "Rasputin" 7ZZ) as co-ordinator for the Youth Radio Club Scheme. Mike, who works shift work, should be very capable of carrying out this job, and our thanks to you, Mike, for allowing yourself to be talked into this position. We have one High School (Taroona) in the Headquarters Zone, where the science master and some 20 pupils are very keen indeed, and I believe Latrobe High School in the N.W. Zone also will be another station.

The congratulations of VK7 Division go to the VK5 boys for winning the 1964 R.D. Contest. I know it is late but better late than never. It will soon be R.D. time again, so let us make an all-out effort in Tassie this year and see if we can take it next time.

Our clubroom fund has been revived again now that our I.T.U. commitments have been met, and it was very pleasing to see at the May meeting three members (not councillors) offer themselves as a committee. If anybody has any fund-raising ideas let someone know about them. We are about half way to our four-figure targets, so our own building is s-l-o-w-l-y becoming less than just a dream.

—VK7ZAS.

### NORTH-WEST ZONE

Once again another good roll-up of 17 members to our May meeting, and everyone agreed that it was a very interesting evening.

George 7XL was the lecturer, and he gave us some good practical circuits of transistorised converters and power supplies. Not only that, but George had a working model of each, and they both worked fine business. Thanks George. There should be a lot more mobiles about from now on.

Had a letter from our old friend Basil, ex-7BL, at Spirit River. He enclosed his new QSL card in colour, which is supplied gratis by the Canadian Provincial Government. Tasmanians, please note. Basil gets plenty of contacts mainly because of his accent, and works mainly on 40 metres.

David 7MS can be heard quite often with his new s.s.b. transceiver. Ken 7AI has really taken to the air, this time in a plane. Believe he has been flying solo for quite a while. Bob 7ZAA has been confined to bed but should be up and about by the time he reads this.

Nice to see this zone well represented in the R.D. Contest results. I reckon there will be even more starters this year.

John 7JF has settled in at his new home at Gowrie Park and is getting good results with a long wire antenna. Max 7MX is still very active on 80 metres and works ZL regularly.

All the best of DX. 7KH.

## NON-DELIVERY OF "A.R."

If you are not receiving your copy of "A.R." please follow these steps which will ensure the correct procedure is followed; any attempt to short circuit the system will only further delay matters.

**Write to your Divisional Secretary** advising non receipt of "A.R."; do not write to "A.R." The Divisional Secretary should write to the Circulation Manager "A.R.," P.O. Box 36, East Melbourne, C.2, Vic., advising him of the problem. Unless this advice is received before the 8th of the month, a further month must elapse before the member can be re-instated upon the circulation list.

Please ensure that you always advise your Divisional Secretary in writing, verbal advice will not do.

## SUNSPOTS

For those interested, Zurich final analysis of sunspot numbers for 1964 indicated a yearly mean figure of 10.2

During 1964, sunspots of both old and new cycle occurred in the Northern Hemisphere. However, insofar as the Southern Hemisphere is concerned the new cycle is considered not to have started until February, 1965.

The mean number for January, 1965 (Northern Hemisphere) was 18.5 and predictions for the following months for both hemispheres indicated a very slow upward trend to the figure of 20 by July.

For comparison purposes the relative number at the time of maximum sunspot activity is in excess of 200.

—Eric Trebilcock (L3042).



# HAMADS

**Minimum 5/-, for thirty words. Extra words, 2d. each.**

Advertisements under this heading will be accepted only from Amateurs and S.w.l's. The Publishers reserve the right to reject any advertising which, in their opinion, is of a commercial nature. **Copy** must be received at **P.O. Box 36, East Melbourne, C.2, Vic., by 8th of the month** and **remittance should accompany** the advertisement.

**FOR SALE:** Complete Station of VK2BJ, now overseas. "Collins" 75S1, 32S1, S16F2 Power Supply and Speaker, "Astatic" 10 D Mic., with p.t.t. stand, "Vibroplex" auto. key, "Heath" S.w.r. Bridge and "Gonset" Tri-band Beam. All had little use. £600 the lot. Contact VK2HX. Phone 80-4263.

**SWAN** 120 Transceiver, s.s.b, complete with home-brew a.c. power supply. Modified to operate on 80, 40 and 20 metres. Now in current use. £150. Apply VK3ARP, 7 Kyora Parade, North Balwyn, Vic. (Ph. 85-1184.)

**WANTED:** Someone to supply or build compact a.c. bench power supply for MR10 2-metre Car Phone. Circuit supplied. Ring 28-2326 (evenings), Melbourne.

**WANTED:** 2-metre A.M. Transmitter and Receiver, commercial type preferred. Converter suitable for Lafayette may be considered. Tony Swinton (VK3ZGA), 760 Waverley Rd., Glen Waverley, Vic.

**COLLINS** 75S1 and 32S1 for sale. complete s.s.b. station with 240v. power supply. As new condition. £650. VK2BRW, W. Beveridge, 18 Murdoch St., Turramurra, N.S.W. (44-7701).

**FOR SALE:** Communication Receiver Lafayette HE80, 14 tubes, receives a.m., f.m., s.s.b., c.w., continuous and bandspread all Ham bands, including 6 metres. Brand new and unpacked, complete with speaker and transformer, £98. Phone Sydney 44-3181.

**WANTED:** Cowl Gill Motor, suitable for Beam rotation. Also Electronic Keyer. R. Callander, VK3ZZO, 383 Warrigal Rd., Burwood, Vic. (Phone 28-2326.)

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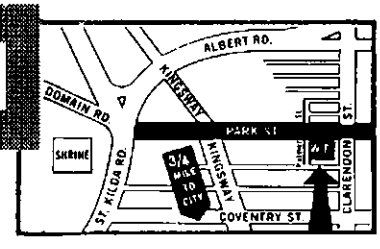


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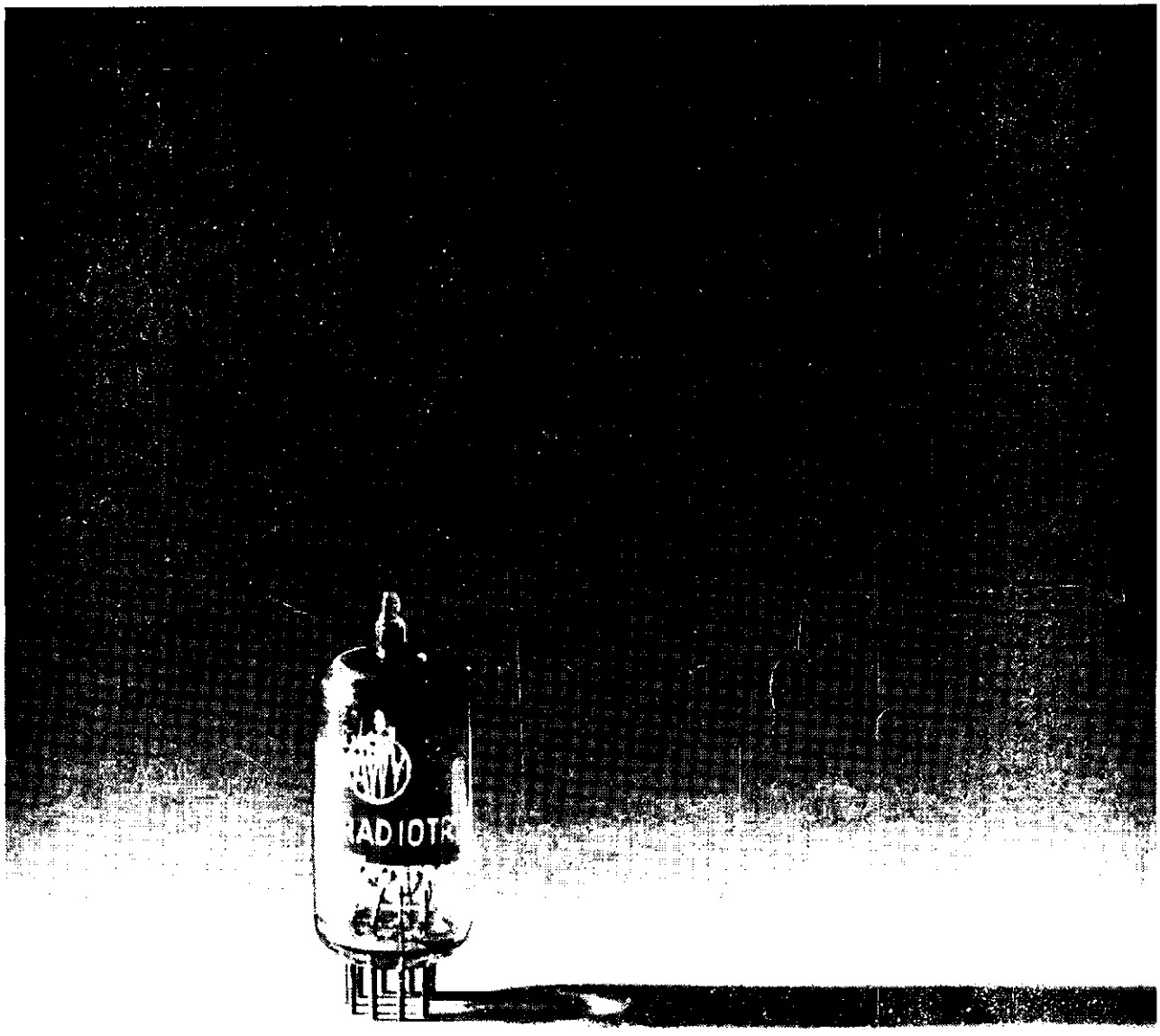

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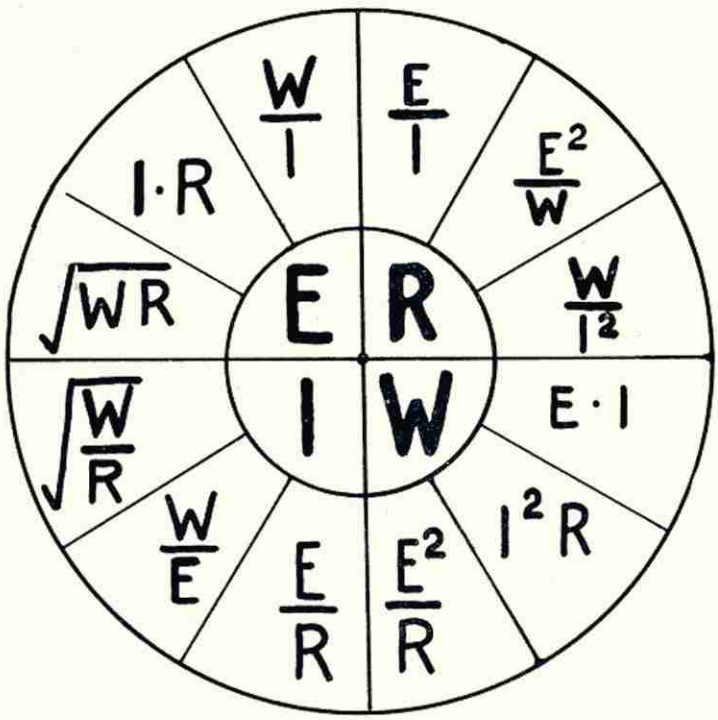
# AMATEUR RADIO

JULY 1965




Vol. 33, No. 7

2/6

Registered at G.P.O., Melbourne, for transmission by post as a periodical

# NEW VALVES AT BARGAIN PRICES

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A3 | 2/0 | 10 a £1 | 2C48 | 15/- | | 6BE6 | 15/- | | 6SF5 | 7/6 | 3 a £1 | 12A6 | 3/- | 7 a £1 | 717A | 7/6 | 3 a £1 | EF39 | 5/- | 5a £1 |
| 1A5 | 5/- | 5 a £1 | 2D21 | 12/- | | 6BQ5 | 17/- | | 6SF7 | 7/6 | 3 a £1 | 12AH7 | 5/- | 5 a £1 | 725A | 20/- | | EF50 | (VR91) | |
| 1C7 | 3/- | 7 a £1 | 2X2 | 5/- | 5 a £1 | 6C4 | 5/- | 5 a £1 | 6SH7 | 4/- | 6 a £1 | 12AT7 | 7/6 | 3 a £1 | 808 | 10/- | | | and socket | 3/6 |
| 1D8 | 7/6 | 3 a £1 | 3A4 | 22/- | | 6C6 | 5/- | 5 a £1 | 6SJ7 | 12/6 | | 12AU7 | 15/- | | 809 | 20/- | | EF70 | 5/- | 5 a £1 |
| 1F5 | 10/- | | 3A5 | 16/- | | 6C8 | 10/- | | 6SK7GT | 20/- | | 12AV6 | 5/6 | 3 a £1 | 830B | 15/- | | EF72 | 5/- | 5 a £1 |
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| 1M5 | 5/- | 5 a £1 | 6AC7 | 7/6 | 3 a £1 | 6J6 | 10/- | | 6X4 | 10/- | | 12SR7 | 5/- | 5 a £1 | 1629 | 5/- | 5 a £1 | RL18 | 7/0 | 3 a £1 |
| 1P5 | 5/- | 5 a £1 | 6AG5 | 5/- | 5 a £1 | 6K7 | 5/- | 5 a £1 | 6X5 | 13/- | | 19 | 5/- | 5 a £1 | 5763 | 28/- | | UL41 | 7/0 | 3 a £1 |
| 1Q5 | 5/- | 5 a £1 | 6AG7 | 12/6 | | 6K8GT | 12/6 | | 7A8 | 2/- | 11 a £1 | 30 | 5/- | 5 a £1 | 6021 | 10/- | | VR53 | 5/- | 5 a £1 |
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| 900 ft. on 5 in. reel (Acetate Base) | 19/6 |
| 930 ft. on 5 in. reel (Mylar Base) | 22/6 |
| 1200 ft. on 5 in. reel (Mylar Base) | 35/- |
| 1800 ft. on 5 in. reel (Tensilised Mylar) | 52/6 |
| 1200 ft. on 5¾ in. reel (Mylar Base) | 35/- |
| 1800 ft. on 5¾ in. reel (Tensilised Mylar) | 52/6 |
| 1200 ft. on 7 in. reel (Acetate Base) | 22/6 |
| 1200 ft. on 7 in. reel (Mylar Base) | 27/6 |
| 1800 ft. on 7 in. reel (Acetate Base) | 35/- |
| 1800 ft. on 7 in. reel (Mylar Base) | 39/6 |
| 2000 ft. on 7 in. reel (Mylar Base) | 42/6 |
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# "AMATEUR RADIO"

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"AMATEUR RADIO,"
P.O. BOX 36,
EAST MELBOURNE, C.2, VIC.

Acknowledgments will be sent following the Committee meeting on the second Monday of each month. All Sub-Editors should forward their articles to reach "A.R." before the 8th of each month. Any item received after the Committee meeting will be held over until the next month. Publication of any item is dependent upon space availability, but in general about two months may elapse before a technical article is published after consideration by the Publications Committee.

★

Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Non members of the W.I.A. should write to the Victorian Division, C/o. P.O. Box 36, East Melbourne. Two months' notice is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must, by P.M.G. regulation, be notified to the P.M.G. in the State of residence, in addition "A.R." should also be notified. A convenient form is provided in the "Call Book".

★

Direct subscription rate is 30/- a year, post paid, in advance. Issued monthly on the first of the month, January edition excepted.

★

## OUR COVER

Featured on the front cover is a chart showing voltage, resistance, current and power formulae.

## FEDERAL COMMENT

★

### RECIPROCAL LICENSING

The April 1965 issue of the R.S.G.B. Bulletin, both on its front cover and on the editorial page, featured with justifiable pride an official statement that the British Government would grant Amateur transmitting facilities to overseas Amateurs whose governments were prepared to enter into reciprocal licensing agreements.

For some years it has been the policy of this Institute to obtain similar concessions for overseas Amateurs coming into Australia no matter what the proposed period of their stay here.

To some extent this end has been achieved in that U.K. Amateurs emigrating to Australia have found the acquisition of a VK licence a simple matter, in many cases the examination requirement being waived.

Certain other nationals, mostly American, visiting tihs country have been granted temporary VK call signs whilst here.

It is pleasing to be able to report that the matter of full reciprocal licensing is now being negotiated between Australia and the United States of America. Such negotiations are, of course, the prerogative of the Foreign Affairs Departments of the two countries and some time may elapse before the agreement is formally ratified.

In the meanwhile we can confidently look forward to the time when we—like our English cousins—can report in "Federal Comment" that the first milestone on our journey towards universal reciprocal licensing has been passed.

Harold L. Hepburn, Federal Vice-President.

## CONTENTS

# THE MONASH MODULATOR

*KEN GREEN,* VK3KG*

I WAS interested to read the article by VK6ZDB in March "A.R." relating his experiences with the transistorised modulator circuit originally published in "Mullard Outlook" and in "A.R." Perhaps VK6ZDB and others concerned with mobile a.m. would like to hear of some modifications which have been made to this circuit with gratifying results.

Three of these modulators have been built, in each case plate-modulating a single 807, for use in rural fire trucks. Because it is advisable to avoid the use of crystal and carbon microphones in this application, these rigs employ a two-inch permag. speaker as a dynamic mike working into two OC71 type transistor stages, the second of which operates as an emitter-follower to provide a fairly good match into the 50 ohm primary of the A. & R. driving transformer. The early material published on this circuit emphasised the danger of allowing the output transistors to work into an open-circuit load. The possibility of this occurring on modulation peaks was prevented by the addition of a 22 volt 1 watt zener diode as a clamp between each output collector and the earthed 12 volt positive supply line.

Probably Lady Luck has smiled in our direction, for VK6ZDB's trouble of transistor converter hash invading low level audio stages has never raised its ugly head. The power supplies in these mobile fire brigade units are in seperate metal cases, and are sufficiently filtered to suppress the 800 cycle transistor switching frequency and the 1600 cycle ripple in output from the rectifiers.

Round about the time when I decided that the speech quality in these units was a bit harsh, and the audio stages were inclining towards a delightful state of intermittent instability (noticed particularly when the adjacent 807 was producing r.f.), a handsome offer was made by Mr. Richard Kellett, the Bod-in-charge of the Electronics Lab. in the Dept. of Physiology at Monash University, to "bring it over and see what it was doing". With £2200 worth of double beam c.r.o. fitted with differential amplifiers on each beam chain, the input terminals on one set of vertical deflection amplifiers were connected across a 40 watt 7000 ohm resistor as modulation transformer secondary load, so that the displayed pattern showed at once the effect of any change in circuit constants or operating conditions. The other beam was used to monitor the signal waveform at various points between the microphone input terminals and the collectors of the output transistors.

A drop in distortion was noticed as soon as the collectors of the first two stages were operated from a 9 volt zener supply, this providing a better degree of isolation between stages than any CR de-coupling combination. However, the modification that really registered an outstanding improvement in stability, and giving a lift in overall gain at the same time, was the removal of the resistor and bypass capacitor from the emitter lead of the emitter-follower Q2, and the substitution of a 5.8 volt zener to fix the d.c. emitter potential. The extra gain permitted the removal of the emitter bypass capacitor in the input stage, the added negative feedback resulting in a further small improvement in performance. The 1200 ohm resistor feeds a small current from the 12 volt negative supply rail to the 5.8 volt zener to ensure that the latter is operating well into the zener region, and not popping in and out of stabilisation around the knee of the curve on vioce peaks. Hooray for that c.r.o.!

The final change in the circuit was the addition of a few ohms in series with one of the 47 ohm collector resistors to bring the two OC74 collectors to exactly the same potential in the no-signal condition. This d.c. balancing would be familiar to anyone who has built a Williamson amplifier. This added resistance in one leg is obviously cut-and-try for each set of transistors; the biggest added value I have ever used is 4 ohms.

As a trial measure, next the OC74 bias current was increased temporarily to bring the output transistors into the Class AB operating region, but as the increased temperature in the output-transistor heat sinks was not accompanied by any remarkable performance improvement, the bottom leg of the base voltage divider was changed back to the 10 ohms shown in the circuit diagram. After cycling the 12 volt supply between 9 and 16 volts, with no ill effects, the job was considered complete, and "on-the-air" the received speech quality now compares favourably with other similar mobile rigs using valve modulators.

The frequency response is flat from 150 cycles to almost 7 Kc., this figure almost certainly being slightly degraded by the use of this particular type of speaker-mike.

With the power supply set to 12.4 volts the output audio across the 7000 ohm load goes to 800 volts peak-to-peak with slightly more than normal speaking level, with the 22 volt zeners starting to clip just below this figure. (With an audio oscillator as signal source the peak-to-peak output was run up above 1100 volts without damaging anything. Naturally a sustained input signal from an oscillator produces much more heat in the sinks than the rise and fall of speech from a mike.) The distortion level with sine wave input appears to be in the vicinity of 6% or 7%.

In closing I must acknowledge a debt of gratitude. Again, many thanks, Dick, for your interest and participation in this project, especially in view of the fact that you gave freely two half days of your holiday to open up the University Lab. ●

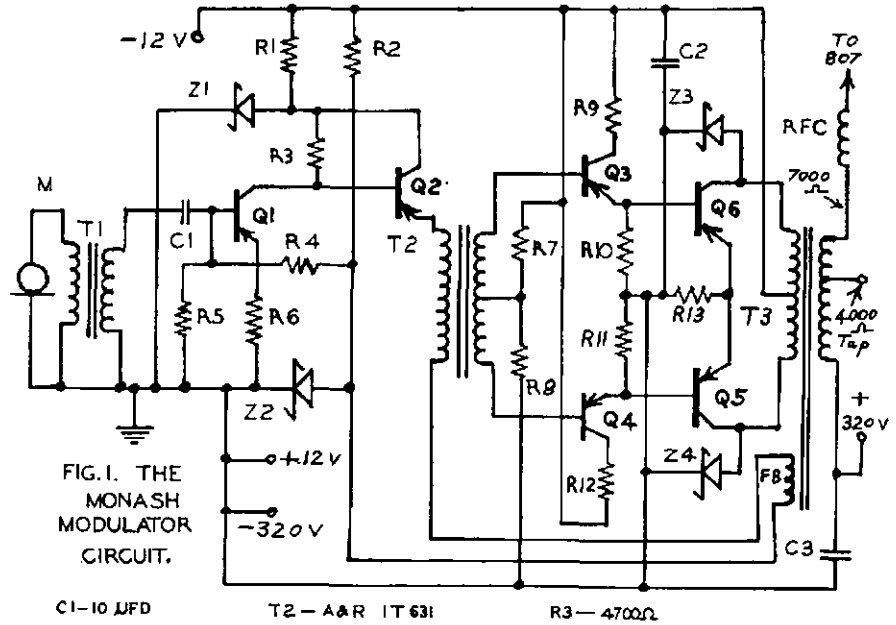



FIG. 1. THE MONASH MODULATOR CIRCUIT.

C1—10 μFD
C2—2000 μFD 18 V
C3—24 μFD 500 V

Z1— 9V 1W ZENER IZ9T10
Z2 — 5·8V 1W ZENER IZ6T10
Z3—Z4 — 22V 1W ZENER IZ22T10

M—2" PERMAG 3·5Ω
T1—A&R T03 OR ROLA LTR10

T2—A&R IT631
T3—A&R MT26
Q1—Q2—OC71
Q3—Q4—OC74
Q5—Q6—AT1138A

R1—150Ω
R2—R5—1200Ω
R3—4700Ω
R4—22 KΩ
R6—470Ω
R7—330Ω
R8—10Ω
R9—R12—47Ω
R10—R11—220Ω
R13—0·4Ω 10 AMP.

* Communications Officer, Diamond Creek Fire Brigade, Vic.

# JUNKBOX 2 METRE COMMUNICATOR

*W. E. J. ROPER,* VK3ARZ*

THE small mobile portable rig to be described in this article makes no pretence to be the ultimate in v.h.f. emergency equipment. But it may provide an answer for those Amateurs who have always wanted to operate mobile or portable on the v.h.f. bands, but have considered that the high cost of power supply components and maybe the small 6 volt battery in the family car are difficult obstacles to overcome.

This unit operates from a standard 200 volt 60 mA. vibrator supply and, despite the 15 tubes, consumes no more than 5.5 amps. from a 6 volt battery, therefore enabling several hours of operation from a stationary portable location.

Controlled carrier modulation is used and the input to the final on voice peaks is 4.5 watts. If a 250 volt supply is used the input could be up to 6.5 watts on voice peaks without exceeding the 60 mA. rating of the supply. This power may seem to be low but under reasonable conditions, several S9 reports have been received over distances of 100 to 200 miles when operating portable in conjunction with a four element beam. Under mobile conditions using a halo-antenna, many good reports have been received up to 20 miles and from high spots, up to 50 miles.

The transmitter, which is the main subject of this article, was designed to work in conjunction with an SCR522 receiver. It actually fits inside the receiver in the space from where the squelch and audio components have been removed and makes a compact rig which can easily be mounted in all but the smallest cars.

The transmitter would be a good companion to the common 2-metre converter-car radio combination, with the power borrowed from the car radio supply.

The SCR522 receiver is far from optimum as a receiver, but—beggars cannot be choosers. In practice the sensitivity is adequate, but the selectivity is rather poor.

The transmitter and modulator are built up on a standard, commercially available 6 in. x 4 in. x 2 in. aluminium chassis. The r.f. lineup is quite standard except that the 5763 is not the most efficient tube that may be used in the final. It was used because a couple of spares from the home transmitter were available.

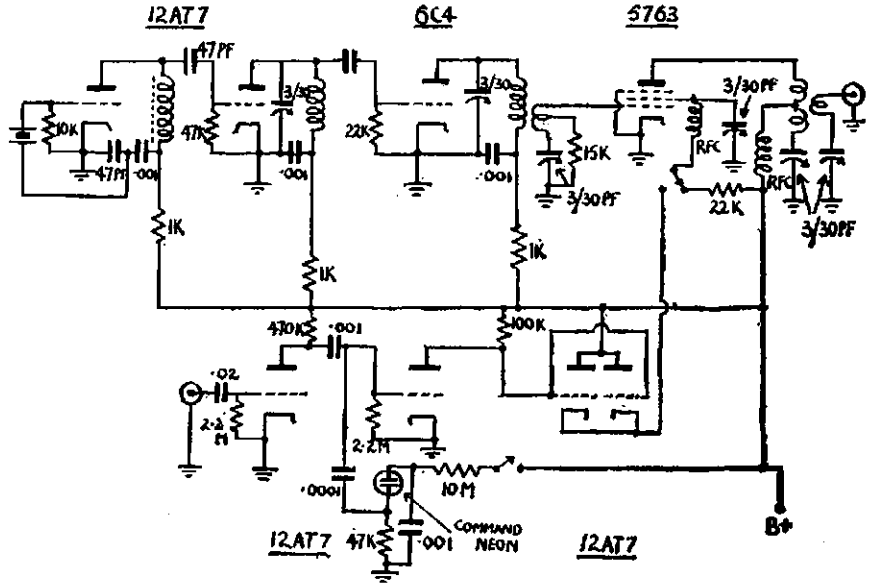
A 12AT7 is employed in a conventional overtone oscillator circuit to obtain 24 Mc. output from an 8 Mc. crystal, and triples to 72 Mc. in the second section of the tube. Coil dimensions are given in the table and the 3-30 pF. concentric trimmers used in several of the tuned circuits are mounted above the chassis to enable ease of tuning when the transmitter is mounted in the SCR522 receiver, and also to prevent crowding of components under the chassis.

* Lot 59, Orchard St., Mt. Waverley, Vic.

The next stage is a 6C4 doubler to 144 Mc. This tube was chosen because of its low filament current drain of 150 mA. and should provide 1 mA. of grid drive to the final, although the 5763 was found to work quite satisfactorily with as little as 500 microamp. drive. If difficulty is found in providing sufficient drive, a 12AT7 may be used with both sections tied in parallel at the expense of several milliamps. of h.t. and 150 mA. of 6 volts.

The 5763 final is mounted with the socket suspended sufficiently far below the chassis so that the top of the tube projects no higher than the other tubes.

Series tuning of both grid and plate circuits is used, and the plate tank circuit may be mounted either on top of the chassis or below, whichever is most convenient for tuning purposes.




The 5763 needs neutralising in either case, and this is quite simply accomplished with the screen grid method indicated in the circuit diagram.

The antenna coupling link is closely coupled to the centre of the final tank and is tuned with a series 3-30 pF. trimmer.

The secret of the modulation system to be described, like all efficiency types of modulation, is that the final be loaded as heavily as possible.

The modulator circuit is straight forward and is about as simple as you can get. No special precautions need be taken with the construction. A miniature transistor radio earphone plug and jack are used as microphone connectors for the crystal microphone which is a disposals insert mounted in a small adhesive-tape tin. Crystal microphones are not optimum for mobile operation for obvious reasons, but one has been in use here for some considerable time without any trouble. They certainly provide the most output and quality for the cheapest price.

A gain control was considered unnecessary and the quality of modulation is governed by the distance of the mike from the mouth.

The r.f. section of the transmitter is tuned up with the tuneup switch SI in the position that places screen voltage on the 5763 through the normal screen dropping resistor. The screen voltage will be about 150 volts. When tuning is completed, SI is put to the modulation position, and the screen voltage should drop to about 50 volts, and the input to the final will also drop to almost half. By talking into the microphone it will be noticed that the input to the final, and the screen voltage, will kick up to about the original values on voice peaks. The value of R1 determines the standing input without speech and some experiment with its value may be worthwhile. Optimum results here were obtained with the 100K indicated in the circuit diagram, but this could be increased to 500K. It will soon be found that after about 90% modulation is reached, speaking louder into the microphone will not increase the level of modulation but will tend to clip or distort on voice peaks.

The tone oscillator is a simple but effective unit based around a neon diode salvaged from a "Command." Operation is controlled by a microswitch which is mounted in such a position that it can be keyed for m.c.w. if necessary.

I will not attempt to fully detail the modifications made to the SCR522 receiver because there are many excellent articles available on various conversions of this unit. The tuning was band spread by pulling out all the plates in the tuning condensers except

one rotor and two double spaced stators in each section and new coils were installed. Single control tuning was obtained by ganging the two condenser shapes together with some dial cord and a spring, and a vernier drive was mounted on the oscillator condenser shaft.

The i.f. stages are standard except that 6SS7's are used because of their low filament current consumption of 150 mA. each, and the second stage had controlled regeneration added to help with selectivity. A 6H6 is used as a combination diode detector, simple a.v.c. rectifier and series noise limiter, a 6SS7 as a pentode audio amplifier driving a 6AM5 in the output. This excellent tube delivers sufficient output and consumes only 19 mA. of h.t. and 200 mA. of filament current at 6 volts.

A small 5 in. speaker was mounted behind the front panel, a disposals meter and shunts added to measure battery volts, h.t. voltage, and final plate current, and the front panel was dressed up with some scrap expanded aluminium, some vynex and indicator labels.

A separate switch is used to control the filament voltage to the transmitter, so that when using the receiver section only, such as in fox hunts, there is no unnecessary drain from the battery. A standard wafer switch is used as a T/R switch, and in the transmit position, h.t. voltage is left on the receiver oscillator to minimise drift. Also, in a third position, the transmitter oscillator only is switched on to allow checking of frequency in relation to other signals on the band.

The antennas are fed with 72 ohm co-axial available cheaply through disposals.

This outfit is also quite adequate for low power home station use and at this location runs entirely from the home station converter power supply.

It can be seen that there is ample scope for variation to this transmitter. For 6 metre operation the 6C4 would be omitted and the 5763, which is more efficient at this frequency can then be run at higher input.

If 100 to 150 mA. is available from the power supply, a QQE03/12 may be used in the final with inputs up to 18 watts on voice peaks.

**COIL DATA**

12AT7 Plate, 24 meg.: 20 turns 20 s.w.g. enamel on ⅜" dia. slug tuned former.

12AT7 Plate, 72 meg.: 4 turns 20 s.w.g. enamel on ½" dia. spaced twice wire diameter.

6C4 Plate: 2 turns 20 s.w.g. enamel on ½" dia. spaced twice wire diameter.

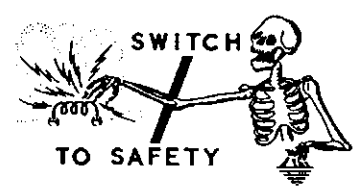
5763 Grid: 4 turns 20 s.w.g. enamel on ½" dia. spaced twice wire diameter. Centre tapped.

5763 Plate: 4 turns 14 s.w.g. enamel ¾" dia. spaced wire diameter.

Antenna Coupling: 2 turns insulated wire interwound at centre of P.A. tank coil.

The keen experimenter should have no difficulty in building up a tuneable i.f. channel and crystal locked converter on a similar sized chassis to the transmitter to make a very compact but efficient station. ●



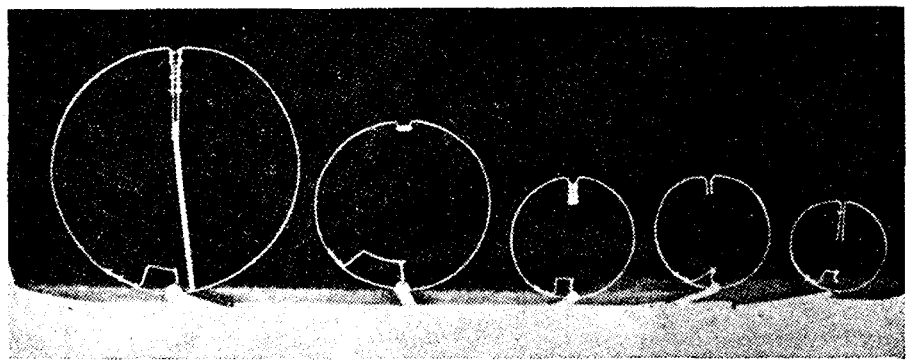


# MINI-HALO AERIALS FOR MOBILE*

## ON TWO AND FOUR METRES—DESIGN, CONSTRUCTION AND ADJUSTMENT

*E. POSTANS, G4AC*

WHAT the writer considers to be a highly effective, inexpensive, easy-to-build (though perhaps a trifle tricky to adjust) lightweight aerial, producing an almost completely circular horizontally polarised pattern for 2-metre mobile operation (similarly four metres when appropriately scaled to that band) is described in this article. Because the majority of fixed stations (possibly /M, too) operate horizontal polarisation on v.h.f, that plane was chosen. After making up and testing a number of /M aerials, final choice for two metres fell to an 8-inch halo, for the reasons now discussed.



Mini-Halo aerials for mobile, as evolved by G4AC, ranging from 6 inches to 12 inches in diameter for two metres, and 18 inches for four metres. These aerials were designed and constructed for the tests discussed in his article.

Types constructed and tried included 12-inch standard halo, handlebar, semi-swastika and turnstile types. All radiated reasonably well, but each produced a horizontal pattern containing nulls of varying severity, to which was largely attributed the well-known irritating, troublesome "whoof whoof whoof" type flutter (as distinct from local change screening effects) on signals received in and from a moving vehicle.

On the assumption that these highly undesirable shortcomings were mainly due to uneven distribution of current over the radiating section of the aerial, concentration was centred upon the halo, which readily lent itself to miniaturisation. Several were made up, including models having diameters of 12, 8½, 8 and 6 inches for 2 metres, and one of 18 in. for 4 metres.

In each case resonance was achieved by means of a solid dielectric capacity loading section, with built-in trimmer, accommodated within the circular radiator (see photographs), its otherwise open ends being continued diametrically within its circumference, as shown. In this way current distribution over the shortened radiating length was made less uneven, reducing with decreasing diameter. But where would the optimum fall?

In the belief that no aerial can radiate better than almost equally in all directions without forfeit of some other quality, it seemed that a maximum average radiation intensity through 360 degrees, consistent with minimum null levels, might well become an acceptable guide to final choice for the diameter.

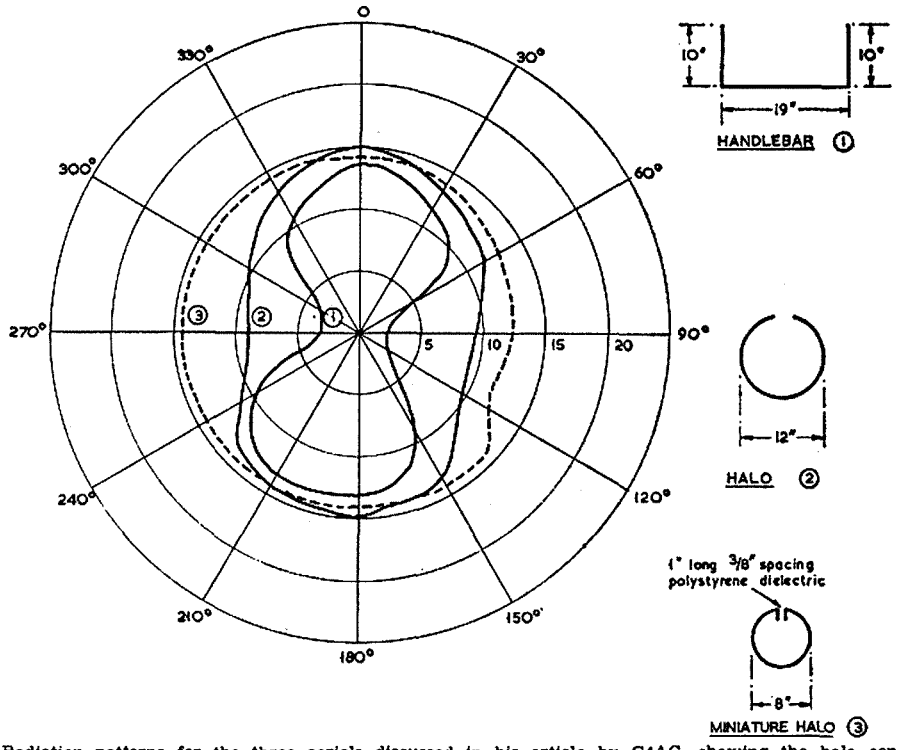
Subsequent testing of these aerials, fixed and mobile, over the 20 odd miles between G4AC, Woodbridge, and G3FIJ, Colchester, tended to support this view; the optimum diameter proving to be around 8 inches. The 6- and 12-inch types produced about equal carrier levels at the receiver, but, whereas the 12-inch displayed two relatively deep nulls, the 6-inch and 8-inch produced but one insignificant null. In every case the s.w.r. was approximately 1.1 to 1.

Since the autumn of 1953, when these anti-flutter-cum-non-directional experiments commenced, very many /M-to-fixed station and vice versa tests have been conducted between G3FIJ and G4AC, to establish the facts.

No measurements have been made of signal strengths received /M via the Mini-Halo. In practice, however, its performance appeared at least comparable with its efficiency as a radiator. For example: Turning the aerial through 360 degrees produced no noticeable change in received signal level, and, under mobile conditions, flutter was almost invariably non-existent. This was also the case on the receiving side.

### WEATHER EFFECT

Therefore, what the writer had set out to accomplish seemed, in the main, to have been achieved. But there was



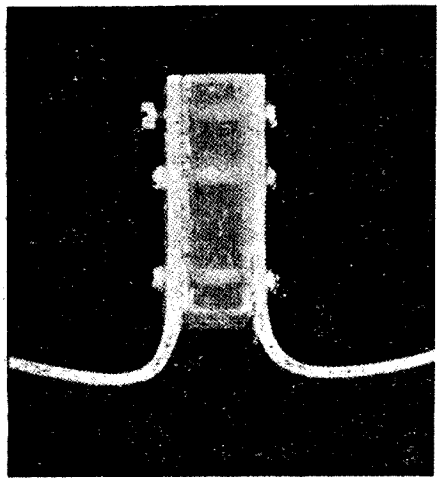

Radiation patterns for the three aerials discussed in his article by G4AC, showing the halo configuration appropriate to each pattern. These are for the two-metre halo's, at a frequency of 144.2 Mc., with an s.w.r. of 1.1:1 exhibited. The gamma matching feeds are 4 in. long wtih a 4.7 $\mu\mu$F series condenser. G4AC claims much improved performance when using these shapes under mobile conditions.

* Reprinted from "The Short Wave Magazine," January, 1965.

one failing. In wet weather moisture across the capacity loading section caused an off-resonance condition and greatly impaired performance — reminiscent of 300-ohm ribbon feeder days!

However, this was eventually eradicated completely by modification of the loading section.

First, each of the two arms were remade to symmetrically opposite shape contained within the circumference of the halo. The substantially increased length was not easily accommodated and, in spite of nigh perfect resonance and almost 1-to-1 s.w.r., the result was an adverse effect upon the aerial's hitherto non-directional horizontal pattern.



Close-up of the solid-dielectric capacity loading section, atcual size, on an 8-inch diameter Mini-Halo for two metres, as designed by G4AC.

Further, whilst water mist sprayed on the loading section produced less deterioration than in the case of the solid dielectric type, the s.w.r. was degraded to an unacceptable level. And so, with some progress in one direction, failing was suffered in another.

To meet this problem, a new 8-inch diameter radiator was made up with spacing between its loading section arms increased to $1\frac{3}{8}$ inches. To each arm was attached a 3-inch diameter capacity disc, capable of being moved along each arm to provide an easy method of resonating.

This time the moisture test showed no adverse effect on s.w.r., which remained at around 1.1 to 1. The next question was the all-round performance.

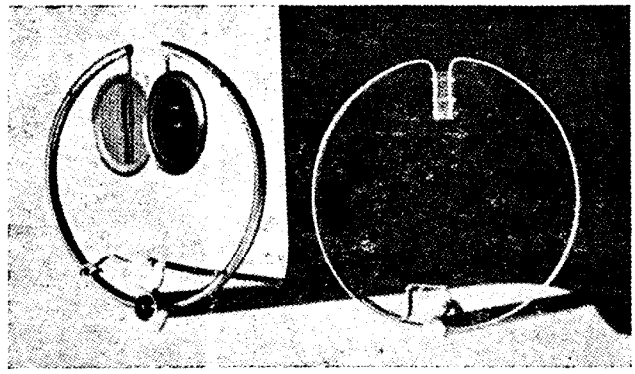
It was air-tested under mobile conditions between Woodbridge and Colchester, and at the same time and place the other halo types were re-tested. At the receiver of G3FIJ this disc-capacity type produced maximum carrier level and an omni-directional effect precisely similar to the results obtained with the best of all types so far tested.

Next, the 18-inch solid dielectric halo for 4 metres was made up and similarly tested, with the same highly satisfactory results.

Regularly for many months the 8-inch solid dielectric type has been operated by G3FIJ and G4AC, both using 6J6 p.a. Tx's and 6AK5 r.f. Rx's, with extremely satisfactory—and indeed, occasionally—extraordinary good results.

G3LQR has also contributed with helpful reports from time to time. One QSO worthy of note was an absolutely solid cross-band duplex Phone contact, with G4AC/M on two metres and G3LQR on 4 metres over a range 26-28 miles, reducing to 18 miles or so at the QTH of G4AC, including passage through forest, riverside roads and narrow streets in built-up areas. The r.f. output at G4AC/M was approximately $1\frac{1}{2}$ watts to aerial, the arrangement shown in the photographs.

Mini-Halo's of 8-inch diameter to the G4AC design showing solid and air dielectric capacity loading (left). These aerials are for two-metre mobile.



## CONSTRUCTION

The photographs should be self-explanatory. However, designs of this nature involve so many inherent variables, which are almost certain to differ aerial-to-aerial, that, in the writer's view, it is not possible to provide completely reliable measurements. For example: The radiator can be (and probably will be) 8 inches diameter more or less. Consequently, the loading section, which is generously accommodating, will be varied accordingly. G4AC's version is $1\frac{1}{2}$ inches in length and G3FIJ's is one inch. Similarly, if the junk-box contains a couple of discs a bit less than 3 inches in diameter, by all means use them and adjust spacing accordingly.

Nevertheless, a few notes may be helpful. For easy reference the three main aerials are numbered: 1—Solid dielectric type for two metres; 2—Disc type for two metres; and 3—Solid dielectric type for four metres. These are given in the Appendix.

## ADJUSTMENT

Having made the solid-dielectric type loading section arms, say, a half inch longer than expected to be necessary, and a gamma match to radiator that can be easily varied, then with the feeder attached and an s.w.r. indicator in circuit, gradually reduce the length of the loading section. As resonance is approached adjustment will become more critical and sensitive as s.w.r. falls. Final adjustment and trimming of the loading section and gamma match will be found to be inter-dependent, and eventually a very low s.w.r. can be secured. Once gained, resonance should be positive and easily maintained—except in wet weather, as already described.

Bringing the disc type to resonance is on the same lines.

If provision can be made for one of the discs to be rotatable on a slightly off-centre single-bolt fixing, a useful trimmer results.

For anyone wishing for the quickest, simplest possible approach to this design—but not by any means the best—arms (flat dural) as already described, merely create the capacity section then drill and tap one arm as close as possible to the rim gap. Accurately opposite this hole drill another in the other arm of a size to accommodate an end plug from a BIC ball-point pen casing (!). Centrally through this drill a clearance hole (6BA). Insert a 6BA bolt, screw it into the opposite arm and thus one has a widely variable capacity loading section—which, once having been brought to resonance, is very easily kept on the nose. But this arrangement will not tolerate more than a watt or two of r.f. input.

## APPENDIX

**Dimensions for 2-m. and 4-m. Mini-Halo**

| | (1) | (2) | (3) |
|---|---|---|---|
| Radiator diameter | 8 | 8 | 18 |
| Radiator material | $\frac{3}{8}$* | $\frac{3}{8}$ | $\frac{3}{8}$* |
| Capacity-disc diameter | — | 3 | — |
| Total length, capacity-section arms | 2 | 4 | $3\frac{1}{4}$ |
| Capacity-section, dielectric length | $1\frac{1}{2}$ | — | 2** |
| Capacity-section, arm diameter | * | 3/16 | * |
| Gamma match, centre mast to radiator connection | $1\frac{1}{4}$ | 3 | $2\frac{1}{2}$ |
| Feed point connection | $1\frac{1}{4}$ | $1\frac{1}{2}$ | $1\frac{3}{4}$ |

Notes: All dimensions in inches. Aerial (1) is for 2 m., solid dielectric; (2) is for 2 m. with disc resonator; (3) is for 4 m. with solid dielectric. Where marked * use $\frac{3}{8}$ inch flat dural curtain valance rail. ** this is continued out 5 in. to provide anchorage for stabilising bracket. Feed impedance in each case is 75 ohms.

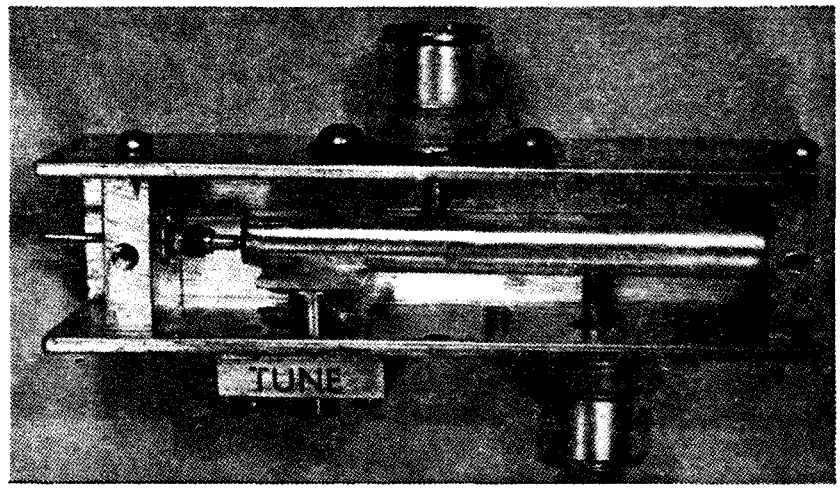
## TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

# TUNNEL DIODE AMPLIFIERS*

## With a practical design for a Parallel Amplifier on 70 cm

*SVEN F. WEBER, B.Mus., L.R.A.M., G6SFW'T, G8ACC*




TUNNEL diodes have been available at a reasonable price for some years. They have been talked about for even longer, but the fact remains that the average Amateur has very little idea of the potentiality of these most extraordinary products of semi-conductor research; and this in spite of the fact that tunnel diode circuits are almost ridiculously simple (at least on paper) and that results are very easy to achieve.

One of the factors which has the largest effect on semi-conductor action is impurity content. By and large, if the impurity content in the semi-conductors forming a junction diode is reduced, the reverse voltage capability of the diode is increased. Equally, if the impurity content is increased, the reverse voltage possible is reduced. So far so good—and taken for granted by most Amateurs. If, however, the impurity content is made sufficiently high, around $2 \times 10^{19}$ atoms per cc in Germanium, the reverse breakdown voltage is reduced to zero and the diode becomes almost an ordinary conductor in the reverse direction. This degree of "doping" is said to make the semi-conductor "degenerate."

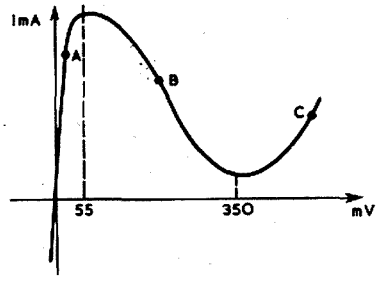



Fig. 1. Plotting current against applied voltage to a tunnel diode.

The fact that the reverse breakdown voltage drops to zero is not by any means all that happens. If degenerate p and n semi-conductor materials are brought together under very carefully controlled manufacturing conditions to make an extremely abrupt junction, of the order of 150 A in thickness, the forward characteristic is also affected. Drawing a graph of current against voltage, one obtains a curve similar to Fig. 1. Starting from zero volts across the diode, the current at first increases more or less linearly in the forward direction. At about 55 mV though, the current levels off and then starts to decrease until at 350 mV (for Germanium) it reaches a minimum and again starts to climb—more as one would have expected from a semi-conductor diode.

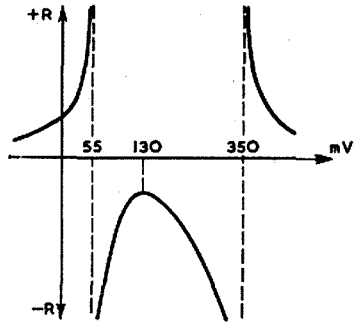



Fig. 2. A.c. resistance plotted against voltage.

Looking at this graph a bit more closely, the slope of the curve at any point is a measure of the diode a.c. resistance, and this can again be plotted against voltage as in Fig. 2.

The really interesting part of this graph is the central portion where the curve is negative. What does this mean or imply? By definition, any ordinary resistor dissipates power when current flows through it. It follows then, that a negative resistance will generate power; in fact, current flowing into it will be out of phase with current leaving it. Impossible? Remember that this is not a resistance in the d.c. sense; it is an a.c. resistance of a valve; a negative incremental resistance. Put this negative resistance

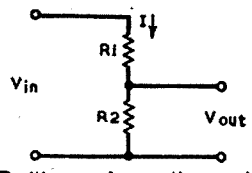



Fig. 3. Positive and negative resistances in series.

in series with or in parallel with a load and the possibility of power gain will become more evident. Let us take the series case first. If a voltage V is applied to $R_1$ and $R_2$ in Fig 3, and the voltage across $R_2$ is measured, it will be found to be $IR_2$, where I is the current due to V through both resistors. V equals $I(R_1 + R_2)$, and therefore the "gain," that is,

$$\frac{V_{out}}{V_{in}} = \frac{R_2}{R_1 + R_2}$$

and, if $R_2$ is negative, the result can be greater than 1. It can even approach infinity if the two Rs are equal. The parallel case is just as obvious though in this case it is better to work with conductances (reciprocal resistances) as in Fig. 4. If source and load conductances are equal then the source current splits equally between the two halves of the circuit, the power of the

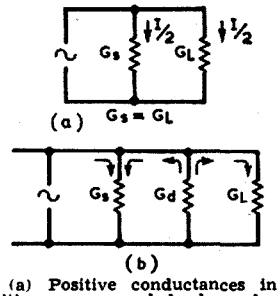



Fig. 4. (a) Positive conductances in parallel; (b) Positive source and load conductances in parallel with a negative conductance.

load is $\frac{I^2}{4g_L}$ and the power gain cannot be greater than 1. If the load is paralleled by a negative conductance, then current in this section will be out of phase with the driving current. That is, the negative conductance acts as an additional source and supplies additional current to the circuit. Load current can now be greater than $\frac{I}{2}$ and power gain exceeds 1. The power gain will be seen to be

$$\frac{P_{out}}{P_{in}} = \frac{4g_s g_L}{(g_s + g_L - g_D)^2}$$

which can again approach infinity, as can be seen by making the source and load conductances together equal the diode conductance.

* Reprinted from "RSGB Bulletin," Feb., 1965.

Drawing a curve for the parallel case, plotting "resultant" impedance against source impedance, all other things being equal, leads to the odd-looking curve in Fig. 5. As the source resistance is increased towards the value of the diode resistance, the resultant increases and shoots off towards infinity. That is, any current I that may be flowing through the source is equally flowing through the resultant, giving rise to a much higher voltage than would appear across the source. Increase the source resistance above that of the diode and the resultant immediately reappears from negative infinity and drops towards a value equal to the diode negative resistance. But, and this is important, the resultant here is always negative, and the device will oscillate (or switch).

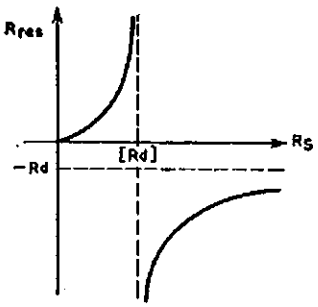



Fig. 5. Resultant resistance for negative (diode) and positive resistances in parallel.

Let us now look at the diode itself a bit more closely. There are many good explanations of its physical operation (1, 2, 3), but these are by no means necessary for an understanding of its circuit function. In purely practical terms, the diode is a negative conductance in parallel with a small capacitance, with the whole lot in series with an inductance and some residual resistance of the more normal kind. We will play with these for a start (see Fig. 6).

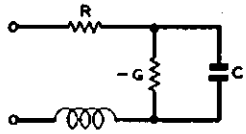



Fig. 6. Equivalent circuit of tunnel diode for a.c.

Total impedance across the terminals:

$$Z_\omega = j\omega L + \frac{1}{j\omega C + |-g|} + R \quad \ldots (1)$$

$$= j\omega L - \left[\frac{j\omega C + g}{(\omega C)^2 + g^2}\right] + R$$

Equating real and imaginary parts:

$$Z_r = \frac{-g}{(\omega C)^2 + g^2} + R \quad \ldots (2a)$$

$$Z_j = j\omega \left[L - \frac{C}{(\omega C)^2 + g^2}\right] \quad \ldots (2b)$$

At frequencies we can call "resistitve cut-off" and "self resonant" respectively, these will become zero:

i.e. $R = \frac{g}{(\omega C)^2 + g^2}$ or $f_r = \frac{g}{2\pi C}\sqrt{\frac{1}{Rg} - 1}$ .... (3a)

and: $L = \frac{C}{(\omega C)^2 + g^2}$ or $f_j = \frac{1}{2\pi}\sqrt{\frac{1}{LC} - \left(\frac{g}{C}\right)^2}$ .... (3b)

The implications of the two equations we have ended with are quite simple. The resistive cut-off frequency, $f_r$, is the frequency above which the diode will not amplify because its negative resistance has been effectively reduced to zero, and the self-resonant frequency $f_j$ decides the normal maximum frequency of oscillation. Let us put in some values. The IN2940 diode is suitable, and the published characteristics are as follows:

g = 6.6 mmho.
C = 5 pF nominal.
L = 1 mμH with leads clipped very short.
R = 1.5 ohm.

which gives $f_r$ as 2100 Mcs., and $f_j$ as 1300 Mcs. So there is obviously some u.h.f. possibility in these devices.

Looking a little more closely at the two equations and remembering that L, C and R can be added externally, if $f_j$ is lower than $f_r$ then the device will want to oscillate. If it is higher, then it will amplify, so:

$$\frac{1}{2\pi}\sqrt{\frac{1}{LC} - \left(\frac{g}{C}\right)^2} > \frac{g}{2\pi C}\sqrt{\frac{1}{Rg} - 1}$$

$$\therefore Lg < RC$$

$$\text{or } R > Lg/C \quad \ldots (4)$$

Also for real values of $f_r$: $\frac{1}{Rg} > 1$

$$\therefore \frac{1}{g} > R \quad \ldots (5)$$

Combining these two results gives: $\frac{1}{g} > R > Lg/C$ .... (6)

and any successful amplifier must satisfy these conditions. Actual gain is determined by matching source and load conductances to that of the diode.

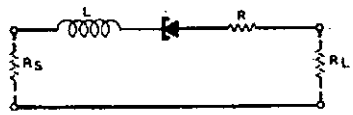



Fig. 7. A.c. circuit of series amplifier.

Take a practical case: a series amplifier for 145 Mcs. (see Fig. 7). Here the source, diode and load resistances are cascaded and the total source and load resistance should again approach the value of diode resistance. The diode with the highest available value of negative resistance (at the inflection point) is the 1N2939, and it is 150 ohms. This is only just twice 75 ohms—a usual aerial and receiver impedance value—so, for the sake of argument, we will assume that impedances of the order of 40 ohms are available (actually it would not matter, as will be explained later), and that the shunt capacity across the diode is 5 pF. Considering the external source and load impedances as part of the diode residual impedance R, we can calculate the total permissible value of R from equation 3a:

$$R = \frac{g}{(\omega C)^2 + g^2} =$$

$$\frac{6{\cdot}6 \times 10^{-3}}{(2\pi \times 145 \times 10^6 \times 5 \times 10^{-12})^2 + (6{\cdot}6 \times 10^{-3})^2}$$

103 ohms.

Impedances external to the diode will account for 80 ohms, the diode for 1.5 ohms, leaving 21.5 ohms to be supplied in the form of a non-inductive resistor. Now for the series inductance. Lg/C must be just less than R (at all frequencies), and working this out gives a figure of 78 mμH, of which up to 12 mμH can be accounted for in the diode leads.

So the design is simply 40 ohms source and load, 21.5 ohms series resistance and 0.078 μH series inductance. If the source and load also happen to have a d.c. resistance of 40 ohms each, biasing conditions (the same in essence) will have been met, or the diode can be supplied as shown. This kind of amplifier can give a steady 30db gain at 145 Mcs. with no trouble at all, which can be increased to over 40db at the expense of bandwidth by increasing L towards its limit of 78 mμH.

It may, of course, be objected that the aerial and receiver impedances are not known accurately enough. This really does not matter much: a commercially built aerial will usually be near its design impedance, and providing it is matched to its cable, one can assume that the impedance at the bottom end is what one thinks it is. In this design there is a total of 103 ohms to play with, so if the aerial is of 75 ohms impedance, 28 ohms would have to be found elsewhere: in the receiver. It would be just a matter of tapping down on the receiver input coil until a suitable point was found. The only possible cause of trouble would be if the impedances were substantially higher at some other frequency, which could cause oscillation.

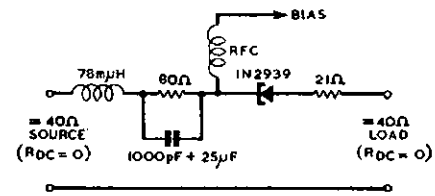



Fig. 8. A practical tunnel diode amplifier circuit for 145 Mcs.

Now, a parallel amplifier. At u.h.f. the parallel amplifier is by far the easier to manipulate (the series amplifier becomes rather awkward, as will be seen if figures for a higher frequency are tried in the equations above), and is conveniently in the form of a loaded quarter-wave co-axial line. Several designs have been published, most of which are noteworthy for their impracticability as far as the Amateur is concerned. One beautiful design uses two diodes across a strip-line coupled hybrid to give a gain of up to 10db—with a noise factor 1.9db—over a bandwidth of from 210 to 625 Mcs. (4), which is all very well until one discovers the price of a strip-line coupled hybrid. The writer has a rooted objection both to paying more and doing more work than is necessary on any project, so after finding out current circulator prices he came down to earth rather rapidly and decided to make life as easy for himself as he could. For this reason, the unit to be described was made with no more tools than a fine hacksaw, a drill, some taps and dies, a precision file and a screwdriver. Plus, well, some elbow grease. Cost? Not more than 10/-, excluding the diode.

## DESIGNING A TYPICAL AMPLIFIER

The centre frequency of this unit is to be 435 Mcs. (a wavelength of 68.98 cm). Tunnel diodes usually have a capacitance of around 5 to 10 pF, and this varies between samples, so far a parallel amplifier of reasonable length, a low impedance trough line would appear the best. Using commercially available ¾ in. brass channel of 16

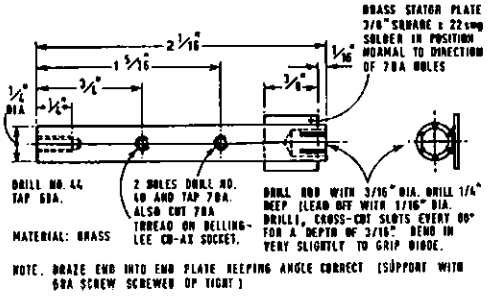



Fig. 9. (a) Details of the ¼ in. diam. centre line; (b) A TO-18 tunnel diode base. Pins 1 and 2 are the positive electrode, connected together internally. Cut these leads to ¼ in., and clip both to the feed-through capacitor. Pin 3, the negative electrode, is connected internally to the housing, and the lead should be clipped short.

s.w.g., with a ⅛ in. lid and a ¼ in. diameter centre rod, the line impedance is getting on for 60 ohms. With a line length of 5 cm, the $Z_oC$ product is 800, so about 13 pF will be needed to tune to resonance. This gives a choice of diodes. The 1N2939 and 1N2940 have a design capacity of about 5 pF; the 1N2969A has about 8 pF. All three have the necessary frequency capabilities. However, the conductance of the first two is 6.6 mmho (150 ohms), which might be difficult to match, while the 1N2969A is 16 mmho (63 ohms) which seems a better proposition (remember that the source and load conductances are in parallel).

The 1N2969A diode will want to see an admittance of 16 mmho at its end of the line. This will be made up of two parts: that of the aerial and that of the receiver, both transformed by their respective positions on the line. From considerations of noise, the receiver

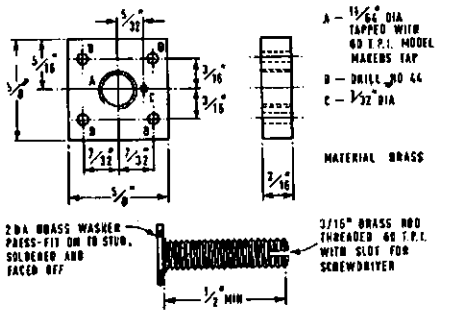



Fig. 10. (a) The tuning capacitor side plate, formed from ⅜ in. x 3/16 in. brass strip. The rotor shaft spring clip is ⅛ in. of 22 s.w.g. piano wire shaped to a "U" form, and bent at one end to fit in the 1/32 in. diam. hole C. The other end clips under one of the 8 BA screws, either top or bottom left; (b) The capacitor rotor assembly.

output should be "undermatched," so its tapping point will be further down the line than the aerial point. We shall allow a bit over 5 mmhos for the receiver and 10 mmhos for the aerial as seen at the diode. If each has an actual conductance of 13.3 mmhos (75 ohms impedance) it is now easy to calculate where the tapping points should be. The line admittance at any point is directly proportional to the cotangent of the phase angle at that point (this sounds awful: all it means is that the line impedance follows a tangent curve), but for a length of line so short in relation to a quarter wavelength, the change can be taken as approximately linear. The receiver point will be at $\frac{5}{13.3} \times 5$ cm $= 1.9$ cm, and the aerial at $\frac{10}{13.3} \times 5$ cm $= 3.8$ cm.

That completes the theory. We now have a 60 ohms trough line made of ¾ in. square channel and ¼ in. rod centre conductor, tapped at 1.9 and 3.8 cm from the shorted end, and with a 1N2969A diode doing all the work.

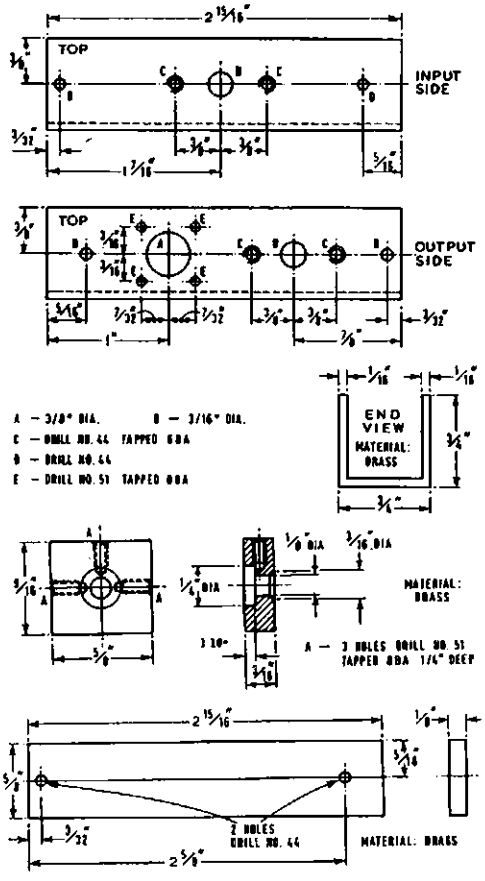



Fig. 11. (a) The tunnel diode amplifier line main body, cut from ¾ in. x 1/16 in. equal sided brass channel; (b) Centre line end support plate, which should be brazed into position in trough. The dimensions and drilling for the capacitor (feed-through) plate are the same, with the exception that the centre hole is 9/64 in. diam. drilled right through. The 1000pF feed-through capacitor, preferably the type having a slot in one end to accept the diode leads, is soldered into the hole. This end plate must not be soldered into the trough; (c) Cover.

## CONSTRUCTIONAL DETAILS

The materials required consist of 3 in, of square section 16 s.w.g. ¾ in. brass channel, lengths of ⅝ in. x 3/16 in. and ⅝ in. x ⅛ in. brass strip, 3 in. of ¼ in. brass rod, and a few inches of 3/16 in. brass rod. Also needed are a 2 BA brass washer and a 1000 pF feed-through condenser, plus, of course, screws, etc. Drilling details are given in the diagrams. To tap 8 BA threads, use a number 51 drill, for 7 BA a number 48, for 6 BA a number 44 and for the 3/16 in. x 60 t.p.i. model engineer's tap, an 11/64 in. drill. A number 44 drill can be used for a hole to clear 8 B.A.

The centre rod is cut to 5.2 cm, and will be recessed in its end plate by 1 mm. To make the socket for the diode at the end of the rod, first drill with a number 44 for a short distance, making certain that it is dead centre. Then re-drill with a 3/16 in. drill to a depth of ¼ in. Assuming that the drill has gone in centrally, then make three cross-cut slots with a saw and clean up the edges.

The tuning condenser is a little more difficult. Cut a ⅝ in. square section from the strip and after marking out the centre, drill a 11/64 in. hole and tap with the 3/16 in. x 60 t.p.i. taper tap (gently does it!). The four mounting holes are drilled as shown. Drill also a 1/32 in. hole a little to one side of the central threaded hole to take the locking clip, made of 22 s.w.g. piano wire. Now tap an inch section of the 3/16 in. rod with the 60 t.p.i. die, saw off the end, clean up with a fine file and carefully make a cross-cut for screwdriver adjustment. Tap the 2 BA washer with the 60 t.p.i. tap, fit on, braze (do not use too much solder) and file flat. With a little care it is quite possible to get a good-as-perfect right-angled fit, which is very necessary. The stator is made of a ⅝ in. flat square of 16 s.w.g. brass brazed on to the end of the centre rod—be careful that its plane is exactly at right angles to that of the two 7 BA holes further down the line.

When all the parts are ready and clean, fit them together and braze the centre rod assembly and channel, but not with the sockets in position. All the other parts screw on. Finish off with a fine file and fit on the sockets and tuning condenser assembly. Having soldered in the feed-through condenser on the end plate, fit the tunnel diode into its socket on the rod, clip lead 3 very short, then leads 1 and 2 to about ¼ in., pinch together and fit into bypass condenser and screw everything together.

## POWER SUPPLY

Tunnel diodes work at very low voltages, and also, as they are majority-current devices, the junction cross-sectional area is very, very small (about 0.0001 in. diameter). So one overload and you go out and buy a new one. An absolute maximum of 10 mA., which represents about 4 mW, is quoted for the 1N2969A, and this really is an absolute maximum if you want to keep the diode intact. Actually, however, with the voltages in use, there is not much danger of passing too much current unless the polarity

is accidentally reversed. A supply is therefore needed to give up to 350 mV, and it should be apparent from our equations that the diode bias supply must also be of equal or lower impedance than the diode, which is 63 ohms in this case. If it is not, the diode will simply switch itself permanently (or bi-stably, depending on circuit inductance) into a high or low voltage state (points C or A in Fig. 1). To get stable operation at point B, the bias supply load line must cross the curve at one point only; in other words, be of lower impedance than the diode. It may also be noticed that stray inductance, even when bypassed by 1000 pF (remember $L < Rg/C$), could prove troublesome. For this reason use a 25 $\mu$F decoupling electrolytic immediately across the 1000 pF bypass. The bias supply can be obtained in many ways: from batteries or other voltage sources via Zener diodes, from forward biased junction diodes or even series regulating n-p-n transistors. The last method has the slight advantages of lower current

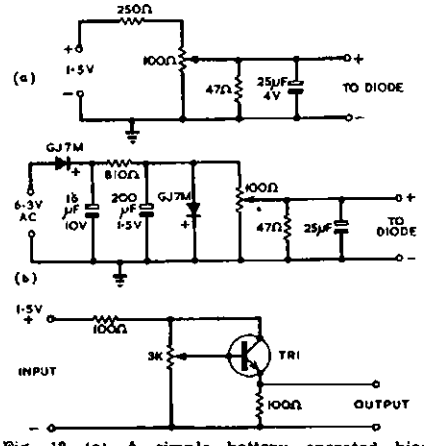



Fig. 12 (a) A simple battery operated bias supply; (b) An a.c. fed bias supply using a forward biased diode to stabilise the voltage; (c) A series regulated transistor supply which was used in the prototype amplifier. TRI may be any n-p-n transistor having a reasonable gain. A 25 $\mu$F electrolytic capacitor must be connected across the output close to the 1000 pF feed-through capacitor.

drain from the battery and a higher value variable resistor for control—low resistance carbon track pot's are rather difficult to obtain. Against this must be set increased cost and complexity. Still, providing that, in this case, the tunnel diode sees a source of no more than 60 ohms, all will be well as far as biasing is concerned. Drain is very low: at the optimum setting the diode will use only about 1 mA. and maybe the bias supply can afford to lose a few more to get the required low impedance.

## ALIGNMENT

Alignment is simple. Using a sensitive volt meter to measure the voltage across the diode, increase this to about 200 mV. Plug in aerial and receiver and search for a medium-strength signal. Tune up the amplifier whilst gradually reducing the bias. The signal will increase considerably in strength without, in most cases, much increase in background noise. In all probability the unit will oscillate before 130 mV. (the point of maximum conductance) is reached: this only means that the aerial and receiver impedances are not quite what you thought they would be. It does not matter though: pretty high gain will be available before it goes off the deep end, as the diode, on some part of its characteristic, can match anything provided it is of lower conductance than the diode maximum. It will thus oscillate when it over-matches. If the gain goes through a maximum and then drops off, the aerial and receiver impedances are less than 75 ohms. However, even with 50 ohms source and load, the maximum available gain would still be of the order of 13db.

## NOISE, GAIN AND OTHER POINTS

The tunnel diode negative resistance shows shot noise as does any resistance, but the noise temperature is of the order of 300° K only, which is much better than either a valve or a transistor, though not as good as a parametric amplifier or a maser. The noise is also frequency dependent to the extent that as one approaches the cut-off frequency, the noise figure gets worse. However, even at a frequency of $1/\sqrt[3]{2}$ of $f_t$, the noise figure is only 6db. At medium frequencies (in the 400 Mcs. range) a noise figure between 3 and 4db can quite easily be obtained (5).

For the particular circuit configuration shown, the calculated gain-bandwidth product is around $300 \times 10^6$ c/s and this appears to agree quite well with results obtained in its use, as does the calculated noise figure mentioned above. One can literally choose the value of gain to suit one's own convenience, the limit being set by what bandwidth is required and the difficulty in holding it stable with very high values. 30db is possibly an effective limit.

As mentioned before, tunnel diodes do not like being overloaded in any way. Up to a point they have a built-in a.g.c. action (this follows from Fig. 1), and this non-linearity can produce some most curious spurious responses from out-of-band local T.V. transmitters. But it will **not** cope with a transmitter feeding it with a few watts: both input and output sides must be well shielded from strong r.f. fields, and it is a good idea to place a 75 ohm dummy load across the input when the aerial is removed. So be careful!

Other than this they are very useful and reliable little devices which work with the minimum of fuss, provided a few simple precautions are observed (i.e., series inductance and bias impedance, stray r.f., etc.). It is quite possible to extend the operation of a parallel amplifier to 1290 Mcs. with an S-band diode, where its noise figure would still make it worthwhile. Their main disadvantage, that they cannot readily be cascaded, is of no consequence to the Amateur. Try one and see how easy it is.

### REFERENCES


(1) "GE Tunnel Diode Manual" (GE, New York, 1961).
(2) "Radio Constructor," November, 1960.
(3) "Tunnel Diode and Semiconductor Circuits" (Carroll: McGraw-Hill).
(4) "Proc. IRE," July, 1960, p. 1321.
(5) NEC Convention Record, 1960.


# 160 METRE DX AND "THE 169 YEAR CYCLE"

[Reprinted from "Radio ZS."]

(With credit to George Jacobs, W3ASK, "The Sunspot Story, Cycle 19, the Declining Years." Available through CQ. One dollar.)

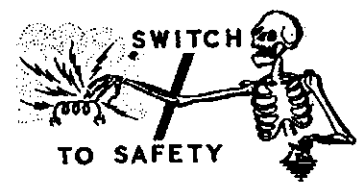
The maximum smoothed sunspot number ever recorded in any sunspot cycle was 201.3, in March, 1958. The lowest ever recorded was 3.3, in April, 1954. The 11 year cycle varies between an average maximum of 140 and an average minimum of 10. Additionally now, it is quite certain, based on some good short term records and long term computations, that these 11 year cycles are superimposed upon a long slow 169 year cycle, such that maximum sunspot numbers increase and decrease rather slowly over a longer 169 year period. What is of particular importance and interest to 160 DXers is that we are now at the low point of this 169 year cycle, and since 160 conditions are better the lower the sunspot number, it means that, since the sunspot numbers will rise slowly for quite a few years, we should enjoy 160 DX quite a lot longer than we ordinarily would. For example, the low 1964 number will hover around 9, 10, 11, 12, 16, 18, and conditions have been quite good. In 1965 (IQSY) the lowest numbers are estimated to be between 5 and 9; 1966, back to about 15-25; 1967, back up to 20-40; 1968, 40-50; with the maximum at the peak of next 11 year cycle being possibly not over 60, or even less.

The next 11 year cycle following that might not exceed a smoothed number of 75, either. In fact, S. G. Luts, of Hughs Research Labs., predicts numbers will not go over 75 for the balance of the century, or until the year 2000, and will probably average around 40! Think of it! Not over 40, when the maximum has been over 200, for the next 35 years! This means we 160 boys should have lots more happy hunting on 160 for some time. We are sorry for the h.f. boys, of course, but we 160ers will thankfully make the most of our golden opportunity.

Why is 160 better the lower the sunspot number, which means lower ionisation of the ionosphere? Because the greater the ionisation, the greater the absorption and less reflection of LF 160 signals and conversely the lower the ionisation (low sunspot numbers), the less absorption and the greater the reflection of LF 160 signals for DX purposes. Interesting? Good theory? Let's all make the most of it—and b.c.n.u. as usual on 160.

Happy IQSY's—1965 and 1966.

—Stew W1BB.



# R.F. RATINGS FOR T.V. DEFLECTION VALVES

## TYPES 6DQ6, 6GW6, 6GT5, and 6JB6

**RF Power Amplifier and Oscillator—Class C Telegraphy**
and
**RF Power Amplifier—Class FM Telephony**

| Maximum Ratings, Absolute | Values: ICAS |
|---|---|
| DC Plate Voltage | 750 volts |
| DC Grid No. 2 (screen) Voltage | 250 volts |
| DC Grid No. 1 (control grid) Voltage | —150 volts |
| DC Plate Current | 140 Ma. |
| D.C. Grid No. 1 current | 3.5 Ma. |
| Grid No. 2 input | 3.0 watts |
| Plate Dissipation | 20 watts |
| Peak Heater-Cathode Voltage: | |
| Heater Negative with respect to Cathode | 135 volts |
| Heater Positive with respect to Cathode | 135 volts |
| Bulb Temperature (at hottest point on bulb surface) | 240°C |

**Plate-Modulated RF Power Amplifier —Class C Telephony**

(carrier conditions per valve for use with a maximum modulation factor of 1.0)

| Maximum Ratings, Absolute | Values: ICAS |
|---|---|
| DC Plate Voltage | 600 volts |
| DC Grid No. 2 (screen) Voltage | 250 volts |
| DC Grid No. 1 (control grid) Voltage | —150 volts |
| DC Plate Current | 115 Ma. |
| DC Grid No. 1 Current | 3.5 Ma. |
| Grid No. 2 input | 2.0 watts |
| Plate Dissipation | 15 watts |
| Peak Heater-Cathode Voltage: | |
| Heater Negative with respect to Cathode | 135 volts |
| Heater Positive with respect to Cathode | 135 volts |
| Bulb Temperature (at hottest point on bulb surface) | 240°C |
| Maximum Grid No. 1 Circuit Resistance | 33,000 ohms |

**AF Power Amplifier and Modulator —Class AB1**

| Maximum Ratings, Absolute | Values: ICAS |
|---|---|
| DC Plate Voltage | 750 volts |
| DC Grid No. 2 (screen) Voltage | 250 volts |
| Max. Signal DC Plate Current | 125 Ma. |
| Max. Signal Grid No. 2 Input | 3.0 watts |
| Plate Dissipation | 20 watts |
| Peak Heater-Cathode Voltage: | |
| Heater Negative with respect to Cathode | 135 volts |
| Heater Positive with respect to Cathode | 135 volts |
| Bulb Temperature (at hottest point on bulb surface) | 240°C |
| Maximum Grid No. 1 Circuit Resistance | 0.1 megohm |

## TYPES 6DQ5, 6GX5, 6JE6

**RF Power Amplifier and Oscillator—Class C Telegraphy**
and
**RF Power Amplifier—Class C FM Telephony**

| Maximum Ratings, Absolute | Values: ICAS |
|---|---|
| DC Plate Voltage | 750 volts |
| DC Grid No. 2 (screen) Voltage | 175 volts |
| DC Grid No. 1 (control grid) Voltage | —150 volts |
| DC Plate Current | 280 Ma. |
| DC Grid No. 1 Current | 3.5 Ma. |
| Grid No. 2 Input | 3.5 watts |
| Plate Dissipation | 32 watts |
| Peak Heater-Cathode Voltage: | |
| Heater Negative with respect to Cathode | 135 volts |
| Heater Positive with respect to Cathode | 135 volts |
| Bulb Temperature (at hottest point on bulb surface) | 250°C |
| Maximum Grid No. 1 Circuit Resistance | 33,000 ohms |

**Plate Modulated RF Power Amplifier —Class C Telephony**

(carrier conditions per valve for use with a maximum modulation factor of 1.0)

| Maximum Ratings, Absolute | Values: ICAS |
|---|---|
| DC Plate Voltage | 600 volts |
| DC Grid No. 2 (screen) Voltage | 175 volts |
| DC Grid No. 1 (control grid) Voltage | —150 volts |
| DC Plate Current | 230 Ma. |
| D.C. Grid No. 1 current | 3.5 Ma. |
| Grid No. 2 Input | 2,3 watts |
| Plate Dissipation | 21 watts |
| Peak Heater-Cathode Voltage: | |
| Heater Negative with respect to Cathode | 135 volts |
| Heater Positive with respect to Cathode | 135 volts |
| Bulb Temperature (at hottest point on bulb surface) | 250°C |
| Maximum Grid No. 1 Circuit Resistance | 33,000 ohms |

**AF Power Amplifier and Modulator—Class AB1**

| Maximum Ratings, Absolute | Values: ICAS |
|---|---|
| DC Plate Voltage | 750 volts |
| DC Grid No. 2 (screen) Voltage | 175 volts |
| Max. Signal DC Plate Current | 280 Ma. |
| Max. Signal Grid No. 2 Input | 3.5 watts |
| Plate Dissipation | 32 watts |
| Peak Heater-Cathode Voltage: | |
| Heater Negative with respect to Cathode | 135 volts |
| Heater Positive with respect to Cathode | 135 volts |
| Bulb Temperature (at hottest point on bulb surface) | 250°C |
| Maximum Grid No. 1 Circuit Resistance | 0.1 megohm |

Reprinted from "Radiotronics," April 1964.

# REMEMBRANCE DAY CONTEST, 1965

A perpetual trophy is awarded annually for competition between Divisions. It is inscribed with the names of those who made the supreme sacrifice, and so perpetuates their memory throughout Amateur Radio in Australia.

The name of the winning Division each year is also inscribed on the trophy and in addition, the winning Division will receive a suitably inscribed Certificate.

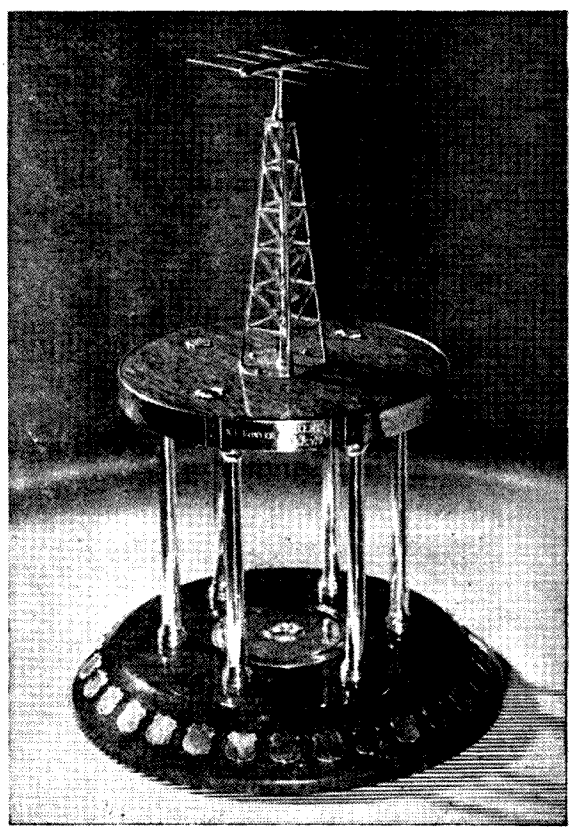
**Objects**

Amateurs in each Call Area, including Australian Mandated Territories and Australian Antarctica will endeavour to contact Amateurs in other Call Areas. In addition, Amateurs will endeavour to contact any other Amateurs on the authorised bands above 52 Mcs. (i.e., intrastate contacts will be permitted in the v.h.f./u.h.f. bands.)

**Contest Date**

0800 hrs. G.M.T., Saturday, 14th August, 1965, to 0759 hrs. G.M.T., Sunday, 15th August, 1965.

All Amateur Stations are requested to observe 15 minutes' silence before the commencement of the contest on the Saturday afternoon. An appropriate broadcast will be relayed from all Divisional Stations during this period.



Remembrance Day Contest Trophy

**RULES**

1. There shall be five sections to the Contest:—
   (a) Transmitting Phone.
   (b) Transmitting C.w.
   (c) Transmitting Open.
   (d) Receiving Open.
   (e) Transmitting Open—v.h.f./u.h.f. only.

2. All Australian Amateurs may enter the Contest whether their stations are fixed, portable or mobile. Members and non-members will be eligible for awards.

3. All authorised Amateur bands may be used but cross-band operation is not permitted.

4. Amateurs may operate on both Phone and C.w. during the Contest, i.e., phone to phone or C.w. to C.w. However, only one entry may be submitted for sections (a) to (d) in 1. A separate entry may be submitted for section (e) in 1. An open log will be one in which points are claimed for both phone and C.w. transmissions. Refer to Rule 11 concerning Log entries.

5. Only one contact per station per band is allowed. However, a second contact can be made on the same band using the alternate mode. Arranged schedules for contacts on other bands are prohibited.

6. Multi-operator stations are not permitted. Although log keepers are permitted only the licensed operator is allowed to make contact under his own call sign. Should two or more wish to operate any particular station, each will be considered a contestant and must submit a separate log under his own call sign. Such contestants shall be referred to as "substitute operators" for the purposes of these Rules and their operating procedure must be as follows:—

Phone: Substitute operators will call "C.Q. R.D." or "C.Q. Remembrance Day" followed by the call of the station they are operating, then the word "log" followed by their own call sign, e.g., "C.Q. Remembrance Day from VK4BBB log VK4BAA."

C.w.: Substitute operators will call "C.Q. R.D. de" followed by the group call sign comprising the call of the station they are operating, an oblique stroke and their own call, e.g., "C.Q. R.D. de VK4BBB/VK4BAA."

Contestants receiving signals from a substitute operator will qualify for points by recording the call sign of the substitute operator only.

7. Entrants must operate within the terms of their licences.

8. Cyphers—Before points may be claimed for a contact, serial numbers must be exchanged and acknowledged. The serial number of five or six figures will be made up of the RS (telephony) or RST (C.w.) reports plus three figures, that will increase in value by one for each successive contact. If any contestant reaches 999 he will start again with 001.

9. Entries must be set out as shown in the example, using ONLY ONE SIDE of the paper and wherever possible standard W.I.A. Log Sheets should be used. Entries must be clearly marked "Remembrance Day Contest 1965" and must be postmarked not later than 6th September, 1965. Address them to "Federal Contest Manager, W.I.A., G.P.O. Box N1002, Perth, W. Aust. Late entries will be disqualified.

10. Scoring will be based on the table shown. A bonus of 25 points may be claimed for the first contact with other call areas on each of the bands 52 Mcs. and above.

**SCORING TABLE**

| From \ To | VK0 | VK1-2 | VK3 | VK4 | VK5-8 | VK6 | VK7 | VK9 |
|---|---|---|---|---|---|---|---|---|
| VK0 .. | – | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| VK1-2 | 6 | – | 1 | 2 | 3 | 5 | 4 | 6 |
| VK3 .. | 6 | 1 | – | 3 | 2 | 5 | 4 | 6 |
| VK4 .. | 6 | 1 | 2 | – | 3 | 6 | 5 | 4 |
| VK5-8 | 6 | 2 | 1 | 3 | – | 5 | 4 | 6 |
| VK6 .. | 6 | 1 | 2 | 4 | 3 | – | 5 | 6 |
| VK7 .. | 6 | 2 | 1 | 4 | 3 | 5 | – | 6 |
| VK9 .. | 6 | 1 | 2 | 3 | 4 | 5 | 6 | – |

Note.—Read table from left to right for points for the various call areas.

In addition, all intrastate contacts on bands 52 Mcs. and above are worth 1 point each.

**EXAMPLE OF TRANSMITTING LOG**

| Date/ Time G.M.T. | Band | Emission and Power | Call Sign Worked | RST No. Sent | RST No. Rcvd. | V.h.f. Bonus | Points Claim. |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

Note.—Standard W.I.A. Log Sheets may be used to follow above form.

**EXAMPLE OF RECEIVING LOG (VICTORIAN S.W.L.)**

| Date/ Time G.M.T. | Band | Emission | Call Sign Heard | RST No. Sent | RST No. Rcvd. | Station Called | V.h.f. Bonus | Points Claim. |
|---|---|---|---|---|---|---|---|---|
| Aug. '85 | | | | | | | | |
| 14 0810 | 7 Mc. | A3 (a) | VK5PS | 58002 | —— | VK6RU | — | 2 |
| 14 0812 | „ | „ | VK6RU | 59007 | —— | VK7EJ | — | 5 |
| 14 1035 | 52 „ | A3 | VK4ZAZ | 56010 | —— | VK5ZDR | 25 | 28 |
| 14 1040 | „ | „ | VK3ALZ | 59025 | —— | VK3QV | — | 1 |

Note.—Standard W.I.A. Log Sheets may be used to follow the above form.

11. All logs shall be set as in the example shown and in addition will carry a front sheet showing the following information:—

Name.....Section.....

Address.....Call Sign.....

.....

Claimed Score.....

Declaration: I hereby certify that I have operated in accordance with the Rules and spirit of the Contest.

Signed.....

Dated.....

All contacts made during the Contest must be shown in the log submitted (see Rule 4). If an invalid contact is made it must be shown but no score claimed.

Entrants in the Open Sections must show C.w. and Phone contacts in numerical sequence.

12. The Federal Contest manager has the right to disqualify any entrant who, during the Contest, has not observed the regulations or who has consistently departed from the accepted code of operating ethics. The Federal Contest manager also has the right to disallow any illegible, incomplete or incorrectly set-out logs.

13. The ruling of the Federal Contest manager of the W.I.A. is final and no disputes will be discussed.

### AWARDS

Certificates will be awarded to the top scoring stations in sections (a) to (c) of Rule 1 above in each call area. VK1 and VK8 will count as separate areas for awards. There will be no outright winner for Australia. Further Certificates may be awarded at the discretion of the Federal Contest manager.

The Division to which the Trophy will be awarded shall be determined in the following way.

To the average of the top six logs shall be added a bonus arrived at by adding to this average the ratio of logs entered to the number of State Licensees (excluding Limited Licensees) multiplied by the total points from all entries in sections (a), (b) and (c) of Rule 1.

Average of the top six logs +

$$\left[\frac{\text{Logs Entered}}{\text{State Licencees exclud. Z Calls}} \times \text{Total of Points from all Entrants Sect. (a) (b) (c)}\right]$$

VK1 scores will not be included with VK2 nor VK8 with VK5.

Acceptable logs for all sections shall show at least five valid contacts.

The trophy shall be forwarded to the winning Division in its container and will be held by that Division for the specified period.

### RECEIVING SECTION

1. This section is open to all Short Wave Listeners in Australia, but no active transmitting station may enter.

2. Contest times and loggings of stations on each band are as for transmitting.

3. All logs shall be set out as shown in the example. The scoring table to be used is the same as that used for transmitting entrants and points must be claimed on the basis of the State in which the receiving stations are located. A sample is given to clarify the position.

It is not sufficient to log a station calling CQ—the number he passes in a contact must be logged.

It is not permissible to log a station in the same call area as the receiving station on the m.f. and h.f. bands 1.8-30 Mcs., but on bands 52 Mcs. and above such stations may be logged, once only per band, for one point. See example given. VK1/VK2 and VK5/VK8 are considered to be the same area for scoring purposes.

4. A station heard may be logged once on phone and once on C.w. for each band.

5. Club receiving stations may enter for the Receiving Section of the Contest, but will not be eligible for the single operator award. However, if sufficient entries are received a special award may be given to the top receiving station in Australia. All operators must sign the Declaration.

### AWARDS

Certificates will be awarded to the highest scorers in each call area. Further Certificates may be awarded at the discretion of the Federal Contest manager.

### TRANSMITTING OPEN — VHF/UHF ONLY SECTION (SECTION E)

**Additional Notes**

1. This section is being introduced this year in answer to the request by many Amateurs that provision be made for participation by Limited Licensees and other VHF/UHF operators. It is in the nature of an experiment and because of this logs entered for section (e) will not be considered in the determination for the Trophy winner at this juncture. In the light of future experience, response to this section by those it is intended to interest, and comments from all interested parties, other additions and changes may be made.

2. All intrastate contacts in the bands above 52 Mcs. will count for one point. Interstate contacts will be valued as in the table for MF/HF contacts including the bonus 25 points for the first contact with each new call area (v.h.f./u.h.f. only).

3. Entrants may submit logs for one Transmitting Section other than (e) and interstate VHF/UHF contacts may be included in both logs.

4. Logs must be set out in the standard manner prescribed.

### AWARDS

Certificates will be awarded to the highest scorer in each call area.

**Note I.**—The Federal Contest manager emphasises the need for strict observance of Rule 9 in the Transmitting Section and Rule 3 in the Receiving Section.

**Note II.**—Note that the use of G.M.T. is required in accordance with Institute Policy to encourage the use of G.M.T. by Australian Amateurs.

# ROSS HULL MEMORIAL V.H.F. CONTEST 1964-65 RESULTS

The Federal Contest Committee takes pleasure in presenting herewith the results of the 1964-65 Ross Hull Memorial V.H.F. Contest.

We would like to thank those contestants who submitted suggestions and comments on the contest. All of these will be extracted and sent to Federal Executive for further consideration. The comments were many and various and a few selected at random, are included in this summary for the interest of contestants.

VK2—I do not favour the suggestion that a 7 or 9 day period of operating be selected instead of the present period. I consider that this would greatly reduce the number of stations partipating.
Contest to be limited to 52 and 144 Mcs.
That the phone section be open to only "Z" calls.
The suggestion of a 9 day log is a good one.

VK3—I can see nothing wrong with the way the contest is run and hope that it is run the same way in the future.
The scoring table encouraged the use of the 432 Mcs. band, and surely this is the purpose of such a contest, to increase the use of the v.h.f. bands.
I enjoyed the contest, but think that a month is too long and that logs should be limited to a 7 day period.
The scoring table for the 432 Mcs. band is unrealistic, as it is very similar to the 144 Mcs. band propagationwise.

VK4—I'm very much in favour of the present duration of the contest being retained and would just as soon stick with the old method of scoring using the full four weeks.
One thing I am very happy with is the way the current Scoring Table is set up, by far the fairest so far.

VK5—Points should be allotted for contacts on 6 and 2 metres otherwise the country stations have an unfair advantage and local interest and activity is less.
A certificate should be awarded for the best 7-day period log submitted in addition to the present awards.
That the contest be shortened to the choice of the contestant, to say a nine-day period within a "limit" time as laid down by Contest Committee, December-January.

VK6—The length of the contest should remain a month but a log for a nine-day period be required.

VK7—No comments.

VK8—I think that the duration of the contest is ideal and would not like to see it shortened, and am quite happy with the rules as they are.

It is not possible to list all of the comments in detail, but contestants should be able to realise that there is a considerable difference of opinion on the matters listed. One of the items passed at the last Federal Convention was the inclusion of a sub-section in the Ross Hull Memorial V.H.F. Contest for an award to be given to the best log for a two-day period. This may meet with approval by some and disapproval by others. It would be almost impossible to have a set of rules to suit everyone.

This year's honours go to VK3ZER R. W. Wilkinson, with a score of 5,787 points, which under the circumstances was a very good effort.

In conclusion we would like to congratulate the other award winners and thank those who submitted logs and suggestions.

Federal Contest Committee, W.I.A.

## TROPHY WINNER

VK3ZER—R. W. Wilkinson .. 5787 pts.

## AWARD WINNERS

**Section A—Transmitting, Open**

| | | |
|---|---|---|
| VK2ASZ—R. L. Lear | 2240 | pts. |
| VK3QV—D. H. Rankin | 108 | „ |
| VK4PU—J. D. Purdon | 1822 | „ |
| VK5CL—H. M. Blythe | 266 | „ |
| VK6LK—C. J. Kosina | 1634 | „ |
| VK8KK—D. A. McArthur | 4312 | „ |

**Section B—Transmitting, Phone**

| | | |
|---|---|---|
| VK1VP—E. Penikis | 1386 | pts. |
| VK2ZFB—A. F. Birch | 2220 | „ |
| VK3ZER—R. W. Wilkinson | 5787 | „ |
| VK4ZLG—C. M. Lloyd | 3338 | „ |
| VK5ZKR—C. M. Hutchesson | 4245 | „ |
| VK6ZCN—A. L. Martin | 2434 | „ |
| VK7ZAH—K. J. Hendricks | 1626 | „ |
| VK8ZMD—A. M. Dunn | 180 | „ |
| ZL1AMN—D. A. Johnston | 330 | „ |
| ZL2APC—H. Burton | 340 | „ |
| ZL3AAU—J. G. Miller | 950 | „ |

**Section C—Receiving**

| | | |
|---|---|---|
| WIA-L2211—R. C. Aberneathy | 466 | pts. |
| WIA-L3138—G. N. Earl | 78 | „ |
| WIA-L5049—D. De Cean | 1404 | „ |

## INDIVIDUAL SCORES

**Section A**

| | | |
|---|---|---|
| VK2ASZ—Blaxland | 2240 | pts. |
| 2TR—Bega | 470 | „ |
| VK3QV—East Malvern | 108 | „ |
| VK4PU—Woombye | 1822 | „ |
| VK5CL—South Plympton | 266 | „ |
| VK6LK—Ardross | 1634 | „ |
| 6MM—Nedlands | 552 | „ |
| VK8KK—Alice Springs | 4312 | „ |

**Section B**

| | | |
|---|---|---|
| VK1VP—Canberra | 1386 | pts. |
| VK2ZFB—St. Mary's | 2220 | „ |
| 2ZLP—Armidale | 2106 | „ |
| 2ZCF—Croydon | 1269 | „ |
| 2ASI—Inverell | 794 | „ |
| 2ZCT—Whitebridge | 780 | „ |
| 2ZDT—Cambewarra | 688 | „ |
| VK2ZFS—Goonellabah | 570 | pts. |
| 2BAE—Armidale | 352 | „ |
| 2ZRE—Cooma | 260 | „ |
| 2ZWM—Kahibah | 226 | „ |
| 2GJ—Kyogle | 218 | „ |
| 2ZAZ—Nowra | 154 | „ |
| VK3ZER—Ballarat East | 5787 | „ |
| 3ZNS—Beaumaris | 1410 | „ |
| 3AEE—Glenroy | 1361 | „ |
| 3ABP—Altona | 724 | „ |
| 3NB—Camberwell | 530 | „ |
| 3ZGP—Fawkner | 396 | „ |
| 3ZOP—Moorabbin | 392 | „ |
| 3ZMS—Frankston | 372 | „ |
| 3ZRY—North Balwyn | 276 | „ |
| 3KU—Kilmore | 162 | „ |
| 3ZDA—Mount Waverley | 60 | „ |
| 3ZBD—Ormond | 58 | „ |
| VK4ZLG—Wacol | 3338 | „ |
| 4RO—Ayr | 1524 | „ |
| 4ZWS—Bundaberg | 698 | „ |
| 4ZWR—Bundaberg | 32 | „ |
| VK5ZKR—Yahl | 4245 | „ |
| 5ZDX—Oaklands Park | 2008 | „ |
| 5ZMJ—Port Pirie | 1706 | „ |
| 5ZHJ—Gawler Rail | 1592 | „ |
| 5ZEJ—Forreston | 1506 | „ |
| 5ZIK—Yorketown | 1332 | „ |
| 5ZGF—Plympton | 1250 | „ |
| 5ZTM— | 1217 | „ |
| 5ZBR—Gawler East | 1110 | „ |
| 5ZJH—Somerton Park | 1069 | „ |
| 5EF—Gawler | 316 | „ |
| 5ZTS—Parkside | 110 | „ |
| 5TN—King's Park | 86 | „ |
| VK6ZCN—Bunbury | 2434 | „ |
| 6ZDS—South Perth | 2022 | „ |
| VK7ZAH—Ulverstone | 1626 | „ |
| 7ZAQ—Lenah Valley | 934 | „ |
| 7ZTX—Newtown | 588 | „ |
| 7ZAA—Burnie | 526 | „ |
| 7ZAO—Lenah Valley | 212 | „ |
| 7ZBK—Glenorchy | 38 | „ |
| VK8ZMD—Darwin | 180 | „ |
| ZL1AMN—Auckland | 330 | „ |
| ZL2APC—Eastbourne | 340 | „ |
| ZL3AAU—Christchurch | 950 | „ |
| ZL3RK—Christchurch | 510 | „ |

**Section C**

| | | |
|---|---|---|
| WIA-L2211—R. C. Aberneathy, Miranda | 466 | pts. |
| WIA-L2188—C. R. Christiansen, Booragul | 22 | „ |
| WIA-L3138—G. N. Earl, Black Rock | 78 | „ |
| WIA-L5049—D. De Cean, Brighton | 1404 | „ |

# VK-ZL-OCEANIA DX CONTEST 1964 RESULTS

## AUSTRALIA

**C.W.—**

| Call | 80 | 40 | 20 | 15 | Total |
|---|---|---|---|---|---|
| VK2EO | — | 4035 | 5515 | — | 9650 |
| 2GW | — | 3210 | 3525 | 2670 | 9405 |
| 2APK | — | 2405 | 4250 | 1660 | 8315 |
| 2RA | — | 1720 | 3695 | 1900 | 7315 |
| 2VN | — | 1840 | 4735 | 570 | 7145 |
| 2QL | 210 | 2235 | 1930 | 1510 | 5885 |
| 2AAH | — | — | 1875 | — | 1875 |
| VK3AXK | — | 3165 | 2070 | 1040 | 6275 |
| 3MR | — | — | 5745 | — | 5745 |
| 3DQ | — | 1575 | 1500 | 900 | 3975 |
| 3XB | — | 3280 | 265 | — | 3545 |
| 3SR | — | 1505 | 1230 | — | 2735 |
| 3RJ | — | — | 750 | 165 | 915 |
| 3QV | — | — | — | 530 | 530 |
| 3TL | | | | | Check |
| VK4LT | — | — | 4515 | 2315 | 6830 |
| 4SD | — | — | 3955 | — | 3955 |
| 4WO | — | — | 1020 | — | 1020 |
| VK5NO | 110 | 5950 | 7435 | 2390 | 15885 |
| 5RX | — | — | 2445 | — | 2445 |
| VK7DK | — | 1725 | 3415 | — | 5140 |
| VK9GC | — | — | 1870 | 1740 | 3610 |
| 9RB | — | — | 790 | — | 790 |

**Band Leaders—C.w.**

| | | | |
|---|---|---|---|
| 80 Metres: | VK2QL | 210 | points |
| | VK5NO | 110 | ,, |
| 40 Metres: | VK5NO | 5950 | ,, |
| | VK2EO | 4035 | ,, |
| | VK3XB | 3280 | ,, |
| 20 Metres: | VK5NO | 7435 | ,, |
| | VK3MR | 5745 | ,, |
| | VK2EO | 5515 | ,, |
| 15 Metres: | VK2GW | 2670 | ,, |
| | VK5NO | 2390 | ,, |
| | VK4LT | 2315 | ,, |
| All Bands: | VK5NO | 15885 | ,, |
| | VK2EO | 9650 | ,, |
| | VK2GW | 9405 | ,, |

**PHONE—**

| Call | 40 | 20 | 15 | Total |
|---|---|---|---|---|
| VK2APK | 1030 | 4575 | 890 | 6495 |
| 2WD | — | 4465 | — | 4465 |
| 2AKF | 710 | 1355 | 340 | 2405 |
| 2MR | — | 1580 | — | 1580 |
| 2CM | — | 1540 | — | 1540 |
| VK3ATN | 2200 | 6605 | 1875 | 10680 |
| 3XB | 845 | 300 | 135 | 1280 |
| 3QV | — | — | 1170 | 1170 |
| 3TL | | | | Check |
| VK4LT | — | 5620 | 660 | 7365 |
| 4DO | — | 915 | — | 915 |
| VK5MS | — | 9860 | — | 9860 |
| 5GG | — | 2865 | — | 2865 |
| 5FT | — | 1520 | — | 1520 |
| VK7DK | — | 2800 | — | 2800 |

**Band Leaders—Phone**

| | | | |
|---|---|---|---|
| 40 Metres: | VK3ATN | 2200 | points |
| | VK2APK | 1030 | ,, |
| | VK3XB | 845 | ,, |
| 20 Metres: | VK5MS | 9860 | ,, |
| | VK3ATN | 6605 | ,, |
| | VK4LT | 5620 | ,, |
| 15 Metres: | VK3ATN | 1875 | ,, |
| | VK3QV | 1170 | ,, |
| | VK2APK | 890 | ,, |
| All Bands: | VK3ATN | 10680 | ,, |
| | VK5MS | 9860 | ,, |
| | VK4LT | 7365 | ,, |

**VK LISTENERS' SECTION**

| | |
|---|---|
| L2033 | 375 |
| L3138 | 2605 |
| L4018 | 1545 |
| L5065 | 3470 |
| L5067 | 330 |
| L6021 | 8445 |
| BERS195 | 4965 |

## NEW ZEALAND

**C.W.—**

| Call | 80 | 40 | 20 | 15 | Total |
|---|---|---|---|---|---|
| ZL1ABZ | — | 1040 | 5235 | 2150 | 8425 |
| 1ARY | — | — | 5395 | — | 5395 |
| 1QW | — | — | 110 | 240 | 350 |
| ZL2GX | — | 5760 | — | — | 5760 |
| ZL3IS | — | — | 525 | — | 525 |
| ZL4GA | — | 3660 | 2410 | 2895 | 8965 |
| 4BO | — | 2860 | 575 | 1435 | 4870 |
| 4JF | — | 1520 | 190 | — | 1710 |
| ZL1HY | | | | | Check |

**Band Leaders—C.w.**

| | | | |
|---|---|---|---|
| 40 Metres: | ZL2GX | 5760 | points |
| | ZL4GA | 3660 | ,, |
| 20 Metres: | ZL1ARY | 5395 | ,, |
| | ZL1ABZ | 5235 | ,, |
| 15 Metres: | ZL4GA | 2895 | ,, |
| | ZL1ABZ | 8425 | ,, |
| | ZL4BO | 1435 | ,, |
| All Bands: | ZL4GA | 8965 | ,, |
| | ZL1ABZ | 8425 | ,, |
| | ZL2GX | 5760 | ,, |

**PHONE—**

| Call | 40 | 20 | 15 | Total |
|---|---|---|---|---|
| ZL1HA | — | 6990 | — | 6990 |
| 1ABZ | 165 | 6420 | — | 6585 |
| 1AGO | 1870 | — | — | 1870 |
| 1HY | | | | Check |
| ZL2GX | — | 2475 | — | 2475 |
| ZL3AB | — | 2130 | — | 2130 |

**Band Leaders—Phone**

| | | | |
|---|---|---|---|
| 40 Metres: | ZL1AGO | 1870 | points |
| | ZL1ABZ | 165 | ,, |
| 20 Metres: | ZL1HA | 6990 | ,, |
| | ZL1ABZ | 6420 | ,, |
| | ZL2GX | 2475 | ,, |
| All Bands: | ZL1HA | 6990 | ,, |
| | ZL1ABZ | 6585 | ,, |
| | ZL2GX | 2475 | ,, |

**ZL LISTENERS' SECTION**

| | |
|---|---|
| ZL149 | 6525 |
| ZL190 | 6165 |
| ZL292 | 370 |

## OVERSEAS

**C.W.—**

### North America

| | | | | | |
|---|---|---|---|---|---|
| HI8WSR | 279 | pts. | K6IEC | 1455 | pts. |
| VE3AU | 18 | ,, | W6FET | 1134 | ,, |
| K1HVV | 203 | ,, | W6IBD | 968 | ,, |
| WB2MFX | 858 | ,, | WA6WPG | 140 | ,, |
| WA2KSD | 266 | ,, | WB6IUH | 32 | ,, |
| W2HL | Check | | K6EVR | 2 | ,, |
| W3VKD | 726 | pts. | K7AL | 1092 | ,, |
| W4HOS | 45 | ,, | W7DJU | 100 | ,, |
| W5WZQ | 1980 | ,, | W8JIN | 2720 | ,, |
| W5BPF | 568 | ,, | W8VSK | 2000 | ,, |
| WA5HDL | 84 | ,, | W8DGP | 280 | ,, |
| WA6EPQ | 4887 | ,, | | | |

### South America

| | | | | | |
|---|---|---|---|---|---|
| HK3RQ | 1288 | pts. | PY2SO | 78 | pts. |
| HK3AVR | 860 | ,, | PY2CQ | 72 | ,, |
| OA4CG | 408 | ,, | | | |

### Asia

| | | | | | |
|---|---|---|---|---|---|
| JA1EUV | 6324 | pts. | JA6AKL | 1120 | pts. |
| JA0ID/1 | 312 | ,, | JA7AD | 3003 | ,, |
| JA1MIN | 126 | ,, | JA7CKM | 80 | ,, |
| JA1PVK | 32 | ,, | JA7CLO/8 | 484 | ,, |
| JA2UJ | 4 | ,, | JA8BY | 232 | ,, |
| JA3DRO | 567 | ,, | JA9AMR | 112 | ,, |
| JA3HLJ | 14 | ,, | JA9ACH | 8 | ,, |
| JA4AQR | 60 | ,, | JA0SU | 144 | ,, |
| JA4ACH | 14 | ,, | | | |

### Oceania

| | | | | | |
|---|---|---|---|---|---|
| DU1GF | 588 | pts. | VR1B | 4620 | pts. |
| KH6AHZ | 96 | ,, | ZK1AR | 1140 | ,, |

### Europe

| | | | | | |
|---|---|---|---|---|---|
| DL7AA | 754 | pts. | OH1WK | 112 | pts. |
| DM2AND | 392 | ,, | OH9RF | 60 | ,, |
| DL1JF | 315 | ,, | OH5PT | 44 | ,, |
| DM3NBL | 64 | ,, | OH1PN | 40 | ,, |
| DM2BJD | 48 | ,, | OH2JM | 20 | ,, |
| DM2ATD | 40 | ,, | OH3XZ | 8 | ,, |
| F8TM | 40 | ,, | OH5VF | 2 | ,, |
| G4CF | 1344 | ,, | OH2AC | Check | |
| G3FKM | 888 | ,, | OH4NS | Check | |
| G2DC | 583 | ,, | OK2KGD | 48 | pts. |
| G6XN | 329 | ,, | OK3CBR | 28 | ,, |
| HA1KSA | 340 | ,, | OK2QX | 24 | ,, |
| HB9IK | 408 | ,, | OK1ADM | 12 | ,, |
| IT1TAI | 650 | ,, | OK2DB | 8 | ,, |
| IT1AGA | 8 | ,, | OK2BCI | 8 | ,, |
| OE1RZ | 520 | ,, | OK1OO | 2 | ,, |
| OZ4PM | 105 | ,, | OK1KDT | 2 | ,, |
| OZ7GC | 85 | ,, | OK3UL | Check | |
| OZ1W | 78 | ,, | PA0LOU | 189 | pts. |
| OZ4H | 72 | ,, | PA0WAC | 104 | ,, |
| OZ1LO | 68 | ,, | SM3AGD | 930 | ,, |
| OH2BBR | 657 | ,, | SM3BNV | 18 | ,, |
| OH5UX | 488 | ,, | SM5CCE | 1080 | ,, |
| OH1QP | 328 | ,, | SM5LL | 504 | ,, |
| OH1SH | 288 | ,, | SM5DSF | 2 | ,, |
| OH2BH | 256 | ,, | SM5MX | Check | |
| OH5UQ | 248 | ,, | SM7QY | 180 | pts. |
| OH3AH | 246 | ,, | SM7MS | 2 | ,, |
| OH7QC | 208 | ,, | YU1BCD | 65 | ,, |
| OH2YV | 144 | ,, | | | |

### U.S.S.R.

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|---|---|---|---|---|---|
| UC2AR | 30 | pts. | UA3KAB | 2 | pts. |
| UC2AW | 30 | ,, | UV3TC | 2 | ,, |
| UP2UK | 18 | ,, | UA3RR | 2 | ,, |
| UP2PT | 8 | ,, | UA3FD | 1 | ,, |
| UQ2GA | 56 | ,, | UA4PA | 286 | ,, |
| UB5GX | 56 | ,, | UW4HW | 65 | ,, |
| UB5CG | 48 | ,, | UW9CS | 42 | ,, |
| UB5K1X | 10 | ,, | UA9MR | 14 | ,, |
| UT5CC | 4 | ,, | UA0KCA | 2025 | ,, |
| UA1KIL | 96 | ,, | UA0SO | 550 | ,, |
| UA1ND | 56 | ,, | UA0AG | 224 | ,, |
| UA3UJ | 472 | ,, | UA0TD | 72 | ,, |
| UA3KAO | 39 | ,, | UI8LB | 60 | ,, |

**PHONE—**

### Oceania

| | | | | | |
|---|---|---|---|---|---|
| DU1GP | 477 | pts. | VR1B | 1250 | pts. |
| KH6EPW | 2563 | ,, | VR2DK | 5396 | ,, |
| KH6FBJ | 2030 | ,, | VR4EE | 90 | ,, |
| WA0DVC/KG6 | 18 | ,, | ZK1AR | 51 | ,, |

### South America

| | | | | | |
|---|---|---|---|---|---|
| HK4AHT | 530 | pts. | OA4GK | 100 | pts. |
| HK3RQ | 336 | ,, | YV5AKP | 315 | ,, |
| OA4KY | 240 | ,, | | | |

### North America

| | | | | | |
|---|---|---|---|---|---|
| HI8WSR | 804 | pts. | W3MSK | 1955 | pts. |
| HP1JC | 368 | ,, | W4RLS | 576 | ,, |
| KP4CK | 434 | ,, | K6EVR | 3234 | ,, |
| KP4BBN | 336 | ,, | K6OVF | 182 | ,, |
| PJ2CR | 192 | ,, | WA6WPG | 80 | ,, |
| WB2MFX | 70 | ,, | W8JIN | 336 | ,, |
| | | | W0LBB | 136 | ,, |

### Asia

| | | | | | |
|---|---|---|---|---|---|
| EP2BQ | 630 | pts. | JA4CPZ | 2 | pts. |
| HL9TT | 120 | ,, | JA5AOU | 2 | ,, |
| 9M2LO | 980 | ,, | JA6NP | 1440 | ,, |
| JA1OHC | 240 | ,, | JA6IQ | 154 | ,, |
| JA1MIN | 36 | ,, | UW9CC | 432 | ,, |
| KA2BW | 184 | ,, | UM8KAA | 96 | ,, |
| JA2DNA | 32 | ,, | UH8BO | | |
| JA4AQR | 21 | ,, | | | |

### Europe

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|---|---|---|---|---|---|
| DJ6QT | 693 | pts. | OH5SM | 138 | pts. |
| DL1KB | 480 | ,, | OH2BH | 102 | ,, |
| DL7AA | 396 | ,, | OH4OO | 80 | ,, |
| DL3DW | 343 | ,, | OH1PN | 24 | ,, |
| DL8DX | 228 | ,, | OH2YV | 14 | ,, |
| DL6EN | Check | | OH1SH | 2 | ,, |
| G8PO | 1462 | pts. | OK1ADM | 52 | ,, |
| G6XN | 670 | ,, | OK1ADP | 32 | ,, |
| G3OQB | 96 | ,, | OK2BEN | 8 | ,, |
| GI4RY | 48 | ,, | PA0HBO | 369 | ,, |
| IT1TAI | 36 | ,, | PA0GMU | 147 | ,, |
| LA5YE | 60 | ,, | SM3AGD | 1080 | ,, |
| OE1RZ | 792 | ,, | SM5BDQ | 1287 | ,, |
| OZ4WR | 102 | ,, | SM5LL | 528 | ,, |
| OZ3SK | 2 | ,, | SM5FA | 328 | ,, |
| UA1CK | 350 | ,, | SM5IC | 80 | ,, |
| UD6KAR | 8 | ,, | SM5BFE | 44 | ,, |
| OH2TJ | 413 | ,, | | | |

**OVERSEAS LISTENERS SECTION**

| | | | | | |
|---|---|---|---|---|---|
| OK1-7453 | 484 | pts. | VE3-7554 | 234 | pts. |
| OK3-9280 | 400 | ,, | W0-10646 | 180 | ,, |
| SM1-3589 | 396 | ,, | WPE 6DX6 | 130 | ,, |
| SM4-2825 | 120 | ,, | JA1-3477 | 1122 | ,, |
| HE9FMO | 248 | ,, | JA1-4451 | 70 | ,, |
| DL 8497 | 297 | ,, | JA2-1885 | 806 | ,, |
| DEA-25955 | 216 | ,, | JA3-2325 | 154 | ,, |
| DEA-13964 | 100 | ,, | JA8-1231 | 108 | ,, |
| DL 8913 | 126 | ,, | UA3-18755 | 384 | ,, |
| GW 7796 | 36 | ,, | HI2PE1H | 70 | ,, |

# W.I.A. YOUTH RADIO SCHEME

## ANNUAL REPORT TO FEDERAL CONVENTION – EASTER, 1965

GENTLEMEN: It is with great pleasure that I report to you on the operations of the Youth Radio Scheme during the 1964-65 period. In the eastern States this has been a period of real progress and major effort by all concerned with the implementation of this aspect of Institute activity. Unfortunately, progress has not been equally pleasing in some Divisions but this situation is normal in voluntary and impecunious organisations such as ours. We must accept the unfavourable aspects philosophically and the successful developments with the determination to do better in the future.

During this year a great amount of correspondence has taken place with the various Divisional Supervisors of the Youth Radio Scheme, with outside organisations within Australia and, notably, with the Radio Society of Great Britain, which has been investigating the possibility of starting its own Youth Radio Scheme. The manager of the R.S.G.B. requested that the Wireless Institute should furnish full details of our Australian project and, unfortunately, this request coincided with the most recent and urgent revision of all our syllabuses and Certificate Conditions. However, this task was duly accelerated and the completed information was air-mailed to the R.S.G.B. for consideration by its Youth Education Committee. After a long delay a letter acknowledging receipt was received and it appears that the English Scheme will involve the use of night school classes which operate under the educational scheme there. This is quite a different concept from our Scheme, which involves Radio Club activity in daytime secondary schools as the principal sphere of development. It will be interesting to watch the progress of the British methods and to assess the relative merits of the two different systems.

Constant negotiations have been conducted with other Australian youth organisations. The secretary of the Duke of Edinburgh's Award Committee asked for advice on the Radio aspects of this new youth scheme. The handbook was drawn up to suit English conditions and the committee felt that an Australian handbook should be prepared to meet local conditions. Accordingly, I submitted a detailed scheme, based on our Certificate syllabuses and this is now under consideration by the Duke of Edinburgh's Award Committee. The proposals envisage three sets of conditions to meet the Bronze, Silver and Gold Awards "Projects" requirements. It is anticipated that some finality will be reached on these negotiations before long. I propose that the next revision of our syllabuses will include the relationships which exist between the Duke of Edinburgh's Awards and our Certificates. The fact that this important committee has seen fit to seek advice from our Youth Radio Scheme indicates that our efforts have met with acceptance and recognition in circles beyond the limits of the W.I.A.

The Boy Scout Movement is currently revising its Proficiency Badge requirements and the various suggestions which have been forwarded to their National Headquarters are still under consideration. Mr. Ken Matchett, VK3TL, has been associated with these deliberations, which, unfortunately have been very slow to reach finality. However, it is hoped that ultimately some final decisions will be reached and mutual recognition of awards will be authorised by the Scout movement.

The Boys' Brigade, a Church organisation of wide distribution, has examined various suggestions which I have submitted for consideration at its recent Federal Convention in Adaleide. It is anticipated that, as a result, there will be close liaison between the Y.R.S. and the Brigade and that the latter body will introduce additional proficiency awards — badges and certificates — to recognise Radio training.

The Australian Air League is another Australian youth organisation which is interested in our work and several discussions have taken place which show considerable promise for future co-operation. I have a special interest in this organisation, of which I was one of the earliest members and for which I prepared the proficiency badge syllabus which has, with some modifications, been in operation for about 30 years. I was pleased to receive an invitation as a representative of the Youth Radio Scheme to the opening of the Air League's new offices at Petersham on Saturday, 10th April. Continual efforts are being made—as time permits—to confer personally with the training officers of these youth movements and to point out the mutual benefits which could accrue from some degree of co-operation and recognition of each other's awards. Most of these negotiations are approaching finality and next year's report should indicate the nature and extent of the co-operation which has been achieved. Of course, there are other youth movements which still have to be contacted and time is the only factor which has prevented this. However, these discussions indicate clearly that there is a real need for the type of activity which the Youth Radio Scheme offers to young Australians.

A pleasing fetaure of this year's operations has been in the number of Youth Radio Scheme members who have gained Amateur Operators' Certificates of Proficiency (Full and Limited) while they were still at school. Most of these were gained by boys in fifth and fourth forms, but Gary Tippett, of St. Edward's College at Gosford, was the first third form student to gain this distinction. In addition, a number of Associate Members from school clubs has increased the membership of the Wireless Institute. It is evident, therefore, that the stated aim of the Youth Radio Scheme—to increase the membership of the Institute—is being achieved, perhaps not in spectacular numbers, but in a steadily increasing volume. However, I still feel that our Scheme can never realise its maximum benefit until a system of Novice licensing is introduced, whereby Science teachers, Manual Arts teachers and leaders of non-school clubs can gain limited transmitting privileges with less time and effort than the present system entails.

In New South Wales the impact of the new Wyndham Scheme of secondary education has been adverse to our progress. Teachers who would have undertaken the formation of clubs under the old system have been deterred by the vast amount of re-organisation that the Wyndham Scheme requires. However, from a long-range point of view, it is possible that the Scheme may be of ultimate benefit because it provides for hobby activities and craft courses. Also, the new Science Courses prescribed for fifth and sixth years include greater attention to electronics than did the former courses. This may help to direct the attention of teachers and students to extra-curricular Radio Club activities to reinforce the formal Physics courses and this, of course, is one of the stated objectives of the Youth Radio Scheme. It is noteworthy that increasing numbers of Science teachers are forming Radio Clubs in secondary schools. In the early days of the Scheme hardly any Club Leaders were members of Science staffs. The picture is changing radically and practically all new clubs are being organised by Science teachers. Much of this is due to Mr. Henderson, Head Lecturer in Physics at Sydney Teachers' College, who urges all his final year students to participate in our Scheme. Recently he organised the Sydney Teachers' College Radio Club, comprising 25 final-year Science teacher-trainees, who will be posted to State High Schools at the beginning of 1966, well versed in matters associated with Radio Club activity and fully aware of our Y.R.S. methods, courses, examinations and Certificates. The New South Wales Divisional Council is well aware of the strategic value of Mr. Henderson's efforts in this matter and has made available a FREE A.O.C.P. Correspondence Course to a student nominated by Mr. Henderson. It is anticipated that 1966 will see a great forward move in the Youth Scheme as these young teachers move into the schools. A further interesting development lies in the approval which the N.S.W. Education Department has given to Mr. R. Pearson, Manual Arts Master at Arthur Phillip High School, Parramatta, to conduct a Radio-Craft Course for Second Form boys, following our Y.R.S. Certificate syllabus. This could lead to further developments within the Manual Arts Section of the Education Department and, in itself, demonstrates the value and versatility of our Scheme, which is applicable to such a wide variety of youth situations.

Another pleasing feature of this year's progress is seen in the increasing numbers of ex-Radio Club boys entering the electronics industry as apprentices, trainees and cadets. Others have proceeded to Science courses at various universities and it is reasonable to assume that their vocational choices have been motivated by their participation in Youth Radio Scheme activities. To mention just one instance, Mr. Keith Howard (Westlakes Radio Club) reports that ten of his club members have been placed in various electronics vocations. Unfortunately, Y.R.S. resources are inadequate to maintain records of all members who move from clubs to the electronics industries, but already employers are becoming aware of this situation and discussions with personnel officers reveal that they are alarmed by the fact that only a small proportion of applicants have any established hobbies. They welcome any applicants of suitable academic standard who can produce our Y.R.S. Radio Certificates as evidence of established Interests and skills. In New South Wales club leaders are directed to "groom" their jobseeking members and to encourage them to take to interviews any good examples of radio or electronic constructional projects as evidence of skill and knowledge. Former Y.R.S. members are found in the armed services as Radio Apprentices, in D.C.A. and P.M.G. Training Schools, in private electronic firms as apprentices and cadets. However pleasing this situation may be, we have no reasons for complacency, nor must we slacken our efforts. At this juncture I must draw attention to a recent television issue of "Four Corners" which showed Chinese children of elementary school age receiving instruction in radio construction. The electronic equipment in the Chinese science laboratories at secondary school level made our local efforts look pitifully inferior. It is evident that we have a long way to go in this field of Science Education and this angle, I suggest, might be one to stress in further representations for Novice licensing to Australian Federal authorities. The U.S.S.R. Youth Training Scheme and the Novice licensing systems of U.S.A., India and Israel make our traditional British attitudes obsolete in this changing world.

The Radio Proficiency Certificate Scheme which operates within the Y.R.S. is progressing satisfactorily. There is considerable variation in this development in the States, but in Queensland, New South Wales, Victoria and to a limited extent in South Australia the Certificate system is functioning. This year saw the award of the first Intermediate Radio Certificate and the issue of the first new Radio Telephony Operator's Certificate. In Victoria, the first primary school boys and the first secondary girls received Elementary Radio Certificates. It was pleasing to see the latter publicised on the front cover of a recent issue of "Amateur Radio". It is interesting to note that after gaining the Junior Certificate some club members take advantage of the school vacations to study for the A.O.C.P. and thereby short-circuit the later certificates in our Y.R.S. series.

Although Y.R.S. Certificates are available to members of adult clubs, mainland adult clubs have not taken advantage of this service. The only club which has submitted adult candidates is that on Christmas Island. It is pointed out that many adult A.O.C.P. students are men who have been away from school for many years and whose skills in answering examination questions under stringent conditions have faded during the years. The Certificate scheme, with its graded levels of testing, could well serve to re-develop examination skills and thereby enhance candidates' chances of success at the P.M.G. examinations. Instructors in adult clubs might give consideration to this matter.

The interchange of Y.R.S. Newsletters and Bulletins is a worthwhile development during this last session. The Victorian Division started this system of disseminating Y.R.S. information and VK2, VK4 and VK5 have followed this example. In VK4 the Y.R.S. Bulletin forms part of the general Divisional Bulletin, whereas elsewhere separate Y.R.S. Newsletters are produced and distributed. The N.S.W. Newsletter carries various items which would normally be found in a Federal Y.R.S. Newsletter, but for the sake of economy in time and effort this procedure has been followed. From time to time other information is posted to club leaders and others on the mailing lists. Details of the Duke of Edinburgh's Award Scheme, Junior recruiting information for the R.A.A.F. and Army, details of the U.S.S.R. Youth Training Scheme are some items which have accompanied the Newsletters.

Youth Radio Scheme activities are well publicised in both "Amateur Radio" and "Radio, Television and Hobbies" by Mr. Ken Mattei (VK1KM) and Mr. Pierce Healy (VK2APQ) respectively as correspondents. Thanks are due to both these gentlemen and to the editors

of these magazines for their continued support during the year. Despite their efforts, one feels that there are many amateurs who know vaguely that the Y.R.S. exists but take not interest in furthering this institute activity. As is usual in all voluntary organisations the real work is left to the few willing workers and, with the rapid expansion of this scheme, is is becoming evident that more assistance is required for a variety of tasks associated with the administration of this scheme. In fact, it would not be an exaggeration to state that there could well be a full-time job for some person accustomed to handling correspondence, able to type and willing to exercise a great deal of initiative in furthering this institute activity. However, this seems to be beyond the realms of probability at this stage.

In the N.S.W. Division a large range of inter-club competitions has been presented for the 1965 session. Prizes of money and radio components have been specified, and it is hoped that these incentives will encourage members to participate and club leaders to urge their charges to attempt these contests. The interstate Morse Code Contest had to be abandoned because of lack of support from other Divisions. However, New South Wales will conduct its own championship as soon as practicable. It is hoped that at some later stage an Australia-wide Morse Contest will be possible.

This session has seen the introduction of the Radio Instructors' Certificates, which were specified on the original drafts of the scheme, but were not implemented previously for various reasons. These certificates are now available for distribution to successful candidates in all divisions. It must be noted that these awards are NOT easily obtained, but represent instructional experience and effort over a considerable period. Congratulations are due to Mr. Keith Howard (VK2AKX) of Westlakes Radio Club and to Mr. Ken Mattei (VKIKM) of Lyneham High School on being the first club leaders to achieve these distinctions.

It has been found that staff changes at the end of each year cause havoc in the club situations in each State. Accordingly, it has been found necessary in New South Wales, at least, to require clubs to register annually. Club Registration Certificates are available for distribution to State Supervisors for this purpose. The Victorian Division was the first to use this system and it is worth the effort. Other Divisions should be encouraged to adopt this method.

Critics of the Youth Radio Scheme stress that hobby radio tends to interfere unduly with the academic studies of members. This may be true in certain instances but the chances are minimised by the fact that most club leaders are school teachers who should be in a position to assess whether certain members are neglecting school work by excessive concentration on radio. A few well-chosen words or other means of persuasion can usually rectify this position, whereas, before Y.R.S. was introduced, excessively enthusiastic hobbyists had no such guidance and may, in certain cases, have suffered academically. At this stage I might mention that four young people in New South Wales who gained A.O.C.P. status while still at school also gained excellent Leaving Certificate passes and Commonwealth Scholarships. Three of them were special guests of the Institution of Radio and Electronic Engineers at the Dunrossil Memorial Lecture, delivered by the Duke of Edinburgh at the University of New South Wales. The fourth member of the successful students was debarred from attendance because of her sex! However, she has enrolled at the University and hopes to become a teacher — and, presumably a Radio Club Leader of a transmitting type club.

With increasing numbers of boys and girls participating in Y.R.S., I suggest that State Supervisors should express opinions regarding the desirability of having lapel badges made. It is suggested that, should agreement be reached, the present overall "motif" should be retained with "Youth Radio Scheme" replacing the present wording. The colour scheme, too, might be varied for the junior members. Federal executive might then arrange for manufacture and sale to Divisions at an appropriate price.

I feel, too, that the position of Federal Co-ordinator is one which should be shared by other divisions. The Scheme has developed to the stage of a "going concern" and sufficient agreement has been achieved to ensure that each State Supervisor can work on lines similar to those observed by all other State Supervisors. I feel that one person in office can become too dogmatic, too intolerant of new ideas and the "new broom" technique has much to recommend it. In addition, combining the duties of Federal Co-ordinator and State Supervisor for N.S.W. has become far too onerous and I should like, therefore, to stand down while other Divisions take their share of the burden in rotation.

I should like to express very sincere thanks to those who have eased the load by co-operation, by suggestion, by expression of opinions, by willingness to try new ideas and by keeping in touch by letter frequently to advise what has been happening elsewhere. Such co-operation has not, unfortunately, been of uniform standard and while I do not propose to specify any Divisions for lack of support, I feel that they are missing out on the undoubted advantages which accrue from developing an enthusiastic Youth Radio Scheme to provide fresh blood to replace the ageing membership.

R. G. Black (VK2YA),
Federal Co-ordinator, Youth Radio Scheme.

# NEW CALL SIGNS

**MARCH, 1965**

VK2GK—R. B. Digby, 15 Lennox Street, St. Mary's.
VK2GL—F. E. Atkins, "Illawong," Thurlow Avenue, Nelson Bay.
VK2HP—N. C. Nugent, 24 Carrington Parade, Harbord.
VK2IT—D. E. Woollett, 12 Broadarrow Road, Beverly Hills.
VK2UV—G. A. Murray, 1 Gladstone Street, Belmore.
VK2AHL—A. S. Heckenberg, 36 Lennox Street, Richmond, 1.W.
VK2AZU—T. E. Woolley, 4/148 Campbell Parade, Bondi Beach.
VK2BXK—1st Kyeemagh Sea Scouts Youth Club, Station: Scout Hall, Bestic St., Kyeemagh; Postal: 23 Caroma Avenue, Kyeemagh.
VK2ZBT—N. R. Crosby, 92 Abbotsford Road, Homebush.
VK2ZDD—C. J. Jones, 706 Forest Road, Peakhurst.
VK2ZEN—E. M. Norris, 16 Koorabel Street, Lugarno.
VK2ZHD—H. J. D. Duncan, 15 Aloha Street, Mascot.
VK2ZHG—M. A. Harrison, 14 Market Street, Rockdale.
VK2ZHR—P. Halpin, 19 Morton Street, Waverton.
VK2ZNZ—B. D. Bannister, 193 Wangee Road, Greenacre.
VK2ZSQ—J. Potts, 3 Forrest Street, Oak Flats.
VK3KV—M. J. Y. McCartney, Flat 6, 23 Docker Street, Elwood.
VK3AAQ—A. L. Osborne, Station: 110 Arundel Street, Benalla; Postal: P.O. Box 16, Benalla.
VK3AED—J. R. Walker, Jordon Road, Point Lonsdale.
VK3AIE—R. S. Tucker, 40 Panoramic Road, North Balwyn.
VK3ZGV—D. B. Judd, 23 Ralton Avenue, Glen Waverley.
VK3ZHJ—J. A. Horan, 2 Harry Street, West Brunswick.
VK3ZHY—A. R. Webb, 60 Stevens Street, Portarlington.
VK3ZID—J. C. Livsey, 27 Maude Street, Shepparton.
VK3ZJX—F. J. Iliff, 25 Weatherston Road, Seaford.
VK3ZPO—D. P. James, 133 Victoria Road, East Hawthorn.
VK3ZPQ—N. J. Schruhm, 418 Nepean Highway, Parkdale.
VK3ZPU—B. D. Ritchie, 1347 Gregory Street, Wendouree.
VK3ZYE—I. R. Prior, 47 Tannock Street, North Balwyn.
VK4BW—Bundaberk Amateur Radio Club, Station: Avoca Street, West Bundaberg; Postal: Post Office Box 129, Bundaberg.
VK4SI—J. E. Spencer, Ann Street, Woombye.
VK4ZAB—J. A. Berry, 34 Merehaye Street, Wooloowin.
VK4ZCB—B. C. Chapman, 42 Dempsey Street, Mt. Isa.
VK4ZKD—K. H. Dredge, 16 Brilliant Street, Mt. Isa.
VK4ZSN—N. D. Stallman, Deerhurst Road, Brookfield.
VK5AD—B. C. Jellett, Station: Beach Road, Beachport; Postal: P.O. Box 1, Hynam.
VK5BD—D. S. Brown, 14 Lachlan Avenue, Woodville West.
VK5TO—R. K. Westbrook, 42 Chillingworth Road, Elizabeth East (incorrectly shown in February issue as VK5LO).
VK5TY—G. M. Taylor, 18 Fairmont Street, Black Forest.
VK5ZAG—J. D. Churcher, 41 Wood Street, Kurralta Park.
VK5ZKB—K. R. Burrows—17 Railway Road, Blackwood.
VK5ZTN—T. D. Niven, 4 Laurie Street, Mount Gambier.
VK6NM—N. Martinsons, 166 Shaftesbury Avenue, Bedford Park.
VK6SE—R. M. Ellison, West. Australian Missionary College, Carmel.
VK6TJ—A. C. Gray, 205 Townshend Road, Subiaco.
VK6ZBG—C. H. Baker, 21 Hovea Crescent, City Beach.
VK7ZMK—M. J. Knott, 6 Aberdeen Street, Glebe.
VK7ZYL—Mrs. A. Jenner, 3 School Road, Geeveston.
VK9AL—R. A. Love, Commonwealth Office of Works, Hostel 425/3, Rabaul, T.P.N.G.

**APRIL, 1965**

VK2DT—A. R. Harrison, 61 The Drive, Concord West.
VK2UN—G. Welch, 6 Bradley Avenue, Bellevue Hill.
VK2UX—G. A. Tippett, "Karloo," Kincumber Road, Green Point.
VK2AAY—R. P. Jones, 20a Carter Street, Cammeray.
VK2ZDZ—D. Parker, 9 Balaclava Road, Eastwood.
VK2ZMB—B. R. Mitchell, 13 Scarborough Street, Kogarah.
VK2ZRZ—R. P. Ronai, 103 Edinburgh Road, Castlecrag.
VK3ABR—D. H. Jenkin, 22 Monash Street, Box Hill.
VK3AKS—R. K. Smyth, 256 Moreland Road, Brunswick.
VK3ANI—K. A. Nicholls, 591 Riversdale Road, Surrey Hills.
VK3ATX—A. L. West, 11 Could Street, Brighton Beach.
VK3ZPP—R. G. Gordon, Tennyson, via Prairie.
VK4ZBV—J. P. Hayden, 151 Maygar Street, Windsor, Brisbane.
VK4ZCA—A. J. Chappel, D'Aguilar, Queensland.
VK4ZFF—F. W. Baker, 33 Crammond Street, Wilston.
VK4ZKB—K. E. Ballantyne, Postal: 16 Army Light Aircraft Sqn., R.A.A.F., Amberley; Station: Hanbury Street, North Bundaberg.
VK4ZRE—R. A. Everingham, 30 Hunter Street, Everton Park, Brisbane.
VK4ZRF—G. R. Flodine, School Road, Rochedale.
VK4ZTV—T. W. Vieritz, 44 Silvester Street. Windsor, Brisbane.
VK5DR—R. C. G. Jackson, 19 Park Road, Kensington Park.
VK5VG—Bro. J. V. Griffin, Christian Brothers' College, 214 Wakefield Street, Adelaide.
VK5ZDW—D. K. Wallace, 112 Stephen Terrace, Gilberton.
VK5ZKG—K. W. Gooley, 4 Ormonde Avenue, Millswood.
VK5ZKH—K. G. Searle, 96 East Avenue, Clarence Park.
VK5ZOP—N. I. Smith, 5 Marine Parade, Seacliff.
VK6US—E. F. Wirtz, 70 Howes Crescent, Dianella.
VK6ZFX—T. J. Broom, 2 Armada Street, Bayswater.
VK7ZBL—B. Kelly, 29 Park Street, Wynyard.
VK7ZMW—M. A. Wood, Walton Street, Huonville.
VK7ZPD—P. R. Dowde, 77 Talbot Road, Launceston.

# S W L

Sub-Editor, Chas. Aberneathy, WIA-L2211,
30 Urunga Parade, Miranda, N.S.W.

This month you will no doubt notice that our section has been reduced somewhat in size. The problem of space brought this about, so I have been compelled to abridge, and delete portion of the notes that appeared in the past. With this in mind I shall rotate items, such as the DX ladder, which will only appear four times a year.

Congratulations to each member of the various States who gained awards in the 1964 R.D. contest.

SSB. To read a station on s.s.b. by the injection method, the station should first be tuned in on normal a.m. position. Then switch in the b.f.o., and adjust it until the signal has a normal voice quality and is understandable. This may mean that the sensitivity of r.f. gain must be reduced since many s.s.b. stations are very powerful. A few times at practice and the operator will soon learn the best technique for him to use.

**NEW SOUTH WALES**

With the increased attendance at our May general meeting we feel that the lapse of which our committee complained was just a period that most groups experience from time to time. We can, with continued support, go ahead and organise to retain the interest of those who attend.

Arnold L2291. I trust by now that you have the information about the converter, if not let me know, and I shall place a request in the Bulletin.

Robert L2289. Very good on all your projects O.M. A decent antenna should put you really in business.

Mac L2074. Your weekly comments are much appreciated. Latest card to hand UP2CT.

Don L2022. I am very pleased to hear of your decision and many thanks for your letter at long last. Hope to meet you in the near future.

**VICTORIA**

The Victorian S.W.L. group wishes to thank the four people who have supplied us with chassis and spare parts during the past few months. These were most welcome by the younger members. President Harry Roach has voiced alarm at the poor safety precautions on a lot of the equipment members are bringing along to the radio construction evenings, the use of more tag strips for the firmer mounting of components is also more important, remember, fellows, cover those leads with voltage on them. The group is considering the Y.R.S., but more of this at future meetings. Our group extends congratulations to Peter Drew L6021 for winning the receiving section of the 1964 R.D. contest and to Greg Earl for his win in the VK3 section. It is interesting to note that VK5 had as many entrants as VK3 with only a quarter the membership that this division has. Ian L3006.

Greg L3138. Thanks for those QTH's, they will be very handy, and keep me going for some time. QSL's received, VK0, 9M2, KX6, VK9, HC1.

Warwick L3211. That radio/study timetable seems quite a good idea. Pleased to hear that you had some good DX, and received cards from VS9, EP2, VK9 and LU3.

Eric L3042 has sent 340 reports for the first five months of the year to 90 countries, with inwards QSL's from CO2, FK8, HM5, HL9, UA0, UH8, 8AE, UP2, K8/VO, 4UI, 4X4, 5A5 and 5Z4. Heard, 1.8 Mcs., VK3WI, VK3YQ. 7 Mcs., F3, UT5, UB5, 9HI, 5R8, UO5. 14 Mcs., OH7, UQ2, DL4, UA2, DU1, UB5, KL7 and JA7/MM.

**QUEENSLAND**

At the moment 3.5 Mcs. is very good for local and interstate, with quite a marked increase in s.s.b. ops. on that frequency. On 21 Mcs. the JA's are plentiful with good spasmodic openings to the States. Afton L2136/VK4.

Afton L2136/VK4. Thanks for the information on the vertical, I will use it when time permits. I trust that your trip will be a pleasant and profitable one. Hope to catch up with you on 52 Mcs. later this year.

**SOUTH AUSTRALIA**

Alan L5065. I trust that you managed a replacement for the tube in question. O.K. re those cards, very good indeed, and thanks for the offer. Latest QSL's to hand, OD5, TI2, FK8, VK6, WA3, and heard 7Q7, W's, JA's and ZL's.

**WESTERN AUSTRALIA**

Bryan L6028. Sorry re the mix up with those numbers, all now under control. Suggest that you place an ad. in "A.R." re that v.h.f. receiver. Logged during the month, W6, K7, VE5, 9U5, JA0, VE6, KH6, LAI, UA1, HA2 and TF3.

Allan L6029. Heard on 20 metres, CT1, UA3, SM3, W0, YV5 and VP2, whilst on 15 metres, ZS9, JA6 and GM3.

Geoff L6030. Sorry to hear of DX conditions at your QTH. Additions to log for the month, HK3, XE1, ZD8, KH6, 7Q7, WA4, CR6, 9J2 and VU2.

**TASMANIA**

Very good openings on the I5 metre band between 1000 and 1700 east, with W's strongest around 1300 hrs. 20 metres dead after 1800, but quite lively during daylight hours.

Greg Johnson. Many thanks for the circuit of the convertor, which will be copied and offered to our members. Heard BV1, CR7, FO8, G3, HL9, HP1, JA's, KP4, UA1, UM8, VP3, VE's, W's, XE1, ZE4, 9M4, OZ5, YV5, etc.

**GENERAL**

VK3AHO is to be CR8AE shortly, no details to hand as yet, but it is to be a DX-pedition. Eric L3042.

Alan Jones, 29 Little Green Lane, Chertsey, Surrey, England, would like to hear from VK S.W.L.'s.

For the card swappers, Joe Serbek, 75 Clark St., Torrington, Connecticut, U.S.A.; Yasushi Takeda, 19 Kita 9 Bancho, Sendai, Japan; Norman Parks, 740 N Belforte Av., Oak Park, Illinois, U.S.A.; Tetuo Ikari, 188 Imazu-cho, Jyoto, Osaka-City, Japan.

There was quite a fall off in the mail during last month as a number of my regular reporters failed to pen me of their doings. I trust that this is only temporary, and they will once again appear in the August issue. Well, chaps, that's it for now, so cheers, but remember, mostly things are found where they are left. But are they always left where they are found?

**S.W.L. DX LADDER**

| | Countries Cont. | Countries Hrd. | Zones Cont. | W States |
|---|---|---|---|---|
| E. Trebilcock .... | 285 | 293 | 40 | 50 |
| P. Drew .... .... | 165 | 258 | 36 | 38 |
| A. Westcott .. .... | 102 | 159 | 34 | 11 |
| M. Hilliard .. .... | 92 | 241 | 33 | 14 |
| M. Cox .. .... .... | 89 | 225 | 33 | 23 |
| G. Earl .. .... .... | 87 | 165 | 33 | 14 |
| L. James .... .... | 83 | 181 | 32 | 15 |
| R. Kearney .. .... | 80 | 148 | 32 | — |
| W. Smith .... .... | 78 | 183 | 29 | 7 |
| N. Harrison .... | 62 | 181 | 32 | 38 |
| A. Raftery .. .... | 33 | 154 | 21 | 9 |
| R. Harrison .... | 20 | 70 | 17 | 5 |
| B. Prosser .. .... | 17 | 136 | 8 | 2 |
| B. Mackintosh .. | 15 | 58 | 15 | 3 |
| T. Corbin .. .... | 12 | 34 | 9 | — |



# Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

**INVENTOR OF SUPERHET**

Editor, "A.R.," Dear Sir,—How much longer is "A.R." going to keep stating that Armstrong was the inventor of the superheterodyne? Twice recently this inaccurate statement has been seen in the pages of "A.R." Can we get it correct? The facts are: The patent of Armstrong is 6 months behind that of Schottky of Germany.

Schottky was 12 months behind Levy of France.

In the 1920's a law suit involving Armstrong and Levy and the superheterodyne was decided in favour of Levy by the U.S. Court.

If you could print this letter it may help to clear up the wrong impression created.

—Norman Burton.

**THAT WORD "WE"**

Editor, "A.R.," Dear Sir,—I have noticed recently that many chaps when on the air use the personal pronoun "we" when they mean "I."

The fraternity is reminded, therefore, that the only Amateurs entitled to use "we" are those who:

(a) Are Siamese twins; (b) are pregnant; (c) have tapeworm.

Unhappily, this is not original!

VK5EK.

["We" are not amused.—The Editor.]

**"HAM"**

Editor, "A.R.," Dear Sir,—America's 280,000 Amateur radio "Hams" were honoured on December 15 with the issue of 5 cent stamp.

The stamp was issued on the 50th anniversary of the American Radio Relay League, an organisation almost as old as radio itself. The designation "Ham" for the Amateur radio operator, however, is older than the League and there is an interesting story behind this word.

In 1909 one of the first Amateur radio stations operated under the call letters "H-A-M." his word was a composite of the first letter of the surnames of the three Amateurs who operated the station at Harvard—Albert Hyman, Bob Almy and Peggie Murray.

When proposed Federal legislation threatened to destroy Amateur radio Albert Hyman came to Washington to testify and to defend his station "H-A-M." As a result the word "Ham" came to mean all Amateur radio operators.

—"Stamp News," April 1, 1965, Page 28.

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# Publications Committee Reports That . . .

Inward correspondence from VK's: 4WP, 4SS, 5EK, 3AVU, 2ZTM, D. Priestley, N. Burton, J. C. Haseldine and Rev. Bro. P. L. Ellis has been published in this issue or acknowledged. Technical articles were received from: VK's: 2ZRL, 5TH, 3ZCK, 3AK and 3ZFS up to the last mail on 14th June, 1965.

It was nice to note that many correspondents followed the suggestions requested in the June issue of "A.R.," this is most gratifying and it is hoped that this co-operation will increase, to everyone's benefit.

Due to the non-arrival of the N.S.W. Bulletin we were unable to print the prediction chart this month, however, regular publication can be anticipated in future issues.

Readers will note the altered front cover design and we invite comments, as it is our intention to amend the layout; consequently various designs will be tried during the next few months.

The Committee generally discussed the layout of the magazine and several ideas have been put forward; these will be adopted over the next few issues and we trust will improve "A.R."

All Amateurs are requested to promptly notify the P.M.G. and "A.R." of the change of address, as the next edition of the Call Book will shortly be in preparation, hence if your current address in the Call Book is incorrect then this amendment should be notified as soon as possible.

# V H F

## 52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Out of the mid-winter gloom arrived an interesting note from K6MQG. W6DNG, who made OHINL via 2M moonbounce, is looking for sched.'s with VK stations on 144 or 432 Mcs. He is available every day of the year between 0030-1330 G.M.T. Any interested Amateur may contact either K6MQG or W6DNG for further details. W6DNG's frequency is 144.002. Here is an opportunity for some enterprising Amateur or groups to make a worthwhile contribution to Amateur radio by joining with W6DNG in this venture.

Following the lead of VK5, VK6, it is reported in the VK2 V.H.F. Newsletter that ZL is investigating the possibility of setting up beacons on 2 M. It is also reported NZART has requested technicians be allowed to use 6 M., but was refused because N.Z. has signed agreements with the I.T.U.—morse required below 2 M.

Wonder how many Amateurs followed the progress of the recent U.S. space journey. Haven't heard a whisper as to what frequencies are in use—close secret perhaps. It is a pity that we cannot use the signals—excellent training for Oscar. Anyone know what frequencies are in use?

Hope all correspondents will remember the new requirements when forwarding their notes from now on. Refer to P. 6, "A.R." June for further details. VK3ZGP.

### NEW SOUTH WALES

The forthcoming events in VK2 for July and August include the usual lecture at the July meeting which is on the first Friday evening, 8 p.m., at Wireless Institute Centre, 14 Atchison St., Crow's Nest (July 2). The lecture on the combined transmitting antenna for Channels 7 and 10. Instead of the 6 metre fox hunt on 7th July there will be a home station event. The 2 metre hunt will be on 28th July. In August the meeting on the 6th will be the 1965 version of the "Mobile Forum," a panel discussion on 2 metre mobile and portable operation. The 6 metre hunt on the 11th and the 2 metre on the 25th. The day event for August will be the v.h.f. section to the Remembrance Day Contest. The same as last year with the rules almost the same as the h.f. section. The only major difference being that a station may be reworked once an hour has passed, the scoring is based on local population zones. The group committee suggests that other States may hold thier own event. From next year a v.h.f. section should be included with the general contest.

Little is known about the activity round the State at the moment. In the far north Eddie 2BB and some of the locals are converting taxi phones to 6 metres. At Orange, Brian 2ZQX has been working back to Sydney on 2. To help the group keep in touch with the country operators, David 2ZVW has been appointed liaison between the city and country and would welcome reports and information.

The subject of calling frequencies for 6 and 2 metres has been raised and at the last committee meeting it was decided that such a move should be done on a nation-wide scale rather than by States. The request has been passed on to the Federal Councillor 2APQ.

Early this year ZL3AAU paid a visit to VK. He has since sent a request for some information re the setting up and operation of beacon stations. Anyone who could help should write to John as I expect that they would have to supply some good reasons to the Post Office. His address is John Miller ZL3AAU, 95 Paparda St., Christchurch, New Zealand.

It is odd the number of times and places that you can meet other Amateurs. During a recent trip to VK4, Brian 2AND stopped for 10 minutes at the post office in Gunnedah, and while there was greeted by John 2ZBA who was also in town for about 10 minutes. Both are Sydney Amateurs, and of all the towns in VK2 to pick what would the odds of their meeting have been?

Operators on 146 Mcs. taxi phones in this State have suffered some interference from the sound channel of Channel 10. This has been overcome by using a different crystal in the receiver. An article on this appeared in the June V.H.F. Newsletter of which some spare copies remain. (14 Atchison St., Crow's Nest.) Some activity is starting up on Channel A (145.854).

Some signals from Channel 0 Wagga have been received in Sydney during May. The DX season should prove interesting.

2ZM.

### SOUTH AUSTRALIA

Activity in VK5 at the present time has resumed the usual Christmas level, regardless of winter elements, which tend to keep Amateurs firmly entrenched in front of the "modulated ink bottle" and radiators at this time of the year.

Current interest on 6 M. at the moment is centred on a mobile net on 52.04. At the present time approximately 15 stations are actively engaged on this frequency. Caustic comment has been emphatically voiced by those normally operating in this region, however, due to the availability of large numbers of crystals on this frequency, the establishment of a net frequency was deemed most necessary regardless of the frequency. Due to the insistent comment regarding the choice of this frequency, an alternative net is being considered on 52.2. Whatever the complications associated with the selection of frequencies may unfold, the asset of such a net has so far seen the mobiles increase in numbers in a very short period. Mobileers are always assured of air space, which was not always the case previously.

Two M. activity has also increased in intensity, with outlying stations in excess of 100 miles from Adelaide providing the main source of activity. Sunday, 23rd May, saw the 2 M. scramble with Bob 5ZDX as control. The result was Ian 5IZ past the post in No. 1 position, hotly pursued by Edwin 5ZS and 5ZDX sharing No. 2. Nine stations participated in some manner or form, which resulted in much discussion relating to future scrambles.

On 432 Mcs. Amateur T.V. appears to be the only occupant. Of particular interest is the "Colour Television" transmissions being conducted by VK5ZEY. The system being used is the 3-colour revolving disc synchronously rotated at transmitting and receiving points. Excellent results have been achieved so far with minor complications and future experiments may provide many points of interest. 73's VK5ZHJ.

### WESTERN AUSTRALIA

The fox hunt on 22nd May was good fun. It was away out in one of the new northern suburbs, and upon arrival there was no trouble in finding the fox. It was a beam hung by string from a branch of a tree. The fox was in the VW right underneath—6WY in person. Supper was at Brian Pemberton's place only we were not given directions. There was another TX going about 2 Kcs. away and if you followed this you got back to supper. Unfortunately a couple of cars found supper first and had to get the TX subdued before they could hear the second. Graham 6ZDO and another ham named Spider got themselves lost in a marsh. They followed the telegraph poles until they got bogged. A May-day call on 6 sent a couple of cars their way and fortunately they managed to extricate the Austin A40 in time.

Supper was served by Mrs. Pemberton. Some cream puffs met a sad fate when they were dropped on the carpet. However, the carpet is now O.K. Brian told some interesting tales of life in the Air Force and I went home happy.

Graham 6ZDB had his GT Cortina out on the fox hunt and said it took the corrugations very nicely at 50, or was it 70?

New calls heard are Glen 6ZFH, Igor 6ZFG and Cyril 6ZBG. S.s.b. cannot be used on Igor as he persists in calling it d.s.b., but it is no difference really, as he has only got a transistor receiver which was not made for invasion by a b.f.o.

Wally 6ZAA has returned from two weeks in the east (States, not oriental) and is making up another 2 metre converter with a surplus of E88CC's he acquired. Andrew 6ZCN is making a big power supply to run a pair of 4 x 250 B's in sideband on 2 m.x. I understand he is going to use d.s.b. with inverted audio to make tuning easier. Have you noticed the way 7094's are being plugged in the ads.? They must be trying to develop a market for them. 73, 6ZAG.

# SIDEBAND

By Phil Williams VK5NN.

Before my departure for Melbourne at Easter time for the Federal Convention it was suggested that VK5 should do something about the absence of s.s.b. notes in "A.R.," so with left arm in pain following the twisting, your new scribe "volunteered" to try the other hand at writing the column until such time as the material dries up.

Here in Australia the use of commercial equipment is gaining ground quite rapidly, but there are still many VK Amateurs who wish to build their own, and it is to help these chaps that this column will be written. If it can be carried on for a few years along these lines then the objectives will have been achieved.

Before proceeding too far I should like to make a request for data and news of all sorts, dealing with single-sideband techniques, construction and operation. Most evenings when I am at home I shall be on 80 metres, near the high frequency end of the band, on s.s.b. at about 10.30 p.m. E.A.S.T. time, to pick up snippets of news and information, which should reach me by about the end of the month for inclusion in next month's "A.R." Of course, if you would care to write to me and include diagrams and photographs even, of your home-constructed gear, and descriptions of how you went about construction, adjustment and lining up your gear, then I shall be very pleased to incorporate the gen in the column. This applies more, of course, to "hints and kinks," not fully fledged constructional articles, which, if they cover sideband gear, will be well received by the Editor.

There must be many little tips about getting the s.s.b. station on the air and working, not only to the owner's satisfaction, but also to the satisfaction of other Amateurs, and I should like to hear about the doubts of newcomers to "sideband" so that many difficulties may disappear before they arise—in much the same way as the well-known Irish footballer, Danny Blanchflower, who told his team to "Get out there and equalise before the other team scores!" The topics I have in mind to cover are:—

(1) Improvements to phasing type exciters, and towards this end, these notes will conclude with a description of a simple and effective audio filter, to go in the 2000 ohm output circuit of the usual audio amplifier.

(2) The design and operation of linear amplifiers for the DX hounds who want to get out and work hundreds of countries—so that they may still remain popular with their nearest Amateur neighbours.

(3) Tips on transceivers and using them mobile—and there must be hundreds of ideas in this field worth passing on to others.

(4) The use of s.s.b. on v.h.f.—with the advent of long distance record chasing, moonbounce, and the Oscar satellites, there is an upsurge in interest in v.h.f., s.s.b. The VK5 v.h.f. group is conducting a series of technical meetings dealing with 2-metre sideband, and I hope to be able to report some of their doings shortly.

(5) Reviews of commercial equipment—not with a view to extolling its virtues, but to let people know what the particular item is and what it is supposed to do. Perhaps I should say right here and now that I do not sell any radio equipment and have no pecuniary interest in commercial equipment. As an electrical engineer with the Electricity Trust in S.A., I leave that side of things to others, my interests are purely technical, and all of my own s.s.b. gear is home constructed.

### A SIMPLE AUDIO FILTER FOR A PHASING EXCITER

To conclude these notes I thought it might help some of those with simple phasing exciters to have a design for a low-pass audio filter to reduce the output of the audio amplifier to negligible proportions beyond 3 Kcs. One of the worst features of the phasing exciter is its audio amplifier which gives out frequencies below 300 cycles (for male voices) and above 3000 cycles, but oscilloscope tests have shown that the phase shifting network is only capable of giving the correct 90 degree relative shift between 300 and 3000 cycles per second. The other frequencies result in the sort of hash and splatter which make one unpopular.

Fig. 1 shows the circuit of the filter and the recommended position for its insertion in between the audio output transformer and the resistance divider network supplying the 7:2 voltage ratio signals to the audio phasing network. It will be noted that with the resistances shown the ratio 1650/470 ohms, using one per cent. tolerance resistors gives the correct voltages without having to use a potentiometer between them for adjustment, and eliminates one more thing which can be maladjusted to give poor signals.

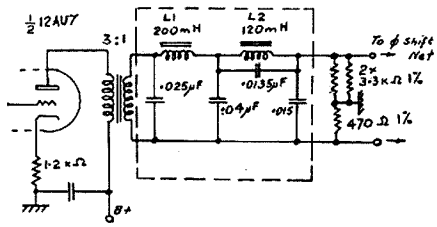


Fig. 1—3 Kc. Low Pass Audio Filter.

The load on the transformer through the filter is (1650 plus 470 ohms) 2120 ohms, which when stepped up by the 3:1 transformer presents a load of 19,000 ohms to the half-12AU7 triode amplifier, and this is quite good for the output level required from it.

The condensers used in the filter are values which may be built up quite easily from small paper, mica or small plastic film capacitors. Mine were 200 volt rating paper condensers of small dimensions.

The easiest way for the home constructor to make filter inductances of the values required is to obtain suitable ferrite pot-cores or cup-cores. It is easy to get these larger audio types, look up the technical data for the number of turns per millihenry, and remembering that inductance is proportional to the square of the turns, figure the turns required.

As an example I purchased some Philips cup-cores type K3.001.07 which require 32 T. per mH. To find the turns, simply take the square root of 200 (mH.) which is about 14, multiply this by 32, which gives 450 turns for L1. Likewise for L2 which is 120 mH., the square root of 120 is about 11, and 11 x 32 gives 350 turns.

Winding the coils by hand, using 36 gauge hard enamelled wire on the end of a screwdriver handle just larger than the core of the cups (or on the correct formers which sometimes come with the cores), then adding a little thin tape and P.V.C. tubing to the leads, took about five minutes each.

Checking the filter with an audio oscillator showed the amplifier response to be level to about 2.7 Kcs., with a quite dramatic drop in excess of 30 db. at 3.2 Kcs.

Similar filters have been built using homemade windings on Rola filter choke cores, but it is only fair to point out that these are not quite as high-Q as the ferrite cored coils.

Next month's s.s.b. column will deal with the frequencies below 300 cycles, and a few other tricks in the audio section of the exciter. 73, Phil 5NN.

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## DX-PEDITION OF THE MONTH

Increasing popularity of the "DX-Pedition of the Month" programme, as evidenced by the increase in number of QSL cards received during the past six months, now necessitates a change in procedure for submitting QSL's for confirmation.

Beginning April 15, 1965, QSL cards received from all W/K stations should be accompanied by a S.A.S.E. (self addressed, stamped envelope). All other stations (outside the U.S.A.) should send a properly self-addressed envelope. (Stamps or I.R.C.'s not required.)

Since "DX-Pedition of the Month" is now handling the QSL-ing for over 35 different stations, and we anticipate the continued addition of new ones, this new procedure will help to confirm QSO's more quickly and accurately. By initiating this plan, we expect to reduce the delay in getting your QSL's into the mail.

Our policy concerning cards received via QSL bureaus shall remain the same. All such cards are confirmed by way of the appropriate bureau.

—Stuart Meyer, W2GHK, P.O. Box 7383, G.P.O., New York. N.Y. 100001.

# YOUTH RADIO CLUBS

This column has Correspondent's Syndrome this month—scarcity of letters bringing news. There is an open invitation for not only State Supervisors but also Club Leaders and others to send me items from anywhere. The space available is not used to favour anybody—the biggest share goes to the greatest volume of news, wherever it comes from. VK2 usually leads but others are welcome to match them.

Two "Quotes of the Month" are worthy of special note. The first is an eminently sensible one from our Federal President—"I urge Divisions where Y.R.S. is not functioning, or only just starting, to give this aspect of institute activities every assistance possible. for recruitments in this field will eventually make itself felt in added membership apart from the better public relations it creates." I would add to the President's thoughts that any large organisation, such as the W.I.A., which is in a position, without strain on itself and even with a prospect of added strength, to render service of value to young people and to the nation, should eagerly provide that service. My second quote, without comment, is from Division Notes: ". . . but then isn't VK5 always ahead of things?"

I had a talk on the air with two club leaders who were naturally a bit disturbed that their clubs had started well but had declined in membership. This is quite common, and, although we should examine our methods if our clubs falls off, there is no need to worry about it. It's the nature of the youngsters to have flushes of enthusiasm, but also quite commonly to change their interests suddenly, usually many times. The majority of clubs I have known went up and down periodically in membership quite noticeably. The consistently increasing number of clubs and numbers of Y.R.S. shows that you Club Leaders are "with the strength," apart from the fact that you are, by any impersonal standards, providing a most valuable opportunity for young people. So take your declines as calmly as your successes—except perhaps to sharpen up your publicity and re-examine your methods.

It is highly desirable to have a uniform Federal policy on the aims of Y.R.S., and in this regard, everybody should note that it is NOT an aim of the Y.R.S. to compel all members to concentrate on Amateur Radio. Such pressure would defeat itself and turn young people away. Because most Club Leaders are enthusiastic about Amateur Radio, that enthusiasm will probably be communicated, but our aims must be much wider in scope. We should provide training in any branch of Electronics (as far as we can): (i) to help Science Education generally; (ii) to provide an absorbing hobby which may keep youngsters on a sensible course of behaviour; (iii) to help them evaluate a career in Electronics. The fascinations of Amateur Radio can be used fully, of course, to keep them working along. Any Club Leader who has not read Form Y.R.S.1 may get it by sending S.A.E. and 6d. in stamps to Bro. D. L. Kinsella, St. Edmond's School for Blind Boys, Wahroonga, N.S.W.

Would anybody at all in other Divisions please take great interest in the promise of expansion contained in the new Sydney Teachers' College Radio Club? The prime tarket should be the senior Science Teacher at every Teachers' College. Miss Bernice Langmead, Secretary of the S.T.C. Club, has received the Station Call-Sign VK2ZTC.

Mr. Knowles, Overseas Telecommunications Commission Training Officer in Sydney, informs that his organisation has donated £10 towards the Y.R.S. Prize Fund, with candidates from VK3 (where the Commission also operates) eligible. Later in the year, the O.T.C. will be looking for trainees to be given a 3-year course. Club Leaders are asked to advertise this. Further information can be obtained by writing to Mr. Knowles.

State Supervisors are asked to investigate whether a Y.R.S. Lapel Badge would be popular—perhaps a similar one to the W.I.A. Badge but a different colour. Please advise Rex 2YA with a rough numerical estimate.

Roger Davis (1RD) formerly of Lyneham High and now at University, has been authorised to give supervised "on the air" experience to candidates for R.T. and W.T. awards, and to sign the test requirements. An R.T. Certificate (Grade 3) has been earned by Andrew Davis, his brother, still 15. There is no favoritism here—Andrew is a very experienced operator. Ken 1KM.

# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL

### MEETINGS OF F.E.

**15th March.** It was resolved to change the Federal QSL Bureau address from Box 2611W, G.P.O. Melbourne, to 23 Lansdale Street, Box Hill, for the purposes of overseas countries and to save double handling of inwards cards. It was also agreed that a draft letter should be prepared dealing with reciprocal licensing rights between the U.S.A. and Australia, this letter to be sent to the P.M.G.'s Department, requesting that matter to be taken up with the appropriate U.S.A. Dept. Final arrangements for the Easter Convention were made, and Secretary was directed to ask all Federal Councillors for further agenda items. It was agreed that the Federal letterhead should be redesigned and this was left to the Business Manager to arrange.

**30th March.** This was a special meeting to finalise Convention arrangements and the business was restricted to sorting agenda papers and detailed preparations for the Convention dinner. The Treasurer notified FE that he wished to retire this year but would carry on until a new one was appointed.

**28th April.** This was the first meeting of the new Executive and the incoming President, Max Hull, indicated for the benefit of the new members the tasks he believed should be carried out by each member. He pointed out that the new Communications Manager, Bill Mitchell, would prepare the new Handbook for the Guidance of Federal Officers as his major task for the year. It was resolved to accept the A.A.R.L.'s offer of handling subscriptions to QST and the A.R.R.L. and the Business Manager, Alf Seedsman, undertook to administer the proposal and keep the necessary records. The Chairman indicated that the pressing business was the preparation of the minutes of the Convention and allocated work in this regard to other members. It was reported that the P.M.G.'s Department had accepted action to obtain reciprocal licensing with the U.S.A. through the Department of External Affairs. It was proposed also that each member would critically review a particular section of the Handbook for the Guidance of Operators in the Amateur Service, this review to be complete by the next meeting. It was agreed to arrange a demonstration of the copying machines before making a final choice. It was resolved to make a presentation of a pen to the retiring Secretary and Treasurer, the new Secretary to arrange.

### F.E. APPOINTMENTS FOR 1965-66

It is regretted that some confusion may have arisen of the notifications of the new Executive appointments that appeared in the the last issue of "A.R.." There were differences between those shown under Federal Comment and Federal Notes. It is advised that the correct appointments are as shown under Federal Notes, with the exception that there appears to be some doubt on the appointment of the new Federal Contest Manager. Mr. Rumble on advice from the VK6 Councillor was nominated for this job, but due to other commitments Mr. Rumble may not be able to accept. Action is in hand to immediately straighten out this appointment, and further advice will be given in the next issue.

### JAMBOREE CARDS FROM VK3WIA

Amateurs awaiting cards for contacts with VK3WIA at Rowville during the recent Jamboree will be pleased to hear that cards have now been printed and have in most cases, been forwarded through the QSL Bureau to those who made QSO's. All cards should have been sent during the past month.

### SILENT KEY

It is with deep regret that we record the passing of:

VK2LE—F. H. S. Lee.
VK2VC—W. B. V. Cahill.
VK3ZDJ—D. J. Ashcroft.

### CONVENTION MINUTES

The minutes of the Easter Convention have been completed in draft and checked. Before this issue has been circulated, the minutes should be in the hands of the typist and issued to Divisions before the end of this month.

### R.D. CONTEST RULES

Some slight changes will be noted in the 1965 rules for this popular Contest. A special section has been incorporated, as the result of a former convention, to include Z call licensees. Although the entries from Z calls for this year's contest will have no bearing on the final result, it may give an indication of the interest in such a section, and in how it might be best to include them in future contests.

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## FEDERAL QSL BUREAU

QSL's for OH0 Amateurs may now be sent to Box 1, Mariahamn, Finland.

Results of the 5th All Asian DX Contest are now to hand. The following excerpts may interest VK hams: Continental Winners (Multi Band): EP2RC 64,419, PY1MCC 120, DL7AA 7,998, 6O6BN 2,277, WA6SBO 7,904, KG6AAY, 10,428.

Continental Leaders (Single Band): 3.5 Mc.—UW9WB 1,512, OK-MG 44, WA6SLU 8, VK5LD 4; 7 Mc.—JA7XF 1.520, OH2BBR 380, W6OMR 700. PY7AD 10, VK4SS 33; 14 Mc.—UW9VB 20,790, OH1QP 4,032, W4KXV 689, PY2SO 170, DU1GF 1,890; 21 Mc.—4X4MR 3,090, OK1GT 153, VK3QV 120; 28 Mc.—JA1HGY 6.

OCEANIA.— DU1GF 14 1890, FK8AH 21 18, KH6FIF M 2288, KH6EPW 14 1524, KG6AAY M 10,428, VK5ZP M 8430, VK2GW M 2775, VK3TL M 2528, VK5LD 3.5 4, VK4SS 7 33, VK2APK 14 999, VK3QV 21 120, VK2DK M 480.

K6MQG, associate of W6DNG, who made moonbounce contact on 2 metres with OH1NL last year, advises that W6DNG now wants a sked with VK on 144 or 432 Mcs. He is presently reading on 2 metres and is available 0030Z through 1330Z every day of the year on 144.002 Kc. Write either of above.

A DXpedition to the Aland Islands will be made by OH2AM from July 18 to 27, 1965.

Operation on frequencies: S.sb.: 3790, 7070, 14,125, 14,240, 21,350 C.w.: 3505, 7005, 14,040, 21,040. 24 hours' operation daily.

Equipment. TX FL 100B plus PA, RX FR 100 B by Sommerkamp G.m.b.H., W. Germany Antennas: TH3 3 Element Beam 10/15/20 Inverted Vee 40/80.

QSL via Jack, W2CTN. Amityville, N.Y., U.S.A.

Operators: Martin OH2BH, Art OH2BQ, Mark OH2BS, Rick OH2SB.

—Ray Jones, XK3RJ, Manager.

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## NEW SOUTH WALES

The Council is now up to full strength of seven with the vacancies being filled by John VK1ZJB/2 and Frank VK2ACQ. John is m Sydney with an army posting for a couple of years. The divisional notes are being written by Tim VK2ZTM.

An attendance of 50 at the May general meeting heard an interesting lecture of "Whistlers," by Joe VK2JR. The vote of thanks was moved by Phil Zeich 9M2CP, a visitor at the meeting. The lecture for July will be on s.s.b. Sid 2SG will deal with transmitters and Stan 2EL with the transceiver sets. Don't forget, the fourth Friday at Wireless Institute Centre (23rd July).

Divisional President, Ivan VK2AIM, during a recent holiday to VK4 met with Laurie VK4ZGL and the VK4 President, who sends his greetings to the VK2 Division. On his way home Ivan attended the annual meeting of the Far Northern club at Lismore. On the invitation of the President, Fred VK2PF, Ivan spoke to the meeting on divisional activities.

For those who believe the h.f. bands are dead must surely wonder about the 4000 cards handled by the bureau for May. The only way to keep the numbers up is to work on all possible bands and to keep the bands is to send your two dollars to the I.T.U. fund. VK2 Division is dragging the chain this time —refer page 23, June "A.R."—then send your money to the Divisional Secretary, 14 Atchison Street.

There are now four official call signs used in the VK2 Division. VK2WI is used by the Divisional station at Dural. The broadcast is carried out at 11 every Sunday morning on 3595 kcs., 7146 kcs., 53.266 mcs. and 145.13 mcs. VK2AWI is the portable call sign of the Division. This is the call used with the morse training (every night at 7.30 p.m. on 3550 kcs.). VK2BWI is the v.h.f. and T.V. Group call sign used for their broadcasts and activities. VK2AWX is the call sign of the Hunter Branch. Their broadcast is at 7 p.m. on Monday evening. It contains the main points of the Divisional broadcast from the day before and their own local news. The frequencies are 1815 kcs. and 3595 kcs. and 7050 kcs. with a 2-metre relay from Newcastle. The station is at the Westlakes Radio Club, Teralba.

With a shortage of disposal items being released on to the market the Divisional Disposal section has been carrying an ever-increasing range of new components. Sales are good which seems to indicate that members prefer these items to the disposal range.

In May a publication was released by the printing section. It is called the "Amateur Guide." It consists of a form of hints and tips and the first sub-edition contains articles of a technical nature which appeared in interstate bulletins and also the V.H.F. Newsletter. The price of the sub-edition is 10/- and the enquiries should be addressed to "Handbook," 14 Atchison St., Crow's Nest.

2ZTM.

### HUNTER BRANCH

The June meeting of the branch was honoured by a visit from Keith VK2BK of the staff of "Electronics Australia," who gave a most informative lecture on proposed equipment to be featured in the magazine. The large gathering of 45 members, associates and visitors listened attentively while Keith described the Amateur Band Ten and the Single Sideband Transceiver. The demonstration of tihs equipment caused many eyebrows to be raised and such was the interest shown that even after President Frank had concluded the meeting with a vote of thanks, the would-be builders lingered and plied the lecturer with many questions. During the course of the lecture Keith also informed the meeting of several frightening facts about electric shock and fibrillation of the heart muscles—so now nobody even thinks about getting anywhere near the a.c. Apparently 6 volts at 11 microamps is all that is required to immobilise the heart if applied at the correct time! Remember, always to work on equipment with one hand in the pocket or behind the back. And switch to safety!

During the month a group from the most active Cessnock Radio Club visited the Westlakes Radio Club and exchanged ideas. Chris, 2PZ, who is the guiding hand behind the activities of the Cessnock boys, is to be complimented on the interest he has aroused in the electronics hobby, and we wish him well in the licence race. One very cunning method Chris uses with the boys is to give them a receiver which is working with the instruction that they should pull it down completely and rebuildt it. This pays off and boys, so practised at this art, become very familiar with the internals of steam radio.

Those who are used to visiting the office of Frank, our friendly Radio Inspector, amid the relays and selectors of the Wolfe Street telephone exchange had better not call there again looking for information. The District Office has been moved to a most salubrious location in an elevated position in Latec House, Hunter Street West. Those beautiful Eddystone receivers and that most pleasant secretary, together with all the others of the staff have taken up residence in Suite 5, 4th Floor, at 741 Hunter Street. It sounds rather like a late night film address, fresh from the U.S.A., but you can be assured that they are there in fact.

Some of the more mobile-minded members of our fraternity have taken unto themselves exotic equipment for use in the cars and the results of all this have been nothing short of miraculous! Bill 2XT gave me a demonstration of a well-named duck-talking machine only this week and succeeded in raisfng several DX stations while parked in the driveway. This s.s.b. really works you know and I think that within the next 10 years or so

I will be able to save up enough to be able to pay the deposit on one of these versatile rigs. Jim 2AHT also is in the race and has a well-equipped mobile station with which he can speak to the world while on the move.

Because of the recent field day activity, the two-metre sniffer so carefully described in the "Amateur's Guide" has proved a popular project with young and old alike. All who have built this gear agree it is a winner and simple to make. All the details are in the publication mentioned, together with many articles reprinted from various divisional bulletins. It is a most worthwhile buy at one dollar and full details are available from the Divisional Secretary.

Preparations are well in hand for the Spring Field Day of the branch which will be held over the long week-end in October, so it may pay to get all the cobwebs blown out of the equipment which you propose to use. Pedestrian hunts are the done thing at the present and plenty can be achieved with the most elementary equipment.

Who said that it is impossible to work DX on C.w. while mobile? Harold 2AHA has proved this to be false and he regularly has C.w. contacts with the rare prefixes while on the way to work. Perhaps the traffic is too heavy to do so on the way home but Harold certainly gets among them on one leg of the journey. By the way, this activity is undertaken with home-built gear which is a great credit to its builder. Les 2RJ is also having some fine results from the recently completed mobile. This uses switched crystals in the oscillator and since Les has plenty of these he is able to choose all the best frequencies on 40.

One of our members, David 2BSC, recently received a tape from some of the broadcast-types in ZL outlining the signals sent up the line to warn that a programme was about to commence. If you want a good laugh at the ingenuity of the engineers to write electronic parodies on popular songs, you should hear this one.

The big clothes-line (in fact, a folded dipole on 160 metres) is now in operation at the 2AWX transmitter. This has been done to improve the field strength on top band and by all reports it is doing just that. However, you who would try to emulate those brave Teralba tree-climbers, take note—a span of some 270 feet is required for the exercise!

Henry Schroeder is the latest branch member to apply for his Z call and by all reports he is busily practising on the 2-metre band to become accustomed to the procedure. Rumour has it that Fred Overvliet, the flying Dutchman, will not be far behind him in the scramble for band space on two. By the way, did you know that Fred's small daughter sings a well-known ditty to the words "My Old Man's a Dutchman" — which is a new angle, to say the least.

I suppose that nobody has forgotten that the dreaded tax man would like a long letter from each of us very soon, so please don't give this all your attention and forget that the July meeting of the branch will be held in Room 6, Clegg Building, Newcastle Technical College, Tighes Hill, at 8 p.m. on the first Friday in July, which is the 2nd. All the details of the meeting will be given in the broadcast, which is on 1815, 3595 and 7050 kcs. at 7 p.m. each Monday night. I hope you'll be able to come so I'll see you then.

73,2AKX.

### CENTRAL COAST AMATEUR RADIO CLUB NEWS

The regular monthly meeting of the Central Coast Amateur Radio Club was held on Friday, May 21. Twenty-seven amateurs and associates attended and all had a most interesting evening. The speaker was Phil Levenspiel, VK2TX, who explained the basic principles of using a slide rule in clear and concise form. He had a giant demonstration model slide rule which made it very easy for everyone to observe what he was doing. It is rather amazing that the slide rule can be used for a multitude of different jobs from working out monetary exchanges to complicated formulae connected with refrigeration.

Geoff Mann, VK2XA, gave a short report on his trip to the Canberra Convention. He found it very interesting and enjoyable but stressed the importance of having confirmed accommodation.

Club members are very interested in Civil Defence and the most recent member to attend the school at Mt. Macedon, Victoria, is Gordon Proctor. The culb realises the importance of this training for other emergencies besides national. Gosford is located on the Brisbane Water and recently two teenage boys had disappeared while sailing but the Civil Defence crew, which included some of our members, located them on Lion Island at the mouth of the Hawkesbury River.

## OBITUARY

### FRANK LEE, VK2LE

Frank Lee, VK2LE, of Avoca Beach, N.S.W. died on May 20 at the age of 73 after a lengthy illness. He received his Amateur licence in 1928 and his commercial operator's licence in 1935. He spent 20 years in New Guinea as a wireless operator and engineer and was on the last boat to leave New Guinea at the beginning of the Japanese invasion. In fact, he intercepted the message which advised this was to happen and for this was specially mentioned in despatches. He is survived by a son and daughter and we wish to extend our condolences to them.

### WILLIAM BENJAMIN VINCENT CAHILL (VK2VC)

The N.S.W. Division in particular, and the Amateur Radio movement generally, have lost another keen supporter in the death of Vince Cahill (VK2VC), who, we regret to report, passed away suddenly on May 28.

Although not active in Institute affairs in later years, Vince will be remembered very well as one of those who interested themselves in the building of the transmitter site for VK2WI at Dural. Much of this work was carried out by voluntary labour, and Vince was responsible for the installation of the electrical wiring at the station.

At about the same period he was a Councillor under the chairmanship of the late Jim Corbin, VK2YC, and also filled the position of Secretary-Treasurer.

The Divisional Council was represented at the funeral at Woronora Cemetery on Friday, May 28, by one of the Councillors, Mr. Chas. Wilkins, VK2ALB, and there were also several other members in attendance.

Vince is survived by his mother and four brothers, and all members of the Division join with their many friends in offering them our condolences in their tragic loss. VK2AIM.

Paul Goldsborough, of Gosford, now has his licence and his call sign is VK2AVX. He passed his examinations several months ago but has only recently turned 16. It is good to see boys like Paul coming into the club and we are looking forward to more.

At our last meeting we had a visit from David Grauman, K7QOL, of Tucson, Arizona. David is a young medical student anxious for a look at Australia and has fitted out a Landrover for a three months' tour of Australia visiting Pt. Augusta, Alice Springs, Darwin, Mt. Isa, and the east coast—and all places in between. He has a KWM2 on board and will be operating under the call sign of VK2KJ as well as a Flying Doctor call sign of 8NJL. He is due back in the Sydney area around the end of Augsut but in the meantime will be looking for VK contacts. He will also be working his father, K7RJK, back in Tucson. So this will be an interesting trip to follow on the air. David has been a guest of Doug Pearsall, VK2ASA while in the Gosford district.

Frank Pearson, VK2ACQ, now of Umina, has been elected to the W.I.A. Council and we wish to congratulate Frank on this honour received.

The club meets on the third Friday of each month at the School of Arts, Mann Street, Gosford. Visitors are welcome and we would be interested to hear from any interstate people who may be heading north for a winter holiday. 73, VK2AXS.

## BAND ALLOCATIONS

| C.w. Only | C.w. and Phone |
|---|---|
| Kc. | Kc. |
| 3,500 - 3,535 | 3,535 - 3,700 |
| 7,000 - 7,030 | 7,030 - 7,150 |
| 14,000 - 14,100 | 14,100 - 14,350 |
| 21,000 - 21,150 | 21,150 - 21,450 |
| 28,000 - 28,200 | 28,200 - 29,700 |

## VICTORIA

VK3 Council met on 24th May. The first matter attended to was the annual "dobbing" session. The result gave the following:

President: K. E. Pincott, VK3AFJ.
Vice-President: J. B. Battrick, VK3OR.
Vice-President and Fed. Councillor: M. J. Owen, VK3ZEO.
Treasurer: K. Roget, VK3YQ.
Librarian: R. Henderson, VK3ARV.
Editor, "A.R.": K. M. Cocking, VK3ZFQ.
Asst. Ed. "A.R.": K. E. Pincott, VK3AFJ.
QSL Inwards: E. Trebilcock, L3042.
QSL Outwards: I. Stafford, VK3XB.
Class Instructors: J. R. Lancaster, VK3JL.
C. N. Pickering, VK3ATP
Correspondence: K. J. Prichard, VK3UI.
Course Inst.: D. Pinson.
Transmitting Officer: P. E. Linden, VK3BX.
Disposals Committee:
J. B. Battrick, VK3OR.
J. I. Kelleher, VK3AIJ.
J. W. Spicer, VK3ZEL.
L. C. Fowler, VK3ZGF.
A. J. Stewart, VK3ZFS.
Education Officer: J. K. Matchett, VK3TL.
Broadcast Committee:
W. E. Roper, VK3ARZ.
J. P. Downie, VK3APD.
P. E. Linden, VK3BX.
C. B. Edmonds, VK3AEE.
L. H. Poynter, VK3ZGP.
W.I.C.E.N. Co-ordinators:
J. B. Battrick, VK3OR.
M. J. Owen,a VK3ZEO.
W.I.C.E.N. State Controller: H. L. Hepburn, VK3AFQ.
W.I.C.E.N. Tech. Co-ord.: J. W. Spicer, VK3ZEL.
Y.R.C. Equip. Officer: V. Barnes, VK3OT.
Property Officers:
J. I. Kelleher, VK3AIJ.
T. J. Cuthbertson, VK3ZIQ.
T.V.I. Committee:
W. M. Rice, VK3ABP.
G. Farthing, VK3AFR.
J. A. Taylor, VK3ZJF.

Other matters discussed included improved lighting in the rooms, space for F.E. records, publicity for meetings and non-return of library books.

The June General Meeting was held on 2nd June. Ron Henderson kept a full house enthralled for over an hour when he spoke on Astronomy. He showed one of his telescopes and some excellent photographs. The interest in this subject was amply shown by the number of questions asked.

Next month Syd. Clarke VK3ASC will describe and demonstrate new equipment shortly to be available to Australian Amateurs. To whet appetites he produced an HRO 500, continuous coverage from 5 Kc. to 30 Mc., for its first Australian showing. As Syd said, when he followed the previous speaker he was also on astronomy. Just have a look at the price, £1212/10/- for one Rx. I have his assurance that his demonstration next month will include equipment more in the reach of the Amateur pocket. So come along next month. The date, 7th July, place 478 Victoria Parade, East Melbourne.

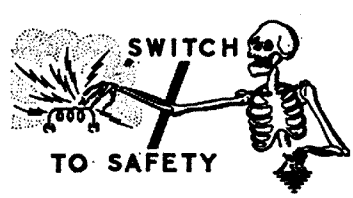
### WESTERN ZONE

The Wednesday evening zone hook-up has been suffering from the vagaries of 80 metre propagation during the past few weeks but numbers on seem to have been up to average.

Bert 3EF and Herb 3NN are still the most regular, with 3AKW when shifts allow and the farmers when they aren't out on their tractors.

As usual there is no news of world-shaking importance. Ray 3ATN is certainly the greatest doer in the zone at present with 432 Mc. signals going vast distances in all directions. Ray also has a very potent signal on 160.

We believe Gordon 3NX was on the zone hook-up recently for the first time in quite a while. Roy 3AOS is busy reconstructing various antennas on top of his 75-foot tower. He will have skeleton slots on 2, both vertically and horizontally polarised for a.m. and f.m.



Roy and 3AFU, 3KT have been keeping the flag flying on 2 f.m. but 3AFU, 3KT had a power supply disintegration on the f.m. base set and at the moment are forced to operate on the ridiculous, as opposed to the sublime, bands.

160 metre signals are now very good. 3AFU/M copied 3ARZ, 3AKZ, 3NS, R5 following the broadcast about 1000 Kc. on 6th June. We never hear zone stations on 40 and we haven't heard from the DX hounds in the zone so we know nothing of any DX exploits.

Would any Amateur like to make a reasonable offer for one copy of "A.R." with 5PS on the cover? We get two "A.R.'s" each month. We are willing to let one go to anyone who wants a glossy, unsigned 5PS. No, not you Warwick, any other Amateur.

VK3KT, VK3AFU.

**MOORABBIN AND DISTRICT RADIO CLUB**

The Club's May General Meeting was a rather cool affair, in fact, so cool the members voted, in the absence of the Treasurer, to purchase two radiators, this should warm things up a bit. The meeting was quite well attended, considering the weather, with our visitors being made very welcome. This meeting was followed, on 4th June, with our usual natter night. After nattering, Harold AFQ kept all present interested explaining the mysteries of a home-brew Sideband Exciter. Whilst on the subject of sideband it is interesting to note the increasing number of club members on s.s.b. Members heard are BM, LC, LZ, ZE, ARD, SK, with quite a few ready to take the step. Ken ZNJ was heard at one stage but it is believed that the rig ended up in the river, or somewhere, we are just not quite certain of the facts. There is a very strong rumour that a certain fellow will very soon be re-appearing on two A.M. The power supply has now had the wires soldered together, see you in the next scramble, Hal, or will another kidnapping be arranged. We have noticed that a few members have been appearing in the two metre scrambles, all the more the merrier. Eddie EM has been taking things very quietly of late, after celebrating the arrival of grandpappyhood, he is now eligible for the baby sitting stakes, all the best for the new generation Ed. Bob ZRD has been on 2 A.M. again, after an absence of many months. And to top it all off, Lindsay ZNS has been heard again, after many months, on 2 A.M. Someone accused him of being a new call. Lindsay is about to join the ranks of the bearded types, some cad pinched his cut-throat razor. He probably flogged it off to pay for his fare to the V.H.F. Convention at Mt. Gambier.

A number of v.h.f. types from the club intend to attend the Convention at Mt. Gambier. We will hear more about this on their return. Ken ZNJ has built himself a new modulator, guaranteed to 200% modulate, sorry Ken, we meant to type one hundred per cent., just a slip of the key, it's my damaged finger, I injured it repairing my feedline, that stuff Jim KE sold me. Peter XKis pleased to announce that he has, for the moment anyway, managed to get rid of the bugs from his A.M. gear. It is operating again after an absence of many months. It is now sporting C.w. facilities, and that white elephant key harmonic Graeme purchased at the club sale has been botted for the price of an icy pole, so watch out you key bashers. Stan ZE and Ted TG were heard the other night on eighty. Stan tells me they try and have a bit of a yarn on a Monday night, everyone is welcome to join in. Ted is living in the bush now, at Kyabram. Stan is still having a ball of a time on twenty, with beam trouble on fifteen preventing him from using this band. Another old-comer to the bands is Wally AHZ. Wally used to be heard quite regularly on the Moorabbin Club Monday night net, but like a lot of others, other things which had to be done took priority. Wally is very active in the scouting movement, doing a sterling job.

Alf LC, now on sideband, is, in between shifts, heard regularly on 40 and 80. Another sideband member is Clive LZ, who is heard working a bit of DX and twenty. Jim KE was tackled the other night and accused for not getting airborne, at the moment he is rather water-logged, what with all those fish, he is beginning to look like one. At the moment of writing Jim tells me that his current problem is how to get rid of snails in his fish tanks. Easy Jim, just breed fish that eat snails. Jim's shack has not any power, so when he gets the sunroom built, and those other jobs done, and the snails out of the way, we may be rewarded with that rare contact, from the QTH of Jim KE. Jim is a regular attender at our meetings and was one of the founders of the Club.

Way back in November, 1949, President J. Keenes KE, Treasurer E. Manifold EM and

Secretary E. Scott. As a matter of interest, the club subscription was 10/- per year and meetings were held at the Moorabbin Town Hall for quite some considerable period. The present subscription is £1 per year, 10/- for juniors. Getting back to chit-chat, Val OT is still looking after his XYL in ward one and due to a bit of ill-health himself has not been heard as regularly on two F.M.

As mentioned in the notes last month, a Social Evening was held at the QTH of Eddie EM. As usual, an enjoyable evening was spent by all.

That is all for the month, and to round it up, for interested persons, the following is a list of Club Officers for 1965:

President: Col Anderson, VK3XV.
Vice-President: Ken Seddon, VK3ACS.
Secretary: Harold Hepburn, VK3AFQ.
Treasurer: Peter Hebard, VK3XK.
QSL/Certificate Officer: Ken Seddon, VK3ACS
H.F. Transmitting Officer: Kevin Connelly, VK3ARD.
Auditor: Ian Caporn, VK3AXC.
Committee: President, Vice-president, Secretary, Treasurer, Greg Earl, Bill Sievers, VK3CB, Bob Dorin VK3ZRD.

73, VK3XK.

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# QUEENSLAND

The monthly meeting of the Council of the Queensland Division of the Wireless Institute of Australia was held in the Social Service Rooms in Berwich Street. Valley, Brisbane, on Thursday, June 3, with a full attendance of councillors.

Laurie VK4ZLG presided. David VK4DP reported on Federal Council matters. Paul VK4VS was appointed as new councillor. Les VK4XJ gave some interesting sidelights on the Bundaberg activities (Bundaberg being his old QTH).

The Queensland Sunshine State Contest this year has been extended to embrace v.h.f. and fine pennants will be awarded to winners in all sections.

It is anticipated that news sessions on six metres will be resumed by VK4WL very shortly and this will be welcomed by the v.h.f. group.

VK4XP is to resume slow morse on 3504 Mcs. at 1930 hours on Mondays and Thursdays.

Plans are afoot to improve our publication, "Q.T.C." Much voluntary work goes into this effort and we wish those concerned every success with their new plans.

W.I.C.E.N. matters are proceeding slowly but certainly very surely and the foundations now being laid point to a very successful operation in Queensland.

Six new members were proposed for acceptance by the next general meeting.

It is proposed to make eye-ball contact with some of the VK2 boys, in northern rivers of N.S.W., with a view to arranging an annual Hamfest somewhere close to the border and the boys in VK4 are very keen for this.

The Ipswich and District Amateur Radio Club although not overstrong numerically certainly are a go-ahead group. They plan a 150-mile round trip for the Queen's Birthday week-end, and many of the boys will be mobile on 52.0 Mcs., the club's official net frequency.

Channel "0" up this way has quietened the six metre boys down a bit. Many of them are on two metres, and quite a few are swotting hard at the code, and we expect a few more calls after the next exam.

Forty metre activity has picked up in VK4 this last month and good to hear so many chaps on again. Twenty metres also quite lively, and plenty of DX available, but band openings a little erratic. Not much in the way of personal notes this time chaps.

73's, Reg VK4VX.

### BUNDABERG AMATEUR RADIO CLUB

**Operation Tannum Sands.** Our advance party travelled to Tannum Sands last week-end to meet members of the Central Queensland Branch on the spot, and together they assessed the potential of the locality, and thoroughly "cased" the joint.

Our contingent consisted of Rusty, Roy, Steve and Eric, who report that the beach is beautiful, accommodation arranged, and the caravan party appointed with all modern conveniences. Four dwellings have been rented by the Wide Bay members. Any further bookings contact Rusty VK4JM.

This Tannum Sands convention has really got the six metre boys busy around our QTH. Robert VK4ZRW has been heard testing a six metre rig—apparently a few bugs still evading Robert, but no doubt the de-lousing is only a matter of time. A blue panel van with a 7 meg whip mounted, which resonates very well on 30 Mcs., is roaming around scaring the daylights out of everyone doing over 35 m.p.h. The designer of the rig is still trying to find out why 7 Mcs. comes out at 30 Mcs. I tell you this rig had the Youth Club lads all excited last Saturday when it appeared at the shack. They thought Scott McLeod of Space Angel fame had arrived. Then another monster arrived. A 6 metre beam perched on top of a sedan car, the only thing missing was the identification marking XL5.

John VK4XC is busy putting the finishing touches to a 40 watt final for his six metre rig also.

An ex-club member and student, George VK4ZMG has been seen back in our QTH of recent week-ends. George is at present doing a course with D.C.A. in Brisbane. Len VK4LL, another club member, has just completed a course in Rockhampton and is now settling in at Calpour, Biloela.

Those who attended last month's meeting really enjoyed the talk by one of our old club members, Les VK4XJ, on the producing of T.V. programmes, etc. Les is always easy to listen to, and we appreciated his visit very much.

Robert, VK4ZRW and Don are putting every effort into preparing themselves for the morse test later this year. Every lunch hour finds them at the shack with key and oscillator busy.

**Youth Club.** Class is very keen and the lads have passed out on two parts of the course, crystal sets and continuity tester. Last week resonance theory was their task and soldering the practical application.

The Youth Club urgently requires more parts for construction projects; parts needed are as follows: pieces of wire, condensers, resistors, torch bulb holders, metal threads and nuts, fine wire for winding coils in ear pieces for next project. Can anyone help? Better still, let's all sort out our junk boxes and help these keen youngsters along.

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# SOUTH AUSTRALIA

The S.A. Division monthly meeting varied its nature again last month by calling on Gilbert 5GX as guest speaker, to talk on and show slides of his recent trip to Japan. This, in spite of a cold night, was moderately attended to provide Gil with an attentive audience who were not only interested in the travelogue provided, but intrigued at his method of description. I don't know if Gil knows it or not, but many of his "asides" gave a much more vivid picture of the scene than the pictures themselves. There were some mighty edifices shown including some that would have formed the basis of "towers" for an array, but unfortuately there were no beams to be seen, and as Gilbert was on a tour with his XYL, there was no opportunity for him to check up on the many JA boys he has been contacting freely in recent times. Many thanks are due to him for giving us his time and for those who missed the meeting, it is advised that another one will be planned soon to enable him to cover the Hong Kong and Manila part of the trip. We all look forward to that.

The general business conducted was cleared fairly quickly, for as it is in VK5, there is never any difficulty in clearing the agenda particularly when "volunteers" are required. As an instance of this the chairman called for someone to take on the job of Associates Representative, when up jumps a young fellow and took the job, even without first enquiring what was entailed. That's the kind of enthusiasm that makes this Division really function.

We were able to say farewell to John 5KX, who attended the meeting just prior to his departure for U.K., where he will be looking into a lot of mysterious (to us) things for the up and coming power house at Torrens Island. We wish him good fortune on the trip, and after talking to him, would not be surprised at anything he brings back with him, either for his shack or the Trust. He has quite a few dates already made, one of which is with Rex 5DO who is at present in U.K. with his XYL on the tour of their lives.

The meeting concluded at an early hour (for us) and the question asked was why? It was not hard to answer for that great extender of debate, i.e., Pansy 5PS was not there, and it was interesting to note just how quickly any discussion can be concluded without him. A couple of times the chairman looked around for further comment, and I'm sure that in his way he really missed old Pansy and his quips. Anyway, unfortunately he will be back next month, and the usual long arguments will be resumed. Have not heard a whisper from the old so-and-so since he went away, not even an AM contact this year, so don't know what he has been up to but no doubt he will let forth next month and bring us up to date.

No doubt you all know Ken 3AFJ, who apart from being the blue-penciller on "A.R" (boy have I suffered in that regard) has been on the receiving end of many a quip from Pansy, well now let it be nicely stated that he, Ken, has been appointed president of the VK3 Division, so from now on when he visits Rose Park he will have to be addressed as Mr. Ken and will be entitled to more than the usual courtesy extended him by 5PS. Congratulations, Ken, and pleased to be able to extend the hand of friendship before Pansy sails into you, so please for at least one month don't think of all VK5's as being bike-riding bandits out for your blood.

Had a note from Mount Gambier the other day giving some news from that neck of the woods, wherein they complained of poor reception of the VK5 Sunday broadcast. Don't give up fellows for there are some changes to take place which could improve your position, which includes the possibility of a night rebroadcast, which for distance may be the answer. I am assured by the Council that they are ever conscious of the needs of country members, so this matter is not being overlooked in current planning.

In a recent Sunday session announcer Geoff made a request to all men of the Division to let him have news to add to that he gets by just listening on the bands. Some have mentioned that news does not always cover the whole of activities for the week, well, it's up to you to help in this regard. If you think an item is of interest that others might like to hear about it, if you are doubtful whether Geoff may have picked it up, then drop him a line. It will make his task that much easier, and the session that much more interesting. It is "your" session, "your" Division, so it is the responsibility of all of us to contribute in whatever way we can.

Last year VK5 won the RD contest, now the Council is on to us to do it again. There is no reason why this should not be so, and seeing that it is only a few short weeks from your reading this that the Contest will be on again, get into the spirit and eliminate all those deficiencies that may have caused you to be off the air for even an hour last time, check everything you can to enable a trouble-free run for the duration, make sure you have log sheets available (Uncle Tom has stacks of them for the asking) and then, finally, don't forget to put them in. Let's al make a special effort to please the President and hold the trophy for two years in a row.

Whilst Bob 5OD is overseas the Youth Club activities are being handed over to a committee comprising John 5UL, who with Bruce 5OR and others will handle and expand youth activities. These two have been co-opted to Council as a result of this extension and will be pleased to have any enquiries directed to them. I.C.S. have donated a course in basic electronics for allotment to a club member. Our thanks to them.

Quite a few Z boys recently completed their morse and are now either on the DC bands or awaiting their call signs. In order to assist in this matter Council has obtained tapes for Morse practice, and is making them available to any member who would like them copied on to his own tape. There is no charge for this service, and any member seeking this service is asked to contact Geoff Taylor, of Clarence Park, or the secretary through the usual channels.

The Sunday morning call-back on 80 has gathered quite a clan these days, not always country members, although they do predominate, but quite a few out mobile or portable, the remarks from whom have proven very interesting in regard to the coverage of that band and the varying noise levels of different locations. Lance 5XL as Clare very seldom complains of noise, Ian 5IZ of Yorktown commends that town for its quiet conditions, whilst 5LV portable at a location near Walkerie quoted "no noise" and was considering taking up permanent residence there for that advantage. He was putting in a colossal signal in here to Gawler on that occasion so it was a good transmitting site as well, Joe 5UJ at Whyalla seems satisfied with his location also and never excuses for noise.

Clem 5WG in a recent contact described an even queerer antenna than usual in that it was under water, and he was not sure whether to call it a "water plane" or not, it was something like the Larson E. Rapp job where the antenna was buried and the "image" was upstairs rather than the reverse, so maybe Clem has something in his new design.

Recent activities include a weak signal from Tom 5TL who obviously was getting through to 5WI but apparently forgot to connect the antenna, or maybe he has gone fleapower these days—remember the old days, Tom, when all you could put off the air was the big station next door? John 5ZZ will soon be desertitng the lower bands for the more glamorous DX segments when his mighty quad gets into operation, whilst Vern 5VB will be a competi-

tor for the same reason. The most recent conclusion of a task, and this time it is not on the bands, is one from the south, i.e., Kingston, where Bill 5XB has at last completed the concreting around the house that had to wait whilst antennas, exciters, receivers had first claim. It is understood that it is now possible to walk around the place and view all the external evidence of Ham supremacy without getting the shoes dirty. Mrs. 5XB is of course delighted, but is it true that she is thinking up something else so that Bill can have another project on the slate for years to come. Good luck to you Bill.

Up at the Centre things are moving along quite well, where 8ZCX has now become 8AV, taking Eugene's old call, and will soon be heard on the DC bands. Doug 8KK continues to be the voice of the Centre on most of the frequencies, and is out to give a contact on 2 for anyone trying to complete WAS on that band; by the way, he will do it on any of the modes you request, including s.s.b. Doug also advises that when Les 8UX puts his key down the lights tend to dim at his (Doug's) shack.

A recent visitor to Gawler, and not just passing through, but stopped off several times, was Cole 6CS, who came over from W.A. for the Lions' conference, then went to Newcastle and back to VK5 and looked up a few of his friends. His car was fitted with a Swan 350 which enabled him to keep in touch with the boys whilst mobile.

Last month reference was made to the new three-element, semi-wide-spaced beam Les 5AX was building; yes, it is finished and according to Les the sunspot activity increased the day he put it into operation, for the 20 meter band sprung to life so much so that he will not acknowledge any report that is less than 20 over 9. A most successful installation that seems to have more DB's up front than the Commonwealth Bank.

It would not be right for me to conclude the stand-in period without some reference to sideband, if only to keep face with Pansy, who warned you that such would be your diet for two months, so if you will excuse me, Ken (see how polite one can get), we will get to it. By the way, I'm not too certain if some of my last month's writing got through or not, for there is to be a sideband page soon, so maybe some previous references may have been deleted in anticipation.

Naturally you are "Getting with the strength" by going sideband, don't delay the decision, for if not now then you will later on, so why not be in it right away. Last month I mentioned that 610 VK's were on this mode, well in the four weeks since then it has climbed to 625 and is still going, it is easy to do and the problems are not great, the new s.b. correspondent will show you how. The main problem is getting rid of that half ton AM modulator, but then if you are like me, you will keep it and have all modes available for the time.

An interesting item, the details of which may be announced soon is a project being undertaken by Ken 5KC, and simultaneously by A1 5MF who will be producing an s.s.b. transceiver smaller than a Brymay box, but will have everything, Vox, antivox, AALC, AVC, S. meter and so on, might even include a Bar-B-Q and by that means encourage 5PS to go s.b. Yes, there you are, Pansy, it will be small enough to put on your bike, so that you will be able to go mobile with the rest of the elite! Anyway, it would be a lot better than the method you use now. What do I mean? The method of turning the transmitter on and off by means of a knobby looking switch that you use with your hand or foot, absolutely no use mobile.

Thanks for reading this far, fellows, next month you will have the old headache back so won't have to be bashed by my ramblings. See you on one or other of the bands; s.s.b., of course.

73, Comps VK5EF.

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## TASMANIA

News seems very scarce indeed this month, still I expect the editor will be pleased if nobody else.

Our June General Meeting was very well attended with close to 50 members and several visitors present. Strange, it is not the business of the meeting that attracts them, it is the lecture or what-have-you that follows. An auction of donated equipment followed this meeting and so another 20 odd pounds were added to the Memorial Clubroom Fund. A raffle at the meeting yielded nearly £4 for the same C.R. fund, and this was won by "Lucky Chas." (7KS).

Ray (7TR) has now gone sideband with a "Swan," and several other members are fast becoming converts. A few weeks ago saw the biggest s.s.b. nets in VK7 so far, if memory serves me correctly, about 15 stations took part. I must admit a couple of a.m. stations in it, too, be interesting to see how many there will be this time next year.

Victor King Seven Ear Basher has been, and still is, on the sick list, and is at present on long service leave. We all wish you a speedy and complete recovery Ted, and on your behalf may I invite friends to visit you to help break the monotony a bit. What he has is not contagious chaps, so no need to worry on that score.

Brian (7TX) was "voted" V.H.F. Group Sec. at the recent V.H.F. Group annual meeting, and most other positions were filled by younger members of the Zone, which I think is very good indeed, as this, and similar small groups make excellent training grounds, not only for meeting procedure and decorum, but also public speaking and so on.

Congratulations to Bob (7KZ ex-7ZBK) on getting his C.w. and also to Mike (7ZMC) on getting the limited ticket.

Told you there was not much news this month, let's hope Ian (7ZZ) can find a bit more next time when he deputises for me.

73's, Geoff (7ZAS).

### NORTH-WEST ZONE

Once again there was a very good roll-up to our monthly meeting. here were 24 members present who listened very attentively to Winston VK7ZWN give an illustrated lecture on v.h.f. mobile equipment.

He had some very well-built mobile equipment which I believe was built by Reg 7ZAO and it works fine business. So start getting those mobiles ready now chaps and there won't be that rush on the first field day.

Reg, incidentally, is looking for any parts which may be of use to the group of lads he is teaching in youth radio activities. Nice work, Reg. So how about it chaps. Go through the old junk box and if you find anything which could be of use, bring it along to the next meeting.

For any of you DX boys, Basil VE8APO is now on s.s.b. on 20 metres and is looking for N.W. contacts. Cheers for now.

73, DE VK7KH.



# HAMADS

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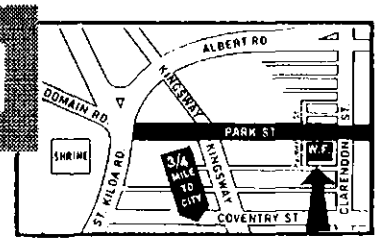


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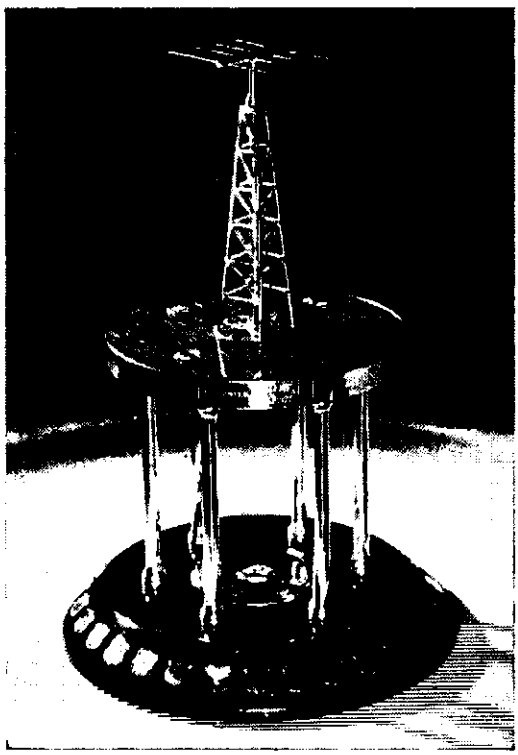

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| 24 | 500 | 7/6 | 1000 | 6 | 8/3 |
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| 25 | 6 | 3/3 | 1000 | 18 | 11/6 |
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| 25 | 50 | 4/3 | | (can type) | |

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MR1P 1 m/a. 32/6

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| | | | |
|---|---|---|---|
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| MR2P | 100uA.DC 45/- | MR2P | 15Amp.DC 35/- |
| MR2P | 500uA.DC 37/6 | MR2P | "S" Meter 37/6 |
| MR2P | 1ma.DC 35/- | MR2P | 15 volt D.C. 42/6 |
| MR2P | 5Ma.DC 35/- | | |
| MR2P | 10Ma.DC 35/- | MR2P | Stereo Balance Meter 42/6 |
| MR2P | 15Ma.D.C 35/- | | |
| MR2P | 50Ma.DC 35/- | MR2P | VU Meter 45/- |
| MR2P | 100Ma.DC 35/- | MR2P | 50-0-50 U 55/- |

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| | | | |
|---|---|---|---|
| MR3P | 50uA.DC 82/6 | MR3P | 50Ma.DC 37/6 |
| MR3P | 500uA.DC 55/- | MR3P | 100Ma.DC 37/6 |
| MR3P | 1Ma.DC 47/6 | MR3P | 250Ma.DC 37/6 |
| MR3P | 5Ma.DC 47/6 | MR3P | 500Ma.DC 37/6 |
| MR3P | 10Ma.DC 47/6 | MR3P | VU Meter 77/6 |
| MRSP | 25Ma.DC 47/6 | MR3P | 300 volt A.C. 50/- |

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| | | | |
|---|---|---|---|
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| MO65 | 500uA.DC 37/6 | MO65 | 15v DC 35/- |
| MO65 | 1Ma.DC 35/- | MO65 | 30v DC 35/- |
| MO65 | 5Ma.DC 35/- | MO65 | 300v DC 42/6 |
| MO65 | 10Ma.DC 35/- | MO65 | 300v AC 42/6 |
| MO65 | 20Ma.DC 35/- | MO65 | 1Amp.DC 35/- |
| MO65 | 50Ma.DC 35/- | MO65 | 30-0-30 Amp. D.C. 42/6 |
| MO65 | 100Ma.DC 35/- | | |
| MO65 | 150Ma.DC 35/- | MO65 | 50 mV DC 37/6 |
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MR52 2½ in. Square Face, 2 in. Round Hole, Black Plastic Case.

| | | | |
|---|---|---|---|
| MR52 | 500uA.DC 47/6 | MR52 | 50Ma.DC £2 |
| MR52 | 1Ma.DC £2 | MR52 | 100Ma.DC £2 |
| MR52 | 5Ma.DC £2 | MR52 | 250Ma.DC £2 |
| MR52 | 10Ma.DC £2 | MR52 | 500Ma.DC £2 |
| MR52 | 25Ma.DC £2 | | |

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# "AMATEUR RADIO"

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## OUR COVER

Featured on the front cover is the Remembrance Day Trophy, Contest for which takes place on the 14th and 15th of this month.

## FEDERAL COMMENT

★

## THE GATHERING STORM

A statement in a recent paper by the Radio Society of Great Britain read as follows: "It must be shown to all other users at the next I.T.U. Conference that Amateur Radio movement is thoroughly conversant with modern practice and that its equipment and operating procedure conform to exceed the best commercial practice, **and that it is in the public interest to have frequencies available for Amateur operation.**" The bold type is ours, but the complete comment reflects the concern of all countries at the increasing demand for frequencies.

Developing countries, to keep pace with the world, must have communications; industrialised nations need more space in the limited frequency spectrum. Amateur Radio therefore will have to justify its existence on more than the extended arguments of the last I.T.U. Conference, and in fact it is now agreed that more than the presence of observers and lobbying during the talks will be needed to win the case.

Therefore, we must commence to think about our use of the frequency bands, how we can serve the world, and of what value we are. As an indication of the concern felt by the A.R.R.L., and the necessity to upgrade the Amateur Service, we should look closely at the policies surrounding the proposed introduction of incentive licensing in the U.S.A. Whilst these proposals will help reduce congestion on the heavily populated bands, the real intentions are, to use A.R.R.L.'s own words, "for more effective use of the Amateur frequencies, for increased Amateur technical proficiency, for more effective performance in the public interest, convenience and necessity."

The Wireless Institute of Australia is not unmindful of these problems and it could well be that the trend of Amateur Radio, even in this country, is moving away from the attainable and desirable goals of the A.R.R.L. programme.

May this Executive suggest that we all consider our own attitudes to Amateur Radio in the light of the A.R.R.L. and R.S.G.B. words, and to decide whether their deeper appreciation is possible or desirable in Australia?

We must remember to consider the Amateur in the World rather than merely the Amateur in Australia because this hobby, more than any other, depends upon international co-operation. To help decide our attitude we must answer these questions also posed by the I.A.R.U.:

1. Why have we Amateur Radio?
2. What purpose does it serve?
3. Can its usefulness be extended?
4. How can our Amateur Service continue to operate and expand in a world which is changing politically, economically, and technically?

Upon these answers will depend our ability to ensure the future of our hobby.

Peter D. Williams, Federal Secretary, W.I.A.

## CONTENTS

# TRANSISTORISED 432 Mc. CONVERTER

C. B. EDMONDS,* VK3AEE

IN the quest for a low noise r.f. amplifier for use on 432 Mc. the author's attention was attracted to the ever-increasing use of transistors in u.h.f. t.v. Eventually an AFY16/AF139 was obtained and tried with very gratifying results. This in turn led to a complete converter using transistors.

Comparing valves with transistors makes it obvious that transistors compare more than favourably with any but the more expensive valves, and these have the disadvantage of a comparatively short top performance life.

| Valve | Transistor | Probable N.F. |
|---|---|---|
| E88C | | 7.5 db. |
| 6AM4 | | 10 db. |
| A2521 | | 6.5 db. |
| 7077 | | 4.5 db. |
| 416 | | 4 db. |
| | AFY16/AF139 | 4 db. |
| | 2N2398 | 5.5 db. |
| | AF186 | 5.5 db. |

The converter makes use of AFY16/AF139 as r.f. stage mixer and final multiplier in the oscillator chain. The other transistors in the oscillator chain are OC171 or AF114N. All of the transistors are p.n.p. The oscillator chain could also use 2N706 transistors but this would require an additional battery to supply 12v. for the n.p.n. 2N706's.

Referring to the circuit diagram the oscillator is a 3rd overtone circuit giving output at 23.1 Mc. The collector circuit is tuned to this frequency and the feedback is adjusted by the ratio of C1/C2 so that the oscillator only operates over a narrow range of tuned circuit, about resonance. Increasing the value of C2 will decrease the feedback, and decreasing the value of C2 will increase the feedback. The exact values of C1/C2 will depend upon the loaded Q of the collector circuit and the activity of the crystal.

With the values shown for the biasing this stage will draw a collector current of 4 mA.

The next stage is a tripler to 69.3 Mc. operating in class C, the collector circuit being tuned to this frequency. The drive to the base is taken via a low impedance link coupled to the cold end of the oscillator tank. The value of emitter resistor is chosen to fulfil two functions:

(a) To adjust the collector current within safe limits according to the drive available from the previous stage.
(b) To adjust the drive available to the next stage.

A collector current of 2 mA. was found to be adequate.

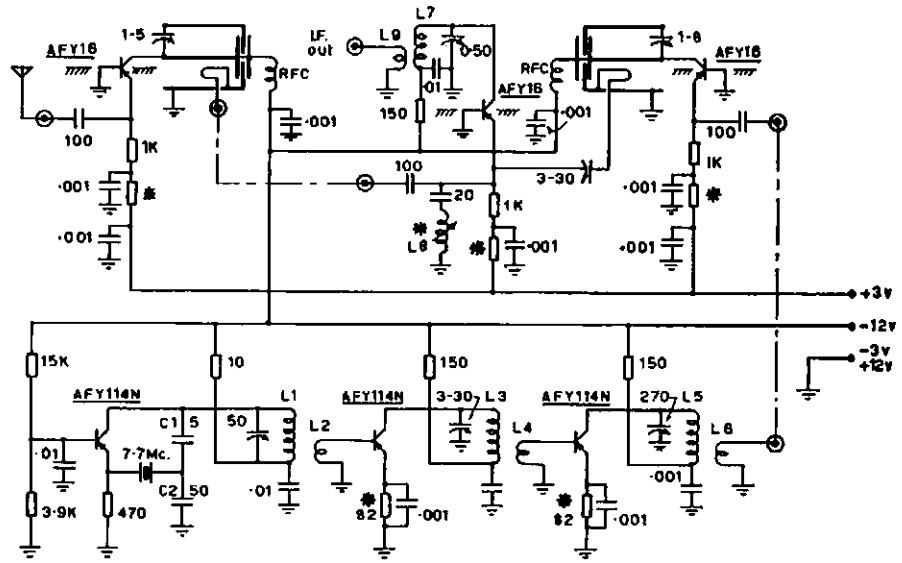
The next stage is a doubler to 138.6 Mc. and the collector circuit is tuned to this frequency. The same biasing considerations apply to the emitter resistor as in the previous stage.

* 12 Acacia Street, Glenroy, Vic.

The output of this stage is link coupled via a short piece of co-axial to the tripler AFY16/AF139 which gives output at 415.8 Mc. to drive the mixer.

The u.h.f. tripler is built into a cavity which forms the collector tuned circuit (a trough could be used if more convenient). The collector is series fed and the transistor is mounted in a shield with the base and housing leads earthed directly to this shield. The 138.6 Mc. signal is fed via a d.c. blocking capacitor directly to the collector which is connected to the emitter and completely screened from centre conductor of the cavity.

The load for the emitter is a 1K ohm resistor which is taken to positive 3 volts via a second resistor, the value of which is chosen to adjust the collector current to the desired value.




TRANSISTORISED 432 Mc CONVERTER

Components with * see text.
L1—12 turns ¼ in. diam. close wound, with irondust core.
L2—Two turns close coupled, cold end L1.
L3—Six turns 18 s.w.g., ¼ in. diam. ⅝ in. long.
L4—One turn close coupled cold end L3.
L5—Six turns 18 s.w.g., ¼ in. diam, ⅝ in. long.
L6—One turn close coupled cold end L5.
L7, L8, L9—To suit i.f. frequency. Five turns close coupled cold end L7.
R.F.C.—1 in. long, 24 s.w.g. enamelled, close wound, ⅛ in. diam.

Best tripling action was obtained with a collector current of 0.75 mA. and in most cases should not exceed 1.5 mA.

The cavity is a short circuit (to r.f. only) quarter wave and the 415.8 Mc. is taken via a low impedance link to the emitter of the mixer. The d.c. blocking condenser in this link is made variable so that the link can be tuned away from series resonance at 432 Mc.

The r.f. stage, which is also an AFY16/AF139, is in a grounded base unneutralised circuit and uses an identical cavity to the tripler. The signal is connected to the emitter which has an input resistance of approx. 75 ohms. The emitter load is a 1K ohm resistor and the second resistor is chosen to give a collector current of 1.5 mA., this being the optimum value for best noise figure.

The output of the r.f. stage is link coupled via a d.c. blocking condenser to the emitter of the mixer.

The emitter load of the mixer is a 1K ohm resistor and the second resistor is chosen to adjust the collector current for the best mixer action, in this case 1.25 mA.

The collector load of the mixer is a tunable tuned circuit at the i.f. frequency of, in this case, 16.5 Mc. upwards. The circuit is not broadbanded but peaked for the portion of the band required. The output of the i.f. is taken via a low impedance link to the main receiver.

The mixer transistor is mounted in a hole in the shielding partition between the tripler and i.f. output circuit, with its housing and base leads directly earthed.

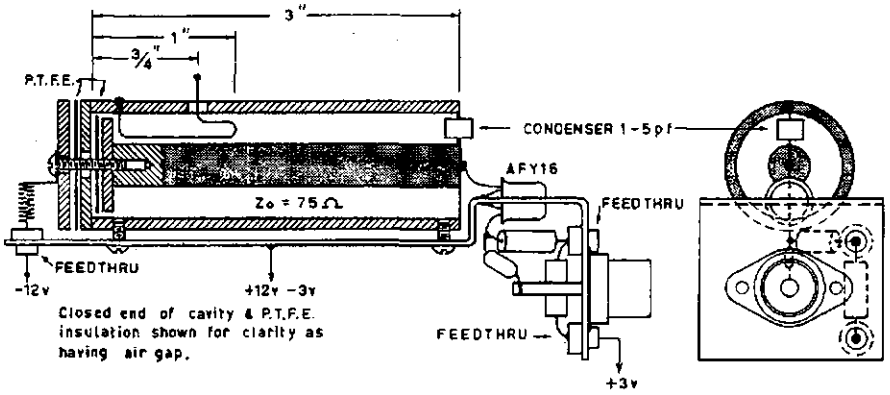
To satisfy the requirement of a low impedance, to i.f. frequencies, between base and emitter a series tuned circuit resonated to 17.5 Mc. is connected between emitter and ground. (This is an essential for efficient mixing.)

Care must be exercised when soldering the transistors in circuit to protect them from excessive heat. Therefore, the metal surfaces are firstly thoroughly tinned and then, with the transistor in position, a very quick touch with the soldering iron is sufficient.

The cavities consist of an outer conductor made of 1" diam. brass or copper tube with a blanking disc at one end. The inner conductor is made of ⅜" diam. rod with a disc at one end, the disc being of diameter ½" less than the inside diameter of the outer conductor. In addition, a further disc is required of 1" diameter.

The output coupling loop is 1" long and shorted to the outer conductor as close as practicable to the condenser, the other end coming through a ¼" hole in the side wall of the outer conductor.

The cavities are tuned by means of a suitable (miniature trimmer) condenser connected between inner and outer at the open end. This assembly is then mounted on a piece of sheet brass or copper which is bent so as to screen input and output circuits when the transistor is mounted. (See diagrams.)




CAVITY AND MOUNTING BRACKET SHIELD

The inner conductor is drilled and tapped at the disc end and the outer conductor blanking disc is drilled in the centre to give at least 1-16" all round clearance of the bolt. The additional disc, which is drilled in the centre to give clearance for the bolt, is then clamped to the inner conductor through the hole in the outer conductor; p.t.f.e. or polystyrene sheet of .005" having been placed between both discs and outer conductor.

This then forms a two dielectric condenser with the outside disc and inner conductor disc as one electrode, the outer conductor as the other electrode and the p.t.f.e. sheet as the dielectric.

The usual precaution of shortest possible leads is most important when dealing with 432 Mc.

**ADJUSTMENTS**

It was found to be impossible to grid dip the tuned circuits with the transistors connected, however, grid dipping before the transistor was connected did give enough drive for final peaking after the transistor was connected. This can be done stage by stage from the oscillator whilst selecting the correct value of emitter resistor, or metering the collector current of the succeeding stage, which should be very small in the absence of drive. The series tuned trap should be set to frequency before connecting it in circuit and thereafter should not be touched.

The mixer transistor will give increased noise at the i.f. frequency (with the collector tuned) in the absence of output, or insufficient output from the 138 or 415 tripler, and this can be used as a tuning indication, should an r.f. indicating voltmeter not be available.

The r.f. cavity should resonate with 5 pF. total capacity and can be tuned on noise. If two peaks of noise are heard choose the higher frequency peak. One r.f. stage is sufficient although the author will be using a second r.f. stage as a masthead amplifier. The converter gives a noise figure of 4 db. which is measured on a suitable noise generator rated to 1,000 Mc. and of commercial origin. ●

## W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

### PHONE

| Call | Cer. No. | C'ntries | Call | Cer. No. | C'ntries |
|---|---|---|---|---|---|
| VK5MS | 24 | 316 | VK2ADE | 65 | 231 |
| VK5AB | 45 | 312 | VK2JZ | 61 | 229 |
| VK6RU | 2 | 307 | VK6KW | 4 | 211 |
| VK6MK | 43 | 304 | VK3WL | 14 | 211 |
| VK3AHO | 51 | 300 | VK4HR | 12 | 208 |
| VK4FJ | 21 | 283 | VK3ATN | 26 | 204 |

### C.W.

| Call | Cer. No. | C'ntries | Call | Cer. No. | C'ntries |
|---|---|---|---|---|---|
| VK3KB | 10 | 330 | VK2AGH | 71 | 274 |
| VK3CX | 26 | 306 | VK6RU | 18 | 262 |
| VK2QL | 5 | 305 | VK2EO | 2 | 260 |
| VK4FJ | 29 | 300 | VK3AHQ | 79 | 260 |
| VK2ADE | 81 | 298 | VK3ARX | 66 | 250 |
| VK3NC | 19 | 286 | VK3YL | 39 | 240 |

Amendment:
VK3RJ 42 228

### OPEN

| Call | Cer. No. | C'ntries | Call | Cer. No. | C'ntries |
|---|---|---|---|---|---|
| VK2ADE | 28 | 322 | VK2ACX | 6 | 300 |
| VK6RU | 8 | 312 | VK3NC | 77 | 287 |
| VK4FJ | 32 | 308 | VK3JA | 43 | 271 |
| VK6MK | 74 | 306 | VK4HR | 7 | 254 |
| VK2AGH | 83 | 305 | VK2VN | 18 | 247 |
| VK3AHO | 76 | 304 | VK7LZ | 23 | 242 |

AMATEUR FREQUENCIES:

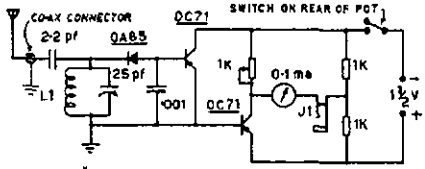
USE THEM OR LOSE THEM!

# V.h.f. Field Strength Meter and Fox Hunt Sniffer

When "Fox Hunting" and testing your v.h.f. (6 and 2 metre) transmitter a reliable but simple instrument is required.

The one described herewith fits the bill easily and for a very small outlay.

We used it recently at two field days, and with remarkable success. Its range is, on a 15 watt transmitter in a 3-element Gamma matched antenna, about one quarter of a mile. You don't believe it? Ask Norm VK2QA (if you can hear him on the air). Our antenna on the sniffer was a quarter wave whip plugged straight into the aerial socket. When a 3-element beam was substituted the directivity was improved and slightly greater range obtained.




L1-3½" HAIRPIN LOOP. J1-CLOSED CIRCUIT JACK.
V.H.F. FIELD STRENGTH METER/FOX HUNT SNIFFER

We shunted the meter with a 1 ohm shunt, capable of being switched in and out, so as to lessen the sentitivity of the meter at close proximity to the fox.

My thanks go to Norm Durham (VK2QA), who supplied the necessary receiver.

Incidentally, a signal generator will not work—not mine anyway—it is not powerful enough.

—David Priestley.

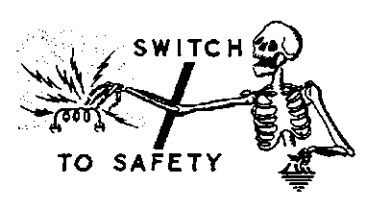
**SOME THOUGHTS ON THE FOX HUNT SNIFFER**

There may be blokes who will be way ahead of me with these brainwaves; but, without actually trying it, I think David Priestley's nice little gadget would make a fine outboard "S" meter by plugging in a suitable i.f. trannie in lieu of the hair-pin loop and coupling to the rx by a gimmick condenser.

Alternatively one could possibly hook up to the a.v.c. line and do without the transformer, but this might load the line too much.

A further thought is that the circuit could be adapted to use in a solid state receiver to supply both "S" meter and amplified a.v.c.

—Ken Gillespie, VK3GK.



# Silicon Replacement of Tube Rectifiers*

## SOME NECESSARY PRECAUTIONS

G. L. COUNTRYMAN, W4JA

**• Silicon diodes can be used to advantage in the power-supply circuits of existing equipment, as well as in new construction. This article discusses some of the precautions that should be taken to ensure trouble-free operation.**

TUBE manufacturers won't like to read this, but the vacuum-tube rectifier is about to go the way of the coherer. Those who still use tubes for new design, or for replacement are, in most cases, wasting money, losing some high voltage and shortening the life, or reducing the stability, of other components by the generation of unnecessary heat. Furthermore, silicon-diode rectifiers virtually will last indefinitely, provided certain precautions are taken. This article is an attempt to accumulate in one place for easy reference the procedures necessary in using semi-conductor diodes, some simple methods of construction, and sources of inexpensive components.

Let us start with a relatively insignificant item. The 6X4 bias rectifier in the author's Navigator required replacement. Was another 6X4 purchased? Not on your life! A Vector P7D 7-prong plug with an aluminium shell was obtained, and one 400-p.i.v. 600-mA. silicon diode was wired inside it. Burstein-Applebee sell these diodes for 59 cents, their No. 18C44. Barry's new catalogue lists a similar rectifier, 600 p.i.v. 750 mA. for only 39 cents.

Next, it was decided to replace the 5U4GB high-voltage rectifier tube in the Navigator. Diodes could have been wired into an octal base for plug-in replacement, but it seemed simpler to obtain an octal-base 1800-p.i.v. 700-mA. unit from Barry's for $3.10. An unexpected dividend resulted from this operation. With no other changes, the increase in high voltage enabled the Navigator to drive a 500-watt triode amplifier to full output, Class C, on all bands.[1]

### SELECTING DIODES

In selecting silicon diodes for a particular application, there are five important ratings that must be observed. These ratings are:

(1) Peak-inverse (or peak-reverse) voltage.
(2) Peak recurrent current.
(3) Surge current.
(4) Average forward current.
(5) Operating temperature.

### P.I.V.

The p.i.v. (or p.r.v.) is the peak value of the reverse voltage that appears across the diode on the nonconducting portion of the cycle. In both the centre-tap and bridge full-wave rectifier circuits, the p.i.v. across each diode (or each string of diodes in the case of diodes in series) is approximately 1.4 times the entire transformer r.m.s. secondary voltage. Most diode manufacturers recommend a safety factor of at least 1.5 (with suitable precautions to suppress transients), so the diode you select should have a p.i.v. rating of at least twice the total transformer r.m.s. voltage measured at minimum load on the supply.

### PEAK DIODE CURRENT

The peak recurrent current is the peak value of the rectified current wave passed by the diode. With a choke-input filter having a choke of at least "critical" inductance value ($L_h$=full load output voltage/maximum load current in mA.) the peak value will be limited to about twice the D.C. current drawn from the supply. With a choke of less than critical value, or with a capacitor-input filter, the peak-current value may be several times the D.C. load current. Although the peak-current ratings of silicon diodes are at least twice as great as comparable tube rectifiers, most diode manufacturers place a lower load-current rating on their diodes when a capacitor-input filter is used—about 75 per cent. of the rated load current for choke input.

### MAXIMUM SURGE CURRENT

Maximum surge current is the peak nonrepetitive current for a single cycle. In normal Amateur operation, it is related principally to the charging current to a capacitor-input filter at the instant the supply is turned on. Although this rating is in terms of several amperes for even small silicon diodes, a limiting resistance of 5 to 10 ohms in series with the diode is recommended. In most Amateur supplies, however the resistance and leakage reactance of the transformer will supply more than this value, so an external resistor may be required in only very low-voltage supplies where the transformer impedance is unusually low.

The large peak- and surge-current ratings of silicon diodes permit the use of sufficient capacitance in a capacitor-input filter to provide at least as good voltage regulation as that normally obtained with a choke-input filter. Thus, advantage may be taken of the approximately 50 per cent. increase in output voltage provided by the capacitor-input filter in cases where the higher voltage is desirable.

### MAXIMUM LOAD CURRENT AND OPERATING TEMPERATURE

The maximum average forward current is the maximum D.C. load current that should be drawn from the supply. A temperature restriction is attached to this rating. Most of the silicon units suitable for Amateur transmitter plate supplies are of the type designed to be mounted by their wire terminal leads. For these types, ambient temperatures (temperature of the air surrounding the unit) are specified. (The temperature of stud-mounted units is usually referred to the stud or case.) Maximum rated temperatures vary from about 25 degrees C. (77 degrees F.) to 100 degrees C. (212 degrees F.) It is obvious that unusual precautions are necessary when units rated for the low end of the temperature range are to be used. The most practical measure for an Amateur to take would be to derate the unit according to curves supplied by the manufacturer. However, on the average, the difference in price between low-temperature units and those rated for higher temperatures is negligible, so there is no point in using low-temperature units for most Amateur applications. But keep the temperature restriction in mind when selecting a diode; temperature restrictions are often not specified for "bargain" diodes.

Regardless of the temperature rating, silicon diodes should be mounted well away from heat-generating components, and placed so that they will be well ventilated, using a fan or blower, when necessary, to keep the ambient within rating.

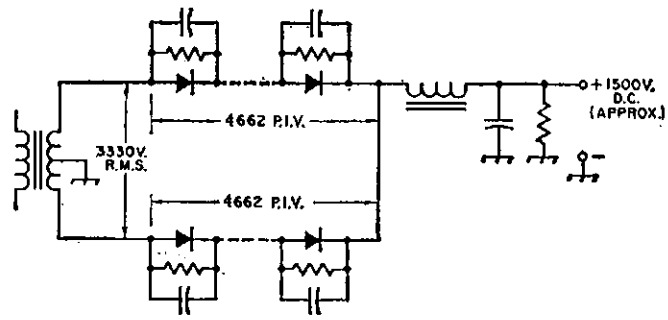



Fig. 1. Typical centre-tap full-wave circuit showing voltage-equalising resistors and transient - suppressing capacitors across each diode in the series strings. The resistors are each about 470K, ½ watt. The capacitors are 0.01 μF. 1000-volt disc ceramics. See text for diode ratings

* Reprinted from "QST," January, 1965.

[1] A certain amount of caution should be used in making such substitutions, since some components may not be able to take the increase in voltage.

## DIODES IN SERIES

The back resistances of diodes, even of the same type, are not uniform, so a reverse voltage across units in a series will not divide evenly. The voltage distribution can be equalised by connecting a resistor across each diode. The resistance value should be low compared to the back resistance of the diode; values of 100K to 500K are commonly used.

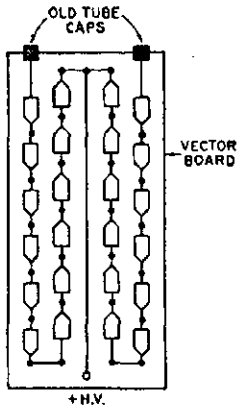



Fig. 2. Sketch showing diodes mounted on a perforated board for plug-in use. The shunting resistors and capacitors are mounted on the reverse side of the board. Further details will be found in the text.

## TRANSIENTS

Various high transient voltages are developed in power supplies, in normal operation as well as when switching. These have much more serious consequences for silicon diodes than for tube rectifiers. The most violent transients occur when switching the power supply off, particularly when a choke-input filter is used. It is essential that measures be taken to attenuate these transients to avoid permanent damage to the diodes, particularly when several diodes are used in series to accumulate the necessary p.i.v. rating. (Silicon diodes do not open up when they fail; they short out, placing the total voltage across fewer diodes. The result is that when one diode goes, the rest in the string follow suit.) A capacitor connected across each diode unit will take care of most transients. Disc capacitors of 0.01$\mu$F. with 1000-volt ratings are usually adequate.

When a choke-input filter is used, a transient-suppressor across the choke is good insurance. This consists of a capacitor and resistor in series across the choke. The capacitor should have a value of not less than

$$C\mu F. = \frac{LI^2 \times 10^6}{4E^2}$$

where L is the inductance of the choke in henrys at minimum load, E is the D.C. output voltage of the supply, and I

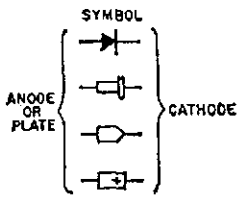



Fig. 3. Sketch showing the polarities commonly associated with diodes of different types.

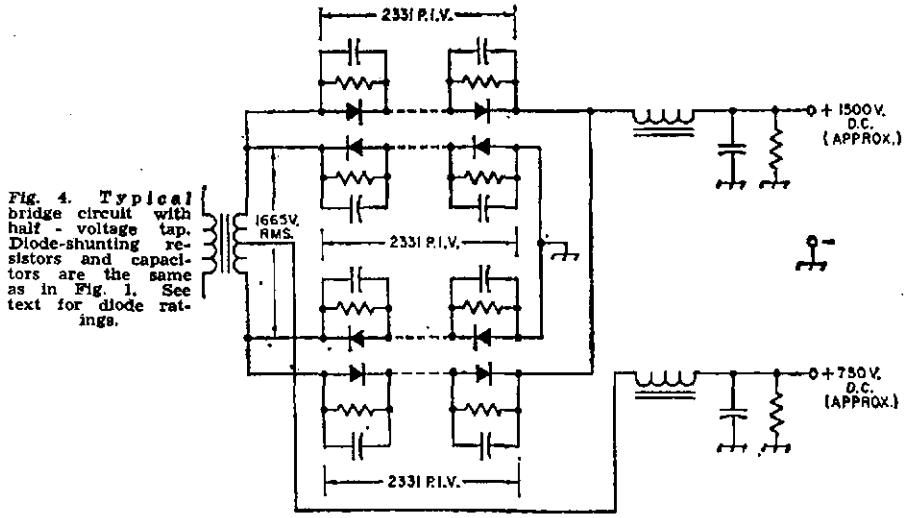



Fig. 4. Typical bridge circuit with half-voltage tap. Diode-shunting resistors and capacitors are the same as in Fig. 1. See text for diode ratings.

is the maximum D.C. current drawn from the supply. The resistor should have a value not greater than E/I.

It should perhaps be pointed out that the higher the p.i.v. rating of the diode used, the less susceptible it will be to damage from transients. Therefore, where the difference in price is not too great, the diode with the higher p.i.v. rating should be chosen (or the number of diodes in series increased).

## CIRCUITS AND CONSTRUCTION

Fig. 1 shows a typical centre-tap full-wave circuit. The total transformer-secondary r.m.s. voltage is 3330 at minimum load. (The minimum-load voltage should be used in estimating p.i.v. ratings.) The p.i.v. across each rectifier string is therefore 1.4 × 3330 = 4662 volts. If the recommended 50 per cent. safety factor is provided, the p.i.v. rating of each rectifier string will

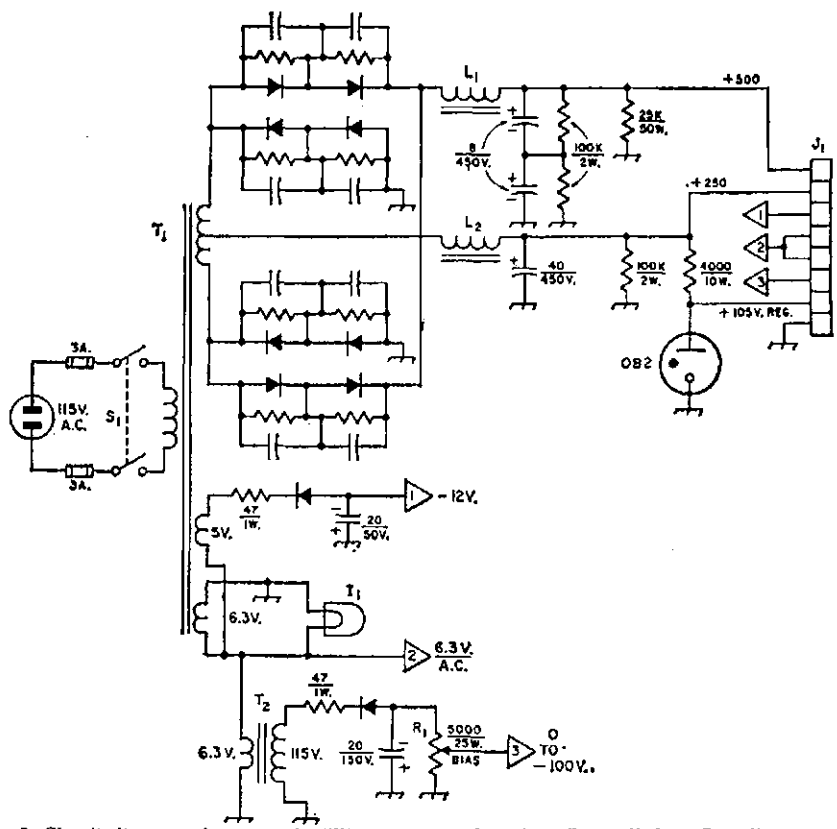


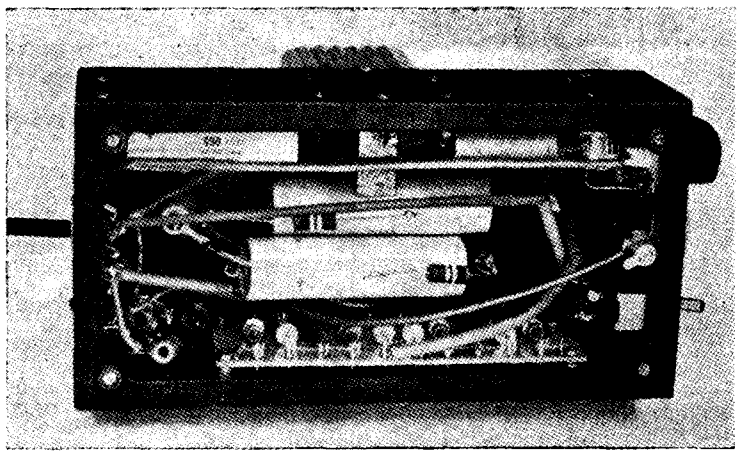

Fig. 5. Circuit diagram of a general utility power supply using silicon diodes. Capacitances are in $\mu$F., and resistances are in ohms (K equals 1000). Capacitors with polarity markings are electrolytic; others are 0.01-$\mu$F. 1000-volt disc ceramic. Unmarked resistors are 330K, ½ watt. All diodes are 700-p.i.v. 750-mA. silicon (see text).

I1—6.3-volt panel lamp.
J1—Octal tube socket.
L1, L2—Filter choke (see text).
S1—D.p.s.t. toggle switch.
T1—Power transformer; 600 volts, r.m.s., centre-tapped; 5 volts, 3 amp.; 6.3 volts, 9 amp. See text.
T2—6.3 volt 1-amp. filament transformer used as step-up transformer.

be 4662 × 1.5 = 6993 volts. To accumulate this p.i.v. rating it will be necessary to use a minimum of 9 diodes with a p.i.v. rating of 800 volts each, 12 diodes rated at 600 p.i.v., 14 rated at 500 p.i.v., or 18 rated at 400 p.i.v. in each of the two strings. The current rating of the diodes should be at least half of the maximum D.C. current to be drawn from the supply, with derating according to the manufacturer's curves if the units are to be operated above rated ambient temperatures.

A typical bridge circuit is shown in Fig. 4. The p.i.v. across each of the four rectifier legs is 1665 (no-load r.m.s. value) × 1.4 = 2331 volts. Adding the 50 per cent. safety factor brings the total p.i.v. rating for each leg of the bridge to 3496 volts. This will require at least 5 diodes rated at 800 p.i.v., 6 rated at 600 p.i.v., 7 rated at 500 p.i.v., or 9 rated at 400 p.i.v. in each of the four legs.

With an input choke of at least critical inductance, the D.C. output voltage from this circuit will be appoximately



Bottom view of the general utility supply. Diodes are mounted on a perforated board attached to one side of the chassis. Shunting resistors and capacitors are on the opposite side of the board. The power-input cord emerges from a grommeted hole in the left-hand end of the chassis.

If the choke has at least critical inductance, the output voltage will be approximately 45 per cent. of the total secondary r.m.s. voltage (measured at full load) minus the voltage drop across the D.C. resistance of the choke.

The high-voltage supply in most transmitters uses this circuit with 886s or 3B28 tubes. For direct replacement, a plug-in unit can be made up. This may take the form of a strip of Vector board (0.093-inch holes on 0.265-inch centres) with Vector T9.4 push-in terminals to hold the diodes, resistors and capacitors. If two plate caps, removed from defunct tubes, are attached to the top end of the board, as shown in Fig. 2, the original cap connectors may be used in making connections to the transformer. A pair of 4-pin tube bases can be attached to the bottom of the board with a spacing to fit the original rectifier sockets in the equipment. The diode leads are soldered to the push-in connectors on one side of the board, and the resistors and capacitors to the same terminals on the opposite side of the board. If the plug-in unit is not desired, the board can be mounted on stand-off insulators. Wiring is simplified because no filament connections are needed.

At times there may be confusion as to which terminal of a silicon diode is the anode, and which is the cathode. Refer to Fig. 3, which shows the designs most commonly used. Particularly in the case of surplus diodes, which often bear no markings, this information will be useful.

90 per cent. of the total transformer r.m.s. voltage (measured at full load), minus the D.C. drop across the choke. Half voltage may be obtained from the centre tap, as shown.

The current rating of the diodes should again be at least half of the maximum D.C. current to be drawn from the supply. This must include the current drawn from the low-voltage tap if it is used.

## A GENERAL UTILITY SUPPLY

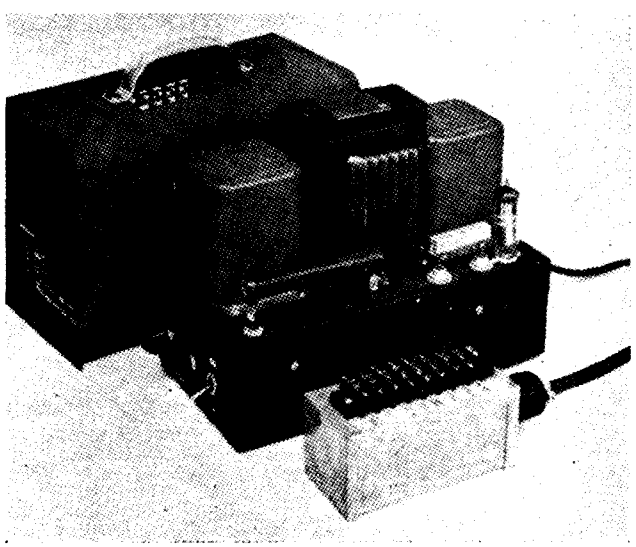
The photographs show a power supply designed by the author to power an auxiliary 80-watt transmitter and also to be available in the shack for experimenting and testing. Requirements were somewhat unusual, the voltages needed being 500, 250 and regulated 105 volts positive, a fixed negative voltage variable from 0 to 100, and 6.3 volts A.C. at 7 amperes. Fig. 5 shows how this is accomplished.

A bridge circuit with a half-voltage tap provides the positive voltages. The transformer is a husky Burstein-Applebee No. 3A118 costing $7.99. If you should require higher output voltages, B-A No. 13A162 will provide 750 and 375 volts at the same price. The diodes are "tophat" 750-mA. 700-p.i.v. units (B-A No. 18B195) selling for 59 cents each. While you are making out your order, pick up a few of their No. 18A73 feedthroughs at only 19 cents each. They are excellent for r.f. use and up to 1500 volts D.C. They fit into a $\frac{3}{8}$-inch hole.

The filter chokes are bargain items from World Radio Laboratories costing only 89 cents each. They were manufactured for Collins and are rated at 8 henrys, 100 mA. However, experience has shown that they will carry a considerably large current. At around 350 mA., the inductance is reduced considerably, but is adequate for sufficient smoothing.

The supply is constructed on a Premier AF510 amplifier foundation having a 5 × 10 × 3-inch chassis and a cover 6 inches high. Rubber feet were added at each chassis corner and a Bud handle to the top of the cover. The total weight is 24 pounds. The power supply cable is Belden No 8418 microphone cable. There are 8 No. 20 conductors enclosed in a shield with an outside coating of rubber. A male octal plug at one end of the cable goes to the supply; a female plug at the opposite end goes to the transmitter, or into a small terminal box constructed around a 5 × $2\frac{1}{4}$ × $2\frac{1}{4}$-inch Minibox which is mounted on the workbench and can be seen in one photograph. The various supply voltages are then available for experimental work at the terminal strip on the Minibox. Because of the high current required at 6.3 volts, two conductors

(Continued on Page 16.)



The general utility supply is built on an amplifier-foundation chassis. The large resistor is the high-voltage bleeder; the smaller one is the VR-tube dropping resistor. At the left-hand end of the chassis are a control for the variable-bias output, pilot lamp, and power switch. The output cable plugs into an octal socket at the opposite end. The supply may be plugged into equipment having an appropriate male input connector, or into the terminal unit shown in the foreground for experimental use on the work bench.

# A CHEAP LOW POWER (5W.) CONVERTER

*P. WARD**

"A ringing choke converter," you say. "Hummph, not much favourable reference to them in any of the standard texts. Inefficient and poorly regulated they say. Best left alone!"

Well, discard any textbook prejudice and you may discover how to produce 5 watts of the best d.c. for only 45/-. This may be the cheapest five watts you could find in 1965. Just glance at the V/I curves (Fig. 1). They are all for the same unit, used at different input voltages. Absolutely no change in component values was necessary over the input range 2 to 12 volts (although for optimum efficiency this may be desirable). When the unit was designed, components were selected for a 6 volt input.

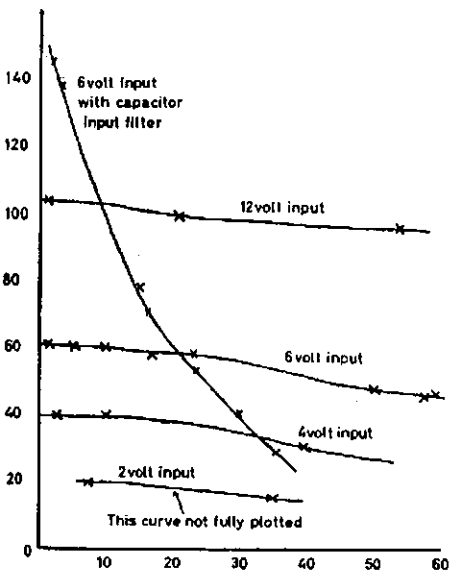



Fig. 1.—V/I curves (output) for ringing choke converter, with varying input voltages (240 turn double wound secondary).

In the same enthusiastic breath, I must concede that the textbooks were right in some respects. Efficiency of this unit, for 6 volt input, is only 55%, and power output is limited to about 5 watts with the core I used. Also, unless the unit is carefully cased, it is annoyingly noisy!

The output waveform of a ringing choke converter is like that shown in Fig. 2. This output is obviously suited to half wave rectification, and no text read to date shows any other system on such a converter. Indeed, it was only a touch of Scotch blood that made me tack on a full wave rectifier to get the last drop of output. But now, after exhaustive tests, I am convinced that the full wave rectifier is far superior. Granted we are working with a waveform as in Fig. 3, but provided we use a choke input filter, stability under load is good. Remember, that the extra filtering needed is partly compensated for by the higher efficiency of the choke at 2 Kc., which is the approximate switching frequency of this unit.

For interests sake, Fig. 1 contains a V/I curve for a capacitor input filter. Stability under load variations is shocking. Not only that, but the high back e.m.f. that will be developed across the collector and emitter under no load conditions can be disastrous. One of my ASZ17's suffered a C/E "punchthrough" in this manner, and within 30 seconds the coil, wiring and transistor were all smoking ruins.

The circuit shown (Fig. 5) was originally designed to power a small battery receiver requiring 90 volts h.t., from a 6 volt accumulator. Unfortunately, not enough wire was at hand to put enough turns on the secondary but the problem was easily solved by running 12 volt input!

Note that, unlike many ringing choke systems, no complex switches are needed to initiate oscillations. The secret of the low cost of this unit lies in the coil assembly. The ferrite core is one scrounged from the local t.v. service department—and was originally part of the e.h.t (flyback) transformer. These cores are usually one of the several types described by Mullard in its pamphlet (reprint) dealing with the building of push-pull d.c. converters. If anyone wishes to mathematically work out exact coils for their particular core, I suggest they get hold of this article. Details of the coil given below are suitable, with a simple change of primary tappings, for most cores you will be able to get hold of—and there will be no mathematical headaches.

Having obtained your core, prepare two bobbins, one for each half of the core, as shown in Fig. 4. Four tag-eyelets can be attached to a small piece of matrix board which can in turn be attached to the bobbin. Aquadhere, a p.v.a. glue, makes this job easy. I have used a separate bobbin for primary and secondary, so that either can be replaced or rewound, without affecting the other.

In order to be able to juggle your circuit for best results with the particular core you have, use 18 s.w.g. and wind 110 turns on the "primary" bobbin. Tap at 30, 50 and 70 turns.

It is interesting to note that, despite all indications to the contrary in reference books, my converter gave highest efficiency with more turns on the feedback winding than on the power winding. In fact, power winding was only 30 turns, whilst feedback was 80 turns.

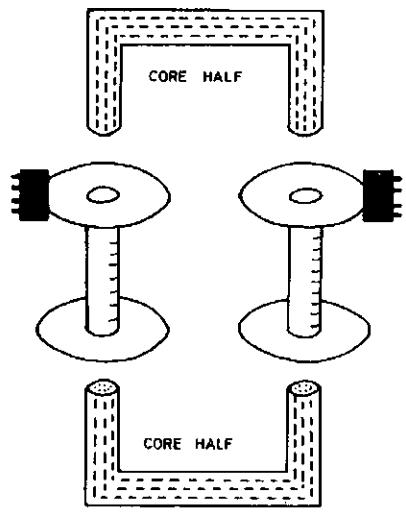



Fig. 4.

On the secondary bobbin, double wind a coil to give the required output. Work on approximately five turns per volt. "Pot" the coils in the resin usually supplied in "Fibreglass Repair Kits." Don't forget to add hardener!

Before assembling coils on to core make sure that ends of core halves are a perfectly flat fit. This is very important. If necessary lap the ends on a piece of emery paper laid on glass. Bolt the halves firmly together.

Having built the circuit, take these precautions before applying power.

Place a 2 ohm current limiting resistor in the power lead until approximate value of R1 and correct primary tap is ascertained. Check your polarity again.

If using a capacitor input filter to boost the voltage, always ensure that the secondary is loaded to prevent high back e.m.f. damaging transistor.

The value of R1 must now be established by experiment. In my mind, optimum value is 330 ohms, but I suggest you start with at least 670 ohms. Connect the emitter to the tap giving a 50-turn primary power winding first, and load the secondary with a 4.7K 2 watt resistor.

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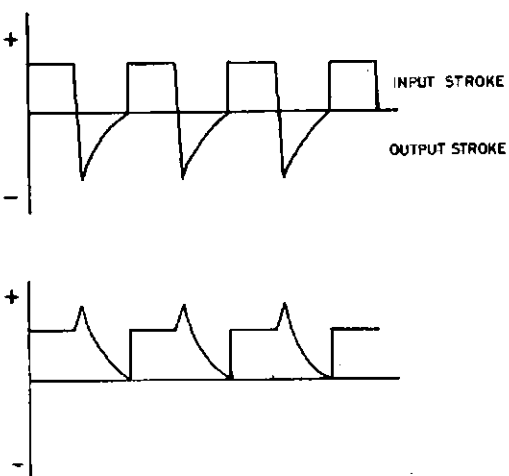



Fig. 2—Above.
Fig. 3—Below.

* Teacher's Residence, Litchfield, via Donald, Vic.

# END-FED AERIAL MATCHING UNIT*

*F. G. RAYER, Assoc.I.E.R.E., G3OGR*

THE use of a reactive network for matching dissimilar impedances is generally well known[1] and the aerial matching unit described here is simply an application of these principles. It is intended for use on the 3.5 Mc. to 28 Mc. bands, with pi-output transmitters, and end-fed aerials of indeterminate length. In tests, it allowed a 120 watt transmitter to be fully loaded on all bands (3.5-28 Mc.) with any aerial from 6 ft. to 160 ft. in length. A length greater than 160 ft. was not available during tests, but could be used.

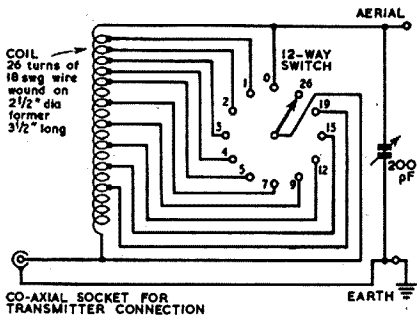



Fig. 1. Circuit diagram of end-fed aerial matching unit.

## CONSTRUCTION

The circuit is shown in Fig. 1. The 12-way switch positions are marked to agree with the number of coil turns in circuit. With the switch in the "0" position, the coil is completely shorted, while the "26" position puts the whole coil in circuit. An ordinary single pole 12-way rotary switch was used, and appears to be adequate, though a transmitter type switch would have been fitted if to hand. A make-before-break switch is preferable to the break-before-make type. A wide spaced variable capacitor is necessary: the one fitted was from an old 1154 transmitter. The voltages across the capacitor depend on the aerial, as well as transmitter power, and spacing at least equal to that of the p.a. tuning capacitor is recommended.

Coils of other dimensions could be used, though the coil shown can be wound on a readily obtainable Eddystone 5 in. x 2½ in. diameter Frequentite former. The wire is strained, looped through one end hole, twisted and soldered. The 26 turns are wound on, and the end similarly fixed. To simplify construction, short pieces of ordinary single flex were soldered on, tappings being staggered as in Fig. 2. This allows short leads to the switch with no crossing.

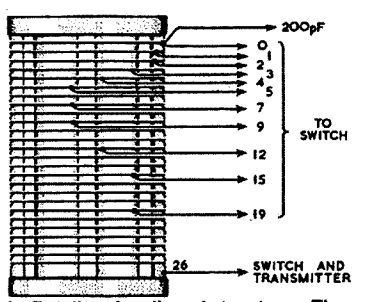
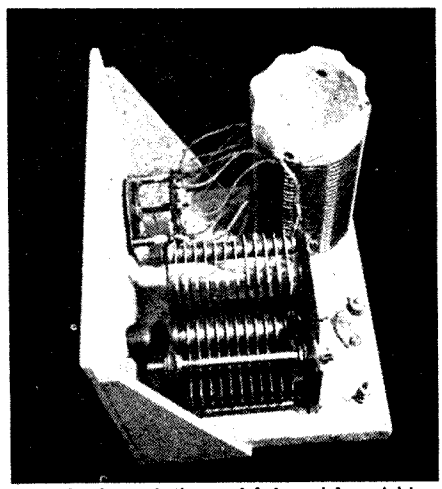



Fig. 2. Details of coil and tappings. The coil is wound on an Eddystone Frequentite former.



General view of the end-fed aerial matching unit.

The layout in Fig. 3 was adopted, with plywood panel and ¾ in. thick baseboard. Dimensions can be changed to suit a different capacitor or coil, or to fit an existing cabinet. The coil should be at least half a diameter from a metal chassis, if used.. The coil is mounted with brackets, and the flexible leads are cut and soldered to the switch tags. The switch was fitted with the dial shown in Fig. 3. The switch stop pin was removed to allow complete rotation.

A stand-off insulator provides an aerial terminal. The earth terminal is connected to the co-axial socket (Figs. 1 and 3). A short piece of 75 ohm or similar co-axial cable is used between the pi-output socket of the transmitter and the matching unit. The length of cable depends merely on a convenient layout of equipment.

## AERIALS

The length of the aerial need not be known. However, adjustments to the matching unit are in general less critical if the wire is fairly long. Better radiated signal strength is also to be expected from reasonably long aerials. If the aerial is very short, adjustment of the capacitor is likely to be critical. In tests with an aerial 4 ft. long, sparking over began in the 12-way switch when the transmitter was loaded to an input of only about 75 watts, and this set a limit to the shortness of aerials tested.

If an r.f. ammeter is included in the aerial lead, current will be fairly high on bands where the aerial length is near an odd multiple of quarter-waves, but fairly low where the aerial length is near a multiple of half-waves. This arises because Watts = $I^2 \times R$, where R is the resistive part of the aerial feed impedance, and is high at half-wave points. Therefore low aerial current on some bands does not indicate inefficiency.

When the aerial system is unchanged, maximum current, as shown by the ammeter, will agree with maximum radiation, as checked with a field strength meter. If the aerial system or operating frequency is changed, a change in aerial current is to be expected.

When a standing wave indicator is included in the co-axial lead from transmitter to matching unit, nearly zero reflected power is to be expected when almost perfect matching is obtained. When loading of the transmitter is obtained at some impedance other than that for which the s.w.r. indicator is intended, reflected power may be shown. This does not necessarily mean that there is any drop in power radiated from the aerial, because the transmitter pi-output circuit can feed effectively into a line with a high standing wave ratio[2]. When the co-axial cable is only a few feet long, it is not necessary that transmitter or matching unit adjustments are selected to obtain any particular impedance in the circuit between transmitter and matching unit. In practice, this circuit is likely to be working at an impedance of some 50 ohms to 100 ohms or so.

If a harmonic filter of particular impedance is included in the co-axial lead from transmitter to matching unit, it then becomes necessary to adjust the transmitter and matching unit until this circuit is working with minimum reflected power at the filter impedance, as shown by a s.w.r. indicator.

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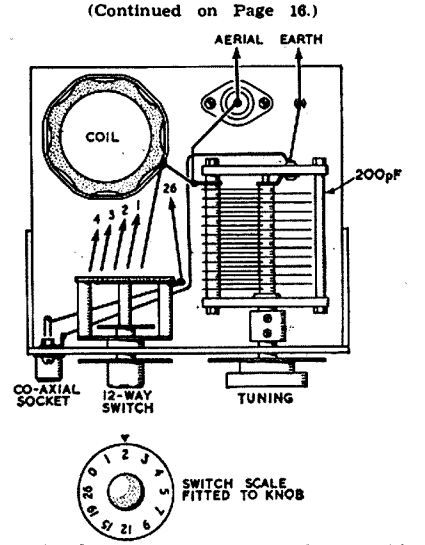



Fig. 3. Component and wiring layout. The switch scale shows the actual number of turns in use.

* Reprinted from "RSGB Bulletin," November, 1964

# VK-ZL-OCEANIA DX CONTEST, 1965

W.I.A. and N.Z.A.R.T., the National Amateur Radio Associations in Australia and New Zealand, invite world-wide participation in this year's VK-ZL-Oceania DX Contest.

**Objects:** For the "world" to contact VK, ZL and Oceania stations and vice versa. Note: VK and ZL stations, irrespective of their locations, do not contact each other for Contest purposes.

**Dates:** Phone: 24 hours from 1000 G.M.T. on Saturday, 2nd October, 1965, to 1000 G.M.T. on Sunday, 3rd October, 1965. C.w.: 24 hours from 1000 G.M.T. on Saturday, 9th October, 1965, to 1000 G.M.T. on Sunday, 10th October, 1965.

**RULES**

1. There shall be three main sections to the Contest:—
   (a) Transmitting Phone
   (b) Transmitting C.w.
   (c) Receiving Phone and C.w. combined.

2. The Contest is open to all licensed Amateur transmitting stations in any part of the world. No prior entry need be made. Mobile Marine or other non-land based stations are not permitted to enter.

3. All Amateur frequency bands may be used, but no cross-band operation is permitted.

4. Phone will be used during the first week-end and C.w. during the second week-end. Stations entering both sections must submit separate logs.

5. Only one contact per band is permitted with any one station for scoring purposes.

6. Only one licensed Amateur is permitted to operate any one station under the owner's call sign. Should two or more operate any particular station, each will be considered a competitor, and must submit a separate log under his own call sign. (This is not applicable to overseas competitors.)

7. Entrants must operate within the terms of their licenses.

8. **Cyphers:** Before points can be claimed for contact, serial numbers must be exchanged and acknowledged. The serial number of five or six figures will be made up of the RS (telephony) or RST (telegraphy) report plus three figures which may begin with any number between 001 and 100 for the first contact and which will increase in value by one for each successive contact.

Example: If the number chosen for the first contact is 021, then the second must be 022 followed by 023, 024, etc. After reaching 999, start again from 001.

9. **Scoring:** (a) **For Oceania Stations other than VK/ZL**—2 points for each contact on a specific band with VK/ZL stations; 1 point for each contact on a specific band with the rest of the world.

(b) **For the rest of the world other than VK/ZL**—2 points for each contact on a specific band with VK/ZL stations; 1 point for each contact on a specific band with Oceania stations other than VK/ZL.

(c) **For VK/ZL stations**—5 points for each contact on a specific band and, in addition, for each new country worked on that band, bonus points on the following scale will be added:

| | | |
|---|---|---|
| 1st | contact—50 | points |
| 2nd | „ 40 | „ |
| 3rd | „ 30 | „ |
| 4th | „ 20 | „ |
| 5th | „ 10 | „ |

For this purpose the A.R.R.L. Countries List will be used with the exception that each call area of W/K, JA, and UA will count as "countries" for scoring purposes as indicated above.

10. **Logs:** (i) **Overseas Stations:**

(a) Logs to show in this order—date, time in G.M.T., call sign of station contacted, band, serial number sent, serial number received, points. Underline each new VK/ZL call area contacted. A separate log for each band must be submitted.

(b) Summary Sheet to show the call sign, name and address (block letters), details of station, and, for each band, QSO points for that band, VK/ZL call areas worked on that band.

"All-band" score will be total QSO points multiplied by sum of VK/ZL call areas on all bands, while "single-band" scores will be that band QSO points multiplied by VK/ZL call areas worked on that band.

(ii) **VK/ZL Stations:** (a) Logs must show in this order—date, time in G.M.T., call sign of station worked, band, serial number sent, serial number received, contact points, bonus points. Use a separate log for each band.

(b) Summary to show—name and address in block letters, call sign, score for each band by adding contact and bonus points for that band, and "all-band" score by adding the band scores together; details of station and power declaration that all rules and regulations have been observed.

11. The right is reserved to disqualify any entrant who, during the Contest has not strictly observed regulations or who has consistently departed from the accepted code of operating ethics.

12. The ruling of Federal Contest Manager W.I.A. will be final.

13. **Awards: VK/ZL Stations**—The W.I.A. will award certificates to the top scorer on each band and the top scorer in each VK/ZL district provided that at least three entries are received from the call area or the contestant has scored 1000 points or more.

**Overseas Stations:** Certificates will be awarded to each country (call area in W/K, JA, and UA) on the following basis:—

1. Top scorer using "all bands" provided that at least three entries are received from the "country" or the contestant has scored 500 points or more.
2. Other certificates may be awarded, to be determined by conditions and activity.

N.B.: These are separate awards for C.w. and Phone.

14. **Entries:** All entries should be posted to Federal Contest Manager, W.I.A., Box N1002, G.P.O., Perth, Western Australia. VK/ZL entries to be **received by 15th December, 1965.** Overseas entries to be **received by** 15th January, 1966.

**RECEIVING SECTION**

1. The rules are the same as for the transmitting section, but it is open to all members of any S.w.l. society in the world. No transmitting station is permitted to enter this section.

2. The Contest times and logging of stations on each band per week-end are as for that transmitting section except that the same station may be logged twice on any one band—Once on Phone and once on C.w.

3. To count for points, logs will take the same form as for transmitting, as follows: date, time in G.M.T., call of station heard, call of station he is working RS (T) of the station heard, serial number sent by the station heard, band, points claimed. Scoring is on the same basis as for transmitting section and the summary should be similarly set out with the addition of the name of the S.w.l. society in which membership is held.

4. Overseas Stations may log only VK/ZL stations but VK receiving stations may log overseas stations and ZL stations, while ZL receiving stations may log overseas stations and VK stations.

5. Certificates will be awarded to the top scorer in each overseas scoring area and in each VK/ZL call area provided that at least three entries are received from that area or that the contestant has scored 500 points or more.

☆

## ATTENTION ALL AUSTRALIAN AMATEURS

This is R.D. Contest Month. Get on the air over the week-end of the 14th and 15th, make contacts and, most of all, **put in your log.** Help your Division win the Trophy.

Full details in July "Amateur Radio."

## Wireless Institute of Australia, Victorian Division

# W.I.C.E.N. EXERCISE, 4th and 5th SEPTEMBER, 1965

*J. BATTRICK,* VK3OR, and M. OWEN,* VK3ZEO*

MANY people outside this Division have asked us "How does your W.I.C.E.N. work?" This brief description of our forthcoming exercise in conjunction with a two-day car trial of 500 miles centred on Bendigo may put the basic picture. It is based on past policy modified by our recent Gippsland experiences.

Firstly, the requirements of the organisation for which we are communicating, that is the V.A.D.C. and the Volkswagen Club of Victoria. These requirements go to Joint State Co-ordinator VK3ZEO and in this case are:

1. Five mobiles to accompany trial officials around the circuit setting up and closing control points.
2. Five portable stations at check points to gather and relay scores.
3. Scores to be collated at trial headquarters in Bendigo then sent to Melbourne for further collation and information.

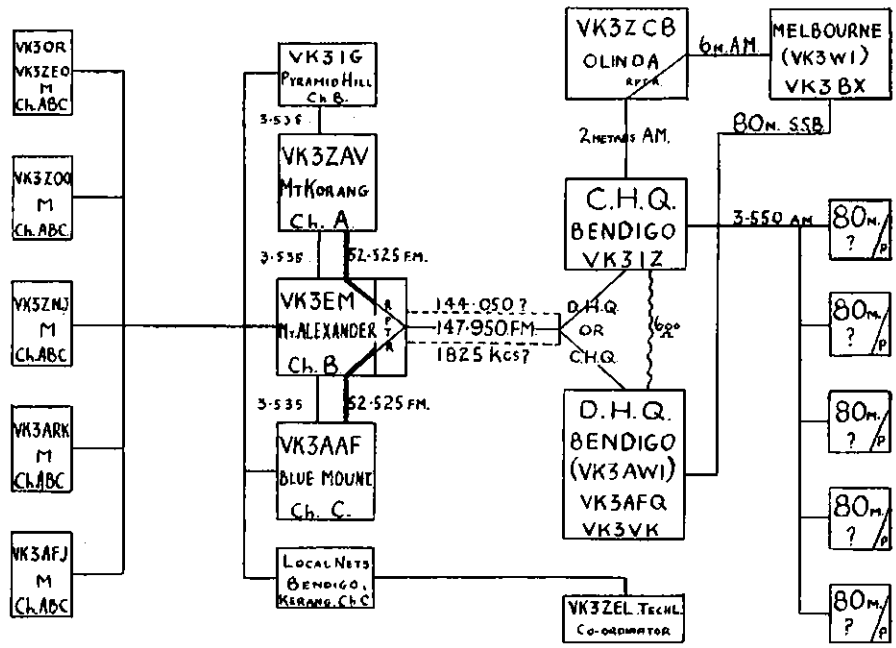
Secondly, these requirements are translated into a communciations system by Joint State Co-ordinator VK3OR in liaison with technical Co-ordinator VK3ZEL, Zone Co-ordinator VK3VK, and State Controller VK3AFQ. Out of this comes the system illustrated above. The Zone Co-ordinator acts in liaison with the local P.M.G. Divisional Engineer, organises his zone members and surveys and selects sights for D.H.Q. (Disaster Headquarters) and C.H.Q. (Communications Headquarters). The State Controller is concerned with control of the actual operation when the "show is on" and prior to this organises personnel to man the communications points.

### THE COMMUNICATIONS SYSTEM

On the left of the diagram are five mobiles, each with three-channel 2 metre f.m. These are the fast-moving mobiles concerned with trial control and they work into a hilltop relay station. As the trial covers 500 miles from Gisborne, near Melbourne, to Kerang on the Murray River and back, three relay sites are necessary. Channel C is used in the southern area to Blue Mountains control (VK3AAF). In the centre, Channel B to the main control at Mount Alexander near Bendigo (VK3EM), and in the north to Mount Korong control (VK3ZAV) on Channel A. At Pyramid Hill a short duration control may be necessary for a few hours during the night.

These three controls are all in line-of-sight contact and are operating continuously so must be on separate frequencies or they will mutually interfere. Control A and C are linked to Control B on 6 metre f.m. (52.525 Mc.) and a "pipeline" 2 metre f.m. channel X (147.9 Mc) from Mount Alexander to Bendigo completes this circuit from mobile to Bendigo. At Mount Alexander is a manned talk-through repeater from 6 f.m. to 2 f.m. channel X and vice versa which allows automatic contact to relay points from Bendigo. Backups between hilltops is 80 metres (3535 Kc.). Every circuit is backed up with an alternative. The pipeline on channel X is backed up with channel Y (144.05 Mc.) so our f.m. system has three mobile channels in the centre of the band 145.854 Mc. channel A, 146.0 Mc. channel B. 146.146 Mc. channel C, and link frequencies at each end.

On the right of the diagram the 80 metre a.m. portables on 3550 Kc. link direct to Bendigo C.H.Q. (VK3IZ) skip permitting. Home relay stations have provided helpful service here if skip is long. This 80 metre circuit terminates in Bendigo at C.H.Q.




This C.H.Q. separation from D.H.Q. has been found essential. At Disaster Headquarters in early stages of our development, a "gaggle" of h.f. transmitters and receivers on frequencies 2 to 6 Mc. operated by W.I.C.E.N., C.F.A., Police and everyone else proved impractical so we positioned our communications headquarters at the most convenient site for separation from other services, a mile or so, and also if possible on the high point in the area for v.h.f. links. Also, we were able to keep off-duty operators, maintenance crews, etc., out of everybody's hair.

Disaster Headquarters was linked to Communications Headquarters by radio links once, but now in an actual emergency we can usually rely on direct phone lines provided by the P.M.G. It is interesting to note that at Bruthen in Gippsland, W.I.C.E.N., R.A.C.V., C.F.A. and Forestry had transmitting sites around the perimeter of the town with phones into D.H.Q.

In this exercise we may depart from this policy as no other outside communications systems will be operating. We hope to place the end of the pipeline from Mount Alexander at D.H.Q. (VK3AWI) and work direct to relay points through the repeater. The 80 metre terminal will be separated still as an 80/40 s.s.b. link is to be established direct from VK3WI Melbourne to Bendigo D.H.Q. This circuit will be duplicated from Bendigo C.H.Q. to Region 8 control station site (VK3ZCB), at Olinda near Mt. Dandenong, using 2 metre a.m. and high gain beams, thence through VK3ZCB's manned repeaters to VK3WI on 6 metres a.m.

At VK3WI direct lines to D24 Police Headquarters are installed for communications during disasters. In this exercise information will simply be handed to officials of the clubs running the trial. This communication system is basic and is a result of some experience, but it is flexible. Naturally, some features are pertinent to an exercise of this type but the five mobiles could be 10 on one channel, with similar nets working on the other two channels and doubled for relief operators. The five portables could be eight or so with extra operators. In this exercise mobile operators put their gear in a trial official's car and operate 24 hours. They don't have to thrash their own vehicles around the trial course and are in the hands of some of Victoria's most experienced drivers.

(Continued on Page 16.)

* Joint State Co-ordinators, W.I.C.E.N., Victorian Division, C/- Box 36, East Melbourne.

# ELECTROLYTIC CAPACITORS

## Pigtail Type—

Lots of 1 Dozen Only (may be mixed).

| | Each |
|---|---|
| 2, 5, 10, 25, 50 or 100 μF. 6v.w. | 1/9 |
| 2, 5, 10, 25, 50 or 100 μF. 12v.w. | 2/- |
| 2, 5, 10, 25, 50 or 100 μF. 25v.w. | 2/6 |
| 2, 5, 10 or 25 μF. 50v.w. | 2/6 |
| 8 μF. 350v.w. or 450v.w. | 3/- |
| 16 μF. 350v.w. or 450v.w. | 3/10 |
| 24 μF. 350v.w. or 8 μF. 500v.w. | 4/- |
| 32 μF. 350v.w. | 4/3 |
| 16 μF. 500v.w. | 4/10 |

## Insulated Can Type—

| | |
|---|---|
| 100 μF. 200v.w. | 7/6 |
| 50 plus 50 μF. 350v.w. | 11/3 |
| 100 μF. 350v.w. | 11/6 |
| 200 μF. 350v.w. | 16/3 |

All above plus 25% S.T. Plus pack. and post. 1/6 dozen.

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**TRANSISTORISED**

Mixes the outputs of up to 4 high impedance microphones. Separate volume controls for each mic.

Attractive metal cabinet 6" x 2¾" x 2¼".

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Includes: Magnets, Compass, Motor, Iron Filings, Wire, Clips, Sockets, Lamps and Batteries.

Full colour 52-page Instruction Book.

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Built-in Ammeter.

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# GELOSO 2676 COIL KITS

5 Bands—Covers from 520 Kc. to 18.5 Mc.

You get:—

1. Completely Wired Coil Bracket with Switch.
2. Pair of Ferrite Cored I.F. Transformers.
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# MITYAMP

- Powerful 2 watt Transistor Audio Amplifier **Module.**
- Completely encapsulated in epoxy resin.
- Cannot be affected by high humidity or salt.
- Will function submerged in water.

Size: 2" x 3½" x ⅝" thick.

Weight: 6 oz.

**Frequency Response:** 20 cycles to 15 Kc. plus 2 db. at 1 watt level.

**Input Voltage:** Required to drive full power, 0.5v.

**Input Impedance:** 45 ohms to 50K ohms.

**Output Impedance:** 3.2 ohms to 45 ohms.

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Complete instruction leaflet supplied showing how to make: Intercoms., Signal Tracer, P.A. Systems and Record Players.

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Available in either 6 or 12 volt.

Plus pack. and post. 5/-.

# GRID DIP OSCILLATORS

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Made in England.

8 Frequency Ranges from 1.5 Mc. to 300 Mc. May also be used as:

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| | |
|---|---|
| **Lapel Type Crystal** c.w. Lead and Plug | 10/6 |
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| **Hi-Imp. Dynamic Hand Type** with built-in Wire Stand and Cable | 35/- |

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A.C. operated. Compact case contains both Speakers, one at each end for good stereo effect.

**£15**

Plus 25% ST., plus freight 7/6.

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For the younger generation. Attractive Plastic Cabinets. Nicely Boxed with Earplug and Aerial.

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Plus Sales Tax 25%.

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**MR2-P** — 1¾" Square:

0-50 Microamps ..... 45/-

0-500 Microamps ..... 31/6

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**EW20** — Edge Reading Type:
2 3/16" x ¾" Escutcheon Size.
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**P20**—5¾" x 4¼" Clear Plastic Case.
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All above S.T. Extra.

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**EW16**—Edge Reading Type:
V.U. Meter 3¼" x ¾" Escutcheon Size. Minus 20 to Plus 3 ..... 85/-

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"S" Meters—**P25**—Clear Plastic Face. Size 2¾" Square F.S.D. — 1mA. ..... 39/6

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### TOKAI MODEL TC-911

- 9 Transistors, with crystal control circuit.
- Compact and light weight.
- One-hand operation.
- Separate built-in Speaker and Microphone for telephone-like operation.
- Economical—uses 7 pen light batteries (supplied).
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**£33-15-0**

Plus S.T. 12½%. Set of two.

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**Similar to E Type:**
5,000/3.5 — 7,000/3.5
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**13/4 each**

Plus S.T. 25%.

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## POLYPACS

Bags of Assorted Components.

**10/- each**

S.T. Inc.

No. 1—30 Resistors, ½ and 1 watt—also Presets.
No. 2—20 Capacitors — Paper, Mica, Plastic, Ceramic.
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## TRANSFORMER RECTIFIER SETS

A. & R. Transformer and Matching Contact Cooled Rectifier.

**Output:** 250 v.d.c. at 60 mA. Much cheaper than ordinary transformers using valve rectifiers, or silicon diodes. Suitable for instruments, radios, amplifiers, etc.

**36/- set**

Plus S.T. 12½%.

**ALSO**

Low Voltage Sets — Transformer and Rectifier to give output of 12-15 volts at 2 amps. Suitable for model trains, transistor radio power supplies, etc.

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- A.C. Mains Operated.
- Kit consists of Light Source and Eye Unit.
- Complete with power supply, amplifier, buzzer, hardware and connecting wires.

Use across doorways or other openings up to 25 ft. wide.

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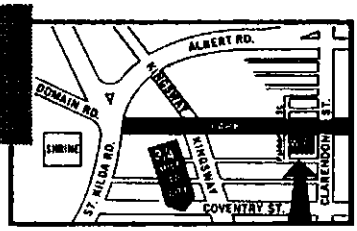
## WF WARBURTON FRANKI

**220 PARK ST. SOUTH MELB., VIC.** PHONE 30 lines **69-0151**




★ *TRADE ALSO SUPPLIED*

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## LOW POWER CONVERTER

(Continued from Page 9.)

All you have to do now is switch on, and, with voltmeter and milliammeter in the output circuit, adjust R1 and the emitter tap for maximum power output. If maximum efficiency does not give sufficient output volts add a few turns to the secondary. If efficiency is not at least 50%, look for poor mating of core halves, or the primary winding reversed.

Now it is up to you to think of some good uses for this circuit. ●

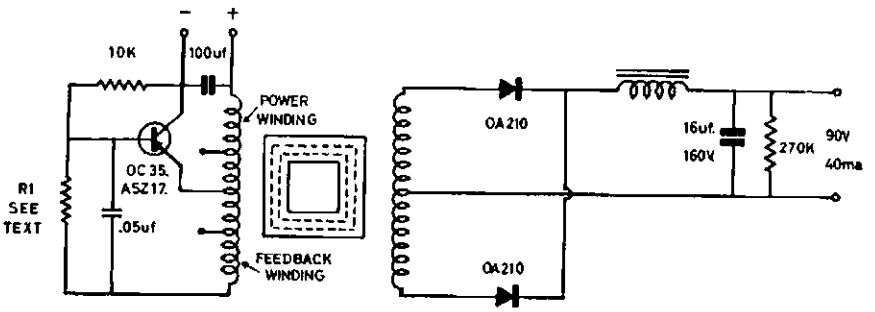


Fig. 5.—Circuit of Author's Converter (choke is unknown value, salvaged from vibrator pack in junk box).

## AERIAL MATCHING UNIT

(Continued from Page 11.)

### MATCHING ADJUSTMENTS

The 12-way switch is initially set at "0" and the capacitor at minimum. The p.a. anode and output capacitors of the transmitter are then adjusted in the usual way. If the transmitter cannot be loaded sufficiently, the match-unit switch is rotated to introduce 1, 2, 3 or more turns and the 200 pF capacitor is rotated until correct loading is obtained.

On the h.f. bands, few turns will be required, but on 3.5 Mc. in particular, 12, 15, or more even turns may be required. As various combinations of inductance and capacitance can provide a suitable impedance match, there is some overlap of switch and capacitor settings. One switch position can be noted for each band, for reference, or may be found in a few minutes by rotating the switch, beginning with no turns in circuit.

The transmitter can be loaded with its pi-tank output capacitor in many positions, corresponding to a wide range of output impedances. The output capacitor may be adjusted for about 75 ohms (as if working into a dipole) and loading adjusted with the matching unit. In all cases the p.a. tuner is dipped for minimum anode current in the normal way.

### RECEIVER COUPLING

The unit can be employed to improve matching between the aerial and receiver. Where aerial and receiver impedance are reasonably similar, no improvement will result from including the unit. But on bands where a bad mis-match exists, including the unit will increase signal strength. Adjustment is simply for best results, as shown by the receiver signal strength meter.

A matching unit of this kind intended for reception only can be constructed with a small receiver type coil and capacitor. ●

#### REFERENCES

[1] "R.F. Transformers using L-C Networks." R. C. Hills, G3HRH, RSGB Bulletin, May, 1962.

[2] "Some Reflections on Standing Waves," R. C. Hills, G3HRH, RSGB Bulletin, January, 1964.

## *Publications Committee Reports That . . .*

With pleasure at their last meeting they had in attendance the Federal Secretary and the v.h.f. sub-editor.

Correspondence was received from VK's: 2QL, 2ZTM, 4SS and VE7BGK, in addition to letters from R. L. Gunther, Rev. Bro. Ellis, and R. L. Erwin. One technical article was sent in by VK3ZRX.

Many correspondents are unaware that all items for the various columns must be at our printers by the 8th of each month, it is too late if they are sent in in time for the publication committee meeting night. Therefore, this month we have to omit the notes from Y.R.C., Hunter Branch, N.W. zone VK7, and the V.H.F. section. Please have your notes in before the deadline which is the last mail on the 8th of each month.

Arrangements are being made, in conjunction with VK2QL to print Prediction Charts each month similar in layout to those already published. These charts will be of assistance to the DX hounds and will, we trust, serve a useful purpose. This feature will increase "A.R." costs by an additional £200 a year, hance your committee had to have this money available before making promises they may have been unable to finance.

The new Call Book was discussed and agreement reached regarding layout and cover design. If you have not already notified the P.M.G. of change of address, then your old address will have to be shown in the forthcoming edition.

Due to delays, we did not introduce the new cover design last month, hence our report did not reflect the correct position. However, this month all should be in order and we trust a new front cover design will be used.

Readers are asked to forward technical articles and to comment to the committee regarding "A.R." Constructive ideas do assist our planning and are always welcome.

The question of the W.I.A. handling overseas publications was discussed and certain suggestions were put forward for consideration. This matter will have to be fully discussed before a final decision is reached.

## SILICON REPLACEMENT

(Continued from Page 8.)

were used for the 6.3-volt lead, and one conductor plus the shield for the ground connection. In connecting the two filament windings in series, the polarisation must be correct. If the — 12-volt supply doesn't work with the first connection you try, reverse connections to the 5-volt winding.

Three Vector boards were used, one cut to 6¼ by 2 inches for the h.v. rectifiers, capacitors and resistors, one 3⅞ by 1¾ inches for the 250-volt filter components, and one 2¾ by 1½ inches for the components of the variable negative supply.

The 50-watt bleeder resistor, the 3500-ohm dropping resistor for the 0B2 tube, and the 0B2 tube itself are mounted along one side of the top of the chassis near the ventilating holes in the side of the cover. The feed-throughs mentioned previously are used here. The power supply runs stone cold, hour after hour.

The front of the chassis contains the rheostat for negative-voltage adjustment, pilot lamp, and the d.p.s.t. on-off switch. At the rear of the chassis are installed an octal socket for the power cable and the A.C. cord with its fused line plug. Tekni-Cals are used appropriately fore and aft.

The supply pictured is only one example of the compact, efficient and cool-operating supplies that can either be constructed separately as in this case, or incorporated in a transmitter or receiver by the use of silicon-diode rectifiers. ●

☆

## W.I.C.E.N. EXERCISE

(Continued from Page 13.)

Normally, of course, 24 hours' continuous operation by one person should be avoided if possible.

At Melbourne VK3WI keeps the P.R. side, informing relatives of whereabouts of operators (XYL's are rung every night between 4 and 5 and informed where their menfolk are and what they are doing!!). VK3WI keeps tabs on location of everyone and is the contact with the outside world.

Each hill top site and headquarters has 10 or dozen personnel and in this exercise it is the responsibility of the leaders to organise equipment and personnel, their welfare (sleeping, watch-keeping, accommodation), to set up correct message handling procedure (on the air and log keeping) to secure spares, battery chargers, etc., etc. This we hope will train future controllers and co-ordinators.

Except for the hard-bitten core of crazy type mobiliers who have done this before, personnel are spread about to have in each group both new and experienced operators and personnel from the local zone are spread to cover all different activities.

Actually this is a gigantic field day with 50 to 100 people engaged. We believe that all those who participate in this sort of activity enjoy themselves, as well as gaining unique experience to fit themselves for a roll that the Amateur Service is anxious to fill for the good of the community.

# SIDEBAND

By Phil Williams VK5NN.

As promised last month we are to discuss the audio amplifier for an s.s.b. exciter. Although this amplifier is designed for a phasing type exciter, its characteristics are suitable for a filter exciter, because a "tailored" frequency response to restrict the audio response to the 300 to 3000 cycles/second band, will definitely improve the communications quality of the signal, and reduce the spurious "whiskers" on the signal.

The audio amplifier usually gets very little attention at the design stage, and following completion of the transmitter, has very little more consideration provided it works. Once the touch of a screwdriver or finger on grid 1 of value 1 produces a "squeal," the amplifier has passed its tests with "flying colours." So often, however, the colours are rather "tatty," and troubles originating in the early audio stages are blamed on other things. This applies equally to a.m. transmitters, as well as s.s.b. exciters.

It is very important to realise that the audio stages in the s.s.b. exciter must provide clean, "noise and hum-free" audio frequencies, which when added to, or subtracted from your final frequency, are your signal. Experience has shown me that there must be no squaring of signals due to wrong biasing, hum level must be at least 70 to 80 db. down below the peak audio, and the transmitted radio frequency signal must not get back into any of the audio amplifier grid circuits. Once you have added a linear amplifier with some hundreds of watts peak input to its anodes, it is likely that you have quite a bit of r.f. floating around the shack, and this stuff just looks around for microphone cables—even half an inch of unshielded microphone lead, an ungrounded microphone case, or a plastic mike case, can cause pandemonium when you talk, and is one of the most diabolical of all faults to trace and remedy. The best remedy is to do everything properly from the start, and even then, keep your fingers crossed, with half a dozen small ceramic capacitors handy for bypassing grids for radio frequencies.

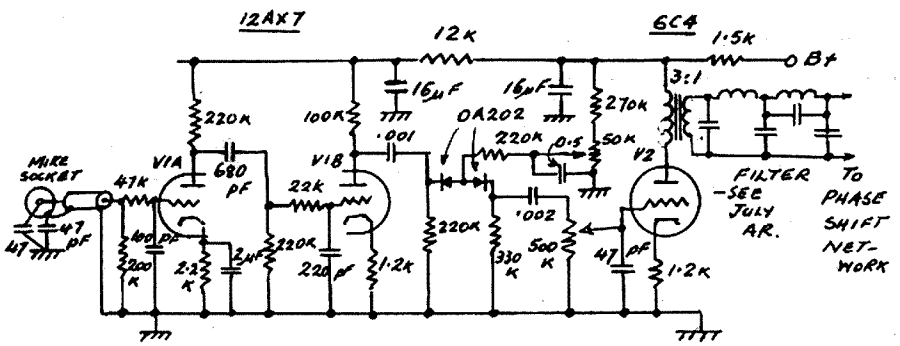


Fig. 1.—Audio Amplifier for S.s.b. Exciter—with restricted response and series clipping.

In a later article it is intended to discuss the layout of the s.s.b. exciter to provide the best isolation of critical stages, but for now, the important thing to say about the audio amplifier is that it should be located near the front panel, say, on the left hand side, and the power transformer and chokes on the rear, right hand side. The exciter output stage (shielded) should also be at the rear to allow the r.f. to go away from the rear, while the mike is plugged in at the front near the first audio stage. Of course the power cord also enters the rear of the chassis, and any front panel a.c. switches are taken to the other front corner of the front panel—certainly not combined with the audio gain potentiometer, as on the t.v. receiver.

Buy a shock-mounted, shielded socket for the first audio tube. This is a good idea to avoid those "ting-ting" noises when the chassis is knocked, but don't forget to earth the shield to the nearest chassis lug via a short flexible lead, as the p.v.c. shock mount is an insulator.

Heater supply to the first audio stage can be a source of hum or r.f. These should be balanced to ground by earthing each lead via a 47 ohm, ½ w. carbon resistor, this being the only earth on this wiring. The earth should be somewhere near the audio tube, but several inches away. The leads should be twisted to reduce the inductance loop of the heater wires, they may be shielded or bypassed with 0.01 μF. ceramic condensers if r.f. is a problem. A separate heater winding for the audio values is a help, if one is available.

The microphone socket, so I have found, can be insulated from the front panel in the interest of avoiding r.f. pickup, but the lead inside the chassis should continue as a screened lead, with the screen earthed solidly at the same position as the input grid components. This idea was given to me by a manufacturer of high powered transmitters. It avoids a hum pickup loop, and both active and screen of the mike cable may be bypassed to earth by small 47 p.f. ceramic condensers, near the socket. All this r.f. treatment may seem unnecessary, but can be very helpful if you ever get to the high power class.

For the normal male voice it is necessary to reduce low frequency response in the audio stages. In the event of a crystal microphone, either piezo or ceramic, being used, this process can be started by terminating the microphone with a 100k. to 200k. resistor instead of the usual 1 megohm. From here on, small coupling capacitors between stages in the preamplifier will give a rising response up to about 800 cycles, with quite low response below 300 cycles, which is below the effective range of the audio phase-shift network in a phasing type exciter.

In the diagram shown, of a typical "treated" audio amplifier, small condensers are included to shunt the grid resistors. These give a slow roll-off above 4 Kc. to make sure nothing in the high audio range gets through to the l.p. filter, and, again guards against any strong r.f. getting in.

Cathode resistors, usually unbypassed, are included, so that grid leak bias, and its attendant rectification troubles will not occur.

A series diode adjustable clipper is included in the amplifier, even though the experts warn that clipping should not be used in s.s.b. exciters. I agree that they cause distortion, but if the bias is set to clip only about 1 or 2 db. off the peaks of the loud consonants, no noticeable distortion results, and the filter (see last month's s.s.b. notes) removes any undesirable components. The clipper will then only distort the loud-voiced shack visitors, without causing flat-topping in the r.f. section of the transmitter.

An amplifier planned along these lines, using the circuit of fig 1 will give a fairly well "rounded" audio signal to the phase shift network, with little in the range which the latter is not designed to handle.

Perhaps I should warn people of my own attempts to filter out frequencies below 300 cycles by means of an inductance/capacitance high-pass filter. Unless you can obtain well screened (mu-metal) inductances, the hum pick-up is quite excessive, so that small coupling capacitors are much better for Amateur constructors.

These first few articles have dealt with the audio amplifier to assist those who may want to improve existing phasing exciters.

I am pleased at the response to the new series of s.s.b. notes. There have been several matters of interest sent to me already, for later issues. By request, next month we shall discuss "Collecting bits and pieces for the s.s.b. exciter project." 73, Phil VK5NN.

# ADDRESS BY THE POSTMASTER-GENERAL (HON. ALAN S. HULME, M.P.)

## Given at the Breif Club Luncheon. Menzies Hotel, Sydney, 17th June, 1965

First let me thank you for inviting me to address this luncheon meeting of the Breif Club. I was very happy indeed to accept your invitation.

If we cast our minds back it gives us a shock to realise that only 120 years ago man's means of communication depended entirely upon the speed of surface transportation. Messages took months—sometimes years—to be carried from one point to another.

Then in 1844 came the telegraph, an event that revolutionised communications throughout the world. And only thirty-two years later—in 1876—the human voice was for the first time transmitted over wires. The first words were used by Alexander Graham Bell, when he said over his telephone, "Mr. Watson, come here."

The people in that era could have been excused for believing that they had reached the ultimate in communications. Who could foresee then that in the future the human voice could be transmitted through space without wires. But inventive minds were still eagerly at work and it remained for the man who was only two years old when the telephone was invented to demonstrate that there was a practicable means of doing just that—transmitting sounds through space. This was Marconi.

The progress of radio technology over the years since then represents one of the more notable achievements in the fields of science and engineering. Some of us remember the great public interest which was created during the early days of radio, the first messages between Australia and the United Kingdom and the novel and exciting experience of receiving the first Australian broadcasting stations with the primitive receivers of that time.

From these beginnings and in a period of less than the average life span, radio has now reached into more fields of activity than can be readily enumerated.

Apart from television and sound broadcasting services, radio is providing large capacity telephone facilities by means of v.h.f. (very high frequency) and microwave techniques, communication facilities to the outback areas by means of the Flying Doctor Service and other special radio telephone services, emergency services in times of national crisis and communication aids in the civil aviation and maritime services. There are also the business users whose vehicles have calling facilities to individual networks.

What's more, over 4,000 Amateurs make radio their hobby. These enthusiasts are not only improving their knowledge of the radio art, but are promoting goodwill through their contact with other Amateur operators in various parts of the world, apart altogether from their assistance in times of emergency.

The twentieth century has therefore seen scientific and technological progress on a scale undreamed of previously and, in the field of radio, these advances are being utilised to the benefit all sections of the community.

And today, of course, we have television, the most powerful and popular entertainment medium so far devised.

Australian television was born in September, 1954, when the Federal Government gave its approval for the introduction of television into Australia in accordance with the following principles:—

(a) The service would follow the same general lines as had proved so suitable to Australian conditions in relation to broadcasting. There would be both a national and commercial television service.

(b) Television should be introduced on a gradual basis commencing with one national station and two commercial stations in Sydney and Melbourne.

(c) The services should be extended to other capital cities and to country areas as soon as circumstances, including financial economic consideration, permitted.

(d) Satisfactory programme standards should be established and maintained, not only to avoid the misuse of the medium, but also to facilitate the positive contribution which it could make to the welfare of the Australian people.

I know you will agree with these principles. The gradual approach to the introduction of television was designed not only to ensure the best possible service, but also to avoid the difficulties experienced in many overseas countries and in order that each stage of development might be related to the economic circumstances of the nation.

The Australian Broadcasting Commission was entrusted with arrangements for the establishment and conduct of the national television service in Sydney and Melbourne through transmitters to be provided and operated by the Australian Post Office. Following public inquiries into applications received for licences for commercial television stations in Sydney and Melbourne, licences were subsequently granted for two stations to be established in each of these cities.

The first television station to commence operating in Australia was the commercial TCN Sydney—on the 16th September, 1956—almost two years to the day after the Federal Government had decided to approve its introduction. The introduction of other commercial and national stations soon brought the total to three each in Sydney and Melbourne. Then followed installations in the other capitals, and the extension to country areas.

And so Australians were introduced to an entertainment medium as influential as anything ever to come before them in the entire history of the nation. Programmes are comprehensive and varied and cover most things that one might wish to view—talks, interviews, discussions, women's sessions, documentaries, outside events, children's sessions, musical appreciation, drama, comedy, quiz and panel programmes, religion, rural programmes, sport and variety.

Prior to the introduction of television to Australia, genuine feeling had been expressed by large sections of the community that the medium might have unfortunate effects on some sections of the population, particularly children. On this aspect, the Federal Government accepted the view of the Royal Commission on Television that although there would be problems to face, arising mainly from the social impact of television, these all revolved around and depended for their solution on the overriding question of the establishment and maintenance of satisfactory programme standards.

Fundamentally, the standards determined by the Australian Broadcasting Control Board require the observance in television programmes of ordinary good taste and commonsense, respect for the individual opinions of the public, proper regard for the special heeds of children and respect of the law and social institutions.

Particular attention has been given to the question of suitable "family and children's programmes," to ensure that programmes provided in the early part of the evening might be viewed, with complete confidence, by the family groups of all ages. These standards have earned the commendation of persons and organisations especially interested in such matters and have been a very important influence in ensuring that the taste and judgment of Australian programmes have been of a very high order.

Television comprises the art and science of converting the variations of brightness of a scene imaged on the sensitive surface of a camera into corresponding electrical voltages, which are transmitted over cables, as in closed circuit television, or carried by electro-magnetic waves, in the case of "radio links" for television broadcast at the reception point, these voltages are reconverted into variations of brightness of the fluorescent coating of a "picture tube" which is viewed directly or projected on a screen.

As the eye may distinguish a quarter of a million points in typical television picture, it is obviously impractical to transmit these all simultaneously over as many channels. A scanning method is therefore used to scan the information to be transmitted, line by line, so many to the inch.

The number of lines required for each picture depends on how much detail we wish to transmit and this depends on the viewing angle. Early television started with 30 lines, with very crude images. As the art has progressed, the number of lines has increased steadily and 600-800 are now practical. The Australian system operates on 625 lines.

Television is an extravagant medium, particularly in bandwidth, and for this reason its uses in communication are restricted. In closed circuit systems, where bandwidth is cheap, its use for instructional and supervisory purposes is spreading rapidly. Striking examples are the demonstrations of micro-surgery in colour to large groups, and the control of a complete steel rolling mill from one point.

Because of the large bandwidths required, television broadcasting can be carried out only on very high frequencies, which behave rather like light rays, so that reliable transmission does not go far beyond line of sight.

Television transmitting aerials are therefore elevated on high masts on mountain tops. The effective radiated power of such stations is increased to several times the actual transmitter power used by concentrating the radiated energy in a flat beam near the horizon.

Most television receiving aerials are more or less directional, to increase signal strength, cut out interference and to minimise reflections or "ghosts" from objects not in the direct line of the transmitter.

Australian television is rapidly passing from the era of independent programme generation to that of networks or stations. These are formed by the exchange of programmes recorded on film, by chains of microwave links, by co-axial cables such as between Sydney and Melbourne, but at present mostly by the exchange of programmes recorded on videotape, which has transformed the industry by the abolition of "real time."

As Australian television started in the capital cities, spaced some hundreds of miles apart, it was possible to re-use the same channels in most cities, and to space the channels widely in each city with the rapid increase in the number of television stations, and the conversion of "patches" of coverage into a continuous area, problems overlap, or adjacent channel, and of co-channel interference are becoming important. With more than 80 stations operating or being established and only 13 channels available, the time is not far away when most television reception areas will be limited by interference rather than by lack of signal strength.

It is estimated that the present 13 channels can provide for five programmes in the capital cities and three in most country areas. When more channels than these are required it will be necessary to use the "ultra high frequencies" where up to 40 channels are available. Unfortunately these frequencies do not carry as well as the existing television frequencies, much higher radiated powers are necessary and even then ranges are considerably reduced. Installation costs become higher also nevertheless they are coming into use in Europe and the U.S.A. and may be used here for educational television transmissions.

The planning of television services in accordance with these principles is implemented by the Australian Broadcasting Control Board which determines the sites for all television transmitters, allots the channels and power to be used, outlines specifications for the transmitting aerials and decides the frequency offsets to be used.

The Australian Broadcasting Control Board also has the task of studying possible future developments and planning for their orderly introduction into the television services. For example, it is at present surveying a wide range of opinion on the use of television broadcasting in education.

By the end of 1966, 91 per cent. of the population will be within range of one or more high-powered television stations. Filling up the gaps in coverage and improving marginal reception is then likely to be effected by a relatively large number of low-powered installations, picking up and relaying the programmes of the main high-powered stations either by cable to individual subscribers to "community antenna systems" or by "translating" them to channels for local re-transmission on very low power.

As regard colour television, the Board is keeping in close touch with the investigations of differing methods proceeding overseas at present the main difficulty resides in the cost and complexity of the colour receiver. Colour television is not likely to be introduced into Australia for some time yet.

As with monochrome (black and white) television, the Board will establish standards facilitating the interchange of television material from overseas. The Board is awaiting with interest the recommendations of an international conference which will consider three possible standards contending for adoption in Europe. This becomes particularly important with the imminence of intercontinental television relay by satellites or other means. Such relays, at least for a start, will be picked up at a special receiving centre (in the same manner as at present for B.B.C.

sound programmes) and fed into the network of existing stations.

Television today is a £300 million industry, employing directly and indirectly many thousands of people. Its impact on the Australian economy has been tremendous but, at the same time, because it has been introduced on a planned stage by stage basis, it has not had the adverse effect economically that has been so evident elsewhere in the world. Fifty-four stations are operating at present and the total in the current programme will be 87 by the end of next year.

I feel that I should make some reference here to frequency modulation broadcasting because a number of representations have been made to me for the re-introduction of this facility.

I have studied this matter very thoroughly, including the developments which led to the cessation of f.m. transmissions, and especially the comprehensive statement issued in 1961 by my predecessor in office, Sir Charles Davidson.

There is no doubt in my mind that the decision to use for television and for fixed and mobile radio communcation services the frequency band used previously for f.m. transmissions was made only after a most careful and expert consideration of all factors involved.

The Radio Frequency Allocations Review Committee examined this thoroughly. This was a committee of experts from Government departments and private enterprise, under the chairmanship of Professor Huxley.

The basic reason for the establishment of the committee was to plan the future use of the entire frequency spectrum.

Apart from the needs of television, the committee was faced with a tremendous demand for radio services used by business, industrial and professional organisations and essential community services.

During the years 1955/1960, services such as these had increased by over 200 per cent.—from less than 8,000 to over 24,000. It was apparent also that provision must be made for a further 20,000 services over the next five years.

To permit this development and to provide for expanding television services, the committee recommended the discontinuance of f.m. experiments. The Government was in accord with this recommendation.

A great deal of reference has been made to the development overseas of frequency modulation broadcasting. But in my view, overseas cases are not comparable with the Australian situation.

Australia is well served at present by its medium frequency broadcasting services and it is more in the public interest that the resources should be devoted to the further development of these and other essential services, rather than the re-introduction of frequency modulation broadcasting — notwithstanding that the latter has qualities not possessed by medium frequency transmissions.

Much of the agitation for f.m. broadcasting comes from a relatively small number of high fidelity enthusiasts. I sympathise with their views, but the Government could not introduce f.m. solely on the grounds of its qualities.

It has been suggested that a frequency modulation service could be established to serve the capital cities only, using the frequencies between 92/94 Mc used now for fixed and mobile services and that these could be re-allocated to the u.h.f. band.

In my view, any establishment of f.m. must be on a Commonwealth wide basis and not confined to a section of the listening public. It would need to be provided also for people in country areas who are less adequately catered for than people in the capital cities.

One of the most important points in this matter is that, in the event of the inauguration of f.m. broadcasting, it would be necessary for it to operate in the u.h.f. band. This would immediately render obsolete all equipment now capable of receiving it in the v.h.f. band.

The only justification for introducing a new system for broadcasting in the Commonwealth is the inability to meet all present deficiencies by expansion of the services in the medium frequency band.

The shortcomings now present are relatively few and would not in themselves warrant the introduction of f.m. broadcasting with its wide implications. Such a step would involve high expenditure on the part of the Government which I do not believe would be justified, and by the operators of stations and the general public.

Moreover, further development of other types of services such as medium frequency broadcasting and television would be affected because of the resources which would need to be devoted to the new project.

Television has an assured future but the Government will adhere to its policy of planned expansion and will not consider any further extensions—apart from translator stations—until the current programmes have been implemented.

In the meantime we are turning our thoughts to widening the educational facilities that t.v. can provide and increasing the locally produced content of television programmes. These are both very important aspects of t.v. which can open up even wider fields for Australian artists, script writers, technicians and others associated with the industry.

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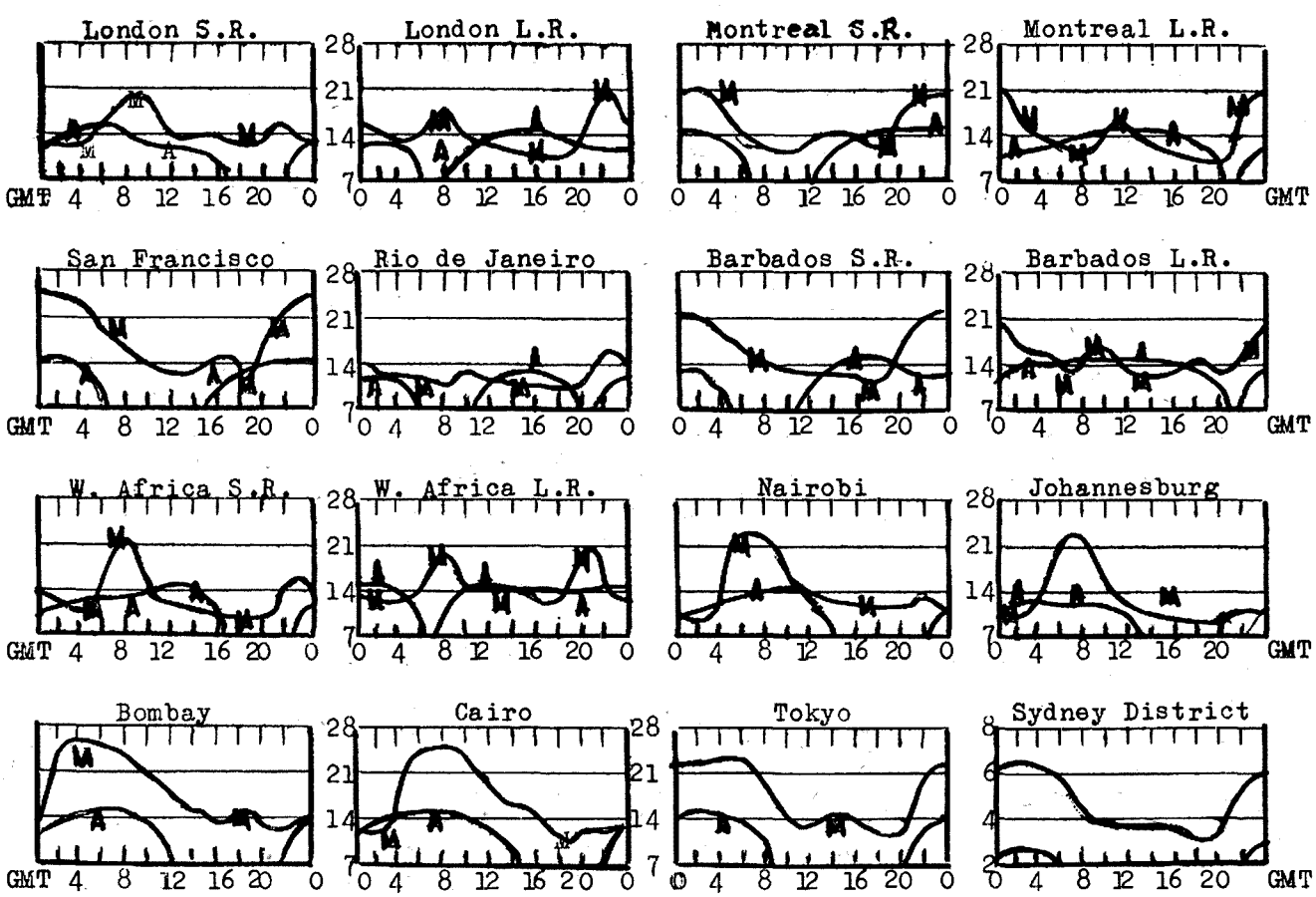
# PREDICTION CHARTS, AUGUST 1965




M is the Maximum Useable Frequency. A is the Absorption Limiting Frequency.

# SWL

Sub-Editor, Chas. Aberneathy, WIA-L2211,
30 Urunga Parade, Miranda, N.S.W.

During the past 12 months it has been my pleasure to compile this section of "Amateur Radio," and I feel now that another member may like to try his or her hand at piecing our page together. If any member is willing, just let me know and I will gladly assist in any way possible.

### INDUCTANCE

Inductance is the property of a circuit which accounts for the production of an induced voltage by a changing current. A voltage is induced in a conductor whenever magnetic lines cut across it. When a magnetic field is estabilshed around a coil of wire, by connecting it to a d.c. voltage source the flux lines cut across adjacent wire turns, and consequently, induce a voltage in the coil. This induced voltage is always of such polarity as to oppose the change of the current which produces it (that due to the applied voltage). Because the total induced voltage in the coil always opposes any change of the current, it is called a counter electromotive force. The greater the inductance in a circuit the greater is the opposition to current changes, that is, the greater is the counter electromotive force.

If the coil is connected to an a.c. voltage source, the magnetic field around the coil builds up in one direction, collapses to zero, then builds up in the opposite direction, and collapses again, all in rapid sequence. This results in the continuous induction of counter electromotive forces, which oppose the varying current flowing due to the applied voltage.

The symbol for inductance is L, and is measured in Henrys. If the current in a coil changes uniformly at the rate of 1 amp. per second, and induces a voltage of 1 volt in the coil, its self inductance is said to be 1 Henry.

### NEW SOUTH WALES

We are still experiencing good attendances at our meetings with new faces to be seen on each occasion. We were sorry to receive the resignation of our Secretary, Tom Harding, who has been a stalwart for some considerable time, during which period he has carried out his duties to the letter, and our thanks go to him for a job well done. Our new Secretary is Gordon Grouch, to whom we extend a hearty welcome, and members wishing to contact him can do so at his Bay Street, Botany, N.S.W., address.

Owing to the moving of his QTH, Don L2022 has been out of S.W.Ling for some time. He is now settled, and hopes to resume activity in the near future.

### VICTORIA

The Group has maintained a high attendance of over 30 members throughout the first half of the year. We thank Messrs. Crohan and Cook for their donation of unwanted radio parts. If you have any radio parts to dispose of they could be marked S.w.l. Group, and left at the rooms. During the next half of the year we have arranged for some lectures by persons from Government departments together with some interesting technical visits.

The S.W.L. constitution for Victoria has been forwarded to Council for their consideration. Members will be informed of the outcome in due course. it is good to see in the Federal report that there is some activity with the s.w.l. certificates, but we must wait until next year, it appears, for this report.

June "A.R." states that the next Call Book is due for issue in September. So far we have not been asked for an up-to-date list of s.w.l. members. Let's hope we have not been forgotten again this year.—Ian L3006. (Forward list to Editor now, Ed.)

Greg L3138. Congratulations on getting that R.H. award. QSL's to hand, VK9, HPI, HB9, WA3, UB5 and ZC5. Thanks for that copy of the mag.

Eric L3042. Rarest QSL's, DU1, FR7, HK7, HM1, HS1, KZ5, OR4, PJ2, UA2, UQ2. Heard, 1.8 Mcs., 17 VK, 2, 3, and 5. 3.5 Mcs., JA1 and VE7. 7 Mcs., 70 countries in all continents. 14 Mcs., BY3, DU1, KG6, KM6, KR6, KH6, CP5 and 9M4.

Lloyd L3141. QSL's to hand, OA4, ZD5, SV0, VP2, KL7, IT1, YJ8, W9/XU, EP2, VR1, HR1, PJ2 and KR8. Pleased on your run up the ladder.

Warwick L3211. Latest cards, 4S7, KM6, OH2, IT1, CR6, K7/3W8, SV0, W9/XU, CP8, ON4, HC1, UL7. Very good on your five new countries and your skip up the ladder.

Noel L3101. Heard VE6, VK8, ZD5, K9, VS6, KC6, BV1, ZS6, II and CR6, with a QSL from OH4.

### QUEENSLAND

Afton L2136/VK4. I trust by now that you have returned from an enjoyable and profitable trip. I am still waiting to get the message on that tape.

Col L4027. Welcome to the page Col. Col uses a Trio (r-4JB rx with a folded dipole antenna. O.K. on the 8 metre set-up. I find that very interesting also.

### SOUTH AUSTRALIA

Alan L5065. Heard OA4, ZL1, ZL2, ZL4, JA5, KC4, W's, ZK1, VS, CR8, YN1, VY5/W8, KS6 and KP4. Cards to hand, YJ8, W4, 9M8 and KZ5. I hope that you managed to get channel 10.

### WESTERN AUSTRALIA

Reports on band conditions in W.A. say that 10 and 15 metres have been quiet, with 20 metres being open during the day. Not much from Europe or West Africa, but W's plentiful. 40 metres is the best for W's and Europe at the moment from 2330-0300 and 0700-1200 G.M.T. Peter L8021.

Peter L6021. Congratulations on that VU2/4S7 contest win. Heard ZS8, CR8, HR2, YJ8, OD5, SP5, YV5, HK4, etc., with QSL's from OZ2, SP4, ZD8, CE0, VQ6, 7Z3, 9L1, 7Q7, etc., and a rare one, ST2AR.

Alan L6029. Very good on your intention of trying for a ticket, and I wish you well. Heard F9, W9, W0, T1, WA4, F5, TG8, JA4, ET3.

Geoff L6030. I trust that you are successful with that tower project. Heard W7, ZE1, VS9, SP9, WA9, F8, XE1 and KL7.

Bryan L6028. Another S.w.l. going to try for the A.O.P.C., well I do hope that you get it. Heard JA9, W9, ZE7, KA2, VE6, G3, FR7, FK8 and TI2.

### TASMANIA

Conditions during the past month were: 80 metres very active, s.s.b. wise with severe QRN on occasions. 40 metres nil. 20 metres very active in daylight hours. 15 metres noisy with openings not as good as in May.

Greg Johnston. No luck re those i.f. formers as yet, but suggest that you write to Ham Radio Supplies whose QTH appears in "A.R." Heard W's, KW6, KL7, KH8, ZS5, XE's, UD6, ZK1, 4X4, XE's, OE3, JA's, 9M4, CR7, UH8 and VP7.

### GENERAL

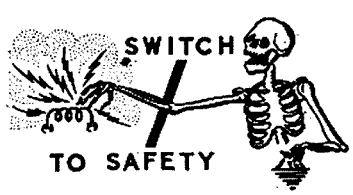
ZL1109, A. W. Green, 22a Okahu Road, Kaitaia, Northland, New Zealand, would like s.w.l. pen friends.

Alan Raftery, L5065, 22 Princes Street, Croydon, S.A., is seeking the QTH of CR8BH.

Tim Corbin L5067 has an interesting idea for cheap QSL cards. For information write to him at C/o Athelney House, St. Peter's College, Hackney, S.A.

For the card swappers a few more contestants. JA1-3893, Seiziro Miyasaka, 779-4 Tagacho, Hitachi Ibaraki, Japan. WPE4IGT, John Seay, 366 Wisteria Street, Fairhope, Alabama, U.S.A. WPE3DTP, Robert Binau, 2704, Johnson Dr., Williamsport, Maryland, U.S.A. WPE1ESB, Ambrose Maxim, 23 Lambert Street, Winthrop, Maine 04364, U.S.A.

Once aagin another section draws to close, so cheers, and all the best DX, but remember, "Rights are always associated with responsibilities."—73, Chas, L2211.




# VHF

### NEW SOUTH WALES

The major v.h.f. events set down for August will be the 6 metre hunt on the 11th. The foxes will be John 2ZGB and Dennis 2ZDW and the start will be at 8 p.m. at Marsfield.

The v.h.f. section of the R.D. will now be a two-section event in VK2. To comply with the local section, it will be the same rules as used last year. In general it follows the National event except that the major cities (Wollongong, Sydney and Newcastle) and the nearby areas are divided into zones for point scores. All v.h.f. bands may be used but no cross band and a station may be re-worked after an elapse of one hour. To comply with the National part (section E) the same log will be used but every time a new station is worked the contestant will be required to underline the call sign. This is then added up to become his National score. It is very good to see the inclusion of the v.h.f. section and every operator is urged to operate and submit a log. The Federal Contest Committee would welcome suggestions re the v.h.f. section. A map and rules appears in the August V.h.f. Newsletter.

The 2-metre fox hunt is set down for Wednesday, the 25th, at 8 p.m.

Over the June holiday week-end VK1VP/P and VK2PT worked a distance of 177 miles on 432 Mcs. In America the 432 distance (via land) is up to 1040 miles, according to a recent report.

The V.h.f. Group technical committee has come up with a 2-metre mobile project. It is a complete rig built into a Playmaster case (12½ in. x 7½ in. x 5 in.) and consists of a a.m. transmitter (3/12 final), modulator, convertor and receiver. At the moment the prototypes are being assembled and some details on construction are expected in the near future. At least a dozen units are expected to be built in the near future by Sydney Group members.

**V.H.F. OPERATORS**

There is, for the first time, a section in this year's Remembrance Day Contest for you. The date, 14th-15th August. Prove you want it by entering your log. Full details appeared in July "Amateur Radio."

A problem always facing the committee controlling mobile and field events in VK2 is to keep the rules up to date with the changing conditions and ideas. In Sydney in the past five years there has been such as vast improvement in main roads and river crossings that old events which used the tricks of poor access can no longer apply. In the south, Georges River for a long time only had a bridge and two "slow" punts. The new road across Salt Pan Creek takes five miles out of the East Hills if you are along that section of the river. The Silverwater Bridge between Ryde and Parramatta and the "high" speed connecting roads, together with the new Gladesville and Figtree Bridge system which is soon to have the last bridge completed and reduce that road system by over two miles, makes the Parramatta River easy. The Roseville bridge and approaches are well under way and will be completed in a few months. With these bottle necks removed the higher average speed, that fox is finding that he has to resort to much more cunning if the hunt is to last for any time.

Over, the last few months the committee increased the airline radius from the start by five miles to a maximum of 15 miles (based on the start). Supper is not served until 15 minutes after the nominated close of the hunt. Even with the modernisation of the rules and thinking there is still one unsolved quesion which appears to plague all the large Australian cities. That is, why there are so few mobile contestants in relationship to the Amateur population of that area? In Sydney it is hoped that the new mobile project will enable operators to make full use of all available frequency space and give everybody a channel to themselves.—2ZTM.

# D X

## VP4, OA4, BV, ZM7, 7GI, FP, AC5, MP4, ZC6, TY2

Sub-Editor: ALAN SHAWSMITH, VK4SS,
35 Whynot Street, West End, Brisbane, Qld.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

A speculative question of the moment might be made on the overall improvement noticeable on the bands. Will this newly emerging cycle eventually produce conditions similar to the 1957-1960 era? There seems to be a case for optimism, and for those who weigh the dollar spent in Amateur Radio against the return the time may now be propitious for the investment for gear for better DXing.

While July and August are usually quiet months, the coming spring should bring the bands to life and may provide a pointer for things to come.

### NOTES AND NEWS

**Pakistan:** The old master Gus W4BPD has of late been active from AC1, AC2 and AC3 but by the time this reaches your mail box he is expected to be working from AP land. Gus is usually very easy to find. His c.w. fqs. are 14032 and 14060. 14105 will spot him for s.s.b. QSL to P.O. Box 7388, N.Y., 10001.

**Tristan Da Cnnha Island:** ZD8HL is planning a DX-pedition to ZD9. Hopes to get started in July or a little later. More information if it comes to hand.

**Western Samoa:** The new prefix is 5W1. 5W1AG, 5W1AZ, 5W1AC (QSL via K6EXO) are active. The latter mainly around 14115, afternoons east.

**Crete:** As of now three active stations are signing SV0WR, SV0WFF, SV0WGG. 14 Mcs. c.w. and s.s.b.

**Saudi Arabia:** HZ0CPL reported QRV 14022 at 2030z. If not a phoney this is a good one for WPX.

**Ceylon:** 4S7IW on 14120 seems on regularly around 1300z. QSL to W8RTW.

**Turkmen:** UH8BO is worked sideband on 14120. He will take c.w. on this frequency.

**Balearic Islands:** EA6BC is on irregularly. 14205 a.m. No times available but 2100z may be best.

**Trucial Oman:** MP4TBO 14056 at 2030z. Box 8 Sharjah—or VE1AKZ. One or two others also on from this country. MP4TBM.

**Sao Tome:** CR5SP still QRV on 21 Mcs. Works States mostly. No other information as yet.

**Sudan:** Remember ST2AR. Most DX'ers will do. His licence is being withheld temporarily anyway. Reason is until Government instability is overcome!

**Faeroes Island:** The call OY2GHK has been issued to Stu W2GHK to use when he sees fit. Hoping to be on soon. All bands and modes.

**Turkey:** If you've worked TA1DB around 14025—forget it. Reported phoney.

**Thailand:** HS1HS 14106, 14272, 14295. QSL to Box 2008, Bangkok.

**French Somaliland:** Remember FL8AK around last December. He is to be on again in July and August, 14040 and 14250. QSL K7UCH.

**Ellice Island:** VR1S and VR1B, both around 14020 afternoons east. The former via Box 288 Suva. VR1B via VK2EG.
(Much of the above by courtesy of L1DXA.)

**Honiara:** Several VR4's live on the hill behind Honiara town. Notably VR4CR and VR4ED on c.w. and one or two others on s.s.b. 14 and 7 Mcs. any afternoon east.

**VP8 Expedition:** Expected to commence mid-June and continue 18 months. This will include South Shetlands and South Georgia besides the Falklands. Sponsor Hammarlund. All bands and modes.

**Kure Island:** Remember KH6EDY who gave so many a new country. Now we have another prefix operating. K5CQK/KH6. Name Kim. Mode s.s.b. 14 Mcs. QSL U.S. Coast Guard, U.S. Navy Station, Box 36 F.P.O., San Francisco. (Courtesy S.w.l. C. Thorpe.)

**Johnston Island:** W6BGT/KJ6. Bob, s.s.b. 14 Mcs. 0500z.

**Rhode Island:** SV5LP is reported as a permanent resident. 14050 and says QSL via Buro.

**Georgia:** UF6UB now on s.s.b. 14120 at 0300 or later.

**Kirghiz:** Boris UM8FZ is another starter on s.s.b. 14121 and listens 14260.

**Afghanistan:** Charlie YA3TNC is regular and very active. Try 14240. QSL K0RZJ.

**Western Carolines:** (as separate from Eastern Carolines), KC6AA and KC6BY 14287 around 1030z. Possibly QRT early August.

**Faeroes Islands:** Another news itsm on this spot says OY1R 14010 and OY2J 14020 are on irregularly.

**Kuwait:** Nasir 9K2AN says he is on every Thursday 14082 at 2300z.

**Christmas Island:** Don is regularly active. His call VK9DR. Frequency usually 14105 but sometimes c.w. VK9XI is also on the air.

**Central African Rep.:** TL8SW is on almost daily. But will be QRT in September for about six weeks then back on air again.

**Spanish Guinea:** TJ1AC is planning an expedition to this spot next October. More news if it comes to hand.

**Frans Josef Land:** DX-pedition was planned for June and July, but UW0IN who is going, says it is off for a while. Vic UA1KED is already QRV from here. 14210-0200.

**Cocos Keeling:** VK9CR is on occasionally and sometimes sheds VK6RU. Try 12100 at 1300z. He does not bother with c.w.

**Indonesia:** Still only at the rumour stage, but *Don Miller* of W9WNV *fame says he has* permission to operate from the land to out north. However, there's many a slip!

**St. Pierre and Miquelon Islands:** Clem W2JAE expects to sign as FP8CK very soon.

**Turkey:** Late news says that TA2BK is now on and authentic.

**EA6, EA9:** WA2QNW is now in Spain and has obtained permission after a long struggle to operate in all the EA9 countries. More news when it comes to hand.

(The above news supplied by courtesy L1DXA, DX Ed. R.S.G.B., Fla, Dx-er and S.w.l. C. Thorpe L4022.)

### QSL's

Rare ones and their managers.

| | |
|---|---|
| AP5HQ via W4LRN | VP2LS via K1IMP |
| CR4AJ via W2VCZ | VR1G via W6BSY |
| CR6JJ via W4QCW | VR2DK via W2CTN |
| CR7IZ via K3HQJ | VP2GTA via W2CQA |
| CR9AH via W7ZAS | VS9MG via WA2WUV |
| EA9EO via EA4GZ | VU2NRA via W4ANE |
| EL2AC via K5SGJ | YA3TNC via K0RZJ |
| EL2AD via K5SGJ | ZD8BB via W7ZMD |
| ET3USA via K7UCH | ZD8DX via WA4KCV |
| EP2RV via G5RV | ZD8HL via W2CTN |
| EL8X via SM5AIO | ZD8C1 via K4SCO |
| HC8FN via WA2WUV | ZD8JC via W5EBJ |
| HK0QZ via K9ECE | ZD8RH via W2CTN |
| KS6BO via K4TWF | ZS2MI via ZS1CZ |
| OD5BZ via W8ZCQ | VP1TA via W2CTN |
| KA2DF via W2CTN | FB8XX via 5R8BC |
| KR6BQ via W2CTN | PY7BAL/0 via |
| LX3BD via DJ6SI | Box 842 Recife. |
| SV0WF via W2PCJ | HL9TQ via |
| SV0WGG via K1EAT | P.O. S.F. 96358 |
| SV0WPP via W5EGR | CP8AM via K4GOX |
| TJ1AC via 5N2 Bur. | 3A2AV via L1ZBS |
| TL8SW via W1BPM | 7G1H via K9BPO |
| UA1KED via RAEM | 9A1PM via W2CTN |
| (Box 88) | 9M8KZ via W6KTE |
| VP1GFQ via W0GFQ | 4S7RS via 4S7WP |
| VP1WH via W6SHC | 5R8AN via W3KVQ |
| VP2AX via W8EQA | 5H3JR via W2SNM |
| VP2MS via K3HGX | 4X4IX via WA2KNC |
| VP2DAD via K1IMP | 9J2AB via W6BAF |

### SUMMARY

The Bands in AUGUST: By comparison DX is a little quiet at this time. On 80 mx is the usual W and J prefixes audible after 0900z. The short, sharp opening to Europe on the s.p. around 1900z has been at this QTH conspicuous by its absence. However, as spring advances this path should improve. 40 mx is not at its best yet, although the usual Asian and N. American prefixes are workable nightly. The regular s.p. opening to Europe may show itself a little earlier than the past two years and QSO's might be possible in late August or early September, from 1700z, 14 Mcs. May be the best band as summer approaches with the general level of DX signals up somewhat. 21 Mcs.: This band has already been showing some good form and 28 Mcs. is open erratically to the States. A gradual improvement is expected.

My best wishes to Bert VK5BB for a speedy return to fitness and at the risk of being pedantic a plea again for DX news. This is your column and any titbits of doings anywhere are truly welcome. Any Oceania news is particularly needed. Good Dx-ing, chaps. —73, AL, VK4SS.

# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL

### EXECUTIVE MEETING, 17th MAY, 1965

After the usual adoption of minutes of the previous meeting, the business arising was dealt with. This involved a draft letter to the Minister of Customs regarding the duty free entry of a mechanical filter for one of our members. The Secretary was instructed to forward this to the Minister supporting the principle of duty free entries for those items not made in Australia. Some discussion took place on the purchase of a suitable copying machine for the Executive and it was finally resolved that the 3M machine demonstrated should be purchased.

The Business Manager reported that replies to his circular on "QST" subs. were being received from members agreeing to take out subs. through the W.I.A. and that monies were being put into a special account. The Communications Manager reported that the Geneva Story had been typed and was now ready for printing. Prices for the sales of R.S.G.B. publications were agreed and the Treasurer was to send samples to all Divisions for their perusal. The major time of the meeting was devoted to a study of the P.M.G. Handbook which was examined in detail for corrections and amendments.

### CHANGES OF QSL BUREAUX ADDRESSES

Notification has been received from the following that new addresses are:—

Lebanon—R.A.L. QSL Bureau, c/o P.O. Box 1217, Beirut, Lebanon.
U.S.A. W4—F.A.R.C.—W4AM, P.O. Box 13, Chattanooga, Tenn., 37401.
USA W7—Willamette Valley DX Club Inc., P.O. Box 555, Portland, Oregon, 97207.

All of the above addresses are effective immediately.

### SEVENTH SCANDINAVIAN ACTIVITY CONGRESS

Brief rules are as follows:—C.W.—1500 G.M.T. 18 Sep 65 to 1800 G.M.T. 19 Sep 65—call "CQ SAC." Phone—1500 G.M.T. 25 Sep 65 to 1800 G.M.T. 26 Sep 65—call "CQ Scandinavia." Bands—3.5 to 28 Mcs. Serial Nos. RST or RS followed by 001, 002, etc. Prefixes to be contacted—LA, LA/P's, OH, OH0, OX, OY, OZ and SM/SL. Points—1 per complete contact. Multipliers max.—8 per band. Final score—points by sum of multipliers.

Logs to show—Date. time G.M.T., stn. worked, sent no., received no., band, note of new multiplier. Summary for each band required. Separate logs for each C.W. and Phone. Also call sign, name and full address, finally signature abiding by rules.

Logs to be submited or mailed not later than 15 Oct. 65 to:—N.R.R.L. Traffic Department, P.O. Box 6594, Rodelokka, Oslo 5, Norway.

### I.A.R.C. NEWSLETTER

The first newsletter of what is to be a quarterly issue from the I.A.R.C. has been received. News of interest to the W.I.A. will be published from time to time.

### FEDERAL CONSTITUTION ALTERATION

Federal Executive, on behalf of the Federal Council of the Wireless Institute of Australia, hereby gives notice that it is intended to alter the **Federal Constitution of the Wireless Institute of Australia** 1947 as follows:

(a) by adding the following words at the end of Clause 3 thereof: "and to form a Company to take over the real and personal property belonging to and to give an indemnity against all or any of the liabilities of the Institute and to pay the costs charges and expenses of such formation and to transfer all the assets of the Institute to such Company."

(b) by adding new Clause 67a after Clause 67 thereof as follows: "67 (a). Upon the incorporation of the Company referred to in Clause 3 of this Constitution, the Institute shall be dissolved and the assets of the Institute shall be paid and transferred to the said Company in consideration of the said Company indemnifying the Institute, the Council, the Executive and members against all costs, expenses and liabilities."

Any member of the Institute not in agreement with the proposed alterations should notify his disapproval with the reasons to the Federal Secretary within 14 days of the publication of this proposal.

### RECIPROCAL LICENSING

Reciprocal licensing is now a reality! Just as this issue of "A.R." was going to press we have learned from the Minister for External Affairs that the agreement to establish reciprocity between Australian and United States Governments in the field of Amateur Radio has been concluded. Notes constituting such an agreement were exchanged in Canberra on 25th June, and will now enable suitably qualified Radio Amateur operators of either country to be authorised, by the administrative agencies concerned, to operate an Amateur Radio station in the other country.

Whilst this has been Institute policy for some time, it was not until the passing of the Goldwater bill in U.S.A. that serious attention could be given to this matter. Australian Amateurs now join Costa Rica, Great Britain and possibly others in having had this facility available.

### THE "ISTOR" FAMILY

The following "istors" are published with acknowledgments to P. J. Hutchings from a recent edition of British Communications and Electronics. It may be remembered that a list was published a few years ago—add these new ones!

Barristor—majority carrier semi-conductor triode.
Binistor—silicon controlled rectifier.
Callistor—silicon controlled rectifier.
Cryosistor—low temperature semi-conductor component.
Deplistor—depletion type semi-conductor.
Fieldistor—field effect transistor.
Filmistor—film resistor.
Frigistor—low temperature resistor?
Gaussistor—magneto resistive amplifier.
Indistor—L/C network.
Indusistor—transistor circuit.
Madistor—magnetic semi-conductor component.
Magnistor—magnetic single junction device.
Memistor—self-adjusting resistor for adaptive memory.
Microsensistor—microminiature sensistor.
Negistor—negative impedance matching network.
Neuristor—neutron simulator.
Nuvistor—reliable valve range.
Optotransistor—optical transistor.
Oscillistor—magnetic semi-conductor oscillator.
Persistor—super conducting computer element.
Phototransistor—light sensitive transistor.
Polaristor—light sensitive transistor.
Precistor—precision resistor.
Resistor—resistance element.
Sensistor—thermistor.
Stabistor—voltage stabiliser.
Statistor—field effect semi-conductor.
Thermistor—thermally variable resistor.
Thyristor—silicon controlled rectifier.
Transistor—basic semi-conductor device.
Trigistor—silicon controlled rectifier.
Trinistor—silicon controlled rectifier.
Twistor—magnetic memory device.
Vamistor—precision resistor.
Varistor—current variable resistor.

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## FEDERAL QSL BUREAU

The Korea Amateur Radio League has forwarded details of two new awards which they have recently sponsored. Full particulars may be had from this Bureau.

Resulting from the formation of a Radio Club, there are now many more OY stations on the air and further additions are expected. A total of 12 OY stations are now active.

The 11th European DX Contest staged by the D.A.R.C. is scheduled to take place as follows: c.w. 0000 G.M.T. August 14 to 2400 G.M.T. August 15. Phone 0000Z 11 September to 2400 Z 12 September. Full details of scoring, log preparation and awards may be had from this Bureau.

Divisional QSL Managers should note the following changes in the A.R.R.L. Bureau effective immediately:—

W4—F.A.R.C., P.O. Box 13, Chattanooga, Ten., 37401.

W7—Willamette Valley DX Club, P.O. Box 555, Portland, Ore., 97207.

The A.R.S.I. (India) and the R.S.C. (Ceylon) invite all Amateurs to take part in their jointly promoted DX Contest scheduled to take place as follows: c.w. 0600Z October 23 to 0600Z October 24; Phone 0600Z October 30 to 0600Z October 31. The object is to work as many VU2 and 4S7 stations as possible. The contest is also open to s.w.l.'s Full details of scoring, logs, and awards from this Bureau.

Ivan Thomas, VE8WT (ex-VK0IT) won the A.R.R.L. Sweepstakes Contest for the Yukon and N.W.T. c.w. section. He is running a HT37 and linear to a 4 el. beam and using a Drake 2B. Ivan will fly to KH6 around mid-August to meet his Sydney bride. After a second honeymoon in KH6 both will return to Yellowknife where his wife will be engaged in her nursing profession. Later they expect to move to the VE7 region.

—Ray Jones, VK3RJ, Manager.

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## NEW SOUTH WALES

The meeting for the 27th of August will be given by Mr. Eric Tischler (from Ducon) and his subject will be on the latest trends and development in "Capacitors." On September 24th, Ted Whiting, VK2ACD, will discuss "Radio Links" and how they are used in point to point circuits. In October the subject will be "Magnetic Amplifiers" and the lecture given by Mr. Allan Morris (from D.C.A.), this will be on October 22. All these meetings will be held at the Wireless Institute Centre, 14 Atchison St., Crows Nest, and timed to start at 7.45 p.m. Interstate and overseas visitors are always welcome.

Once again it is round to the Remembrance Day Contest and this year it is VK2's turn to provide the opening address. This will be performed by the Director of Civil Defence in N.S.W., Major-General I. N. Dougherty. It will be broadcast in the opening ceremony of the Contest at or a little after 0745 G.M.T. on Saturday, the 14th, by all Divisional Broadcast stations. While on the subject of the R.D. may I suggest that all who take part, even if it is only to work the minimum number of stations, should remember to submit a log and help your State. (Refer to the N.S.W. notes in the v.h.f. section re the combination of the v.h.f. Group Contest and the National section.)

The Auction night, which was held in place of the June meeting, was well attended and "quite a bit of gear" changed hands. Frank Pearson, VK2ACQ, has been appointed councillor in charge of the country zone. Interest is being shown in VK2 to obtain "Call Letter" licence plates for cars in place of existing plates. If there is enough support shown a committee will be formed to approach the Transport Dept. If you would like to join this move, drop John VK2IQ a note via Wireless Institute Centre, Crows Nest.

The first sub-edition of the "Amateur Guide" Handbook is now out of print for the moment. Sub-edition number two is expected to be available late in August. This will be added to the existing book and bring it up to about 70 sheets. Further details later.

W.I.C.E.N. is being revived in this State and the Past President, Vic VK2VL, is now the State Co-ordinator. He is at work on

## SILENT KEY

It is with deep regret that we record the passing of:

VK2OF—J. W. Francis.
VK2QC—J. L. Carter.
VK2AHF—R. H. Jones.
VK5JE—E. J. Cawthron.
VK6DX—Bill Barber.

plans at the moment and will report back to Council in the near future. It is expected that some use may be made of v.h.f. as well as h.f. to produce a workable system.—2ZTM.

**CENTRAL COAST AMATEUR RADIO CLUB**

The June 18 meeting of the Radio Club had 38 people present with Leon Brett and J. Daller becoming new members. There were also two visitors from Newcastle. The programme began with a short movie, in colour and with sound, on the construction and operation of the U.S. Mariner II. satellite which was designed to travel near Venus in order to collect information. This satellite travelled 180 million miles and then went into an everlasting orbit. Altogether it sent back 75 million bits of information which helped in the design of a manned vehicle.

N.A.S.A.—National Aeronautical Space Administation—has centres in many countries and 40,000 people engaged in the work. Computers play a very important part in the operations at these centres. Apart from the United States of America there are centres in Bermuda, Spanish Archipelago off the African coast, Muchet near Perth, Woomera, Tidbinbilla near Canberra, Canton, Hawaii, Guaymas, Mexico, and when required ships are placed in the Atlantic and Indian Oceans.

The highlight of the evening was the movie on John Glenn's epic flight through space in "Friendship 7" which took place on February 20, 1962. The build-up of tension was communicated to us forcibly during the count-down as John Glenn's heart beat was on the sound track and when lift-off came I think each individual heart beat a little faster. At the time of this flight it seemed a magnificent feat but because of the numerous flights since, people have become a little blase about space travel. However, this film puts it back in its perspective. Imagine, if you can, travelling four miles for each time your heart beats. That is the speed at which Glenn travelled—going around the world in 88 minutes for each orbit and having four sunsets in the one day. He travelled 81,000 miles through three days and three nights, in four hours and 56 minutes.

Glenn had trouble during his re-entry into the earth's atmosphere as the heat shield of his craft was loose and there was the possibility of his burning up in 3000 degrees of re-entry heat. It was a very worrying time and during this period the reflection of the flame was quite visible on Glenn's face. However, he was very calm and gave reports of what was happening but I'm sure he was a very happy man when he landed in the water 700 miles off the coast of Florida. He had to slow down to 1300 miles per hour from 17,500 miles per hour in two minutes and during this time he was eight times his normal weight.

There was a travelogue quality about the film as the various space centres were photographed in their natural settings which enhanced the feeling of world participation and interest. The Glenn film was a fascinating quick look at the years of work, worry and elation involved in sending "Friendship 7" aloft and well worth seeing again if the opportunity comes.

On Sunday, June 13, the Radio Club held a very successful Barbecue at the QTH of Phil Levenspiel, VK2TX. This is a hilltop location and the view over Wyong and Tuggerah Lakes to the Ocean is marvellous. It was a perfect sunny day and the 53 people who attended all agreed it was really good—so much so that requests were made for a repeat performance later in the year. Lunch consisted of large hamburgers and hot dogs with all the trimmings plus plenty of cakes, cookies, etc. Mona, VK2AXS, was the chef and Rene Levenspiel the dispenser of trimmings and teas. The charge was 5/- per adult and this allowed for many seconds and thirds. In the afternoon there were two transmitter hunts—one on two mx and one 40—both of which were won by Garry Tippett. We will have to make them more difficult next time. Geof. Warner, VK2CK, and his XYL from Brinjelly came along and also Tom O'Donnel, VK2OD, with his XYL and harmonics from Sydney.

Our meetings are held on the third Friday of each month and anyone visiting the area at that time is invited to come along to the School of Arts, Mann Street, Gosford, at 7.30 p.m.—Mona, VK2AXS.

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# VICTORIA

VK3 Council met on 25th June, all members being present. There was not as much business as usual, in fact, the meeting closed at 10.30 p.m. Matters considered included S.w.l. Group rules, R.S.G.B. publications, membership lists, unfinancial members, W.I.C.E.N., S.w.l. Broadcast notes and net frequencies.

The S.w.l. Group rules as submitted did not meet with Council's approval, and have been returned with suggested modifications to bring them into line with our constitution. R.S.G.B. publications will be available from the Division. This decision was reached only after long deliberation, and a close vote. A surprising number of members have not paid their subs. These people will be excluded from the mailing list, hence no "A.R." or disposals. The Broadcast Committee was instructed not to accept any notes from the S.w.l. Group for Sunday broadcasts after 8 p.m. Saturday. This action is necessary to allow the announcer responsible for the broadcast to do any editing considered desirable.

The W.I.C.E.N. Co-ordinators outlined matters they proposed to discuss at the meeting scheduled for the following Wednesday, and obtained Council's approval.

## OBITUARY

**JACK W. FRANCIS, VK2OF**

On Sunday morning, 27th June, another well-konwn Amateur, Jack Francis, VK2OF, of Molong, passed away.

**JESSE L. CARTER, VK2QC**

Jesse Carter, VK2QC, of Belfields (Sydney) died on the 14th June. Jesse had been the Divisional Librarian up to this year.

**R. H. JONES, VK2AHF**

On the 1st July we learnt that Bob Jones, VK2AHF, of Edensor Park (Canley Vale), passed away. Bob was one of the old timers and had been an active operator on 10 metres in the early '30's.

The sympathy of all members of the VK2 Division is extended to the bereaved families.

**EDWARD JOSEPH (TED) CAWTHRON, VK5JE—ex-VK5JC—ex-VK2JC**

The VK5 Division reports with sincere regret the passing on Friday, June 11, of Ted Cawthron, VK5JE, after a long illness.

Ted came to VK5 from VK2 in the early days of talking pictures as Raycophone sound technician, a position he vacated some years later to join the P.M.G. as radio technician, later transfering back to VK2 in the same capacity, from whence he enlisted in the Army at the commencement of World War II. Moving to Darwin he became a prisoner of war in Timor, Java, Changi, and spent 2½ years on the Burma-Thailand railway, where with his specialised Radio Amateur experience he co-operated with Colonel Dunlop and Major Swanton (the present well-known test cricketer commentator for the London "Daily Telegraph") in connection with secret radios, being Mentioned in Despatches for his work.

Returning to VK2 at the end of the war, he returned to VK5 some year or so later, still with the P.M.G., and spent some time at Woomera in connection with the broadcasting station there. He was at the Trainee Instruction School for the P.M.G. at the time of his illness. Amateur Radio in VK5 is the poorer for his passing, and the Division extends to his sorrowing wife Alice, daughter Patti and son Edward its deepest and sincere sympathy in their sad loss.

**BILL BARBER, VK6DX**

It is with deep regret we advise the passing of VK6DX, Bill Barber. Bill was associated with 5PI until it was taken over by 5AD.

Just after the depression Bill came to Kalgoorlie, set up in business on electrical and radio work, and for the past few years has had it looked after by his son Bill.

VK6DX was a household call in the early days and only this last couple of years he has had to take it easy. He had been in and out of hospital on several occasions. Only 3 weeks ago his wife Sis passed on and that no doubt had some bearing on his stay in hospital ending in his death on June 30.

Our sympathy goes to his son and daughters.

A likeable type indeed—So long Bill.

The W.I.C.E.N. meeting was held on 30th June to outline the exercise planned for 3rd and 4th September. This is to be a major effort needing about 80 participants. The area of operation will cover a large part of Victoria. For the purpose of the exercise, headquarters will be established in Bendigo. Relay stations will be wanted around Bendigo to maintain contact with mobiles. The problems to be faced were outlined, and suggestions invited on methods to be used to solve them. Although some ideas were submitted, not all problems were covered. It is hoped those 40 odd who were present will think the matter over for the next few weeks and contact 3OR, 3AFQ or 3ZEL. Volunteers for some jobs will be on the you, you and you system, others have the chance to nominate which job they consider they can manage best, with no guarantee they will get the job they select. So briefly, that is the position. Get your name in early and help make this exercise a roaring success.

Before going any further I must correct an oversight of last month. Somehow our worthy Secretary was omitted from the list of office-bearers. So to set the record straight:

Hon. Secretary: Ken Seddon, VK3ACS.

(How's that, Joan, am I back in favour?)

**July General Meeting** was held on 7th June to a capacity audience. Syd. 3ASC brought along some new National equipment for the boys to drool over. Using block diagrams he outlined the various stages of the NCX5. He really took the wind out of our sails when he tabulated the taxes, etc., paid on imported equipment. How much more s.s.b. equipment would be in the hands of the boys if the taxes, etc., were removed is anybody's guess, but with the price almost halved it would be a vary attractive proposition.

Next month (August) we are to have a White Elephant Night and at the September meeting we are to have a demonstration and lecture on Lasers by Mr. K. Gibbs, of Defence Standards Laboratories.

**PIRATES CAUGHT**

The Melbourne "Herald" of 7th July reported that twin brothers, aged 26, had been fined £5 and their "ham" equipment valued between £250 and £300 confiscated. Evidence revealed the equipment was an Army 122 Set, illegally used to talk to a girl in Brighton.

In view of the fact that 122 Sets are worth only about £12 to £15 cash and the maximum penalty for this type of offence is a fine of £200, we feel they got off with a very light penalty.

We consider it unfortunate that the report by the Herald referred to "ham" equipment, as it gives the general public the wrong impression, thus negating much of the work done to raise the Amateur's status in the community.

We also consider that the sale of transmitting equipment to anybody not holding a licence, should be an offence under P.M.G. regulations, in short, any steps taken to stamp out illegal operation would be worthwhile.

**WESTERN ZONE**

Unfortunately the conditions will not favour VK5 on 80 metres but still the zone hook-ups struggle on, with good signals from the more distant stations 3AKW and 3EF. Herb 3NN is apparently operating but is unable to be heard on the Coorong—better yell at bit louder Herb!

Colin 5ZEV has migrated north, to avoid the cold, and eagerly expects the call 9EV. Hope to hear you on 20 mx soon, Colin. Tony 5ZAI had quite a bit of fun recently with his satellite tracking station bringing Amateur Radio to the foreground of a local newspaper. Fine business Tony and a good advertisement for our hobby.

The Keith area school has had to recess its Radio Club this year. The problems of staff shortages have proved too much with the addition of regular teaching and bus driving for the club's tutor. However, interest is still booming and a group will visit the Annual Zone Convention as usual.

Barry 5YB has had to QRT due to alterations of board on the school bus terminus. It is expected that another shift at the beginning of August will allow the "motor-driven 12 volt 100 watt" rig to burble forth once again. Apologies to all the Adelaide boys who objected to the sub-standard audio emissions whilst portable with this rig at Mitcham. Remember, we are normally 30 miles from the nearest a.c. and that is a 132 k.v.a. supply—I wonder how the "townies" would be without their 240?

It is hoped that some v.h.f. portable conventions can be organised from Keith and environs during the spring. Contacts will be sought on 2 and 6 mx. Hope to hear 3NN, 3ZEA, 3ZOS and a host of other Western Zone members on these occasions.

How did the visit to the big telescope at Parkes go? It appears that we were represented by Trev, 3ATR and Ray 3ATN who had an "open day" at that site. No doubt that Bill 3AKW is "settled in," having returned to work following his long service leave.

I'll have to hand it to PanSy once again—he beats us all. Looking forward to seeing you all at the Convention. 73, Barry 5 Yogi Bear.

**MOORABBIN AND DISTRICT RADIO CLUB**

The June general meeting was held on Friday, 18th June, at the usual time of 8 p.m. After a bit of a chin-wag, the meeting proceeded and business speedily dealt with, as all present were looking forward to a talk by Fred 3ARK on the finer points of how an aircraft becomes airborne and why. Fred was able to make the talk easily understood by producing a slide projector and some very interesting slides. After explaining the finer points of basic flight, Fred concluded with generalities of flying and from the number of questions all present thoroughly enjoyed the talk. I believe Fred is seriously considering becoming aeronautical mobile one day, so we all look forward to this rare bit of DX. Another member of the club is a flying type, Don 3AKN, down at Broadwater.

Our June practical night was taken up with putting the club transmitter on the air, much to the enjoyment of our junior members. The club at the moment is engaged on a fund-raising scheme, to purchase a projector. Newspaper collecting will be the main source of revenue together with any donations or otherwise to aid the funds. After this is procured, it is hoped to resume our film programmes which were usually held to conclude our general meetings.

National Field Day for 1966 was discussed at the May meeting. After a lot of discussion, it was agreed that again several teams would be fielded rather than the club as one team. It is expected that teams will be organised by Jack 3VT, Bob 3ZRD, Ron 3RN, Alf 3LC, with a few more under consideration. In anticipation of Field Day, Harold 3AFQ recently acquired an alternator, well, I mean pieces of an alternator. A team of volunteers, headed by Harold, ascended one quiet Sunday morning on to a house to pick up an alternator complete with motor. As it turned out, the alternator was in half a dozen pieces and the motor, well we lost count of all the parts. At least it was all in one massive box. A very enjoyable afternoon, the following week-end was then spent by Harold and Val 3OT trying to sort out the jig-saw puzzle, anyway, Harold, you still have about seven months before "F" Day.

Whilst still on Harold's segment, he would like me to mention our circulation list. Any member who was not listed correctly in our latest list of members, dated 15th June, 1965, is requested to either drop a line if any alterations are called for, or see Harold at our next meeting. Occasionally errors somehow or other manage to creep in, like the time Harold was referred to as the "Honourable Secretary."

Brief mention was made in our notes last month of members who intended to attend the VK5 South Eastern Zone Convention at Mt. Gambier. Lindsay 3ZNS, Ken 3ZNJ and Fred 3ARK made the grade, and from all reports, thoroughly enjoyed themselves.

Morton 3ANG opened up the other night, didn't know that I was taking notes for the purpose of this column, he spilt the beans. Tells me he is in the process of Channels A and B installation in his MR 10, and what is more has courageously mutilated the roof of his brand new car for a whip. You have now joined the ranks of the "few." Morton also told me he is active on 160 metres and has a 2 metre rig on the drawing board. Looks like this end of town will shortly become fairly active with club members on two.

Why even Hal 3ZOO is back in town, oh, I mean back on two. Must turn my rig on again to hear just who is on. Lindsay 3ZNJ is quietly working on his mobile rig, one of these days he is going to pop up and surprise us all. Whilst on the subject of Lindsay, yours truly was rudely awakened while engrossed watching the one-eyed monster the night prior to Lindsay's departure for VK5 for the convention, to lend a hand to install a two metre f.m. rig in his car. There on my front doorstep I saw it. A car, complete with a genuine quarter wave ground plane perched on the top of a pole mounted on the front bumper bar. After a few adjustments Lindsay parted on his way with the "thing" waving madly in the breeze. Must ask Lindsay one day if "it" made the distance, well at least it would be a good landmark. Noticed Lindsay was clean shaven last meeting, must have borrowed a razor.

David 3ZOP has a new QTH at Oaklelgh, with plenty of room, in more ways than one. Harold 3AFQ is sporting a new antenna on two f.m. A five half waves in phase, and it really works. A report was recently handed to me that Ken 3ACS has carpeted the floor of his shack. I am not too certain of the authenticity of this report, just does not seem correct. A carpeted floor, have to make a few more enquiries here, what are the ranks coming to, a bunch of softies. As it was, Ken had a polished wooden floor. Gee, some blokes I know haven't even got a floor. And another thing, my spies tell me that Ken is seriously thinking about purchasing a commercial sideband rig. Enough said.

Jim 3KE is still bulding his sunroom, and still has snails in his fish tanks. Keith 3AKB is at the time of writing enjoying an aeronautical holiday in VK4 chasing the sun. Another member who has migrated north is Alf 3LC, who is spending his annual leave in VK4. And yet another, Bob 3SK is also in VK4 enjoying the warm weather.

The club issued its first S.w.l. Award recently to L3229. S.w.l.'s interested in this Award can obtain information from club member Greg Earl, L3138, enclosing a stamped addressed envelope.

The August general meeting will be held the third Friday in August at the club room, any further information on this or club activities can be obtained from Harold 3AFQ. 73, Peter.

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## QUEENSLAND

The monthly meeting of the Council of the Queensland Division of the Wireless Institute of Australia was held in the Social Service Rooms, Berwick Street, Valley, on Friday night, July 1. Laurie VK4ZGL was in the chair, and there was a good attendance of Councillors. Al VK4LT is recovering from 'flu and was not present. Mr. Max Klinger and Mr. Jack Dearlove, of the Queensland Surf Life Savers' Club, came along to discuss communications for their big Easter Surf Carnival at Gold Coast, and Councillors were able to assist greatly with advice and recommendations, which solved all of their problems.

**W.I.C.E.N. REPORT**

A net frequency is to be established for the high frequency net and this will be decided later. All matters are proceeding along according to plan.

**JAMBOREE-ON-THE-AIR**

This will be held over the week-end 16th to 17th October, 1965. Since 1965 is International Co-operation Year, organised by the United Nations, the Boy Scouts World Bureau proposes to dedicate this 8th Jamboree-on-the-Air to international co-operation and to invite other youth organisations to participate.

**QUEENSLAND SUNSHINE STATE CONTEST**

This will be held on 10th-11th July. Full details are in QTC which is now in your hands.

**YOUTH RADIO CLUBS**

The Y.R.S. have an urgent need for earphones, both single and double, and also tuning condensers (one or two gang), so fellows, please dig into your junk box and see what you have, and pass on to any of your Councillors.

**CENTRAL QUEENSLAND AND WIDE BAY AND BURNETT BRANCHES**

The Central Queensland, Wide Bay and Burnett Branches held a successful Wireless Institute Convention at Tannum Sands on the long week-end, June 12-15 inclusive, in which 80 members and visitors took part. On Saturday equipment was set up and a Fox Hunt for a hidden transmitter was held.

During Sunday, Rockhampton Amateur, G. Fox, VK4FK, secured the most contacts in an "all-band scramble." He also contacted the most distant station and thus won two prizes for his effort.

V.h.f. enthusiasts conducted three more Fox Hunts and W. Sebbens VK4ZWS, a winner on Saturday, won another two and L. Dobbs VK4ZLO the other.

A tape recorded lecture was given by T. M. Nolan, VK4FN, on a transistorised transmitter.

Children took part in a penny hunt and of 100 buried in the sands all but 11 were found. It is suggested that the Convention be held in the same place next year so as to try and recover the pennies next year, as with the introduction of the decimal currency, pennies may again take on real value, hi.

A Barbeque on Saturday night was followed by a lecture on Receiver Design by Mr. Hazzell, followed by a film programme.

Another All-Band Scramble and V.h.f. Scramble was held on Monday. Prizes for which were won by J. McGrath and L. Dobbs respectively. J. Lyle VK4ZLD successfully judged the frequency of a tuned circuit on display. There was a splendid display of home brew equipment and prizes were won by the following: R. J. Hazzell (Rockhampton), 1; K. Chiperton, VK4ZKC, 2; W. Sebbens, Bundaberg, 3.

**IPSWICH AND DISTRICT AMATEUR CLUB**

This club is one of the most progressive Amateur Radio bodies in VK4. They have now acquired a piece of real estate on which they hope to erect a shack and install the Club's Amateur equipment. Besides the h.f. station they also have a six-metre base station, and operate on the net frequency of 53.032 megs. Many of their members operate mobile and have their converted taxi-phones working on this frequency.

The Club held a 150-mile round tour over the Queen's Birthday week-end. Round through Toowoomba and home, and all had a f.b. time.

They have just completed their third year of activities and have a big programme lined up for the next 12 months.—Reg. VK4UX.

**TOWNSVILLE AND DISTRICT**

There is no doubt about it, wonderful sunshine in sunny North Queensland. There was I showing my visitors the glorious view from the top of Castle Hill in the middle of the town. Beautiful Magnetic Island so close and in the distance is the Palm Island, when I spied a car sporting a whip wending its way up the hill. On leaving my vantage point I met the driver who turned out to be Bill VK5FR all the way from South Australia, he being in contact with Dave VK2BZ, both working mobile. So it was good to meet after being friends on the air for such a long time. Dave was in the preparation of leaving the car park to visit Magnetic Island. So took the opportunity of meeting him also as he stepped aboard. Bill was wending his way back home and Dave was on his way north. Believe there are others in the district but to date have not made contact with them. All you tourists don't forget to call or let us know your movements, we all would like to see you.

Ted 4EJ now sporting a fold over tower and busy getting the Quad back in action. Glad to report that Merv. 4ZMD has been allotted the call sign of 4DV and busy working the DX—6 new countries in 6 QSO's.

Glad to read in this morning's paper that we now have reciprocal licensing with the U.S.A.

Now wouldn't it be a fine gesture on our Government's part to allow us to work the boys in the armed forces overseas with third party traffic. It would be a great morale booster to them. Perhaps Federal Executive could look into this matter.

Congratulations and best wishes to Bob 4MF on his recent marriage. Maybe now will be able to get some spare time to get on the bands 'once again.—73, Bob 4RW.

# SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division for June was held in the spacious and commodious clubrooms to a capacity audience, another public phone booth-filling record if ever there was one (see VK3 monthly notes for June—paragraph 4) and took the form of a jumble sale, a popular form of entertainment in VK5.

The genial chairman, Ross 5KF, opened the meeting right on time and suggested that the minutes of the last meeting be taken as read, a suggestion that met with enthusiastic approval from all present, and after Federal correspondence was read to the meeting, everybody settled back for the piece de resistong, to wit, the jumble sale.

However, such was not to be. Chief trouble maker for the Division (Council's name for him, not mine) rose to his feet and brought up a matter of contention, purely to get it into the minutes for discussion later, to be rapidly followed by Dave 5DS and Vern 5VB who asked some pertinent questions on matters appertaining to the Journal questionnaire and the possible raising of the subscriptions, both appearing to be satisfied with the replies, although methinks that the matters will not rest entirely at that. No reference is made as to whether Chief trouble maker was satisfied with his reply, and again methinks the matter raised will not rest entirely at that.

At long last the proceedings, compered by Brian 5CA commenced, and assisted by Phil 5NN a determined attempt was made to extract the shekels from the members' pockets, and if I may add in closing, with extremely satisfactory results.

Jumble sales, as I have commented before, do not lend themselves to any degree of "padding," expert though I am reported to be, and I reluctantly am forced to conclude the report of the meeting by saying that a good time was had by all, and when I say that the meeting ran twenty minutes over time, I feel that justice has been done.

I left before the caretaker arrived with his Alsatian, but from enquiries made later I am given to understand that no more than a couple of growls from the Alsatian were necessary to close the unofficial meeting, and with the chilly conditions existing outside the clubrooms, no time was lost by the members in retiring to their couches of virtue, there to sleep the sleep of the just, or what passes for the sleep of the just among Radio Amateurs.

Bert 9M2AF was among the visitors and tells me that he has returned to VK for good now and expects to take out a VK5 call in the near future. Welcome, O.M.—you have picked out the best Division without any doubt. Cheers and jeers from the Wise Men from the East.

Another visitor, quite unexpected, was Jack 5JD home for five months' leave after tripping all over the world as radio op. on various vessels. His greeting to me was typical: "How about you and I having one of our old-time box-ons." To think that such wickedness could be! Me box-on? Just because Council calls me names, everybody thinks I am looking for a fight. P for Pansy—P for Peace—What more can I say?

Could not help but notice that Phil 5NN during his sojourn at the auctioneering table, managed to get one back on me. He was offering a portable aerial for disposal at the time, and looking straight at me he said, "All it wants is a couple of guys to hold it up." "Any old guy will do." Just what did he mean?

Talking of Phil 5NN and who wants to talk of him? Anyway, I have it on the best of authority that he will be writing the S.S.B. notes for the magazine in the future. I have said it before, and I will say it again, Pincott 3AFJ will stop at nothing to thwart me, and this is only another of his schemes to make it awkward for me. I should complain to the new VK3 President, whoever he may be—but I won't.

Noticed an old pair of headphones with thick rubber ear cushions on them go up for sale at the meeting. One of the audience said audibly, "What could one do with them?" A wit in the back row said, "They would be good to wear in bed on pay night when the XYL started to quiz on what happened to the pay packet that day!!"

Vern 5VB, the Admiral to you, spent a very pleasant fortnight or so at the QTH of his son-in-law Brian 5BI at Cowell recently, and the fish were biting well—if he can be taken as an authority. He told me of the sad, sad incident when his XYL was helping him to launch the boat down the ramp, and everything slightly slipped a foot or so and the XYL finished flat on her back in 18 inches of water. The tears were running out of his eyes as he told me. Poor fellow, he was terribly upset. I thought he would have a fit in series parallel before he finished telling me. True as true.

Brian 5BI has in the past achieved some notoriety in these notes because of the antics of his pet kitten. Rumour has it that his 18-months-old harmonic has decided to get in the act and was discovered the other night, mainly by the noise kicked up by the kitten, pinching the fish heads and bones from the kitten who had just put his serviette on for the evening meal. They bring them up tough at Cowell.

Dave 5DS, my favourite Scotsman, just returned from a seven or was it nine weeks' vacation to Perth. Thoroughly enjoyed himself, and whilst there called on Len 6LG who sends his 73 to all of his friends in VK5. It is not generally known, but Len is a VK5 member, and a very staunch supporter, too. He sent his usual congratulatory message to the writer of these notes—on asbestos—for which I thank you Len, keep up the good work, O.M.

Met Ivor 5IT the other day, and he does not look a day older. Probably not very well known to the present membership, but is well remembered by those who attended the early meetings of the Division just after the end of World War II. I think I can say, without fear of contradiction, that he did as much or more, than most of his contemporaries of those times, to put the VK5 Division on the map, and right from scratch at that, no finance, no meeting rooms, and even no membership, and his period of Presidency was an arduous task which he carried out with an efficiency for which he has always been noted. I broke into Council under his chairmanship, and I could not have served my apprenticeship under better training. Nice to meet you again O.M.

Charlie 5ON is now the proud owner of a Galaxy III, a present from his XYL, and is as proud as a canary who can hit high C. I tactfully mentioned the matter to my XYL, but the only result that I got was the presentation of a tea towel and instructions as to how to wipe two plates as one. Woe is me.

Jack 5LR is at the moment of writing making a welcome return back to the air after an absence of four years or so. He is in the throes of getting his s.s.b. rig to s.s.b., but the rig is proving a little coy on the subject. One minute he is one of Comp's mob, the next he is one of my mob, and until the rig makes up its mind just to whom it will pay homage and allegiance, life is a little teejus.

Lloyd 5OK was another welcome member of the audience at the meeting, some time since he was last seen at a meeting, but is still quite active on the air, mostly mobileering, and very happy with his results to date.

My one-time sparring partner from the land of momentous decisions (Ken 1KM) who incidentally has been treating me with studied ignore, will be pleased to know that the VK5 Division has appointed Bruce 5OR, John 5UL and Wally 5ZEH to form a committee which will be responsible for the administration of the W.I.A. Youth Radio Scheme in VK5. Now steady Ken, bear up O.M., you must learn to accept exciting news, no matter from whence or where!

I note with interest in reading the v.h.f. notes in the VK5 Journal by the "Voice of the Hills (5ZEJ)," oh, yes, I read them with interest, and also in the hope that he might one day make a mistake which might have possibilities of libel, anyway I note with interest that Wally 6ZAA and Jim 3ZDW have been visiting our fair city. Jim was on his honeymoon, and if I might be permitted to say so, his bride was a charming young lady. What's that?—when did I meet them—well, to be quite true, I didn't, but aren't all brides charming young ladies? Never miss a trick Parsons they call me!

Uncle Tom 5TL by the time these notes are being read, assuming that they are ever read, will have in his cabin, not by the river, supplies of the R.D. log sheets, and if you cannot contact him personally, send him a large addressed and stamped envelope, and without doubt he will be overjoyed to forward your requirements. Be sure to put the stamp on the envelope, Tom never goes near a Post Office, he is allergic to them!

The new Associate members' representative is Ron Hinks, who can be contacted at the meetings or at 12 Penang Avenue, Colonel Light Gardens, so trot our your queries or problems and he will needle Council on your behalf. Poor fellow, they will soon be calling him some nasty names, they do me!

Also noticed in the Journal that Bruce 5MC is moving his QTH. Don't know just whether he is moving away from Port Pirie, or just moving to another part of the town. Possibly the budding authoress will enlighten me one day.

Talking of new QTH's, I have a new address. I now am to be found at 144 Fullarton Road, Rose Park. Don't let it throw you. The baronial mansion (Gordon 3XU please note) is still on the same block of land, only the street name has been changed to protect the innocent.

I see from the Federal comment that it is intended to hold next year's Convention in Brisbane. Remind me to ask Geoff. 5TY, our genial Federal Councillor, the t.v. type, if he will be so kind as to bring me back a bunch of bananas on his return from the Convention. Possibly by then VK4 will have discovered a method of growing them straight. Possibly!

Nobby 5WK has recently left his place of employment and is now on the staff of the Best Broadcasting station in VK. He seemed a little terse when I asked him how he justified his loyalty to s.s.b. by working at an a.m. broadcast station. Strangely enough he was out in one of the mobile cars soon after he started, and believe it or not, the final tube of the transmitter in the car gave up the ghost. When I suggested over the base microphone that it was probably a little s.s.b. sabotage, he was stuttering with rage when I changed over. They don't fool me, I know the tactics of these s.s.b. jokers. Comps 5EF please note. Or should I say Comps (pro 5PS). You Beaut!

Talking of Pro 5PS—and who, I repeat, who would want to talk of Pro 5PS—I think the time is opportune to thank the three people who acted as Pro 5PS during my annual vacation. Phil 5NN and Geoff. 5TY in the weekly notes in the "Advertiser," and Comps 5EF who so nobly carried the war into my camp for two issues of the magazine. As warned by me, Comps' propaganda for s.s.b. had to be read to be believed, in fact it will take all of the next ten issues of "A.R." for me to make up the lost ground, and as for the two reporters for the ""Tiser," they outdid my humble efforts to such an extent that the subs' room at the paper suggested that they should continue with their efforts. Anyway, many thanks O.M.'s, although I often wonder if it is worth it to take annual leave with all the ground I have to pick up!

Incidentally, Doug 2DQ relayed a message to me via Ron 5KS—I think it was Ron—to the effect that the notes in the mag. had never been written better than in the June issue. No doubt about it, these s.s.b. jokers stick together. Anyway Doug. thanks for the flattery. I will do the same for you one day!

One of my best spies tells me that Tom 5TL, Uncle Tom to you, came home from work the other Saturday to find that his cabin was surrounded by water, and was forced to turn plumber on the spot. Understand his efforts in that direction were quite a success, things coming back to normal in the kitchen that afternoon, although his XYL still finds it difficult to accustom herself to flames coming out of the tap in the sink, and water bubbling up through the gas jets. Do it yourself Tom, they call him.

Harold 5ZAB of Renmark, bewailing the lack of Amateur Radio activity in the river towns. Apart from Hughie 5BC and Harold, the activity is at an all-time low. There was a Z call listed at Waikerie, and 5LE at Galga, but aside from this nil. Harold, by the way, has acquired a b.c. ticket recently.

George 5CV has gone holidaying, rumour has it to Benalla, but then you know George. There will be lots of silence around Henley Beach in his absence.

Jim 5JK has been on the sick list again with shingles. I told him that he was neither fish nor fowl, neither s.s.b. or a.m., but s.s.s. He nearly had a return of the shingles when I told him s.s.s. stood for Shingle Short Sullivan!

Had quite a surprise the other night. Ear wigging on 7 Mc. I heard Athol 5LQ confess to being a grandfather of some two or so years' old. Tricked me, I would have expected him to be the proud father of his first, he looks young enough. Must have lived a blameless life.

This new system of submitting the notes with an inch all round has me tricked, I can't tell when to stop, and I would hate to be accused of talking for talking's sake! Anyway I sure will know all about it when the issue of the mag. arrives!

Everybody was surprised and shocked to hear of the passing of Ted 5JE, although it was well known that he was far from well. I have not seen much of Ted these past 20 years or so, but prior to that when he was the sound technician for Raycophone and I was a projectionist at one of the city theatres, we were the best of friends. I well remember one night Ted came to visit us at Henley Beach, and after the evening meal we discussed a transmitter that I was thinking of building in the next year or so. Ted asked to see the junk box, and before I knew where I was, he had the soldering iron flat out, and with suitable substitution of parts, had built the darn thing by four o'clock in the morning, despite the sour looks every hour or so from my XYL. This incident symbolises Ted's atti-

tude towards Amateur Radio, and even professional radio for that matter, and his fanatical interest at times in his favourite band of 40 metres, was the main thing that kept him going towards his goal of DXCC Award for 40 metre c.w., a certificate that he was so very proud of. Ted has gone, but his enthusiasm for his beloved Amateur Radio will live on, although his type of Amateur are becoming rare these days —more's the pity.

Well, I can't finish the notes on such a sombre tone as that, so will have to tell you that in view of my well-known shyness and modesty, it is not generally known that I am very interested in the arts, music and poetry. So much so that in my wanderings through the country towns on my vacations, I am often to be found in familiar places admiring the poetic efforts of the local inhabitants written on the walls and other strange places. Most of what I read leaves me cold, but recently I came upon a beauty, written by a philosopher somewhat like myself, and I take the liberty of quoting for your benefit:

He who loafs and fools about
Will surely be sacked when he's found out
But he who works and does his best.
Will get the sack with all the rest! ! !

73, de VK5PS (PanSy to you).

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## WESTERN AUSTRALIA

Before I go any further, don't forget the R.D. Contest. Tune up the rx's and tx, become enthusiastic and get cracking, be in readiness. Remember, what the day is for, that is, to commemorate the memory of those Hams who paid the supreme sacrifice in world conflict.

Noted a brand new call sign, 6XY, and a very nice signal too. Congratulations Aub., and welcome to the Amateur bands. Aub. has already achieved some f.b. reports from his tx and Joy Stick antenna, on at least three bands, also note that 6XY is armed with 6 metre equipment, so before long there will be much activity—between Wickepin and Narrogin. Speaking of Narrogin brings to mind that we have not as yet heard Karl 6XW on the breeze yet. I do hear that 5DN is now in the city of Kalgoorlie and very soon to have a VK6 call. Welcome to the Sunshine State, in spite of rain dominating at present.

Well chaps, I do hope these notes on reading are not really hard to follow, well, at least, not as hard as they are to write.

On or about the 1st July I heard a s.s.b. station calling 6KN, and it was quite a surprise to hear Noel 6MF after a long spell. Now back on the air running a very solid signal from Geraldton, another s.s.b.

Activity on 15 metres does seem to be on the up and up, quite often I hear VK's and occasional JA's. Noted JA stations have been very solid over the past mnnth in 80 metre band about 3550 Kc.

Some time ago Wally 6AG built a new shack which was to be lined with fly-wire, it seems that the r.f. is unable to get out Wally, as we don't hear you any more on 80.

What has happened to all the old-time gang, 6CL, 6CW, 6PH, 6TK and others? Surely, conditions on 80 and 40 are not all that bad? The rag-chewing is not what it used to be, along with heaps of humour; although one can still find Bob 6RG, Les 6WL doing their bit on 80, also running exclusive sideband; I should talk, after being absent for about four months, although I have been occasionally listening.

One thing we can depend on each Sunday, and that is the W.I.A. news service via Bob 6BE, being able to get out on 40, 80 and 6 metres, followed by 6GH George (6WI) portable with his technical discussions which are always very interesting, and I feel sure many of the listeners gain a great deal of knowledge.

Today, we at this QTH had the company of two very close friends of ours, Graeme 6GR and XYL Joy, the two newly-weds, they are returning to Perth after a stay in the country area. We all hope that you will both be very happy, Graeme and Joy, but don't forget "DX before dishes."

Bill 6WY has produced a rather minute s.s.b. rig which I think could be a very unique mobile unit. It is certainly quite effective when on the air. Congrats. Bill.

Well folk, that's about the sum total for now, so until next issue, 73, 6KN.

### VK6WS — 91st BIRTHDAY

**18th July, 1965**

It is with pleasure all VK stations and VK6 in particular send greetings to Skipper on reaching his 91st birthday.

His title "Skipper" was instituted when he had a launch on the river and had pleasure in filling it up with other Amateurs. He fitted it up with a transmitter and worked other West Australian stations.

Skipper Schofield obtained his licence thirty years ago and was active on 80, 40 and 20. A few years ago Skipper lost his eyesight and even after that he returned to active radio work, but gave it up only a year or so ago.

He was president of both the Wireless Institute (W.A. Division) and also the old Subiaco Radio Society. He is a life member of both, also a life member and until lately a Vice-Patron of the Royal Freshwater Bay Yacht Club.

Skipper has been a Justice of the Peace for over thirty-six years.

— . . . —

## TASMANIA

The VK7 Division is joining battle in the R.D. Contest this year to win. Your support and duly submitted log is the only means by which the R.D. trophy can return to Tasmania, so, quite obviously, each of us has the responsibility in this matter. Best of luck, chaps.

Geoff. VK7ZAS has been on the mainland for three weeks, mostly in Sydney, enjoying a well-earned holiday, and at the same time seeing his son Ian graduate out of his course in the Navy. Hence, I inflict myself on the unsuspecting public in Geoff.'s stead. Ted VK7EB is on long service leave, and spent three weeks in VK3 during July.

Hobart has had several visitors of late, Winston VK7ZWN, Bruce VK7ZBL and Beaven VK7BW, as well as Les VK3AAO. Les spent a couple of weeks in VK7 in July as the guest of Harry VK7BR and his XYL. The winter DX season on the six metre band was most disappointing this year. I have heard only of one opening, and that was to VK5. On the credit side of 6 mx activity, the Hobart boys are delighted that they can work through to Mike VK7ZMW now on the air in Huonville. Another Mike, VK7ZMK is journeying north for a sojourn of six months as from the beginning of July, at the direction of his employer but we welcome back to Hobart David VK7ZAY, returned also from Mount Barrow to Hobart at the direction of his employer.

S.s.b. is always in the news these days. I hear that three further stations are tooling up for conversion to duck talk, namely, Bob VK7OM, Jack VK7JB? and Keith VK7RX. It is quite apparent that a.m. will soon carry the significance of Ancient Modulation, as predicted by the first s.s.b. operator in VK7, namely VK7LE. 73, Ian VK7ZZ.

### NORTHERN ZONE

I am not very well up on happenings this month due to the fact that I was out of circulation for a while in hospital. However, this is part of what has happened.

An invitation was issued to members of the Zone to attend a lecture concerning electronics in seismology. Although the number of members who attended was disappointing, those who did make it found this a first-class lecture, delivered by a most able lecturer.

A new station appeared on the v.h.f. bands this month, Frank 7ZFR. Not unexpected, at about the same time our W.I.C.E.N. Co-ordinator, Harry 7BR, temporarily forsook 80 mx and came up on 2. This helped the northern activity quite a bit and it seems to have reached an all-time high for a non-DX season with the re-appearance of Ted 7BB.

As well as this there are reported to be others around town who are building rigs for this band, so it looks like the north is in for some real 2 mx activity.

A mid-winter opening occurred on 6 mx. This year the only station to work any of the DX was 7ZMH, who worked a VK4. 73, 7ZLP.



## HAMADS

**Minimum 5/-, for thirty words.**
**Extra words, 2d. each.**

Advertisements under this heading will be accepted only from Amateurs and S.w.l's. The Publishers reserve the right to reject any advertising which, in their opinion, is of a commercial nature. **Copy** must be received at **P.O. Box 36, East Melbourne, C.2, Vic.,** by **8th of the month and remittance should accompany** the advertisement.

**FOR SALE:** Four Command Transmitters, in good order. Price, particulars, A. S. Woolnough, VK3BW, Portarlington, Vic.

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**FOR SALE:** "Topaz" 12 v. Power Supply, £35. Set of 4DA whip antennas, £15. VK4MF, R. Britton, 5 Gordon St., Garbutt, Townsville, Qld.

**FOR SALE:** Tower, counter-balanced, fold-down, rotatable, free standing (guys not needed). Used for 6 mx Quad and similar. Located at Nunawading, £10. VK3GF. Phone Croydon 3-3596 (Vic.).

**SELL:** AR7 Communication Revr.. A1 order and complete except two l.f. coil boxes. £27/10/- or offer. Also 500, 400, 100 and 1000 Kc. xtals, new, ½" spacing, £2/5/- each. VK4SS, 35 Whynot St., West End, Brisbane, Qld.; Phone 4-6526.

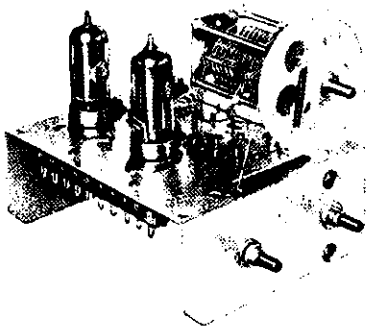
**SELL:** 230 volt, rack mount power supply. Fully fused and metered, h.t., l.t., bias, built for Collins S line, suit most s.s.b. transmitters, £25. Shure 401A mobile microphone, new, £6. VK3AHT, 314-6760 (Vic.), weekends only.

**WANTED:** Buy or Borrow: Operating Manual or circuit diagram of No. 109 and No. 38 Transceivers; will pay postage, etc. I. Ralph, 5 Colwell St., Kingsgrove, Sydney (50-7351).

**WANTED:** C.D.R. rotator and control, new or used. VK3ZNY, Mr. P. M. Crane, 8 Separation St., Mornington, Vic.

**WANTED:** Prop. Motor. Price to VK5GD, G. C. Ramsay, 8 Selby Street, Kurralta Park, South Australia.

# GELOSO V.F.O.



**Model 4/104 V.f.o. Unit.** Tunes 80, 40, 20, 15, 11 and 10 Metres. Uses 6CL6 and 5763 Valves. **Price** (Valves Extra) **£10/18/6** plus 12½% S.T.

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**"BECON"** Chrome Vanadium quality Radio Mechanics' Tool Kits. Comprise assorted screwdrivers, rasp, file, probe, pliers, small wrench, steel rule, etc.

**Price: £3/5/-**

**NEON TESTERS**, 240V. A.C. 6/6

**NEON TESTERS**, 500V. A.C. D.C. Car ignition, X-ray, T.V. sets, etc. 8/6

**"ADEL"** Nibbling Tool, cuts holes in sheetmetal to any size, any shape **£3/15/-**

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**LEADER LDM-810** Grid-Dip oscillators range 2 to 250 Mcs. using 6CW4 Nuvistor with internal 1 Kc. modulation. Meter 0-500 D.C. microammeter. Operates from 110-250 volt A.C. 50 cycle mains. Can also be used as absorption wavemeter, AM monitor, neutralising RF stages and checking receiver calibrations, etc.

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Price: £22/7/6 (inc. S. Tax).

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| 2-08 | ⅝" | 8 | 3" | No. 3006 | 6/3 |
| 2-16 | ⅝" | 16 | 3" | No. 3007 | 6/3 |
| 3-08 | ¾" | 8 | 3" | No. 3010 | 7/4 |
| 3-16 | ¾" | 16 | 3" | No. 3011 | 7/4 |
| 4-08 | 1" | 8 | 3" | No. 3014 | 8/5 |
| 4-16 | 1" | 16 | 3" | No. 3015 | 8/5 |
| 5-08 | 1¼" | 8 | 4" | No. 3018 | 10/6 |
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| 8-10 | 2" | 10 | 4" | No.3907 | 13/9 |

**SPECIAL ANTENNA ALL-BAND TUNER INDUCTANCE**

(equiv. B. & W. No. 3907-7")

7" length, 2" diam., 10 t.p.i., **24/6**

References: A.R.R.L. Handbook, 1961; "QST," March 1959; "Amateur Radio," Dec. 1959

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PENETROX "A"

**Price: 10/- per tube**

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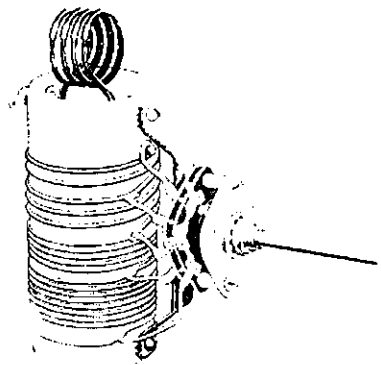

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For use up to 600 watts p.e.p. Match plate loads of 2,000 to 3,500 ohms (Z) and higher into coaxial cable. Operating Q increases on higher frequencies to increase harmonic suppression enabling practical values of tuning capacity to be used on 10 and 15 metres and allowing for wiring inductance (L). Incorporates extra switch section for shunting additional capacity (C) if required, or switching other circuits. Switch rated for 10 amps. at 2,000 volts with contact resistance (R) of 0.8 milli-ohms.

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To suit above Pi-Coupler. No resonances within Amateur bands if spaced diameter or more from metal panels. Stands 6 inches high on 1 inch diam. ceramic former. Base mounting bracket included.

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# AMATEUR RADIO

Vol. 33, No. 9

SEPTEMBER
1965

2/6

Registered at G.P.O., Melbourne, for transmission by post as a periodical

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| 1800 ft. on 5 in. reel (Tensilised Mylar) | 52/6 |
| 1200 ft. on 5¾ in. reel (Mylar Base) | 35/- |
| 1800 ft. on 5¾ in. reel (Tensilised Mylar) | 52/6 |
| 1200 ft. on 7 in. reel (Mylar Base) | 30/- |
| 1200 ft. on 7 in. reel (Acetate Base) | 25/- |
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## COAXIAL CABLES

UR67 50 ohm ⅜ in. diam. coaxial cable, 1/6 yd. or 25/- per 25 yds. roll. 10/- postage.

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**All above cables are in as new condition.**

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**SPECIFICATIONS:**

Standing Wave Ratio: 1:1 to 1:10.
Accuracies: plus or minus 3% scale length.
Impedance: 52 ohms and 75 ohms.
Meter: 0-100 DC microamperes.

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9 Transistor 10 mW output Citizens Band, 27.24 Mc. Fully transistorised Walkie Talkies. Individual speaker and microphone. Dimensions, 7⅛ in. x 2⅝ in. x 2 in. Complete with batteries, earphone and leather carrying case.

**£42/10/- Pair**

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| 24 | 350 | 7/- | 500 | 50 | 13/- |
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| 25 | 25 | 3/6 | 50plus50 350 | | 16/- |
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| 6 in. Speakers, 3.5 or 15 ohm | 42/- |
| 3 in. Speakers, 3.5 ohm | 32/- |

## COAXIAL CONNECTORS

**AMERICAN TYPE**

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| PL259 Coaxial Plug | 0/8 |
| 4087-1 Coaxial Plug (PL259, PTFE) | 14/8 |
| SO239 Coaxial Socket (Suit PL259) | 9/- |
| 4802-1 Coaxial Socket (PTFE) | 14/8 |
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| | |
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| Coaxial Plug (Suit ¼ in. Cable) | 4/- |
| Coaxial Socket | 3/6 |
| Coaxial Socket (flush mount) | 3/6 |
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| Socket to suit above | 3/6 |
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## 122 AERIAL SETS

24 ft. high. Eight 3-ft. rods, ¾-in. diam., guy ropes and pegs, etc. **£3**, for rail.

**LOG BOOKS 6/6 each**, postage 1/-

**CALL BOOKS, 6/- each**, postage 1/-.

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# "AMATEUR RADIO"

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"AMATEUR RADIO,"
P.O. BOX 36,
EAST MELBOURNE, C.2, VIC.

Acknowledgments will be sent following the Committee meeting on the second Monday of each month. All Sub-Editors should forward their articles to reach "A.R." before the 8th of each month. Any item received after the Committee meeting will be held over until the next month. Publication of any item is dependent upon space availability, but in general about two months may elapse before a technical article is published after consideration by the Publications Committee.

★

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★

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## OUR COVER

One of our draughtsmen, Ken VK3GK, gets his boy off to an early start. What makes it tick!

## FEDERAL COMMENT

★

## SHOULD WE ALL GO SINGLE SIDEBAND?

There seems to be a current misconception—quite widely spoken about—that all Australian Amateur transmitting licensees must change over to single sideband transmission by 1970. This is not true! It is true to say, however, that the 1959 Conference of the International Telecommunications Union did require fixed and mobile services operating in the frequency spectrum between 4 and 27 Mcs. to make the change by this date, and a sub-committee has been making investigations on this problem since the Conference. Whilst this decision included Commercial Services, it did not include the Amateur Service which, because of the nature of its experiments, investigations and research, is granted band allocations in which it is free to operate using most of the known modes of transmission and reception.

However, the matter prompted some thinking on whether we should all go single sideband or not. Naturally, many of the sidebanders—some of whom have been using the technique for 15 years—will tell every a.m. and c.w. operator to "get modern and cease using ancient systems."

Is this really what we want to do? Are we really right in thinking that we should dispense with all the older systems of communication in favour of single sideband? Is single sideband the ultimate from which every newcomer to Amateur Radio can gain experience and knowledge in exercising the privileges granted to him with his licence? Perhaps we should all take another look at this!

Certainly single sideband has proved to be a most useful form of transmission, particularly during the current condition of the sunspot cycle. And for sure it offers the advantage of "more-stations-per-kilocycle" when produced efficiently. But should we so upgrade this mode of transmission that the younger ones coming up behind us tend to lose interest in Amateur Radio because they (a) perhaps cannot afford the cost of s.s.b., or (b) become scared of the technical complicity compared with a.m. and c.w.?

Perhaps at this stage of the art we should do less preaching about "getting modern" and encourage our youth through every possible medium to take an interest in Amateur Radio at the lower level. The W.I.A. Youth Radio Scheme is doing this most successfully. Australia is in dire need of electronic engineers in every phase of the radio and electrical industry and Amateur Radio is a wonderful launching platform to send young people off on the right course to fit them for the posts available to those who choose electronics as a career.

Let us not become so sophisticated that we think only of the latest technique and that everyone should use it. By all means let us encourage the experienced Amateur to exploit new fields and keep abreast of progress in the art of Amateur communication. But we must not fail to also encourage the young people to graduate from simple a.m. and c.w. communication for it is the bulwark of our hobby no matter what technical advances are achieved at the ultimate. It is, perhaps, too early for all of us to go single sideband!

—Max Hull, VK3ZS, Federal President.

## CONTENTS

# A LOW NOISE FIGURE CONVERTER FOR TWO METRES*

C. J. HURST,† VK5ZHJ

RECENTLY Jeff VK5ZP, Tubby VK5NO and the author entertained thought of attempting 144 Mc. Moonbounce. One of the many obstacles crossing "easy street" was a converter having an acceptable noise figure. For Moonbounce a n.f. of 3 db. or less is most essential and first up a parametric amplifier was considered. However, due to the high tolerances required in the construction of same, it was considered that a conventional converter could achieve a comparable n.f. with less constructional difficulties.

Having decided on the construction, the choice of an r.f. amplifier was considered with valves in mind such as the 416B, 417A, A22521 and GE7077. Of these four valves the 416B and GE7077 have n.f.'s at 144 Mc. of 2 and 2.2 db. respectively. Because the 416B has to be "blown," it was considered that at a cost of 0.2 db. a GE7077 would be the logical choice as the r.f. amplifier. To obtain this published n.f. a grounded grid amplifier has to be used. In order to minimise mixer noise a triode mixer was considered desirable and a 6CW4 grounded grid mixer was our final choice.

To obtain a good match to the main receiver a cathode follower was considered necessary, hence the addition of another 6CW4. The oscillator injection was required to be as stable as practicably possible. To this end the transistor fundamental crystal oscillator is to be placed in a thermos flask for temperature stability. The output from this oscillator is then multiplied to the heterodyning frequency on one half of a 12AT7. However, oscillator chains usually depend on the individual constructor.

With reference to the circuit diagram it can be seen that the r.f. amplifier is a conventional grounded grid stage with the exception that additional capacity C2 was found necessary to give the plate coil L2 a good peak when C3 was tuned. Without C2 added, the plate coil was very broad with no definite peak in signal.

The plate coil of the mixer L4 is wound to resonate with the plate grid capacity of the mixer and capacity loading of the cathode follower, at the frequency of the i.f. used, which in this case is 26 Mc. The purpose of R4 is to broaden the tuning of L4. Generally L4 can be replaced with a resistor of approx. 47K as the mixer plate load, but in this case the coil was considered necessary to reduce images to a much lower level than considered necessary for general "Hamming." The length of co-axial cable connected from J2 to the receiver input should be a maximum of 24" long.

The tuning of this converter is no different from any other xtal locked converter, and should not present any problems. However, to obtain the lowest noise figure a noise generator is required to aid adjustment. By varying the tap on the input coil and tuning of same, the published n.f. can be obtained. To date the n.f. has not been measured for the converter described but in comparison with the 6ES8 cascode in service at this QTH a marked improvement is most apparent. In order to obtain the ultimate possible an additional 7077 grounded grid pre-amplifier has been constructed and added in front of the unit described. This pre-amplifier is identical to the r.f. amplifier described with the addition of a one-turn link coupled into the plate coil which feeds into the aerial input connector J1 of the main converter.

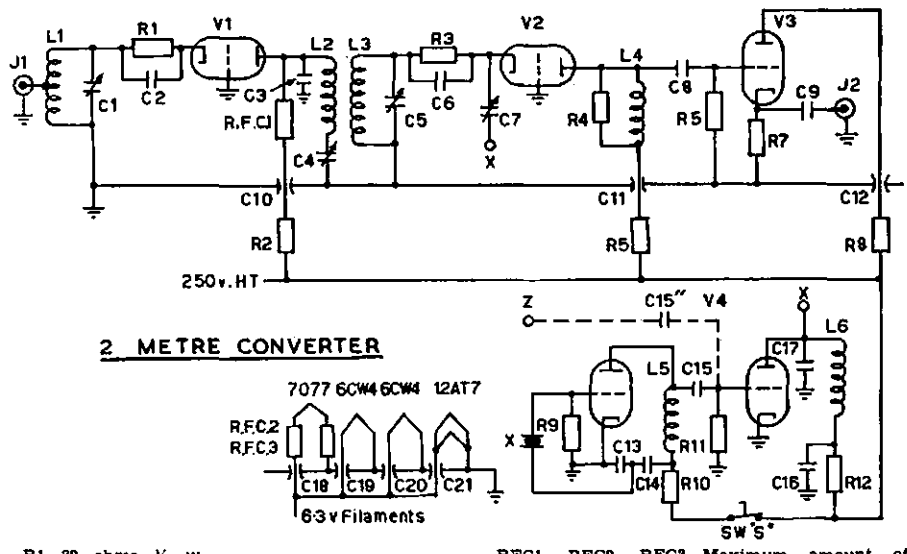
Although a GE7077 has been used as the r.f. amplifier in the unit described, no reason exists why any good v.h.f. low noise triode cannot be used —for example, 417A, A22521 or even a 6CW4, instead of a 7077 if one is not available. The only variation in circuitry will be the value to grid leak R1 and slight variations in valve capacities may necessitate a slight change in coil sizes. The coil information supplied will allow tuning of converter to frequency with little trouble. The use of a grid dip oscillator will make the adjustment of coils all that much easier. To facilitate construction a brass chassis was used. This allows you to solder components directly to the chassis, thus reducing long r.f. connections, and the chances of introducing instability.

A logical method of construction is to (after deciding on the layout):—

(1) Mount valve sockets and co-axial fittings.
(2) Solder feed-through capacitors and variable capacitors into position.
(3) Wire up filaments.
(4) Wire in resistors and capacitors.
(5) Wind and mount coils in correct positions.

It is generally wise to mount the coils last so as to prevent damage while constructing. At the completion of wiring, testing can be initiated. Firstly, the oscillator chain should be peaked up and the overtone oscillator checked for the correct mode of operation. The Robert Dollar overtone shown will work effectively with a 47 pF. feedback capacitor. Checking in a receiver either on the fundamental frequency or the 3rd harmonic of the fundamental will indicate the correct operation. As L5 is tuned to frequency, the fundamental will cease to be heard, and if listening to the 3rd harmonic, a decrease in frequency of approx. 20 Kc. will be evident, when the crystal is operating in correct overtone mode.

(Continued on Page 10)




R1—82 ohms ½ w.
R2—18K ohms, 1 w.
R5, R12—1K ohms ½ w.
R4—22K ohms ½ w.
R5—75K ohms 1 w.
R6, R9, R11—100K ohms ½ w.
R7—2.2K ohms 1 w.
R8—270K ohms 1 w.
R10—10K ohms 1 w.
C1, C4, C5, C7, C17—1-7 pF. variables.
C2, C9—220 pF. disc ceramic.
C3—4 pF. disc ceramic.
C6, C8, C13, C15—47 pF. disc ceramic.
C10, C11, C12, C16, C18, C19, C21—0.001 μF. feed-through's (preferably solder-in type).
C14—0.001 μF. disc ceramic.
J1, J2—Co-axial connecters.
X—Crystal to suit individual requirements.

RFC1, RFC2, RFC3—Maximum amount of turns of 28 B. and S. that can be fitted on 47K 1 watt resistor.
L1—7 turns ½ in. diam. x ¾ in. long, 16 s.w.g. tinned copper wire, tapped at 4 turns from cold end.
L2—6½ turns ½ in. diam. x ½ in. long, 16 s.w.g. t.c.w.
L3—3 turns ½ in. diam. x ½ in. long, 16 s.w.g. t.c.w.
L4—Tune to i.f. used, 28 B. and S enamel.
L5—To suit 3 x xtal frequency, 28 B. and S. enamel.
L6—To suit 144 Mc. i.f.
V1—GE7077.
V2—6CW4.
V3—6CW4.
V4—12AT7.

* Reprinted from "Info," January, 1965.
† 12 May Terrace, Gawler Rail, South Aus.

# ANTENNASCOPE-54*

WILFRED M. SCHERER, W2AEF

THE Antennascope and Antennascope-54 are very simple radio frequency bridges for the measurement of antenna impedance and resonance. They may also be used for a wide variety of other measurements and the second part of this article will discuss this subject at great length.

As usual in bridge circuits, the variable element (R1) is adjusted until a zero null is obtained on the indicating device (Detector). Through the calibration of R1, the value of the unknown element, Rx, is found. Since the ratio arms, R1, R2 and R3, are resistive elements, the unknown Rx must also be resistive, or non-reactive, before an accurate balance can be obtained. The configuration of this simple bridge is shown in Fig. 1. The schematic of the improved Antennascope-54 may be seen in Fig. 2.

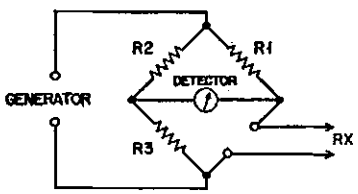



Fig. 1.—Fundamental bridge circuit. This is the basic idea of the Antennascope-54. Balance of the bridge is indicated by a null, or zero reading on the meter.

The impedance presented by an antenna is resistive only at resonance. The bridge in the Antennascope-54 cannot be brought to balance until the r.f. generator is at the resonant frequency of the antenna in question. Thus, the Antennascope-54 also provides a foolproof method of quickly and accurately determining the resonant point of any antenna. It is the working out of these two problems; i.e. radiation resistance and resonance, where the constructor will find the greatest value of the Antennascope-54.

The useful range of the Antennascope-54 is from 10 through 500 ohms. In the original unit this was covered by a single scale which resulted in those readings below 100 ohms being crowded. In this new improved model two scales have been provided. A "high" scale (R1a) with readings of good visibility from 50 to 500 ohms. A "low" scale (R1) with good readings of from 10 to 100 ohms. Values between 0 and 10 ohms, and 500 to 1,000 ohms, may be read through the use of external resistors.

The Antennascope-54 is designed to be used with a grid dipper as the r.f. generating source.

## CONSTRUCTION

In the wiring schematic of the Antennascope-54 (Fig. 2) the only real critical components are R1 and R1a. Crystal sensitivity is also important and is discussed later on in this text.

* Reprinted from "CQ", June 1954.

**• It is the ambition of each magazine editor to be able to look back upon a continuing series of notable contributions to the field of his journal. "CQ" has been fortunate to include on its staff the Ham that popularised the grid dipper and TNS, while adding the "antennascope" to the family of test instruments. After its introduction in 1950, the "antennascope" quickly became a necessity in many Ham shacks and is being manufactured by equipment companies.**

**The activation of many new Amateurs since 1950 has forcefully brought to our attention the fact that to many the "antennascope" is a mysterious device. With the depletion of back issues of "CQ" containing the original disclosure on the "antennascope" (September, 1950), no further material on its use has appeared in print.**

**It is also known that the mechanical design of the first "antennascope" left something to be desired. Electrically, although basically a simple design, it had never been up-dated to use the newer crystal detection diodes.**

**The "Antennascope-54" is a modification of the original instrument. The improved version is the result of several years of study on how and where it is used. We are sure you will find this article of interest.**

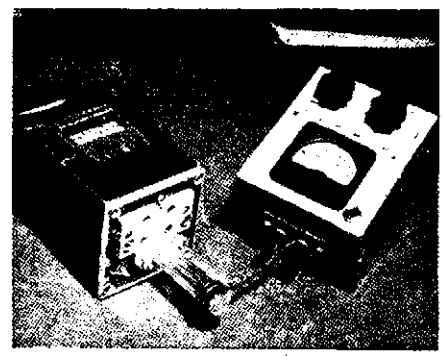
From an ideal aspect, R1 and R1a should be perfect non-reactive resistors, thus any-old-type potentiometer of the proper value will not work in this spot. Each potentiometer that we have used and measured has had some internal inductance and capacitance. Too much of either of these items will seriously inhibit the use of the Antennascope-54 on the higher frequencies.

The original model of the Antennascope employed a Centralab Type M composition potentiometer. Unfortunately, this control is not available on the general amateur market, although some companies have obtained a quantity on special orders. During the development of the Antennascope-54 we tried dozens of substitutes to find a suitable replacement. The next best thing to the Centralab potentiometer is the Allen-Bradley Type J, followed rather closely by the Ohmite Type AB. Either of these controls may be used for entirely satisfactory results within the useful frequency range of this instrument.

Before a potentiometer is soldered into this circuit it should be checked with an ohmmeter. Temporarily mount it with a scale so that the presence of backlash may be ascertained. Rotate the arm back and forth and note whether or not the identical ohmmeter readings occur at the same scale reading when approached from either clockwise or counter-clockwise rotation. In some controls the carbon contact in the slider arm may be loose. It can be tightened by crimping the mounting clip.

The range switch, Sw1, which is a new feature in the Antennascope-54, must be of the small slide type. Toggle and wafer switches cannot be used here.

Resistors R2 and R3 must be identical values and although shown in Fig. 2 as having a value of 200 ohms, they can be anything from 50 to 200 ohms —as long as they are identical. Another word of caution. Do not make the mistake of using the wire-wound resistor that physically look like their carbon brothers.



Antennascope-54 coupled to Grid Dipper.

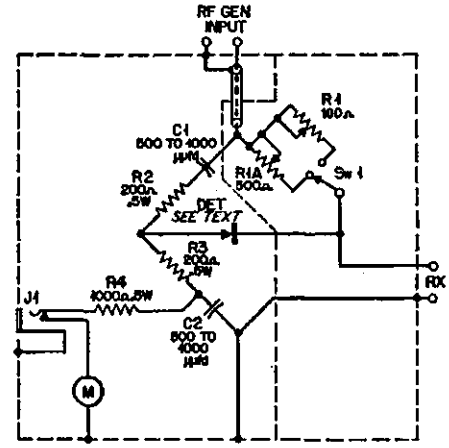



Fig. 2.—Wiring schematic of the Antennascope-54. In this model a range switch, Sw1, has been added. A jack, J1, is placed in series with the meter, although it is essentially unnecessary. Some constructors will find it useful for making readings somewhat removed from the actual position of the instrument.

C1, C2—(see text) must be identical values of from 500 to 1,000 pF.
J1—closed circuit jack.
R1—(see text) 100-ohm potentiometer.
R1a—same as above, but 500 ohms.
R2, R3—(see text) must be identical values of 50 to 200 ohms, non-inductive.
R4—1,000 ohms, ½w.
Det.—(see text) may be 1N23B, if mounting clip is constructed, or G7A if wire leads are desired.

Condensers C1 and C2 must also be matched to identical values between 500 and 1,000 pF. The button type ceramics are ideal for maintaining low inductance in their corresponding bridge arms. It is possible to use mica, disc or tubular ceramics in the Antennascope-54 if the instrument will never be used above 30 Mc.

## CRYSTAL DIODES

The design of the original Antennascope was predicated on the use of the 1N23A diode. Since that time, the stability and sensitivity of that diode has been improved (1N23B) and a great number of crystal diodes are now on the market for use on u.h.f. t.v. Some of these are cheaper than the 1N23 series and have the additional facility of being easily mounted.

The comparative sensitivities as I have measured them during the development of the Antennascope-54 are as follows:

| | | |
|---|---|---|
| 1N23B | .. .... | 100% (Sylvania) |
| 1N23A | .. .... | 95% (Sylvania) |
| G7A | .... .... | 93% (General Elec.) |
| 1N58 | .... .... | 65% (Sylvania) |
| 1N34 | .... .... | 65% (Sylvania)* |
| CK710 | .. .... | 60% (Raytheon) |

* Very frequency sensitive and poor at the high frequencies.

Since the Antennascope-54 is to be used with a very low power r.f. source (a grid dipper) the eventual sensitivity will also depend upon the meter movement. A full-scale movement of 200 microamperes is recommended with an internal resistance of 1,000 ohms. The second part of this article will describe the Antennascope Junior which is built without a self-contained meter. This will further reduce the overall cost of this instrument by making use of the existing microammeter in your volt-ohmmeter.

## MECHANICAL DETAILS

An "exploded" view of the Antennascope-54 is seen in Fig. 3. The unit is assembled in a box 3" x 4" x 5". An inner shield and shelf (B) is folded and drilled out as shown in Fig. 4. The box is also drilled and cut out as shown in the latter figure. Note particularly the irregular cutout in the left-hand view (A) which clears the binding posts (Rx) and range switch, Sw1.

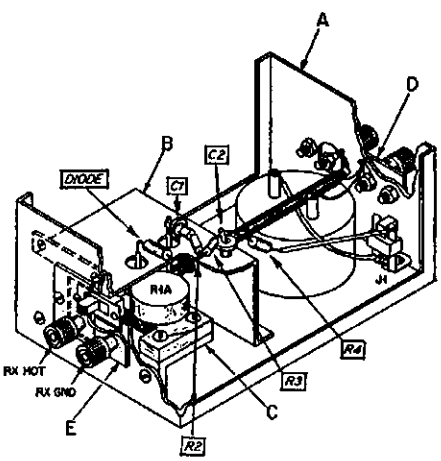
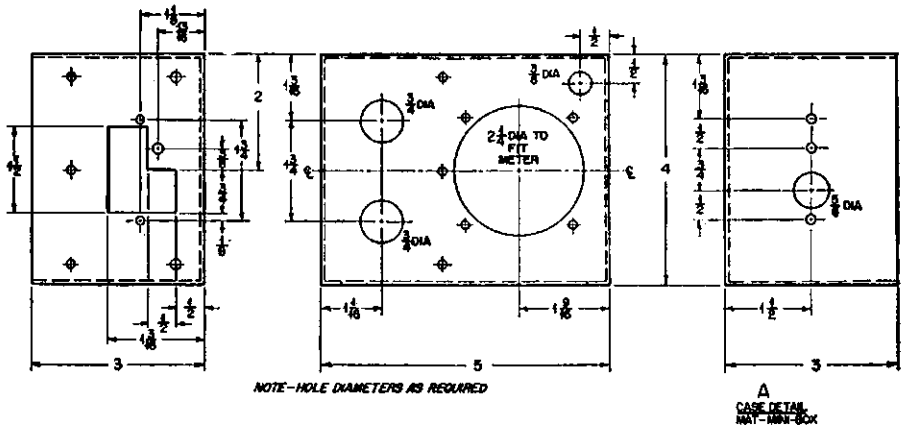
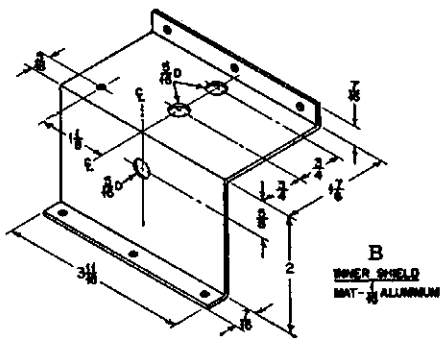
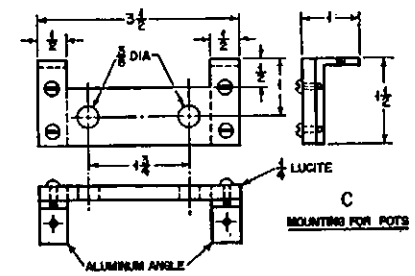



Fig. 3.—Wiring view of the Antennascope-54. The layout should be followed as closely as possible.



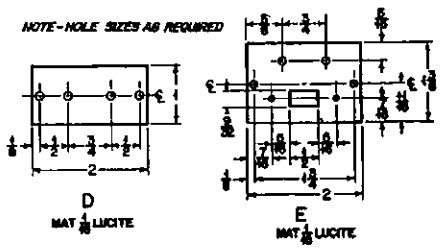



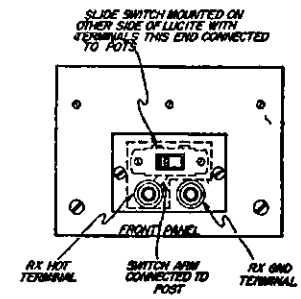

Fig. 4.—Box, shield and mounting bracket layouts and drilling dimensions.

The terminals for Rx are mounted on a piece of lucite (see part E of Fig. 4) which in turn is mounted over the cut-out in the top of the box. The range switch, Sw1, is also mounted here to reduce any stray capacitance effects between elements of the switch and the box.

Controls R1 and R1a are then mounted directly under the Rx terminals on a ¼" thick piece of lucite. This insulating section is cut and drilled out as shown in part C of Fig. 4. The constructor must then drill two ¾" diameter holes in the front panel of the box to permit the shafts of R1 and R1a to pass through without making contact with the box frame. Use extension couplings if the original shafts are not long enough.

The terminals for the r.f. generator input are mounted at the bottom of the box. The "hot" lead is connected to a short length of R9-59/U which passes through the hole in the inner shield. The other end of the coaxial cable goes directly to R1 and R1a.

The connecting leads to the various components in the bridge arms must be made as short as possible to minimise inductance and to prevent stray




Top view of the instrument.

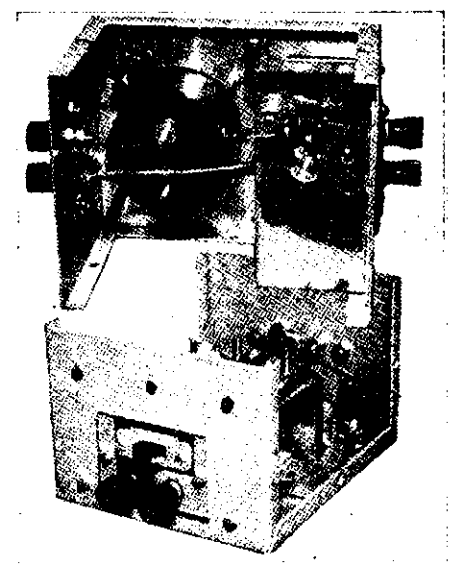
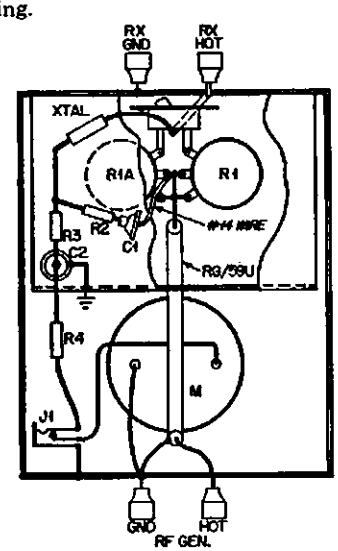


Photo views of the Antennascope-54.

coupling. Minimum lead length is especially important for the connections between the potentiometers and the range switch, and between the "hot" Rx terminal and the switch. For these reasons, R1 and R1a are positioned and mounted so that their terminals may be soldered almost directly to the switch tabs. The tab from the sliding arm of the switch is connected directly to a lug at the bottom of the "hot" Rx terminal.

The crystal diode shown in the unit in these photographs is a G.E. G7A. It is mounted in place with its own wire leads.

The various numbered and unnumbered figures and photographs in this article should clearly illustrate the wiring.




Wiring view and layout.

**CALIBRATION IS EASY**

The first step in calibrating the Antennascope-54 is to attach an accurate ohmmeter between the "hot" Rx terminal and the "hot" r.f. generator input terminal. Place the range switch to the left to engage R1 for the 10 to 100 ohm range. Mark out your scale on the face of the base (the design of which I leave to the individual) and divide it into steps of from 2 to 5 ohms.

Now slide the switch to the right to engage the higher range and subdivide the scale into steps of 25 to 50 ohms. Don't be startled to find that the potentiometers increase their resistances in opposite directions. Remember that R1, because of this mechanical layout, must be turned counterclockwise and R1a must be turned in a clockwise direction.

It should now be possible to verify these calibration points through a facsimile of an actual r.f. measurement. First couple the r.f. input of the Antennascope-54 to your grid dipper coil and put a 50-ohm resistor across Rx. See Fig. 5 for a general idea of how this is done.

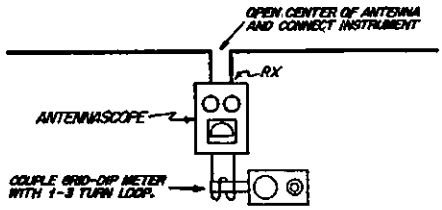



Fig. 5.—Basic use of the Antennascope-54.

Use a frequency from the grid dipper of about 20 Mc., and while it is oscillating put the range switch on the "low" scale and see if the 50-ohm value is being read. Move to the "high" scale and repeat to see if 50 ohms is also being read there. Rotate each control several times to find a scale value, and see if backlash is absent—it should be.

The readings should result in pronounced nulls on the meter. If only partial nulls other than absolute zero are observable, the Antennascope-54 is not working properly. Check first with a different value of test resistor since the first one might have been reactive. It is important to keep the leads very short during this test and that the resistor be non-reactive—oddly enough some are quite reactive.

Once a null has been found with a given resistor you will find that lead length can upset the balance. The leads of your test resistor must also be very short. Do not parallel connect resistors for testing the Antennascope-54—use non-reactive ½-watt single resistors.

Poor nulls can result from stray coupling effects in the Antennascope-54 but if the wiring and chassis layout is followed as shown in the figures this trouble should not arise. ●

# Extending Range of the BC221 Frequency Meter*

## V.H.F. AND U.H.F. RANGES WITH HIGH ACCURACY

*ALFRED K. ROBINSON, W6PM*

**• By making use of the harmonics of the highly stable crystal calibrator of the BC-221 in a heterodyne system, the accuracy obtained at frequencies up to 200 Mc. or higher is essentially that of the BC-221 in its 2-to-4-Mc. range.**

THE improvements that have been made in recent years in radio-receiver and transmitter oscillator stability have not lessened the need for frequency measurements of high accuracy. Particularly in the v.h.f. and u.h.f. ranges, reliable measurement, has, in fact, assumed even greater importance.

Amateurs interested in frequency measurement have long relied on the surplus BC-221 frequency meter because of its low cost compared to that of any other instrument of equivalent accuracy. Using the original calibration book, the excellent hermetically sealed 1-Mc. crystal oscillator, and the standard calibration points, an accuracy of 0.02 per cent. or better can be expected over the fundamental range of 2 to 4 Mc. By the use of intermediate calibration points and careful adjustment this accuracy can be easily increased to 0.01 per cent.

Measurements at frequencies higher than 4 Mc. are made by comparing the unknown frequency with harmonics of the fundamental 2- to 4-Mc. range. Even if the same percentage accuracy is possible at these harmonic frequencies, the absolute accuracy (in terms of cycles or kilocycles) deteriorates in direct proportion to the order of the harmonic used. An error of 0.01 per cent. at 2 Mc. is 200 cycles; at 200 Mc. it is a matter of 20 Kc. Greater absolute accuracies at the higher frequencies require that the percentage accuracy increase as frequency increases.

Controls along the bottom edge of the front panel of the BC-221 are for crystal-frequency trimming, the calibrate-operate switch, and the power switch.

A heterodyne system offers a method of accomplishing this objective. In such a system to be described, the unknown high frequency and a highly stable signal of known frequency are combined in a mixer to generate a beat frequency lying in the 2- to 4-Mc. fundamental range of the BC-221. If fixed marker signals are provided, spaced a intervals of 4 Mc. throughout the desired range, the unknown frequency will always lie within 2 to 4 Mc. of one of these markers. The BC-221 then is used as an interpolator measuring the difference between the unknown frequency and an adjacent marker. Assuming that the marker frequency can be determined with zero error, the absolute accuracy with this system is the absolute accuracy of the BC-221 at its fundamental. The percentage error in measurement of the unknown frequency is then the fundamental percentage divided by the order of the harmonic against which the unknown signal is beating.

### REFERENCE MARKERS

In this modification, the original 1-Mc. crystal oscillator taken from the BC-221 is used as the primary source of reference markers. The required 4-Mc. spacing is obtained by means of the circuit shown in Fig. 1. Frequency is quadrupled to 4 Mc. in the plate output circuit of the oscillator. This signal is fed to a 4-Mc. amplifier which attenuates the 1-Mc. components, and other undesired products generated in the quadrupling process. The filtered 4-Mc. signal is used to overdrive a series of multiplier stages with broad-bank tank circuits and oversize coupling capacitors, each stage overdriving its successor. The result is a series of strong marker signals spaced at intervals of 4 Mc. throughout the desired range. By adjusting the crystal frequency so that one of these markers zero beats with WWV, the marker sig-

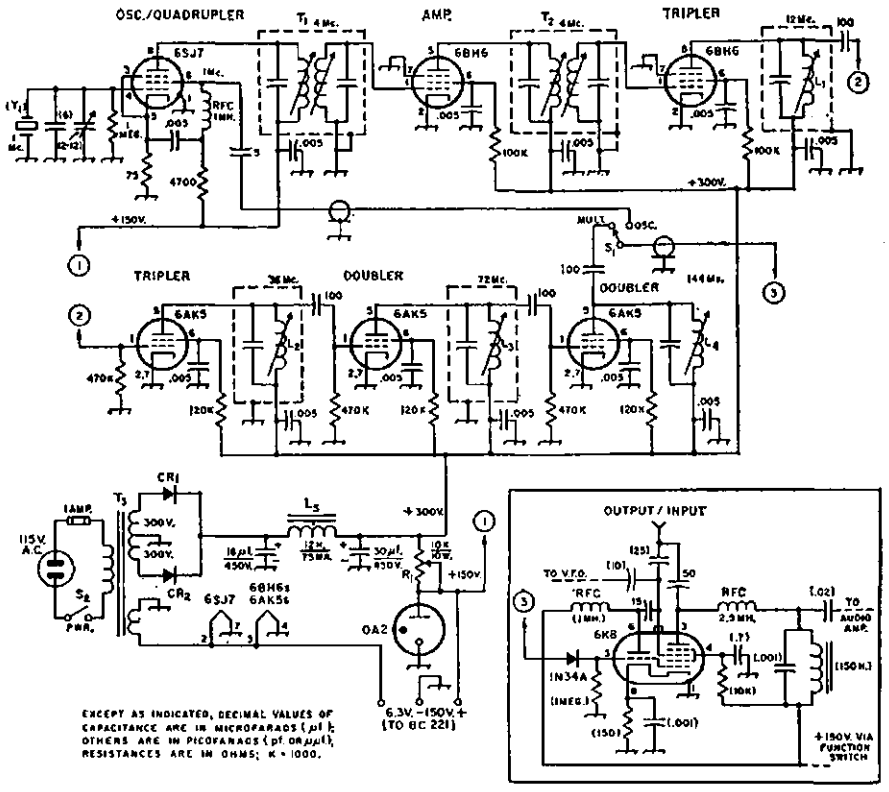



Fig. 1. Circuit of the 1-Mc. crystal oscillator and frequency multipliers which generate markers at 4-Mc. intervals throughout a wide spectrum. Fixed capacitors of decimal value are disc ceramic; others are silver mica or NP0 ceramic, except where polarity indicates electrolytic. Fixed resistors are ½-watt composition. Values in parentheses are the original. Inset shows modifications in the original mixer circuit.

CR1, CR2—Silicon rectifier, 10000 p.i.v., 100 mA. or more.

L1-L4, inc.—Circuits should resonate at the frequencies indicated. Coils may be air-wound, or wound on adjustable iron-core forms, and used with or without shunting capacitance. Capacitors, if used, should be silver mica or NP0 ceramic. Approximate inductances required when no shunting capacitors are used are as follows: L1—12μh., L2—1.3μh., L3—0.3 μh., L4—0.1 μh.

L5—12-hy. 75-mA. filter choke.

R1—Slider adjustable.

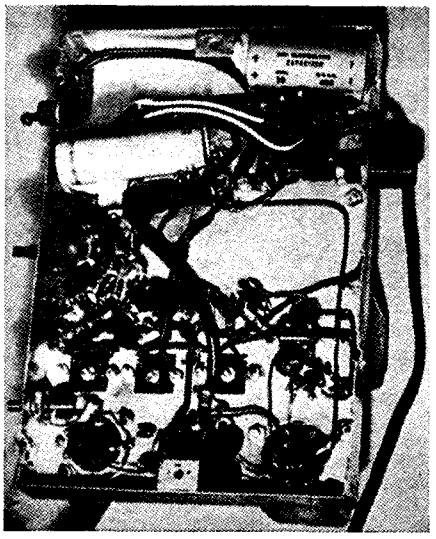
S1—S.p.d.t. rotary switch.

S2—S.p.s.t. toggle switch.

* Reprinted from "QST," December, 1964.

nals can be set with a high degree of accuracy.

The unknown frequency and marker frequencies are combined in a modification of the original BC-221 mixer. As described, the unit is designed to make measurements in the range of 2 to 300 Mc. In some other similar units, the range has been extended to 600 Mc., although the 4-Mc. points become increasingly difficult to identify. $S_1$ provides a means of feeding the 1-Mc. crystal signal directly to the mixer for calibration purposes.



Bottom view of the oscillator-multiplier chassis. The crystal-oscillator trimmer is in the lower left-hand corner. The crystal-oscillator screen r.f. choke is close to the 6SJ7 socket under the bottom-plate bracket at bottom centre. L4 is immediately below S1 at left centre. The three controls at the left extend through holes cut near the bottom of the front side of the BC-221 cabinet.

## POWER SUPPLY

A small power supply is included. This provides about 300 volts for the multipliers, and regulated 150 volts for the crysal oscillator and the circuits of the BC-221, as well as filament voltage for both. The original 6X5GT tube rectifier shown in the top view photo was eventually replaced with silicon diodes to reduce heating.

## MIXER MODIFICATION

The inset in Fig. 1 shows the simple modification of the original mixer circuit. The triode section of the 6K8 is used as an untuned amplifier for the signal from the multiplier chassis. This revision requires the addition of only the diode and the 15-p.f. coupling capacitor after removal of the crystal and its trimming capacitors. The diode serves to accentuate the harmonics.

The hexode section of the tube is unchanged except for the insertion of a 2.5-mh r.f. choke in the plate circuit to provide an r.f. load, and the addition of a 50-p.f. r.f. coupling capacitor between the plate and the output jack.

## CONSTRUCTION

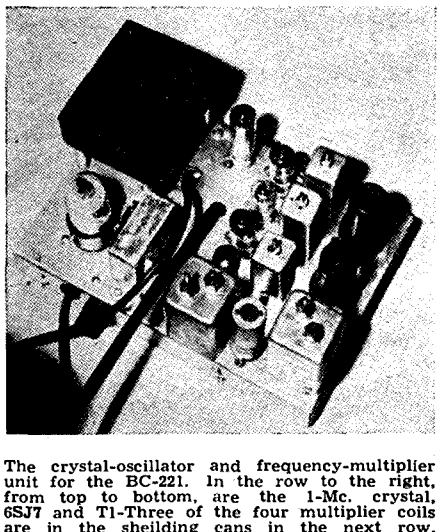
The components indicated in the main diagram of Fig. 1 are mounted on a chassis whose dimensions are proportioned to fit the bottom part of the BC-221 cabinet. Sufficient space for the chassis is provided by drilling out the rivets and removing the headphone compartment.

The essential details of the layout are visible in the photographs. The 1-Mc. crystal, its socket and associated trimming capacitors are removed from the BC-221 proper and remounted on the new chassis. It will be noticed that power-supply components and the crystal oscillator are at opposite ends of the chassis to reduce heat transfer and hum pick-up. Holes in each side of the case provide ventilation.

## MAKING MEASUREMENTS

Practice with a few signals of known frequency and an accurately calibrated receiver to identify the 4-Mc. markers will soon show the utility and limitations of the system. To set up for a signal output at some desired frequency, a simple procedure should be followed. To create a signal at a desired frequency, the nearest crystal marker removed at least 2 Mc. from the desired frequency should be used as the reference. If the desired frequency is 157.71 Mc., the 160-Mc. marker should be used. (The 156-Mc. marker is closer, but is less than 2 Mc. away from 157.71 Mc., and therefore the beat will fall outside the 2-4 Mc. range of the BC-221.) The difference between 160 and 157.71 is 2.29 Mc., which (in my case) corresponds to a dial reading of 879.3. The nearest calibration point shown in the calibration books is 795-1 to which the dial should be set. With the 1-Mc. calibrator signal injected, the frequency meter correction knob is adjusted for zero beat. Then, shifting the mixer drive to the multiplier chain and setting the meter dial to 879.3 will produce a signal at the desired frequency.

For quick reference for this and other much-used frequencies, notations similar to the following are made:



The crystal-oscillator and frequency-multiplier unit for the BC-221. In the row to the right, from top to bottom, are the 1-Mc. crystal, 6SJ7 and T1-Three of the four multiplier coils are in the sheilding cans in the next row, with the 6BM6 4-Mc. amplifier tube at the bottom. The fourth multiplier coil (L4) is mounted through a hole in the chassis, largely hidden by the shielding can at the top. (See bottom view.) The four multiplier tubes and T2 are in the third row. Power-supply components occupy the remainder of the chassis. The coaxial line feeds signals from S1 to the mixer in the BC-221. The multiconductor ribbon makes the power connections.

Frequency — 157-710.
Meter Frequency — 2290.
Meter dial setting — 879.3.
Nearest check point — 795.1.

In measuring the frequency of an externally generated signal, it is assumed that other means are available for checking the frequency to an accuracy sufficient for determining the marker frequency that will serve as the reference. The signal is then fed into the BC-221 and, with headphones plugged into the meter, the meter is tuned for zero beat with the beat signal that results when the incoming signal is mixed with the marker. If the nearest marker (removed a minimum of 2 Mc. from the unknown frequency) is above the unknown frequency, as in the example given above, the BC-221 frequency reading should be subtracted from the marker frequency to obtain the value of the unknown frequency. If the marker signal is below the unknown frequency, the meter frequency reading should be added to the marker frequency. This condition would exist if the unknown frequency were, for example, 158-7 Mc. In this case, the unknown frequency is less than 2 Mc. from 160 Mc., but more than 2 Mc. from 156 Mc., so the latter would be the reference.

In measuring externally generated signals, care should be taken to attenuate the signal to a point that will assure that the mixer is not being overdriven. Too strong a signal may result in spurious responses from extraneous mixing with other harmonics of the BC-221, crystal harmonics, or with strong local broadcast or other signals.

If stronger marker signals are desired at the lower frequencies, they can be obtained by using a switch with more positions at $S_1$, and coupling through a 10-p.f. capacitor to the plate of each multiplier tube. ●

## CONVERTER FOR 2 MX

(Continued from Page 3)

Once the oscillator chain is functioning correctly, the remainder of the circuitry can be peaked up using either

(1) A strong local signal—which is not hard to come by around this area;
(2) The 2-metre beacon situated at Mt. Lofty on 144.8 Mc., or
(3) Band noise or a noise generator.

Providing that careful layout has been adopted, grid and plate leads kept short, and good shielding placed between stages, instability problems should be non-existent and alignment should present few problems. The optimum spacing of L2 from L3 is approx. ⅜". Closer coupling brings about heavy loading on the mixer, which is characterised by a drop off in gain and tendency to load down L3 to the extent that adjustment of C5 does not result in a definite peak in signal.

With regards to the circuit, switch S is used to disconnect the overtone oscillator when stabilised signal (as mentioned previously) is fed to multiplier at point Z. For general purposes this function can be ignored, but was an added requirement for the Moonbounce project.

Regardless of the r.f. amplifier used, the mixer and cathode follower section of this converter provides the foundation of an exceptional unit compared to the equipment in use within VK5 today. If any club member requires any more information regarding the construction or operation of a converter similar to this unit, I am only too willing to assist, either on the air or personally.

### FOOTNOTE

Since writing this article the author has had the opportunity to check the n.f. of the converter described. The basic unit described has a minimum n.f. of 4.5 db. This figure would be acceptable even to the most fastidious of 2-metre operators. However, with the addition of another 7077 r.f. amplifier placed in front of the basic converter unit the n.f. of the total system is 2.5 db. Compared with the published value of 2.2 db. it would appear that the value obtained is the ultimate practicably obtainable. Factors of importance when checking the n.f. of a converter with a noise generator are that firstly, the a.v.c. on the main receiver is disabled, and secondly, the r.f. stages on the main receiver are operated in the linear region of valve characteristics.

As mentioned previously the position of the aerial tap on L1 determines to a large extent the n.f. When using the noise generator it was found that varying the aerial tap 1 turn higher or lower than optimum degraded the noise factor by 2 db.

The adjustment of the aerial coil tap is a long and tedious job, and any person hoping to achieve the best n.f. in five minutes can take my advice and forget about it. Results obtained from this converter to date have exceeded expectations, and it is anticipated that within a few months the effort required to build the converter and pre-amplifier to the tolerances required will be well rewarded when a signal bounced off the moon is copied "loud and clear" using this converter. Here's hoping anyhow. ●


Presentation of I.R.E.E. Pennant (1964) to Westlakes Radio Club by Secretary and Chairman of Newcastle I.R.E.E., on 13th June, 1965, at Westlakes Hunter Branch Field Day (referred to in notes, July, 1965). L. to R.: Max McLachlan (Club Treas.), Keith Howard VK2AKX (Club Pres.), Henry Schroeder (Club Secy.), John Clarke VK2DZ (Secy., Newcastle I.R.E.E.), Chris Cowan VK2PZ (Chairman, Newcastle I.R.E.E.).
Block by courtesy "Newcastle Courier."

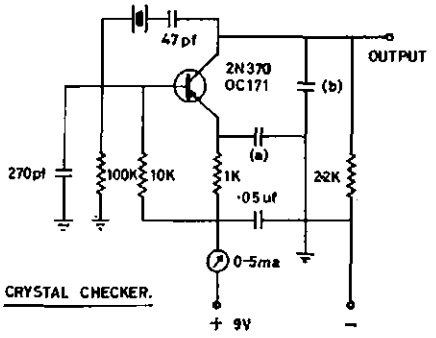
*Technical Correspondence—*

# TRANSISTORISED CRYSTAL CHECKER

Editor, "Amateur Radio," Dear Sir,—I wish I knew where I could take my crystal checker and browse through piles of crystals at 10 c. each! Perhaps Mr. Marriner's article should have been cut to reflect Australian conditions, and to prevent too much drooling at the thought of those "carloads" of crystals.

Actually, what upset me most was his condemnation of transistorised checkers as critical and limited in frequency range.

Here is a circuit, originally appearing in "Transistor Transmitters for the Amateur," by Howard W. Sams & Co., guaranteed to resonate any active fundamental crystal between 100 Kc. and 15 Mc. Although not having any 100 Kc. rocks lying about to try it out to its lower limit, I can vouch for its performance down to 455 Kc. and up to 30 Mc. on overtone crystals.




| Range | (a) | (b) |
|---|---|---|
| 100 Kc. - 15 Mc. | .05 μF. | 270 pF. |
| to 30 Mc. | 68 pF. | 22 pF. |

If the 47 pF. capacitor is replaced by a 5-55 pF. trimmer, output from collector can be tapped off for use in calibrating your receiver with 100 Kc. rock.

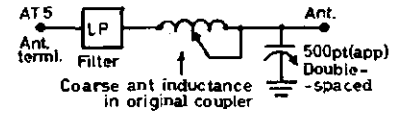
—Peter Ward.



# Antenna Coupler for your AT5 and go on 160 as well

When I bought my AT5 the antenna coupler had been ratted to such an extent that it was of no use to me. The only parts remaining were the coarse antenna inductance and a double-spaced tuning capacitor of about 500 pF., which may or may not have been in there originally.

After much mucking about I wired the thing to the following circuit. It has many advantages, the greatest being that it will match any impedance of unbalanced line; it is practically a pi-coupler, as you can see, when used in conjunction with the existing AT5 tank.




I constructed it in the original coupler box and tied it to the AT5 via about 6 feet of 50 ohm co-axial, and just to be safe I put a low-pass filter in the middle of the line. (I have never operated in anywhere else but fringe areas; the circuit I used is in A.R.R.L.)

Tuning up is a two-handed operation, dip the tank, adjust the loading condenser. If it does not load heavily enough, try a different value of inductance and re-dip. Just like any pi-coupler.

Okay, to go on 160 with the AT5, screw in the trimmer condenser on the v.f.o. 2-2.5 Mc. range until it hits the 1.8 Mc. band. Rip out all of the wiring on the m/f. m.o. tuning condenser. There is some underneath, don't miss that. Now, run a wire across to the h/f. buffer/amp. tuning condenser. Okay, you are now on 160.

To tune, put in max. cap. on the h/f. b.a. tuning and tune with the m/f. m.o. condenser that was (this condenser will only be used on 160, on all other bands it must have all its capacity out). You will now find that tuning down to the 2 meg. end on the tank condenser you should dip the final. If this doesn't happen it usually means that the antenna is not long enough.

You meet some mighty nice people on 160.

—Brian J. Warman, VK5BI.

# AUSTRALIAN S.W.L. CENTURY CLUB AWARD

**Objects.**

1.1. This award was created in order to stimulate interest in logging DX in Australia, and to give successful applicants some tangible recognition of their achievements.

1.2. This award, to be known as the "S.W.L. Century Club Award," will be issued to any resident Australian Short Wave Listener who satisfies the conditions following:—

1.3. A certificate of the Award will be issued to any applicant who produces proof of having logged 100 countries, and will be endorsed, as necessary, for loggings made in respect of one type of emission.

**Requirements.**

2.1. Verifications are required from 100 different countries shown in the official "Australian DXCC Countries List."

2.2. The official countries list will be published annually in "Amateur Radio," and will be amended from time to time as required. Should a country be deleted from the list at any time, members and intending members will be credited with such country if the date of logging was before such deletion.

2.3. The commencing date for the award is 1st January, 1966. All loggings made on or after that date may be included.

**Operation.**

3.1. Loggings must be made in the h.f. band (Band 7), which extends from 3 to 30 Mc. but each logging must only be made of stations operating in the authorised Amateur Bands in Band 7.

3.2. Loggings may be made of any authorised type of emission for the band concerned.

3.3. Credit may only be claimed for the logging of stations using regularly-assigned Government call signs for the country concerned.

3.4. Loggings of ship or aircraft stations will not be allowed, but land-mobile stations may be claimed, provided their specific location at the time of logging is clearly shown on the verification.

3.5. All stations must be logged from the same call area by the applicant.

**Verifications.**

4.1. It will be necessary for the applicant to produce verifications in the form of QSL cards, or other written evidence, showing that specific loggings have been made.

4.2. Each verification submitted must be exactly as received from the station whose signals were logged, and altered or forged verifications will lead to the rejection of that card, and may lead to the disqualification of the applicant.

4.3. Each verification submitted must show the call sign, the date, and the time of contact, type of emission and frequency band used, and the location or address of the station at the time of logging.

4.4. A check list must accompany every application setting out the following details:

4.4.1. Applicant's name and Listener number, if any, and whether a member of the W.I.A. or not;

4.4.2. Details of any special endorsement involved;

4.4.3. Details of each contact as required by Rule 4.3;

4.4.4 The applicant's location at the time of each logging if portable/mobile operation is involved;

4.4.5. Any relevant details of any contact about which some doubt may exist.

**Applications.**

5.1. Applications for membership shall be addressed to the "S.W.L. Awards Manager," G.P.O. Box 2611W, Melbourne, Victoria, accompanied by the verifications, check list and sufficient postage for the return of the verifications, registration being included if desired.

5.2. A nominal charge of 25 c. (2/6), which shall also be forwarded with the application, will be made for the issue of the certificate to successful applicants who are non-members of the Wireless Institute of Australia at the time of application.

5.3. Successful applicants will be listed periodically in "Amateur Radio." Members of the S.W.L.C.C. wishing to have their verified totals, over and above the 100 necessary for membership, listed, will notify these totals to the "S.W.L. Awards Manager" in writing.

5.4. In all cases of dispute, the decision of the "S.W.L. Awards Manager" and two officers of the Federal Executive of the W.I.A., in the interpretation and application of these rules, shall be final and binding.

5.5. Notwithstanding anything to the contrary in these rules, the Federal Council of the W.I.A. reserves the right to amend these when necessary.

—Eric W. Trebilcock, L3042/BERS195, W.I.A. "S.W.L. Awards Manager."

# THE 20th ANNUAL FEDERAL CONVENTION OF THE W.I.A.

The 1965 Federal Convention was held in Melbourne during April and it is perhaps appropriate some months later to make some comment in these columns and to indicate what has occurred as a result of the Convention.

Those of you who are well versed in the administrative organisation of the Institute will know reasons for holding a Federal Convention, but for those who are new to the W.I.A., Federal President Max Hull's editorial in the June, 1965 issue of "A.R." makes it clear that the Convention is the place where Divisional Federal Councillors get together as a Federal Council to consider the policy of the Institute and to instruct Federal Executive how to act on its behalf in the year to follow.

Members attending the 1965 Convention were:

Major W. T. S. Mitchell, VK3UM, Federal President;
Mr. G. M. Hull, VK3ZS, Federal Vice-President;
Mr. P. D. Williams, VK3IZ, Federal Secretary;
Mr. P. J. Healy, VK2APQ, VK2 Delegate;
Mr. K. H. Howard, VK2AKX, VK2 Observer;
Mr. M. J. Owen, VK3ZEO, VK3 Delegate;
Mr. J. B. Battrick, VK3OR, VK3 Observer;
Mr. K. E. Pincott, VK3AFJ, VK3 Observer;
Mr. L. Blagborough, VK4ZGL, VK4 Delegate;
Mr. G. M. Taylor, VK5TY, VK5 Delegate;
Mr. P. M. Williams, VK5NN, VK5 Observer;
Mr. H. Roberts, VK5MY, VK5 Observer;
Mr. R. Chamberlain, VK6RY, VK6 Delegate;
Mr. L. A. Machetti, VK6ZDM, VK6 Observer;
Mr. E. J. Cruise, VK7EJ, VK7 Delegate.

In addition many other Amateurs were present at various times to listen to the discussions taking place.

After receiving the minutes of the 1964 Convention and discussing officers' reports on activities of the previous 12 months, Federal Council bent itself to the task of considering the large number of constitutional, policy, administrative, regulatory, contest and general business items that were on the agenda.

Constitutional matters discussed embraced the preparation of Convention agendas, the appointment of Federal Executive, Divisional membership levels, improved liaison between Executive and Divisional Councillors and the exact role to be played by Federal Executive in the future. Discussion on these subjects was always frank and open and from them came a much clearer understanding of the way in which the Institute would operate in the forthcoming year.

The policies to be adopted by the Institute then came under review and the items considered were reciprocal licensing, reports from F.E., terms of office of Federal Councillors, minimum age limits for A.O.C.P. and L.A.O.C.P. aspirants, badges for Honorary Life Members, the use of sideband in relation to Amateur activities and the venues for the 1966 and 1967 Federal Conventions.

It is of interest to note that the policy of the Institute to press for reciprocal licensing facilities met with major success on the 25th June this year, when Notes of Agreement to establish reciprocity of Amateur licensing privileges were signed between the United States and Australia.

When administrative matters were raised many facets of this phase of the Institute's activities were aired. These included the purchase of sideband equipment for F.E., the establishment of a Federal Reserve Fund, the best publication date for the Call Book, W.I.C.E.N., Divisional slow morse transmissions, the re-establishment of the Federal Communications net and mutual interference between official broadcasts and nets in the various States.

On regulatory matters the subjects of sideband power and measurement, the use of call signs, additional classes of licence, the issue of call books and the granting of high power permits came under review. As a direct result of the outcome of these deliberations, F.E. has prepared and presented a long and detailed memorandum of submissions to the Department and is currently engaged in the sometimes delicate task of ensuring that Amateur privileges are not only maintained but improved. In the submissions to the authorities special emphasis was given to the status of the Amateur in Australia and to power limits for sideband.

Contests and awards are subjects dear to the heart of the Amateur and it is not surprising that considerable attention was paid to them by the delegates. The appointment of an awards manager, the prompt presentation of trophies and certificates, the dates of national contests, the possible modification of contest rules, the vetting of QSL cards and the location of the contest committee all came under review. It is pleasing to report at this time that all the decisions made regarding contests have been implemented.

Matters of general business were the last to be deliberated and were many and diverse. They covered the growth, status and financing of the Youth Radio Scheme sponsored by the Institute, the present situation of the proposal for Federation, the purchase of photo copying equipment for F.E., the appointment of an "Oscar" project coordinator, the presentation of "Federal Comment" in "A.R." and finally, the establishment of a financial operating budget for 1965/66.

It can thus be seen that the 1965 Convention—like its predecessors—was not exactly a holiday in spite of the fact that it was held over the Easter holiday period. Proceedings started after lunch on Good Friday and went on morning, afternoon and evening until after lunch on Easter Monday. The only breaks taken by the delegates were to attend the Convention Dinner on the Saturday evening and to attend a picnic meal in the Dandenong hills orgainsed by the VK3 Division on the Sunday afternoon.

The importance of this, and other, Federal Conventions cannot be overemphasised. In a country as large as Australia it is essential that Divisional Councillors have the opportunity at least once a year of meeting round a table to discuss points of common interest. True they can write to each other—true they can talk to each other on the air—but more can be accomplished by personal contact than by any other means. Misunderstandings can be cleared up and a unanimity of purpose can be established.

The 1965 Convention certainly fulfilled these needs and effectively reaffirmed the purpose of the Institute to act for and on behalf of the Australian Amateur.

It has been agreed that the 1966 Convention will be held in Brisbane and in 1967 the venue will be Hobart.

☆

# 8th Jamboree-on-the-Air

**1000 hrs. E.A.S.T. 16th October**
**to**
**1000 hrs. E.A.S.T. 18th October, 1965**

**Objects:**

To let Scouts and Guides talk to or listen to their brother Scouts—whether they be in the next town or in another country—and to learn about their activities, families and homes.

To introduce them to Amateur Radio and electronics.

**Rules:**

1. Licence regulations must be strictly observed at all times.
2. Any part of the 48 hour period may be used.
3. Any **authorised** frequency may be used. (Your Amateur Operator will be aware of these.)
4. To take part, call "CQ Jamboree" or answer another station using this call. On c.w. use the call "CQ JAM."
5. You can use c.w., a.m., s.s.b. or any mode authorised officially.
6. This is not a contest: there are no prizes given for the most contacts made. A participation certificate is sent by your Branch Organiser to anyone sending in a report to his Branch.

**Reports:**

These should contain a list of stations contacted, showing call signs, locations and Scout Groups represented (and Guide Companies) as well as notes on any interesting happenings, suggestions for next year, etc. If a portable station has been set up especially for the week-end, we would like to know all about it too. Your Branch Organiser would also like a copy of any photograph which may be taken.

# John Moyle Memorial National Field Day 1965 Results

AS was the case last year the number of Logs submitted were few in number. However, there was a noticeable increase in the number of Logs from stations operating in Section C, Portable, Multi Operator.

Few comments on the rules were received. The Canberra Radio Society suggested that a considerable increase in the numbers of contestants would result if the power limit were scrubbed in favour of a points handicap system. The thought behind the suggestion was that a considerable number of Amateurs with commercial s.s.b. transceivers could not enter the Contest because of the difficulty in limiting their power input to 25 watts. Comments are invited on this matter.

One operator thought that the duration of the Contest was too long and should be reduced. Another thought that the duration was ideal.

Some of the equipment used by various operators is as follows:—

VK3ZRY: 6 mx Pye Reporter running 5 watts to a 6J6 and fed into the ¼ wave whip on the car. On 2 mx he used a modified SCR522 receiver with a built-in 20 watt transmitter feeding a 5 element beam.

VK2BWI: Operated on 40, 20, 6 and 2 metres and used a selection of receivers comprising a National H.R.O., AMR300 and Geloso Receiver, plus a couple of crystal controlled converters. The equipment was powered by an a.c. generator and the station was manned by no fewer than eight operators.

VK5CL: Used a Type 3 Mark 2 on 80 metres whilst a Pye unit was used on 6 metres.

VK2ASZ: Found after setting up his station in the car on location that he had left his modulator tubes at home. This necessitated unloading all the gear from the car and making a trip home to get the missing tubes. He had to set up station again when he returned.

In conclusion we would like to congratulate the award winners and thank those who submitted logs and hope that next year's Contest sees an upsurge in field day activity.

—Federal Contest Committee, W.I.A.

## AWARD WINNERS

**Section A (Portable, Phone)**

| | | |
|---|---|---|
| VK1SB—S. E. Brown | 484 | pts. |
| 2ASZ—R. L. Lear | 583 | „ |
| 3ZRY—R. L. Harrison | 280 | „ |
| 4ZK—R. M. Feenaghty | 925 | „ |
| 5TH—T. Mitchell | 186 | „ |
| 6MM—M. J. McDonald | 162 | „ |
| 9X1—D. Reed | 104 | „ |

**Section B (Portable, C.w)**

| | | |
|---|---|---|
| VK1SB—S. E. Brown | 152 | pts. |
| 2JM—J. A. Mead | 130 | „ |
| 5ZF—I. L. O'Donnell | 318 | „ |
| 9X1—D. Reed | 24 | „ |

**Section C (Portable, Multi-Op.)**

| | | |
|---|---|---|
| VK1ACA—Canberra Radio Society | 901 | pts. |
| 2BWI—V.H.F. and T.V. Group of the N.S.W. Division of the W.I.A. | 1176 | „ |
| 3AWI—W.I.C.E.N. Station of the VK3 Division | 1648 | pts. |
| 5TM—R. D. Martin | 800 | „ |
| 6VF—West Australian V.H.F. Group, Inc. | 410 | „ |

**Section D (Fixed Stations)**

| | | |
|---|---|---|
| VK1LF—L. B. Fisher | 195 | pts. |
| 2APK—D. F. Kiesewetter | 750 | „ |
| 3APJ—P. J. Dettmann | 575 | „ |
| 4LT—A. E. Carter | 685 | „ |
| 5RG—R. S. Gurr | 255 | „ |
| 7SM—S. G. Moore | 775 | „ |

**Section E (Receiving)**

| | | |
|---|---|---|
| WIA-L2188—C. R. Christiansen | 720 | pts. |
| L3138—G. N. Earl | 805 | „ |
| L4018—C. H. Thorpe | 215 | „ |
| L5065—A. Raftery | 165 | „ |
| L6028—B. Prosser | 115 | „ |

## INDIVIDUAL SCORES

**Section A (Portable, Phone)**

| | Pts. | | Pts. |
|---|---|---|---|
| VK1SB | 484 | VK3AGH | 32 |
| 2ASZ | 583 | 4ZK | 925 |
| 3ZRY | 280 | 5TH | 186 |
| 3AAW | 275 | 5ZF | 173 |
| 3ASW | 232 | 6MM | 162 |
| 3JO | 139 | 9X1 | 124 |

**Section B (Portable, C.w.)**

| | Pts. | | Pts. |
|---|---|---|---|
| VK1SB | 152 | VK5ZF | 318 |
| 2JM | 130 | 50R | 35 |
| 2YB | 122 | 9X1 | 24 |

**Section C (Portable, Multi-Op.)**

| | Pts. | | Pts. |
|---|---|---|---|
| VK1ACA | 901 | VK3CB | 1001 |
| 2BWI | 1176 | 3YS | 621 |
| 2ANT | 835 | 5TM | 800 |
| 2AWI | 758 | 5VE | 468 |
| 2ATZ | 413 | 5BV | 196 |
| 3AWI | 1648 | 6VF | 410 |
| 3RN | 1438 | | |

**Section D (Fixed Stations)**

| | Pts. | | Pts. |
|---|---|---|---|
| VK1LF | 195 | VK3ANG | 305 |
| 2APK | 750 | 3OH | 135 |
| 2AHV | 500 | 4LT | 685 |
| 2APQ | 215 | 5RG | 255 |
| 3APJ | 575 | 5CL | 50 |
| 3UM | 505 | 7SM | 775 |
| 3EF | 340 | | |

Check Logs VK3ZD, VK7RY

**Section E (Receiving)**

| | | |
|---|---|---|
| WIA-L2188—C. R. Christiansen | 720 | pts. |
| VK2—F. T. Kluth | 710 | „ |
| WIA-L2033—D. W. Shephard | 365 | „ |
| VK2—B. R. Mitchell | 315 | „ |
| WIA-L3138—G. N. Earl | 805 | „ |
| L3229—R. J. Halligan | 700 | „ |
| L3042—E. W. Trebilcock | 630 | „ |
| L4018—C. H. Thorpe | 215 | „ |
| L5065—A. Raftery | 165 | „ |
| L5067—T. C. Corbin | 45 | „ |
| L6028—B. Prosser | 115 | „ |

# SIDEBAND

By Phil Williams VK5NN.

To open this month's sideband notes I should live to voice appreciation to those who have sent me material for future notes. These will be acknowledged individually very soon, but will have to wait until urgent business at the "salt mine" has been despatched.

Our first portrait of a sidebander has been prepared, thanks to several friends who are to be nameless until after publication. This need not always be the case, however, as I have no doubt that shack photographs of active Amateurs, well known to the s.s.b. fraternity, will be forthcoming without undue pressure. I feel certain that, to have available in "A.R." a picture of the friend on the other end of a contact in his shack, operating the equipment pictured with him, will add much enjoyment to contacts. Those who have referred to the photograph taken at the Hamilton S.s.b. Convention in May, 1964, in contacts are many, and I trust the information will come forward to provide an interesting series of "Sketches of Sidebanders."

This month's technical discussion will not include particular circuits, but is an ideas column to give interested newcomers an introduction to home-construction of exciters.

The idea of getting on the air quickly and easily has frequently led embryo sidebanders to build the W2EWL "cheap and easy" sideband exciter. May I say, "please don't"! as having played with one of these I can advise against building a lot of generator, mixer, v.f.o. and amplifier circuitry all mixed up together in a Command transmitter box. The inter-action between tuning, band-changing, loading, carrier balance, and various other circuits has to be experienced to bring home the point that these little boxes are frequently real "beehives."

It is far better to start building with a simple, open layout behind a 19 inches wide x 10 inches high front panel, and what better model can be found for the home constructor than the Hallicrafters HT37 or HT32 exciters. The 37 is a phasing type exciter many thousands of which were made and are still giving good service, and the HT32 is its more sophisticated cousin which employs the crystal filter-type generator. Both generate the s.s.b. signal at 9.0 mcs., mix with crystal oscillators to intermediate frequencies about 5 mcs. from the various Amateur bands, and then subtract a 5.0 to 5.5 mc. v.f.o. signal to give the final frequency, which is then given two stages of amplification, the first a Class "A" 12BY7, and the final, two 6146's in parallel Class AB1.

In the frequency plan shown the only "nigger" is the third harmonic of 5.0 mcs. from the v.f.o., which falls at 15 mcs. when the transmitter is tuned to 14.0 mcs. This one can give a reading on the output meter if the exciter is used in the c.w. portion of the 20 metre band, but a single low-C, series-tuned, trap on the output of the second mixer, tuned to 15.3 mcs. is usually sufficient to attenuate the spurious harmonic when operating just above 14.1 mcs. There are no awkward band-pass tuned circuits required in this exciter, if plate and grid circuits of the 12BY7 driver are tuned with a 2-gang condenser—another reason why this design can be thoroughly recommended.

To get an easy and logical layout of the above design, a chassis 17 in. wide by 12 or 13 in. deep, by the usual 3 in. high, is a good starting point, and Fig. 2 shows such a design. You will see that the band switch right down the centre is the most important, with partitions below chassis, shielding inputs from outputs of the various stages. These should pass right beneath the sockets for the mixers and driver stage.

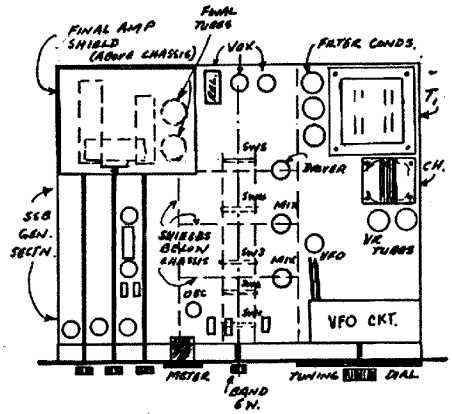



Fig. 2.—Typical layout for s.s.b. exciter.

Note how everything just falls into place! The s.s.b. generator and crystal oscillators feed mixer No. 1, the v.f.o. and mixer 1 output feeds mixer No. 2, and then the driver stage, with its output circuits below chassis, is just right for short connections to the output stage grids. The final pi-tank has 3 controls brought from the final stage shield box—all above chassis—to the front panel by long ¼ in. dia. aluminium shafts, as is the control for the driver tuning condenser.

In these modern days silicon diodes for power supply rectifiers take up no space and do not release unwanted heat, so the only components for the power supply which will take up space are the transformer and filter choke. Even the filter capacitors may be hidden away on the edge of the chassis near the diodes. If you desire, a separate power supply may save weight in the exciter.

These points have been discussed to show anybody who may be apprehensive about building his own exciter that the project may be just as easy as building a good superhet receiver. There is no high voltage or power until the anodes of the output stage are reached, and these are all boxed up in the shield, which is very useful as a safety barrier and a container for r.f., so that it won't get back to the earlier stages. From my humble experience with amplifiers, these r.f. class AB1 linear finals are very much easier to get working properly than class C plate modulated amplifiers, so I trust this discussion may leave you with the idea that perhaps an s.s.b. exciter is not beyond you after all. You can start with this open layout and get working on one or two bands first, say 80 and 20 metres for which mixer 1 and the crystal oscillator are unnecessary. Push-to-talk can be used instead of vox switching, and you have a spacious layout for wiring, but at the same time a companion unit on the table-top, alongside your receiver. There is room for experiments with new circuits such as transistor v.f.o.'s, special sideband generators — filter, phasing, third method, or what you will.

If you are interested in getting on s.s.b. for tens of pounds instead of hundreds, then you should start looking around for the parts, chassis, front panel, slow motion dial, pi-network components, transformer (about 300 volts per side at 150 to 200 mA.), a 100 mA. filter choke, a wide band r.f. choke for the final, nice knobs, flexible couplers, modulator diodes, power supply diodes, and lastly but perhaps most important, that wave-change switch. The latter will need at least four 5 x 2 pole switch wafers, and some very long shaft and spacer sections—hard to find?—yes, but not impossible to fabricate.

More details of these items which are universally applicable to sideband exciter construction, will be given in the next few months, together with their use in the particular circuits described.

Meanwhile, start a sideband circuit scrapbook, and put in it all the promising ideas, circuits, hints and kinks for alignment and adjustment, and good practices from the commercial equipment. You'll be surprised at how quickly you get a feel for sideband. 73, Phil VK5NN.

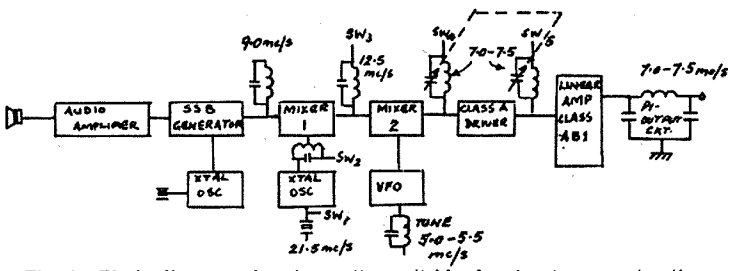



Fig. 1.—Block diagram of s.s.b. exciter suitable for Amateur construction. Frequencies shown for 40 metres. Switched circuits shown SW1-5.

So many exciters have been built using this arrangement of frequencies and similar layout that it does not need my recommendation. Figure 1 shows the block diagram of this arrangement for the 7 mc. band. You can soon work out the frequency arrangements for other bands, but, remember that for the lower frequency bands it pays to beat back from a higher frequency to the band you want, and it pays to use h.f. harmonic-type crystals to avoid the low frequency fundamental signals getting through mixers and amplifiers.

It is said that the following well-known rule for designing s.s.b. exciters was formulated by an Amateur in County Cork. Although somewhat contradictory, it contains good advice, viz.: "In an s.s.b. exciter no harmonic less than the fifth of a fundamental signal or oscillator, shall fall closer than within 20 per cent. of the final frequency." The implications are apparent if you remember that the mixers will make harmonics from anything applied to them.

☆

# *Publications Committee Reports That . . .*

As their meeting was so close to the closing date for receipt of inwards correspondence many readers overlooked this point, hence we will acknowledge next month all correspondence received after the 9th August.

This correspondence was received from VK's: 5FO, 3ZBD, 3ZKC, 3ZRY (tech. article), and N. Lynch.

Correspondents are again reminded that all matter for "A.R." must be received at the printers by no later than the 8th of each month preceding publication and if at all possible notes should be forwarded before the 8th of the month.

The Committee discussed in detail the forthcoming edition of the "Call Book" and agreed with a suggestion from VK2 and VK3 Council that additional items should be included in the next issue, which is due late October. This delay has been caused by the current schedules not being forwarded by the P.M.G. Department. It was agreed that the "Call Book" could carry more general information, but as we are already delayed and any amendment has to be approved by the P.M.G., it was considered that at this stage we should not create further delays. Therefore, your Committee will proceed with planning an entirely new "Call Book" for 1967/68 edition.

Readers are particularly requested to advise the Publications Committee if they prefer the existing size of the "Call Book" or if they would like the new edition to be issued in the same size as "A.R." If this latter step is agreed upon, then there would be some 80 pages in the new size book and it would be possible to scan four of the existing size pages at once. The Committee were not sure if the suggested size book would suit Amateurs due to the fact that it would occupy more bench space. We will await readers' comments before deciding upon the new size of the "Call Book," but if no preference is shown then your Committee will adopt the suggested new size layout, which will enable additional general information regarding contests, frequency tables, DX prefixes, W.I.A. awards, Y.R.S., and W.I.A. broadcast times to be included. This information could be added to the existing size book, but layout would be cramped. As soon as we know readers' preferences planning will proceed.

Remember, that the new edition of the Call Book should be ready late October and will be the same size as previous editions. Your comments will determine the size of the NEXT edition.

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AMATEUR FREQUENCIES:

USE THEM OR LOSE THEM!

# V H F

## 52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

I must apologise for the non-appearance of the main notes last month. Due to a misunderstanding I failed to have the notes available in time for publication. (And you were late again this month.—Ed.)

Reports of Trans-Tasman reception of 5A and O have been received. No openings were reported on the Amateur bands.

The use of net frequencies is growing on both 6 and 2. It is a great pity that some standardisation on frequencies could not be achieved. Of course, availability of crystals and local circumstances prevent reaching agreement, but the majority of the equipment in use are fixed frequency and a common channel is as good as a beacon. Use of 53,032 in VK3 and VK4 has produced DX when the band appeared otherwise dead.

Some enterprising Amateurs have provided variable tuning of receivers to cover all eventualities, but the crystal locked variety has its advantages operating mobile and helps when travelling interstate.

So far as known the following are active frequencies: VK3: 53.032 a.m. 52.525 f.m., some 50 odd a.m. and 6-10 on f.m. VK4 Ipswich: 53,032 a.m. VK5: 52.042 a.m., 15-17 active. VK6: 52.525 f.m., no known a.m. net. VK7: believed to be 53.035 mcs. Nothing known on VK2. On 2 f.m. Channels are 145.854, 146.0 and 148.146 in VK3 as Channel A.B.C. A is the most active with around the 100 mark with overflow to B. and C. VK2, 146 is the main Channel with some active on the lower frequency. Nothing known of other States.

### NEW SOUTH WALES

Activity has generally been slow during the winter months. The Ch. 0 Wagga station is being regularly copied in Nowra over a west/east path of 195 miles with signals between S3 and S9. A few 6 metre openings have occurred during the winter months judging by the reports from the 6 metre operators. Some 2 metre workings have occurred between Canberra and Sydney, and Orange and Sydney.

New interest in W.I.C.E.N. has led to the revived interest in the f.m. nets. Both old and new stations have appeared in the nets. A 50-watt base station is being installed at the Divisional Station VK2WI. It will carry the broadcast on Ch. B.

The next major Group activity will be over the New Year week-end when many field stations will be out on the State's high spots. It is possible that v.h.f. operators in other States may like to take part. The whole event could then become nation-wide. The event is still in the planning stage and details will be available in a few weeks.

The technical section of the Group are working on a project series known as the "Mobileer." The first unit is to consist of a complete 2 metre station built into a Playmaster case. The a.m. transmitter will have a QQE03/12 final, a push-pull plate modulator, a tuneable receiver and a crystal locked converter. The circuit is so arranged that it can be used as the basic unit for many things. It can be used to drive a high-powered final, supply modulation and tuneable i.f. for rigs on other bands. Anybody who is interested may like to contact David McNaughton, VK2ZVW, 2 Combe Place, West Pymble. 73. VK2ZTM.

### VICTORIA

The general 2 metre activity confines itself to spasmodic bursts plus the monthly scrambles produce a dozen or so participants. These are held on the 2nd Sunday of each month at 2045 hours. The fox hunts held on the 4th Wednesday each month attract some 20-30 people in 6-8 cars. Average of 7-8 hunts each evening in the built-up areas within 5 miles or so around the city.

432 mcs. (or thereabouts): The bulk of the activity is concentrated in the period 2000-2030 hours daily. Skeds between Melbourne and 3ZDM/ZPU at Ballarat continue. 5ZDR and 3ZDM have heard each other but a two-way has yet to be made. New stations are appearing at intervals. 3ZWV using a 3/6 final has a good signal and 3ZOW is at the testing stage. 3ATN running a 6/40 modulated tripler to 65 element beam up to 100 feet is S5 in Melbourne. Active stations are 3ZDM, ZPU, ATN, ZBZ, ALZ, AEE, AUX, ZAA, ZWV, ZSJ, ZPA, ZRG, YQ (? Pirate).

The second v.h.f. Convention will be held in Melbourne during the week-end of 9th-10th October. Generally it will consist of a social day on Saturday afternoon, evening and an activity day on Sunday. All will take place within the Melbourne area. More details will be available next month and up to the minute news via VK3WI on Sunday at 1030 hrs. 73, VK3ZCK.

### QUEENSLAND

VK4ZPL reports from Brisbane that VK4WI has at long last opened on 53.032 mcs. VK4IO, Ipswich and District Radio Club's station, will be operating after the news each Sunday and will take the 6 mx call back.

Congratulations to John 4PU and George 4ZLG who took the VK4 honours in the last Ross Hull Contest.

6 mx in Brisbane is still active. Each morning numbers of mobiles are heard.

Two, however, is another story. The pot is kept boiling with day and night activity. VK2 stations heard and worked recently were: 2OE, 144.71, 2AGE 144.015, 2GJ 144.000, 2ZFS 144.17, 2WQ 144.15 and 2ZCQ 144.69 or 144.15. These contacts have all been over 100 miles. Keep a look-out for the VK2's Sundays at 2000 hrs.

A new comer to the bands is ex-G3 Alan VK4AI. His interests include 144 Mc. s.s.b. 70 Cms. and a.t.v. 4ZPL.

### SOUTH AUSTRALIA

Activity within VK5 is slowly gaining momentum to attain the usual Christmas activity. 6 metre enthusiasts have recently found that a b.f.o. is an essential item to demodulate an influx of s.s.b. signals that have made their presence on the bands. The signals heard to date are those of Comps 5EF, George 5GG, John 5ZJH and Bob 5ZDX. Of interest is the exciter being used by Bob in that the unit is being constructed as a project-lecture to demonstrate the simplicity of gear required for v.h.f. s.s.b.

2 metre activity has decreased during the last few weeks due mainly to the t.v.i. troubles being experienced by Jim 5ZMJ at Port Pirie. Jim has voluntarily reduced his transmissions to avoid the harassment deluged upon him by irate viewers. However, it apears that the trouble being experienced is due to incorrect application of receiving appliances. Port Pirie is geographically located 120 miles N.W. of Adelaide, and until recently required fringe area antennas, boosters and the like. Recently the area has received a local Channel 1 transmission. Understandably, perhaps, the local viewers are still using their "fringe area" equipment, unaware they are causing their "own" interference. However, publication of the relevant facts in the local newspaper has prompted an investigation by the F.M.G.'s Department.

A highlight was the South-East Radio Group Convention held at Mt. Gambier on June 12, 13 and 14. In all an attendance of 127—excluding harmonics—registered with the organisers. On the Sunday, the main competitive section of the Convention was decided. After the re-broadcast of VK3WI by Col 5CJ, a 2 metre a.m. and f.m. scramble was conducted by Colin 5ZHJ. Eighteen a.m. mobiles and 11 f.m. mobiles contested two scrambles each with Peter 3ZAV, the eventual a.m. winner, and Bill 3WK, the f.m. winner.

After the "fox" hunts had been terminated the complete contingent converged in the Glenburnie Hall for supper, prepared by the mothers, XYL's and YL's of the S.E.R.G. members, and by reports to hand it appears that their efforts were more than greatly appreciated. Entertainment was provided by a local magician, who incidentally preferred to eat razor blades for supper; and Rob 5RG delivered an illustrated travelogue on his occupational accommodation at Macquarie Island and New Guinea.

To finalise the evening's entertainment the major prizewinners for various competitions held during the convention were announced, and were as follows: Winner a.m. Scramble, Peter 3ZAV; winner f.m. Scramble, Bill 3WK; winner Hidden Tx Hunt, Peter 3ZAV; runner-up, 3ZIW; 1st Fox Hunt, 3ZJF; 2nd Fox Hunt, Darrell 3ZNC; Best Constructed Mobile, 3ZIW; Most Helpful XYL in competitions, Mrs. Sutherland, XYL 3ZAA; Person working farthest distance to convention, Ron 3ZER; Person travelling farthest distance to convention, 5ZHJ from Gawler, S.A.

It was apparent that the convention had been most successful and a credit to the persons responsible, namely VK5's CJ, MS, ZKR, ZER, ZHL, ZGR, ZTN and Trevor Hutchesson. Saturday, June 19, saw the visit of the v.h.f. group to the St. Kilda Propagation Research Centre. Approximately 40 members attended and gathered by the questions asked and information gathered more DX may be scrounged out of the "ether" by the VK5's.

### WESTERN AUSTRALIA

From the VK6 v.h.f. Group News Bulletin for July, 1965, the following items have been noted. VK6ZCB has constructed a portable vidicon camera and has r.f. available on 438.75 mc. The 2 mx beacon has temporarily been discontinued following t.v.i. on neighbouring sets due to 52 plus 144 signals adding and causing t.v.i. on Channel 9.

Activity on the 52.525 f.m. net continues. VK6LR has been heard in Perth, a distance of some 50 miles.

VK6ZCF has been appointed scribe to these notes. Please pass your news items on to Barry early enough to reach VK3 by 2nd of each month.

### TASMANIA

A number of new calls have boosted 2 mx activity. At least five new stations have appeared near Hobart, three near Launceston and two in the north-west within the past few months.

During June VK3 t.v. appeared strong enough to support an opening, but unfortunately no Amateur signals were heard on the North-west Coast. Leigh 7ZLP recently was hospitalised with a 2 mx rig at his bedside.

A number of 53.035 Mcs. mobiles are appearing around Hobart. As they become available up north they will give activity a boost.

6ZDS is expected to visit Hobart for the A.N.Z.A.A.S. Conference in August. Any other participants are requested to contact me beforehand.

Please forward your news to 7ZAO for inclusion in these notes. News from all areas of VK7 should reach 7ZAO no later than the end of the month.

# D X

## VP4, OA4, BV, ZM7, 7GI, FP, AC5, MP4, ZC6, TY2

Sub-Editor: ALAN SHAWSMITH, VK4SS,
35 Whynot Street, West End, Brisbane, Qld.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

The low sunspot activity this past 12 months has surely jaded the most ardent DXer. There are always more enjoyable things to do than to spend fruitless hours staring hypnotically at the receiver dial with ears at the most sensitive notch. Without reward, this exercise is most wearing. If you are one of these the time might be propitious to make a comeback, because some good DX is to be worked —and more promises.

So blow the grime off the dial, dust down the key or shake up the mike and let's see what is doing.

### NOTES AND NEWS

**Western Carolines:** KC6AA Bill, on at 1130z on 14,258. Now QRT late September.

**Niger Republic:** 5U7AU Smitty. Reported on 14,242. No time given but 1930 might suit.

**Don Miller:** W9WNV and Chuck—K7LMU will leave the States during early August for a three-month DX-pedition to the Pacific and Far East areas covering about 10 countries that are in the "rare" classification. Details concerning frequencies, dates, modes, call signs, QSL manager, etc., are not known as yet but will be given as soon as they come to hand. Trip is expected to end late November or early December. Don has promised to sent direct QSL's immediately after QSO to those who have contributed $25.00 or more (wow). All others will receive their cards in the usual manner after the trip is completed. The number of countries visited will depend on number of donations. Contributions may be sent now to Ack W4ECI or to the World Radio Prop. Study Association.

**IFNI:** T12HP and EA2CA will make a full-scale DX-pedition to this hard-to-get spot. Operation to commence 20th September, for period as yet unknown.

**Christmas Island:** Don—VK9DR and VK9XI still active. Try listening 14,107 kcs. around 1230z or daylight hours at the week-ends.

**San Marino:** KH6EDX/MI is as of now active on 14,283 around 2130z.

**Sierra Leone:** 9L1JR on 14,120 at 2100z, QSL to Box 907, Freetown.

**Andora:** At this moment PX1EQ is very active on 14,125 kcs. around 1700z. QSL to Helmut DL9JL.

**St. Vincent:** VP2SK and VP2SM reported on 14,120 at 2100z. QSL to Box 44, St. Vincent.

**Balearic Islands:** EA3OT will sign /EA6 on 20 s.s.b. early September. No fqs. or QTR available.

**MP4TAQ:** Win is now signing VP7DL and expects to be in the Bahamas for three years. If you did not receive a QSL for this MP4 stint try a card to his VP7 call via buro—or direct.

**Ethiopia:** ET3USA on 14,110 is on almost daily now. No information on duration of stay. Try around 1600z if the band is open. QSL to K7UCH. His signal is a big one from a 50-ft. high beam from a 4000 feet elevation.

**Marshall Islands:** KX6BO on 14,228 at 1300z or late afternoons our local time.

**Ascension Islands:** Woody ZD8WZ is said to work 14,290 around 2000z. QSL to W4TVQ.

**Tokelaus and Tonga:** ZM7 and VR5 operation is rumoured to commence soon. Further information if it comes to hand. These prefixes are probably on the list of the Don Miller W9WNV DX-pedition.

### MEMO TO THE DX MEN OF AUSTRALIA

October is VK / ZL / Oceania Contest month and this is **your** Contest. The phone section is on the week-end of the 2nd and 3rd; c.w. on the 9th and 10th. Full details appear in August "Amateur Radio," page 12.

Take part this year and help make the Contest a success. It cannot be if there are no VK stations on the air. Because of lack of activity in recent years, there has been a suggestion that this, Australia's own DX Contest, be discontinued. Don't let this happen—make DX contests **and submit your log.**

**Gough Island:** ZD9BC on 14,240 c.w./a.m. phone (yes, c.w.). Mostly at week-ends. Will be there for two years approx.

**Guinea Republic:** 7GIQ on 14,022 at 2030. QSL to W3ZBG.

4X0TF, Tvsi of 4X4TF, it is reported may extend his operation into September if he can. Mode s.s.b., but no other information available.

**Ellice Island:** Pat VR1S, 14,250, 1230z. Call on his fq.

**Samoa:** 5W1AD just commenced on 14.010 approx and furiously working W's. This looks like the start of the Don Miller stint mentioned above.

**India, Ceylon: Near East and Iran Areas:** VU2GW, VU2LE, VU2FB, 4S7DA, 4S7NE, 4S7RN and many of the more rare U prefixes such as UG, UI, UJ, UO, UL7, UM, etc., are easily workable daily around 0130z at the c.w. end of 14 mcs.

**Saudi Arabia:** Remember HZ1AB with the S9 sig.? The call is again being heard at various places on the 14 mc. band. Listen around 14,273, 14,232, 14,255, etc., from 1400 to 1700z hrs. Home call is K2SZS.

**Yemen:** 4WIC works VK's on 14,245 approx. Calls on 14,103 sometimes.

**New Hebrides:** YJ8BG and YJ8XX are both active. The latter is VK2AEY. Try him on 14,243 around 0330z. The former is often on 21 with a.m. mode.

**Macqnarie Island:** Trevor VK0TO skeds W land around 0400z. Fq. 14,270.

**Aden:** VS9AWR Bill is working 14,260 around 1730z. QSL to Wg.-Cmdr. D. Reid, C/- Officers' Mess, Steamer Point, R.A.F., Aden. Several others are usually active from this place on other bands and modes.

### QTH's

If you need a QSL from any of the following, the logs are at W2GAK: P.O. Box 7388, G.P.O., New York 10,001. Send s.a.s.e.

AC8H, AC9H, AC9H/AC3, G3AWZ, VR1N, VK9BH, F9RY/FC, F9UC/FC, VK9DR, MP4TAX, MP4MAP, MP4MAP/HZ, HZ2AMS, YV0AA/MM, YV0AA, VK9MD, VK9XI, ZD6PBD, OH2AH/0, OH2YV/0, VP8HF/VP8, VP7NY, HZ2AMS/8Z4, HZ2AMS/8Z5, YV8AJ, I1RB/ISI, ZD6I, 7QDI, 7Q7PBD, 7GIL, 6Y5LK/VP5, KG6SZ, YV9AA, K2JGG/YJ, I1RB, CR5SP.

### SUMMARY

Those who follow the DX-peditioners seem assured of getting their money's worth of the rare prefixes, as more adventurous souls are planning operations from new pastures. This is good incentive for overall Ham activity—good enough to buy promotion by commercial interests. Under the influence of progressive thinking the fixed idea of classifying countries according to their boundaries, may slowly give way to a rather more pliable one, of classifying "areas"; more may be heard of this later —we surely are running out of countries, as such.

This also, is the era of Award Hunting: some being worthwhile, some not. One former is the International AH Club (Award Hunters' Club), open to all who can show proof of having obtained firstly, 25 Awards, with Stickers added for progressive attainments. Several VK's should be eligible for this Award. Good Hunting and DX. 73, Al.

## W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

### PHONE

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK5MS | 24 | 320 | VK2JZ | 61 | 235 |
| VK5AB | 45 | 312 | VK2ADE | 65 | 231 |
| VK6RU | 2 | 307 | VK6KW | 4 | 211 |
| VK6MK | 43 | 305 | VK3WL | 14 | 211 |
| VK3AHO | 51 | 301 | VK4HR | 12 | 208 |
| VK4FJ | 21 | 283 | VK2AAK | 58 | 208 |

Amendment:

| | | |
|---|---|---|
| VK3TL | 62 | 207 |
| VK2APK | 64 | 177 |

### C.W.

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK3KB | 10 | 331 | VK2AGH | 71 | 274 |
| VK3CX | 26 | 306 | VK2EO | 2 | 266 |
| VK2QL | 5 | 305 | VK6RU | 18 | 262 |
| VK4FJ | 29 | 300 | VK3AHQ | 79 | 260 |
| VK2ADE | 81 | 298 | VK3ARX | 66 | 250 |
| VK3NC | 19 | 286 | VK3XB | 75 | 247 |

Amendments:

| | | | | | |
|---|---|---|---|---|---|
| VK3RJ | 42 | 230 | VK3TL | 78 | 212 |
| VK2APK | 76 | 230 | VK3KS | 74 | 194 |

### OPEN

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK2ADE | 28 | 322 | VK2ACX | 6 | 300 |
| VK6RU | 8 | 312 | VK3NC | 77 | 287 |
| VK4FJ | 32 | 308 | VK3JA | 43 | 271 |
| VK6MK | 74 | 307 | VK4HR | 7 | 254 |
| VK3AHO | 76 | 305 | VK2VN | 18 | 247 |
| VK2AGH | 83 | 305 | VK7IZ | 23 | 242 |

Amendments:

| | | | | | |
|---|---|---|---|---|---|
| VK3TL | 85 | 235 | VK3SX | 93 | 123 |
| VK2APK | 82 | 242 | | | |

New Member:

| | | |
|---|---|---|
| VK2ANO | 96 | 101 |

# YOUTH RADIO CLUBS

We have all noticed, probably, that the great majority of our clubs are in secondary schools but nobody should take this as the only possibility. A Y.R.C.. can be formed with any number of members anywhere. It is certainly easier to form one where a number of young people are grouped together as in schools, Scout groups, Y.M.C.A., Police Boys' Clubs, Church Youth organisations, etc., but it is not essential.

Successful groups have been formed in many centres by merely getting the right publicity. Any instructor offering his services will soon find a meeting place. With a little ingenuity he will find that the flow of used equipment, although irregular, can be kept going. Instructors are the vital element — you're always needed if you have a few hours to spare.

Interesting news comes from Malaysia. Mr. C. C. Hiew, former Club Leader at the Secondary English School, Pontian, Malaysia, has been sent to Teachers' College at Penang for further science training. He writes: "Acting on the suggestion of a Teachers' College Radio Club, I have the good news that it is well under way. The physics lecturer has been quite enthusiastic and a committee is being formed. The club will run as an affiliate of the Science and Maths. Society." Good luck to Mr. Hiew. Club leaders who can help in any way from advice upwards are asked to write to Mr. C. C. Hiew, 11C, Hutton Lane, Penang, Malaysia.

The new Science syllabi ('buses if you prefer it!) for 4th, 5th and 6th year students in N.S.W. High Schools pay a great deal more attention to Radio and Electronics than ever before—so much so, that many academically qualified teachers will need a new emphasis in part of their training and also immediate help in the schools that can ideally be given by those with practical qualifications in the electronics industry—and that includes Radio Amateurs. In N.S.W. the 4th year Syllabus is in action this year and the new 5th and 6th year Syllabus goes into use in 1966. I don't know the situation in other States but it should be worth while for the Divisions to investigate.

Safety precautions are important in any Y.R.C. Nobody at the elementary or junior level should be allowed to handle anything more lethal than a 9-volt battery. Intermediate Certificate candidates should only be trained in the use of a.c. mains if their parents request it and guarantee to supervise. All high voltage and a.c. points in club equipment must be protected from accidental contact. The Electricity Authority of N.S.W. issues a pamphlet, "Use Electricity Safely," and Club Leaders should consider getting one of these for each member. Boys are apt to become over-confident and not only their welfare but also that of the Y.R.S. must be considered. The proper treatment for electric shock should be taught and posted as a notice in the clubroom.

Congratulaions to John 5UL and Bruce 5OR, public-spirited types who will lead a committee to handle VK5 Y.R.S. activities while Bob 5OD is overseas. The word is that they will expand Y.R.S. activities. I.C.S. have donated a course in basic electronics for a club member. If I am not already excommunicated in VK5, fellows, let me have a little news later. All our officials are unpaid, so I realise it takes a good type to volunteer some spare time to organise at Division level or become a Club Instructor.

What a lot of interesting careers are waiting for all your Y.R.S. types! The Australian Broadcasting Commission is looking (in September) for Technicians-in-Training between 15 and 18, with Y.R.S. work a definite advantage. The Overseas Telecommunications Commission will be calling for trainees, in October, or November, for a three years' course of great opportunity.

Automation will never put you out of a job if you do courses like these.

The American system of Novice Licences (current for one year only) has a great deal to recommend it for this country. India and Israel have got it. The Russian training in radio for young people is highly organised for the obvious benefits to the country and offers privileges like those in America. In China, primary school children learnt the elements of electronics by building simple radio sets. Can we afford to be left far behind? The Federal Government's interest in Science Education could lead to an enlightened attitude to Novice Licences, which, as an incentive towards higher qualifications, could do a great deal of good at practically no cost. Many of us in Y.R.S. work feel that the full possibilities of Y.R.S. cannot be realised without the incentive of a temporary Novice Licence for young people and special concessions to enable busy Science Teachers to have a School Transmitting Station in action without a full A.O.C.P. (proper control and certain restrictions would still be necessary, of course) . Would Club Leaders and others please support this through your Division and also by telling Rex 2YA what you think?

Which one of my four readers will send some news this month? Ken 1KM.

☆

# NEW CALL SIGNS

**MAY, 1965**

VK1AQ—N. McLeod, 33 Canberra Avenue, Forrest, A.C.T.
VK1ZCC—L. G. Carpenter, 92 Phillip Avenue, Downer, A.C.T.
VK1ZMR—D. R. Miles, 7 Stow Place, Watson, A.C.T.
VK2ML—G. B. Hart, 213 Kingsway, Cronulla.
VK2ZDQ—H. K. Bavister, 488 Blaxland Road, Eastwood.
VK2ZFF—P. C. Goldstone, 134 Byangam Road, Murwillumbah.
VK2ZFM—R. J. Shapcott, 33 Clark Road, Hornsby.
VK2ZGM—G. T. Morrison, 20 Farm Street, Boorowa.
VG2ZHP—H. J. Pemble, "Breena," 89 Raunders Bay Road, Caringbah.
VK2ZIN—D. W. Bursill, 47 Drumalbyn Road, Bellevue Hill.
VK2ZKN—C. A. A. Nieuwendyk, 228 Margaret Street, Orange.
VK2ZLN—J. T. Hart, Flat 6, 69 Addison Road, Manly.
VK2ZOZ—R. M. Smith, 6 Central Avenue, Eastwood.
VK2ZPV—V. G. Punch, jun.—C/- Four Square Store, Budgwoi.
VK2ZRX—R. Soulle, 17 Jane Street, Randwick.
VK3AAR—J. Wall, 33 Calvert Street, North Geelong.
VK3AFB—F. Blode, 53 Clay Street, Moorabbin.
VK3ANF—K. Tsiaprakas, 113 Walpole Street, Kew.
VK3ZGY—J. Monro, 75 Devonshire Road, Watsonia.
VK3ZHU—R. B. Knaggs, Wangaratta South.
VK3ZJE—K. G. Moncur, 235 Union Road, Ascot Vale.
VK3ZNK—F. J. Heine, 73 Duff Parade, Lower Plenty.
VK3ZPI—P. R. Hammer, 285 Bay Road, Cheltenham.
VK3ZPS—Dr. D. R. Blackman, 23 Mary Street, St. Kilda.
VK3ZQE—J. A. Evans, 9 Bon Vue Road, North Balwyn.
VK3ZRN—A. L. Harvey, 6 Orrong Road, Elsternwick.
VK3ZSA—A. J. Skewes, 56 Sisely Avenue, Wangaratta.
VK3ZTG—R. J. Seal, 3 Carlisle Crescent, Oakleigh.
VK3ZUL—G. W. Jones, 12 Mendip Road, Reservoir.
VK3ZGV—B. D. Judd, 23 Ralton Avenue, Glen Waverley.
VK4JX—K. J. Drummond, 17 Coronation Street, Bardon, Brisbane.
VK4OX—R. C. Marschke, 50 Leeds Street, Gulliver, Townsville.
VK4ZGR—G. Rees, 92 Fuller Street, Windsor, Brisbane.
VK4ZJG—J. G. H. Rowell, 267 Ellison Road, Geebung, Brisbane.
VK5RY—R. F. W. Collins, 5 Dean Court, Clovercrest, Modbury.
VK5VS—A. V. Sneidze, 78 Reid Avenue, Hectorville.
VK5ZAL—A. L. Purnell, 18-A Arnold Street, Underdale.
VK5ZKX—J. M. Ramsey, 34 Dunrobin Road, Hove.
VK5ZLO—D. L. Price, 53 Robert Court, Para Hills.
VK6IC—G. Cole, Postal Address: P.O. Box 310, Kalgoorlie. Station Address: Trafalgar, W.A.
VK6ZBV—B. E. C. Varley, 79 Stubbs Terrace, Daglish.
VK8ZCP—B. T. Pagoda, 17 Sydenham Street, Rivervale.
VK6ZCU/T—A. A. J. Cook, Postal Address: Box 84, P.O., Kellerberrin. Station Address: Great Eastern Highway, Kellerberrin.
VK6ZFG—I. G. Iskra, 26 Boundary Road, St. James.
VK6ZFH—G. C. F. Hufner, 234 Ninth Avenue, Inglewood.
VK6ZFP—R. V. Parkes, 21 Angelo Street, South Perth.
VK8AM—A. M. Dunn, 752 Dempsey Place, Rapid Creek, Darwin.
VK9ZBB—B. D. Bannister, C/- A.W.A., Lae, T.P.N.G.

# S W L

Sub-Editor: Don Grantley, WIA-L2022.

[Your new scribe needs no introduction, only possibly to the new members of the S.W.L. movement, and for their information, he has been an outstanding S.W.L. for some considerable time, so with the valuable experience gained during that time, will be a very competent person to compile our page each month. I would like to take this opportunity to thank all those who assisted me during my term and trust that they will continue to give the same co-operation to this able member.—Chas. L2211.]

Eight years ago I sat in the shack at Holbrook taking part in the R.D. Contest. The equipment which I used was a battered old R1082, the antenna was a long wire. I did not exactly set the world on fire with this effort, but it was a comeback to Amateur Radio after a period of six years' absence. Since that time I have met many S.W.L.'s and Amateurs, cultivating many friends from their ranks. Any success I have had is due to the help and encouragement I received from such stalwarts as Eric Trebilcock, Frank Hine, Dave Duff and many others in the early part of my listening career. To all these chaps I take this opportunity to encouarge others to this wonderful hobby.

For some time my good friend Chas. Aberneathy has been writing this page with your help and doing a mighty fine job of it, now he feels that he would like a spell, and I have taken over this task which cannot be done properly without the help of all who are in any way connected with swl'ing as a hobby. So chaps, I will be pleased to hear from old friends and new at my new address in the Blue Mountains before the end of each month. N.S.W. listeners, however, would you please send all bulletin notes to Chas. as before. Format of this column will differ slightly this month, but will return to normal next issue.

It is interesting to note in Monitor, official magazine of the I.S.W.L., that S.W.L.'s are held in high esteem by K8UNI and members of the Michigan South-eastern Radio Club, who have had valuable reports from G listeners on 160 metres. Not that it concerns us here I guess, but stations in the Detroit area are heard on 1806 or 1820 mcs.

### OVERSEAS NEWS EXTRACTS

G3UDN is the station of the Mid-Warwickshire A.R.S. at Leamington Spa. Station is active on all bands and they want reports—good, accurate reports that is, from any overseas stations. Congratulations to Eskil Eriksson from the VK S.W.L.'s, during April he received two confirmations to take him to 301 confirmed, making him we believe the first S.W.L. to reach the 300 peg, and thus the top S.W.L. in the world. Having trouble getting QSL's from UB5, then I.R.C. to Joe Kleinmann, P.O. 97, Mukatchevo, Ukraine, U.S.S.R., could help with UT5DK, DL, DM, DU, UB5AOQ, DNB, DMM or VH.

News from SV1 to the effect that there is much pirate activity in that country, and the only licensed Hams are in the SV1AA to SV1BD group. Don't waste a report on any others, as they are not licensed and will be returned to you. On the DX front overseas it is to be noted that 10 metres is on the improve, and openings to many African and Asian countries are reported. 15 metre reports show, too, that this band is a source of good DX to the European S.W.L. That should put Peter Drew and the VK6 boys in the firing line for some more countries. Thanks to "Monitor" for the foregoing notes.

### AUSTRALIAN NOTES

Most of this information has been passed on to me by Chas., and has been answered by him. For this month only, I am giving you this section of news just as it comes to hand without breaking it up into States, however, as stated previously, we will return to normal next issue.

First letter is from Noel Harrison, L3101, of Sunshine. Cold wx has hindered his listening but reception of a W7 has added to his States' tally. Over to Allan L6029, who mentions that his latest confirmation TF2WJF has never contacted a VK. He is heard on 20 metres daily 14,230 to 14,280 Kcs. at 0700z to 0745z. Alan gives an excellent list of countries heard. And Geoff L6030 tells us he has the 50-foot wind-up tower erected with nothing on top. See if you can confiscate a copy of the CQ Antenna issue of 1958 also 1959, you may find a small beam in one of them. And whilst on the VK6 group, we have Bryan L6023 with some good listings—CT1, YO, LU on 20 to name a few.

Back to VK5 for a letter from Alan L5065 who found the bands quiet with DX to North America each week-end and odd openings to South America and South Africa. Alan tells of his QSL's received, including PJ, YS, OA, TI, to name a few. A long and interesting letter from Greg of Newtown, Tas., one of the most interesting letters I have ever handled in Amateur Radio. I, too, will answer you in person.

From Ray L2287 comes his additions to the ladder, and reports of a very fine batch of QSL's. 3W8, FZ, HA, CR6. Colin 2188, of Booragul, has a 20 metre dipole in operation, and is very pleased with the results. From Warwick L3211 word comes of new QSL's to hand from 9M8, ZL3VB and OD5BZ, another five confirmed will take him into the 100 group.

And whilst on the subject of VK3, Chas. has passed me a screed from Eric L3042. One day I will pick up one of Eric's letters and read that Footscray beat the Magpies . . . it can happen, Eric, I've seen it. To briefly summarise Eric's notes, he has 37 QSL's to hand from VK2, 3, 5 and ZL on 1.8 mc., which is a f.b. effort and one which not many of us can get near. How about it chaps? Inwards QSL's: DU9FB, FB8WW, JA1DMX on 3.5, OA4AO, OA4CG, PJ2MI, VU2NRA, YI2WS, K7LMU/3W8 plus 2 MM's . . . a few more confirmations from /MM stations will give Eric his 200th QSL, from this type of station, this is probably another first. It is evident from Eric's list of stations heard on 40 metres that this band is doing the job, last night I heard quite a large number of countries in the c.w. segment of the band but nothing to compare with XE, KR6, UF6, UR2, 9M2, 9M4, UP2, UD6 and VR4, which Eric reports hearing on this battered old band.

Whilst in Melbourne we have a long letter from Harry Major who over the years has done such a fine job with the young chaps. Thanks ever so much for your interest OM, keep up the good work . . . From Greg Earl comes word that he has received QSL's from UB5, ZP5, HM1, K5, KR8, 9M8, HB9 and VU2. Good work Greg, your ladder additions noted. No word this month from VK4. Where are you Afton? My good friend Mac Hilliard, now resident here in Sydney, is going along steadily but like us P.M.G. types is not overburdened with spare time.

Finally, from Ian Woodman L3006 comes a report that 40 members took part in a tour of the Herald-Sun newspaper building and were shown just what it takes to produce a daily paper. The lecturer for the July general meeting was from the fire brigade and spoke of communications in relation to fire fighting. The amount of gear brought along to the July radio construction night was down on previous nights. Ian requests from chaps who want gear adjusted at these nights that they contact the instructor beforehand so that the correct type of test gear is available to do their job. Maurie Cox, where are you, what are you doing?

From the SWL's who are active but do not send in a report we need your support at this vital stage in the life of our hobby. All letters will be answered and the more interesting information I can collect from our own chaps the less I have to import from overseas sources.

Now for a final on the personal side, I have renewed my acquaintance with many of my radio friends over the past few months, some by letter, some by telephone and others in person. Let me, however, place on record my personal sadness at the loss of my old pal Barney Smythe. Over the years he and I worked together behind the scenes on many an occasion, and it was only a few weeks ago I learned of his passing. Thanks for your friendship and help, Barney, you will be ever remembered at L2022.

L2022 came back on the air after a break of six months during July, still using the AR7, and an antenna which was only 4 feet from the ground and tied to a tree. The DX was staggering, although no actual logging was done, it was evident that the new QTH at Hazelbrook when coupled with the old V beams will put 2022 back in business once again.

### CARD SWAPPERS

I have a list of SWL's anxious to swap cards, and whilst we all have our own opinions on this subject, I pass them on to any who may be interested. KBD3846 Daisy May Racine, 82 Furnace St., Danielson, Conn. KKB0962 Roy Morrison, Box 163, Brooklyn, Conn., WB2DTW Rick Shaper, 85 Elm Drive, Roslyn, New York and WA8AWH Mick Wislocki, jun., 6809 Chambers Ave., Cleveland, Ohio, 44105 Cuyahoga County, U.S.A. Reminds me that Ron Hughes, 214 Bishopsgate, Bank Chambers, London, E.C.2, is compiling a list of members wanting to swap cards. I know nothing more other than this note which appears in the current "Monitor."

### COMMERCIAL DX

Whilst these interests are the sworn enemy of Amateur Radio, there are some which warrant a mention, one of these is the giant hydro-electric powered station at Quito Ecuador, South America. HCJB operates in all bands and for anybody who needs an HC QSL they will confirm all reports 100% via Box 691, Quito.

### OVERSEAS LADDER

As mentioned earlier Eskil Eriksson, of Sweden, heads the lists, and our Eric Trebilcock runs second. Countries are running out for these chaps, and with the world situation as it is, we wonder if our boys will ever breach the gap. It is one thing to hear the DX, another to get the report.

### S.W.L. COMMENT

Much has been said and written in the past re the low percentage of returns S.W.L's are receiving in return for their cards. There is no doubt that many of the non-returns are due to the attitude of the Amateur receiving them, however, there are many other reasons to be taken into consideration and a major one is the fact that many of us just don't think hard enough when we prepare a card. I have in the past been one of the worst offenders in this category, and no doubt some of you, too, have been guilty of sending out reports that represent no value whatsoever to the chap who is on the receiving end, and believe me most of the chaps want a report that is of some use to them. The Russian Amateur, however, seems to QSL to anything and everything, in fact, I have a 95% return from stations with any of the U prefixes, all of which I send direct to Box 88, Moscow. In passing I note the card of UQ2AB which reads . . . this card is confirming that S.W.L. . . . heard my etc.

So chaps that winds it up for this month, remember that we would like to hear of your doings in order that this page may remain truly representative of the Australian Listeners. To those chaps who have been disheartened by the attitude of others to our section of the hobby, remember that it is up to us to make our s.w.l groups what we want them to be. We are financial members of the W.I.A., and as such are entitled to a voice in any affairs which may arise concerning us . . . but it is most important that we discuss any difficulties which we may have with our Federal Councillor in order that he may assist us, after all that is the reason why he is in office. Best of luck and good DX. 73, L2022 Don.

### S.W.L. DX LADDER

| | Countries Conf. | Countries Hrd. | Zones Conf. | W States |
|---|---|---|---|---|
| E. Trebilcock .... | 286 | 292 | 40 | 50 |
| P. Drew .... .... | 169 | 259 | 37 | 39 |
| D. Grantley .... | 127 | 285 | 39 | 35 |
| A. Westcott .... | 102 | 159 | 34 | 11 |
| L. James .... .... | 95 | 191 | 33 | 15 |
| R. Kearney .. .... | 94 | 149 | 32 | 8 |
| W. Smith .... .... | 95 | 188 | 30 | 7 |
| M. Hilliard .. .... | 92 | 241 | 33 | 14 |
| G. Earl .... .... | 89 | 165 | 33 | 15 |
| N. Harrison .... | 63 | 183 | 32 | 38 |
| A. Rafferty .. .... | 41 | 161 | 24 | 9 |
| B. Macintosh .... | 20 | 63 | 17 | 4 |
| B. Prosser .. .... | 34 | 164 | 12 | 5 |
| T. Corbin .. .... | 13 | 34 | 9 | — |

# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL

### FEDERAL EXECUTIVE MEETING, 16th JUNE, 1965

Arising from the previous meeting, advice had been received from the Customs Department that duty free admission of a narrow band filter had been agreed. Reference Y.R.S. matters, it was agreed that all out-of-pocket expenses would be reimbursed to the Federal Co-ordinator, Rex Black, and the Activities Manager was to inform him to this effect, also conveying to him the need to take on less of the detailed organising work in N.S.W. and more of the overall co-ordination. Certificates would now be standard throughout the Commonwealth, and the Co-ordinator was at the same time granted an imprest of £10. The Business Manager reported that the "QST" subscription fund was now self-supporting and new subscriptions were continuing. The Communications Manager reported that he and Activities Manager had reviewed the R.D. rules and minor changes made. He had also prepared an article for publication in "A.R." suggesting major changes which would be shortly sent for publication. Mr. Ken Pincott was present from the VK3 Division to inform members of proposed changes to "A.R" and to discuss housing of F.E. equipment. The major point of the meeting was spent in discussing proposed changes to the Handbook and the detailed technical aspects of s.s.b. power measurement.

### FEDERAL EXECUTIVE MEETING, 7th JULY, 1965

Correspondence was received after confirmation of the minutes of previous meeting. The major items were letters confirming that reciprocal licensing arrangements had been concluded with the U.S.A. on June 25, the P.M.G. notification of use of frequencies on 420-450 mcs., the information that Maj.-Gen Dougherty would open the 1965 R.D. Contest, information on the requirement for high power permits for special moonbounce experiments, and letters of appreciation from several Divisions for early receipt of Convention Minutes.

The Secretary reported of further discussions with the P.M.G. re s.s.b. power measurement and several other points which required clarification. The Activities Manager explained of some difficulties in obtaining N.F.D. Contest results and the action he proposed taking to rectify. A lengthy discussion took place on the proposals re the Handbook to be submitted to the P.M.G., for which purpose, Mr. Owen (the VK3 Councillor) had been asked to attend and assist. Further details were to be requested from VK2 re their proposal for a free A.O.C.P. course for the School of Pacific Administration before any action taken. Some discussion also took place on the question of future I.T.U. representation and documents dealing with this matter were to be requested from the present representative. Until a full statement of expenses had been received from the Y.R.S. Co-ordinator it was resolved to forward him an advance payment of £25.

### I.A.R.U. CALENDAR, JUNE, 1965

It was reported that the I.A.R.U. came into existence just 40 years ago, on April 17, 1925, when 23 nations, including Australia, formed the Union.

As most philatelically-minded Amateurs will know, the I.T.U. this year in May celebrated its 100th Anniversary and will top off celebrations with a Plenipotentiary meeting in September. This meeting will only deal with administrative details of the Union with several variations to its structure, but as it is not intended to deal with regulatory matters pertinent to Amateur Radio, official observers will not be invited to attend. It may be decided at this meeting when the next frequency allocations convention will be held. The I.A.R.C., whose active members are mainly I.T.U. employees, will hold its third Amateur Radio Convention between September 17 and 20, and it is hoped this Club will be able to carry on its good public relations work relating to Amateur Radio with national delegates who attend the I.T.U. conference.

From the 4th-6th March this year, the Region II section of the I.A.R.U. met in Lima, Peru, to discuss Amateur matters. One major item was whether the old Amateur Society, R.C.C. (Cuba), was still in existence as an application had been received at h.q. for the A.N.R.A.C. (Asocciacion Nacional de Radioaficionados de Cuba) to represent Cuba in future. This will be further looked at by the I.A.R.U. and a vote if necessary will be taken of member societies. The Region I Executive of the I.A.R.U. held a meeting in Yugoslavia on July 10-11, with a view to a Region I conference in May, 1968, when European matters of concern to Amateurs will be discussed.

It was announced that the following countries had now reciprocal licensing arrangements with the U.S.A.: Australia, Belgium, Bolivia, Canada (under an earlier agreement), Costa Rica, Dominican Republic, Ecuador and Portugal. The first operating permit granted under the new agreement went to Mrs. Grace Glorioso TI2MAG, who is living in Louisiana.

It is pleasing to report that on the 12th February, 1965, through the stalwart work of the A.R.A.L., Lebanon restored operating privileges to its Amateurs.

Newest call sign change goes to the Cayman Islands where former VP5 licensees now sign ZF1 calls.

Due to previous voting proposals, two new societies have been admitted to membership. These are Radio Society of Zambia (R.S.Z.) and Bahamas Amateur Radio Society (B.A.R.S.). The W.I.A. joins with the I.A.R.U. in wishing them every success in the future.

As is becoming all too usual these days, this Calendar contains a list of stations monitored by the I.F.R.B. in Amateur bands from October, 1964, to March, 1965. Stations that may possibly be heard in Australia are shown below:—

| | |
|---|---|
| Peking, broadcasting | 3500, 3659, 3669 |
| Pyongyang ,, | 3560 |
| URS, fixed, A1 | 7006, 7019, 7024 |
| Karachi, broadcasting | 7009 |
| Pakistan ,, | 7020 |
| Peking ,, | 7034, 7060, 7080 |
| KUI 20, fixed "A1 | 7040 |
| Cairo, broadcasting | 7050, 7073 |
| RVZ 73, fixed A1 | 7074 |
| Indonesia, broadcasting | 7089 |
| Moscow ,, | 7090, 14,320 |
| Teheran ,, | 7093 |
| Vatican ,, | 14,209 |
| Cambodia ,, | 14,308 |
| BXR, fixed, A1 | 14,336 |

Any VK Amateurs hearing these stations or others not listed should obtain a report sheet from their Divisional Secretary, who should forward these to Federal Executive for action. Full details, as contained on the sheet, should be obtained.

The admission of a proposed new member to the I.A.R.U. was voted on by the Executive, and in view of the information supplied by h.q., it was resolved to vote for the admission of the Nigerian Amateur Radio Society (N.A.R.S.). A completed vote sheet has been forwarded to the I.A.R.U. on behalf of the W.I.A.

### FEDERAL CONSTITUTION ALTERATION

Federal Executive, on behalf of the Federal Council of the Wireless Institute of Australia, hereby gives notice that it is intended to alter the Federal Constitution of the Wireless Institute of Australia 1947 as follows:

(a) by adding the following words at the end of Clause 3 thereof: "and to form a Company to take over the real and personal property belonging to and to give an indemnity against all or any of the liabilities of the Institute and to pay the costs charges and expenses of such formation and to transfer all the assets of the Institute to such Company."

(b) by adding a new Clause 67a after Clause 67 thereof as follows: "67 (a). Upon the incorporation of the Company referred to in Clause 3 of this Constitution, the Institute shall be dissolved and the assets of the Institute shall be paid and transferred to the said Company in consideration of the said Company indemnifying the Institute, the Council, the Executive and members against all costs, expenses and liabilities."

Any member of the Institute not in agreement with the proposed alterations should notify his disapproval with the reasons to the Federal Secretary within 14 days of the publication of this proposal.

### I.T.U. FUND

As at the 8th August, contributions to the fund, as a percentage of the target set at the Sydney Convention are as follows:—

| | | | |
|---|---|---|---|
| VK2 | 22% | VK5 | 54% |
| VK3 | 50% | VK6 | 103% |
| VK4 | 50% | VK7 | 100% |

These figures do not necessarily represent all monies collected in Divisions but only those received by the Federal Treasurer. Please keep those contributions flowing to your Division to assist in protecting your privileges.

—Bill Mitchell, VK3UM,
Federal Commns. Manager.

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## FEDERAL QSL BUREAU

Watch out for Lew W6EYB who is going on a DX-pedition to British Honduras and will be located at Belize. Call sign to be used and date of operation not yet known. Lew will use 14 mc. mainly and will set aside one night exclusively for VK/ZL contacts.

Mention was made in this column over 12 months ago of an impending stay in VK by Rex Glem ZL2ASM. Unforseen circumstances have delayed his arrival, but he will definitely arrive in Melbourne on 28th September. He will remain here for three years and hopes to be located in Brighton area. He will take out a VK call sign.

Jack W6BPO is also due to arrive in Sydney on a vacation tour with his XYL on October 7. Jack spent some time out here during the war period and married a VK4 girl. He plans to visit VK4, 5 and 6 during his stay. He is connected with Panam and further details of his movements may be had from VK2PU.

Details and specimen copy of the Vienna Award have been received from OE1IU, P.O. Box 24, Vienna, 16/107, Austria. Further information can be had from OE1IU or from this Bureau.

The Hon. Sec. of the Amateur Radio Mobile Society (G3FPK) forwards information of a Mobile DX Activity Sunday on 5th September from 0800 to 2000 G.M.T. Details of suggested frequencies, awards, etc., may be had from this Bureau.

—Ray Jones, VK3RJ, Manager.

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## NEW SOUTH WALES

It has been a generally quiet time in the VK2 Division during July. The first real taste of winter saw to that. John VK2IQ has been collecting names of Amateurs who are interested in "Call Letter Licence Plates." So far he has had 100 positive replies, but the more the better for the cause. If you are interested would you contact John VK2IQ, C/- Wireless Institute Centre, Crows Nest.

The addition of a 50 watt 146 f.m. unit at the Divisional station VK2WI will be a second 2 metre channel for use on the broadcasts. At present there is an a.m. signal on 145.13 mcs. Some problem is being experienced in the h.f. coverage as long skip is often on the 40 metre channel. For those who miss the 11 a.m. broadcast on Sunday may hear a repeat on Monday night at 0900 G.M.T. from the Hunter Branch station VK2AWX on 160, 80, 40 and 2 metres.

On Friday, 24th September, Ted Whiting, VK2ACD, wil be lecturing to the General Meeting of the Wireless Institute Centre. His subject will be "Radio Links" and the part they play in point-to-point circuits. Interstate and overseas visitors are always welcomed.

On the Educational side of Divisional activities, Ces VK2IR, who is handling the instruction with the classes at W.I.C., reports that there are some vacancies in the class and if there are people who would like to improve their theory in order to re-sit for an exam., then they should contact him, at the class on Mondays and Wednesdays. Some new tapes have been added to the Taped Lecture Library. Included are No. 31, Communication Receiver Design, 60 minutes and 21 slides by Keith Woodward, VK2AU; No. 32, As it was in the Beginning, 90 minutes, 26 slides, by Joe Reed, VK2JR; No. 33, Prince Philip's Dunrossil Lecture, 60 minutes. These, and other

tapes in the library, may be borrowed by writing to the Education Officer, W.I.C., Crows Nest.

Next month will be the start of the Field Day and Convention season. During the Six Hour Week-end there will be Conventions at both the Hunter Branch (Newcastle) and the South-West Zone (Tumbarumba). These will be followed by the Blue Mountains Section and about a month later by the Illawarra Section of the W.I.A. at Wollongong, with one-day events.

Did you remember to send your R.D. log in?—2ZTM.

### SOUTH-WEST ZONE CONVENTION

This year the South-West Zone of the VK2 Division will hold the Annual Zone Convention at Tumbarumba. Within easy driving distance of southern N.S.W. and Victoria, a good roll-up is expected. The three-day programme will cater for all interests. From Saturday, 2nd October, to Monday, the 4th, the Tumbarumba and District Radio Club will be host to their visitors.

On Saturday the focal point will be the Soldiers' Memorial Hall. The morning will be registrations, etc. After lunch, there will be a visit to Pady's River Falls. Then afternoon tea followed by either a visit to the Trade Fair or a look round town. The Dinner and Official Opening will include a hook-up with the Hunter Branch Dinner. This will be followed by a social evening.

The field events will be held on Sunday at the show ground and includes all the popular Convention activities. An all-band scramble, 2 metre fox hunt, 2 metre hidden tx hunt, h.f. hidden tx hunt, and the popular new field day event, the 2 metre pedestrian tx hunt. There will be a disposals and other novelty events. The evening will be devoted to social activities.

To finish the week-end, Monday will be spent in a tour of the Western side of the Snowy Mountains Scheme. It will visit Khancoban, Murray 1, Tooma Dam, Tumut Pond and Cabramurra. From here Sydney visitors can return either by Cooma or Tumut. Visitors from Wagga and west will return via Tumbarumba.

Bookings for the week-end may be made with the Club Secretary, Trevor Hoodless, "Blue Hills," Tumbarumba. Motel accommodation, single 42/-, double 37/6 per person, B. and B. Hotel, 30/6 per person, B. and B. Camping ground and Caravan Park at showground with electricity and H. and C. showers, etc. Dinner 15/-, Registration 15/- per person. Deposit on accommodation £1, please state which nights accommodation required.

Once again the South-West Zone Convention will be an ideal chance for Amateurs from near and far to get together and the Tumbarumba and District Radio Club members will be pleased to see you.

John Clode VK2EZ (pres.), Trevor Hoodless VK2ACZ (sec.).

### CENTRAL COAST AMATEUR RADIO CLUB

The regular monthly meeting of the Central Coast Amateur Radio Club was held on Friday, July 16, at the School of Arts, Gosford, with an attendance of 20, including Allen Cundy—a budding Ham—as a visitor. After the general business, which unfortunately was rather lengthy, Lindsay VK2ON gave a short but interesting talk on a transistor tester which he had constructed. He had a lot of attentive ears as transistors are still rather unfamiliar ground for a lot of people. It gave us information on how to judge the amplification quality of a transistor.

A number of surplus f.m. sets were received for disposal, some of which were in good working order. After pulling names out of a hat, five lucky members went home with "possibilities" in the boot.

A good hot cup of tea and delicious supper were enjoyed at the end of the evening. Our president, VK2EH, designed and made a receptacle for holding all our supper gear so that now there is a place for everything and everything in its place, so to speak. Ernie was formerly a manual arts teacher but since his retirement obviously has not lost his touch for excellence.

Geoff Gill, VK2AII, is a very keen flyer and is working hard to join the exclusive fraternity of flyer-hams. He expects to have his pilot's licence in approximately six months, all being well, and he certainly deserves it for he has put a lot of hard work and time into it. Geoff is a man of many interests and is well known in the district as an actor.

Quite a bit of interest is being generated in 432 mcs. Alec VK2AAK was the first from this district to get on 432 working with Eddie VK1VP. He is having his trials and tribulations with an amplifier, but this seems to be a general condition for 432 amplifiers at the moment. The difficulties add to the challenge. There bas been a 432 g.d.o. going the rounds—Phil VK2TX constructed it, Eddie VK1VP calibrated it, and Lindsay touched it with magic and now it is giving yeoman service. Geoff VK2XA and John VK2RF are seriously considering taking the plunge to 432.

Our meetings are held regularly on the third Friday of each month at the School of Arts, Gosford, 7.30 p.m. Anyone able to attend as a visitor will be very welcome. That's all the news for this month, 73, Mona VK2AXS.

### SYDNEY YL's

The Sydney YL's had their regular quarterly meeting on July 12 and celebrated their first anniversary. They met at Hebe's QTH (VK2AOK) for lunch and a yak session which was thoroughly enjoyed by everyone as it seems this is their only opportunity to catch up on news.

Muriel VK2AIA has received the Calgary Stampede Award for having contacted 10 stations in Calgary at the time of the Stampede. This is the biggest rodeo in the world and is a very colourful affair with parades, attractive western-style clothes, and Canadian Indians in their native costumes adding to the general "wild west" atmosphere with displays of war dances, etc. Muriel also has three new Gold seals for her YL International Certificate.

Verle VK2MR was enjoying a spell from work with three weeks' holidays. She and OM, Marc VK2CM, are searching for a suitable new QTH with a friendly landlord with regard to aerials but to date have not had any luck.

Hebe VK2AOK has had a trip to Perth and whilst there met VK6YL and OM VK6RX again, also met VK6CF and VK6KX; and VK5CX Gilbert on a short stop-over in Adelaide. Hebe and Mavis VK3KS got together for a few hours in Melbourne between trains and I understand had a most enjoyable visit.

Mona VK2AXS is the country member of the Sydney YL's and at the moment is concentrating on picking lemons and oranges.

Hebe recently had a visit from Poley Clark VK7CK and XYL, who were on their way to Queensland for a trip. Muriel and Verle were also able to meet them at the same time and I understand there was a lot of interest in reports of the Clark's recent overseas trip.

Raj K7NZO and Hebe try to maintain a sked each Wednesday on 14.230 mcs. at 0600 G.M.T. and YL's are invited to join in. Raj is very active in the International Sidebanders. 73, Mona VK2AXS.

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## VICTORIA

Divisional Council met during July, only one member not in attendance. Matters considered included the proposed W.I.C.E.N. exercise in September, possible repairs to the building, inclusion of Y.R.S. notes in Divisional broadcasts, the next issue of the Call Book and the Federal Councillor's report, plus the usual routine matters.

The overall planning of the exercise is complete and it is now up to the individual groups to complete such plans as they deem necessary for the success of their part of the operation. We are now awaiting a report from the builder on the need or otherwise for repairs to the building. Y.R.S. notes will be supplied by Dave Buck for broadcasting on alternate Sundays. The President reported on his recent discussion with VK2 Federal Councillor, and subsequent correspondence on the subject of the Call Book and the Publication Committee's views on what could be deleted to save increasing the price of the book. VK3 Council feels the same way as our friends in VK2, and therefore publication committee will be advised that it is considered advisable to include everything from the last issue, plus replacement of material deleted from recent issues even if it means some increase in price.

Considerable time was spent on Federal Councillor's report, especially the submission made to the P.M.G.'s Department by F.E.

The Annual Dinner will be held at Menzies' Hotel on 5th November. We have been assured that parking is no problem of a Friday night and it is hoped that this year more members from north and west of the city will join us in this function now that it will not be necessary for them to cross town in peak traffic.

The August general meeting took the form of a white elephant night. General business was quickly dispensed with and the meeting handed over to Harold 3AFQ, who, in a brisk manner, disposed of most of the odds and ends available. The meeting closed officially at about 2200 hours, but most stayed on for a rag chew.

Do not forget the September meeting when the agenda item will be "Lasers."

### WESTERN ZONE

By the time these notes appear in "A.R." the main item of interest will be the Zone Convention. At the time of writing plans had not been finalised, but I can assure any visitors that they will be most welcome and will enjoy the day. Anyone interested should contact Bill VK3AKW for further information.

Congratulations Lyall 3ASA on announcing your engagement, you must be a busy chap with A.O.C.P. classes going also. Roy Goodwin and Bill 3ZAX are two who are going to these classes, so it looks as if Bill will be losing the Z from his call sign shortly, and Roy was enquiring at the best way of obtaining 700-800 volts from a transformer the other day, so I would suggest that the local chaps fit attenuators to their rx's before Roy gets his ticket.

Hitting on a more serious note, friends of Alan 3HL will be sorry to hear that he has been in Stawell Hospital for some weeks. We all wish you a speedy recovery, Alan.

Herb 3NN, his sister, Garry 3ZOS and Bob 3ARM and family paid us a visit the other Sunday to inspect the new shack. Garry showed us a beautifully built 432 Mc. converter which he has recently completed. Bob has just purchased a new v.f.o. and pi-coupler, so we can expect bigger and better signals from 3ARM's QTH. Bob's XYL has just got a new electronic organ and was practising one night when she heard "VK3ARM calling CQ2" blast forth from the speakers in the organ, I believe he was still calling CQ2 when the XYL stormed into the shack, almost taking the door with her and explained to the OM in a very abrupt manner what had happened and advised him not to let it happen again.

I haven't seen Barry 5YB for some time, guess we will see you at the convention, Barry.

Recent signals heard on 144 Mc. include 3ARM, 3NN, 3ZAX, 3AOS, 3ATN, 3AFU, 5ZDR and Graham 5ZOF, who is teaching at Bordertown High School.

The other Sunday morning Bill 3ZAX's XYL Rhonda and my XYL Jill got going on 144 Mc., fortunately our power supplies are rated for continuous service so we were not worried about that but lunch was about two hours late.

That's the lot for now, see you at the convention. 73, Tony 5ZAI.

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## QUEENSLAND

The August Meeting of the Council of the Queensland Division of the Wireless Institute of Australia was held in the Social Services' Club Rooms, Berwick Street, Valley, Brisbane, on Thursday night last. Despite cold weather there was an almost full attendance of Councillors, under the chairmanship of Lawrie VK4ZGL. Much business was disposed of. All sections of the Division are running along smoothly thanks to the effort of Councillors. Another duplicator is to be acquired to make a bigger and better issue of "QTC," the Division's monthly publication.

A quantity of f.m. transmitters and receivers are available ex disposals for ballot and should prove interesting.

The first W.I.C.E.N. exercise, a small-scale one, was held last Sunday. Another exercise on a much larger scale is set down for 29th August.

### IPSWICH AND DISTRICT RADIO CLUB

This club is still progressing well. They meet fortnightly and are very keen. The Ipswich City Council have made land available for the Club and it is being cleared and levelled, for the erection of a club house and QTH for the Club's official station, VK4IO.

**VK2 DIVISION**

**SOUTH-WEST ZONE CONVENTION**

To be held at

**TUMBARUMBA.**

**2nd, 3rd and 4th OCTOBER**

Registrations 15/-. Deposit for accommodation £1. All inquiries and deposits to Trevor Hoodless, VK2ACZ, "Blue Hills," Tumbarumba.

Refer to the N.S.W. Division notes for full details and programme.

VK4IO has been taking the six-metre call-backs after the VK4WI News on Sunday morning and this is proving very popular.

So popular was the Club's last 150-mile round tour that they have planned a trip to Mt. Tambourine later this month and the six metre mobiles will sure be out in force that day.

Gus VK4ZIV, a strong club supporter, has been transferred to VK3 land, and has donated his six metre gear to the Club and this will be used as the Official Station.

### SUNSHINE STATE CONTEST

The contest was very well supported this year and increased activity on h.f. plus a good deal of v.h.f. activity. All-band winner was Reg VK4VX, h.f. bands winner, Geoff VK4FK, bands winner, Lloyd VK4ZLO, Listener's award, L-4108, Chas. Thorpe.

### C.Q. BRANCH

C.Q. branch activity from members has received some impetus with new members acquiring their call signs. There is a good deal of interest and contacts on six metres. In this regard there is Lyle VK4ZLD, Lance VK4ZAZ, Dick VK4ZCK, Charles VK4ZBG, Bob VK4NG, and Doug VK4ZDK. President, VK4FN, sees to it that 80 and 40 mx are well occupied, whilst 20 is the happy hunting ground most of the time for VK4FK, VK4SD and VK4DO, who is active again after some period of ill-health. Joe VK4CL has had some receiver trouble. Silas VK4SC is tackling some s.s.b. transmitter problems.

Arrangements are in hand for a prominent window display and float in the Capricornia Festival, depicting radio gear from 1915 to 1965, a period of 50 years. This will give the branch some good publicity. Again this year there will be active participation in the Jamboree-on-the-Air.

George VK4FK recently enjoyed a visit to the capital and met several of the boys down there, rumour has it a lot of time was spent in disposals stores.

Ken JA7ACM/MM, chief radio operator on a coal ship plying from Japan to Gladstone, is very active and visits Rockhampton when time allows. Hal VK4DO has taken him for a shack crawl to meet most of the local boys. 73, Hal VK4DO.

### TOWNSVILLE AND DISTRICT

Nothing much to report since the last time I submitted the notes. Wonder if others are being troubled by the commercial short wave stations, not the c.w. ones, around 14.13, 14.17, 14.21. Ray VK9RH can be a certainty to come up with one of them—apparently does not hear them at his place, while here they take over with the slightest fall in his signal strength.

Visitors to the shack this month were Bill and Betty VK2AVY, working mobile as they toured north. Very sorry that Poley VK7CK did not call on me as we have QSO'ed many a long year. He met John 4DD, also Ted 4EJ. There have been others in the district during this tourist season but as they have not called on the boys, unable to report their movements.

Bert 4LB and Merv 4DV in camp for a fortnight, playing at being soldiers. Basil way up in Cairns, still trying hard to finish the new receiver, reports that not much being heard on the bands outside a few W's, VE and XE. Have heard some VK3's working to Europe but so far unable to hear them here although I watch the frequency very closely when I hear the boys working them. Still hoping for a breakthrough. 73, Bob VK4RW.

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## SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division for July was held in the clubrooms to a somewhat below average attendance of members, due no doubt to the cold and wintry conditions existing at this time of the year.

I feel that I should mention the below average attendance, because it at least shows that our usual full house report at meetings are genuine, and an occasional below average attendance report helps to quieten the pangs of jealousy across the border with its attendant suggestion that we hold our meetings in a public telephone box.

The genial VK5 Chairman, Ross 5KF, opened the meeting a shade on the late side, probably in the hope that a few more members might roll up, by asking all present to stand for one minute in silence out of respect to our late member, Ted 5JE, at the conclusion of which the business side of the meeting was conducted. QSL cards were distributed by George 5RX, and the stage was then set for the two lecturettes listed for the night, the first being a talk on his new s.s.b. receiver

constructed by Ron 5KS, and then a description of a moonbounce project by Jeff 5ZP and Colin 5ZHJ.

Ron 5KS is no newcomer to the field of describing receivers or transmitters, as no sooner is one or the other finished and described to the members, than another one is already on the drawing board, or whatever it is that serves him for such a purpose. Beside describing the new receiver, he also had it in person perched on a table for all to look, hear and admire, and all members present realised just how much work and effort had gone into the job. Questions flew thick and fast at the end of the description, which incidentally was heard in a silence which clearly indicated just how interested everybody was in the subject, and should have showed Ron how well the talk went down. A short, practical test of the receiver, its dial mechanism, its stability and flexibility, etc., etc., brought to a conclusion a very entertaining run down on a receiver that reflects great credit on its builder, and the applause that greeted Ron should have made him feel that his contribution to a successful evening was well worth while. At this point Jeff 5ZP took the floor and gave members a technical description of a moonbounce project that is well in hand around the Elizabeth and Gawler areas. This description could well have been lost in a mire of technicalities, but with a skill worthy of a veteran he kept it well down to an understandable level, thus allowing even the veriest tyro in the audience to fully grasp the essentials of moonbounce, and at the same time prepare the ground for a more practical description of the project by Colin 5ZHJ, who apparently taking his cue from Jeff's approach to the subject, then spent quite a time giving a practical, and sometimes humorous, report on the work so far attempted. Both speakers proved to have a solid knowledge of their subject, and an undoubted ability to impart this knowledge by the spoken word, and the applause that greeted the end of their contribution to the evening must also have been gratifying to both. The vote of thanks to the lecturers, ably proposed by Phil 5NN received the applause that the night merited. The meeting closed well past closing time, and as the members wended their way downstairs, the breath of the caretaker's Alsatian could be heard coming in short trousers—sorry—short pants, a fact that caused several members to skip a couple of steps on their way to the exit.

Geoff 5TY the TV type—and chief standover merchant for the "Silver coin collection" at the last general meeting—is wondering just what Tom 5TL will be doing to him when he gets his tower up. Geoff is publicly stating, in his best Federal Councillor manner, that the increase of active stations on the lower frequencies, now that he has qualified for occupation, is not in his best interests. For once—but only for once—I agree with him—a blanket would cover him-5DX-5MM-5HY-5TU-5ZF and 5TL. Fancy all those villains under the one blanket—even my fancy could not imagine that!

Received a short note from Bruce, ex-5MC, under the address of Tennant Creek, to say that he has left Port Pirie and will in future be domiciled in the Northern Territory. He is with Geo-Peko Ltd., as their base maintenance officer at Tennant Creek, and beside five diamond drills, numerous vehicles, trailers, etc., to look after, he will also handle all the radio matters. He will be quite a busy person, and although he is at the moment up there on his own, the XYL Pam and the two harmonics will soon follow. He expects to operate from the new QTH with a VK8 call, all of which is in the hands at the moment of the P.M.G. I bumped into him in town one day whilst he was shopping for the move, and was he in difficulties? He wanted to go one way, one harmonic wanted to go the other way, and the other harmonic did not care very much where he went as long as it was not where anybody else wanted to go. Pam was not in sight, and I don't blame her!

Nobby 5WK spending a few days home on sick leave at the moment of writing—slipped a disc or something—no mention as to whether it was a 45 or a 33-and-a-third—anyway he was not very happy. Just goes to show that these s.s.b. types can't take the strain of a.m. broadcasting, although he nearly slipped another disc when I told him this. A.m. breeds them tough!

I noticed with feelings akin to dismay that 3KT and 3AFU, my contemporaries in VK3 for the magazine, are offering for sale an unsigned "Glossy" 5PS. My feelings of dismay are not for my self, but are for these two misguided youths who in the years to come, when thousands of people will be fighting and clamouring for such a collector's item, will realise how for a mere pittance they cheated themselves perhaps for millions—well anyway—thousands — well — hundreds — well, have it your own way—a large sum of money, just because they failed to realise value when they saw it. Incidentally, I can't say that I am exactly hysterical about the "Glossy" bit, I have been called many things and names, but I feel that this "Glossy" business verges on the point of insult.

I note with envy and disappointment that John 5KX has departed for his business-cum-pleasure jaunt to the U.K. I am somewhat hurt that he should sneak off without letting me carry his bags on the trip. The only explanation I can think of is that he has had a lapse of memory—poor fellow—I hope he remembers to return—with or without his bags!

My favourite Youth Club Leader Ken IKM gave two quotes of the month recently, the first quoted at length and commented upon with gusto, the second being somewhat cryptic and quoted upon not at all, although apparently he has decided to bow to the inevitable by admitting in print that VK5 is always ahead of things. This from Ken is praise indeed, and I hope Council now realise just what a good publicity officer they have in me. Keep up the good work OM, they might even give me a rise yet—an Irishman's rise probably!

Ron 5KS, the lecturer on his new s.s.b. receiver at the meeting, is what is known in journalistic circles as "Good Copy." The reason being that he can always be counted upon to slip into his descriptions of his apparatus a reference as to how he borrowed his XYL's egg-beater for a coil winder, or perhaps her latest baking dish for a chassis. All this is usually said in a tone of "what do I care" and general bravado, which incidentally deceives nobody, least of all Ron, but it makes good reading and all goes to keep up the image of the daredavil radio Amateur who snaps his fingers at XYL's, and always earns cheers and laughter at the meeting. I thought this lecture was going to let me down in this direction, but just at the end, when I had completely given up hope, he announced that the receiver cabinet had been painted with enamel and "baked in mum's oven," ending with the simple statement that "it does not take long for the smell to wear off"! I wish I could meet "mum" and see just what she thinks of such a statement. What about it "mum"—care to put his weights up?

Who was the keen type in VK5 who proudly hoisted his new pair of masts high up in the air, stood back with an air of something well done, and then tripped over his aerial wire, pulley and the hoister-upper wire? For a small fee I am willing to make a search among the records and find out his name. A minimum of 336 applications for the search is required! !

It is sometimes forgotten that the Division has a technical committee which is prepared to advise members on such matters as TVI-BCI and any other forms of mental cruelty. The committee is at your disposal, and if you care to contact Ray 5BT he will fall over backwards to help you, and between you and I, he knows his onions.

Uncle Tom 5TL, better known as the Publications Officer, recently received a letter from an interested purchaser of a book that lists all of the schort—I repeat—schort wave broadcast stations and their addresses. The last I heard of Tom they were still throwing water to bring him around!

Moss 5TU has heard someone conducting a radio chess match, and is quite intrigued. If the aforementioned chess players care to call Moss in on the next game he might be interested in taking it up.

On the day that VK5 beat VK3—Yum-Yum—in fooball—Yum-Yum again—Jack 5JX was heard to say to another local station that he had not been to a football match since he was 14 years of age. It appears that Jack at that tender age was watching a football match from a tree at the Adelaide Oval, and fell out of the tree on to a picket fence, the resultant injuries wiping out all his enthusiasm for football for ever. He even forgot the scores at the moment of impact.

Launce 5LD is reported as having stocked up in R.D. log sheets for the coming contest. Does this mean that we can expect a record score to beat all record scores, or does it just mean that the exhortations of Comps, 5EF-Pro 5PS, have borne fruit. What!—no s.s.b.

Talking of s.s.b—and who would talk of s.s.b. unless paid a fabulous salary like myself—a disciple of mine in Len 5ZF was heard conversing with Keith 5KH on the subject of s.s.b. and definitely appeared interested. Imagine how I felt when I heard him say that he was only trying to promote argument when he adopted his previous attitude. How low can one get? Fancy anyone trying to promote an argument about such a subject — Thank Heavens I am pure!

Periodically in these notes I have advocated holding a meeting once a year devoted entirely to getting to know those one does not know, and spending a little time having a talk to those one does know, but seldom sees for long. This would save the programme organiser one month's worry, and might be quite a success. Naturally, nobody takes any notice of anything that I might advocate, but a little bird—well anyway—a medium-sized bird—tells me that this idea has occurred to a member of Council—and who knows—somethings might come of it. Don't tell Council that I have advocted this for years, they would only mount their umbrage and pedal off into the darkness!

Brian 5BI recently had a long trip—Cowell to Adelaide—Adelaide to Southern Yorke Peninsula—back to Adelaide—and then back to Cowell—all over the week-end—arriving back at his QTH at about 2 a.m. on Monday with rumours of running out of petrol just to liven up the trip. Perhaps the additional load of a boat on a trailer was the cause of this. Anyway, he is either going mobile-marine, or has the urge to fish. Has the "Admiral" heard about this?

Great flutter in the dovecotes, to say nothing of seething indignation and charges that the VK5 convention delegate voted for a motion at the convention to make s.s.b. the only mode of communication by 1966—or words to that effect. The rumour started on 80 mx, among a round-table of VK2's, spread like wildfire, and the further it went the more distorted it became. Not having seen the convention minutes as yet, I make no comment, but it would be well to remember that something along these lines was submitted by a well-known VK5 member as a convention item, read out at a general meeting for ratification, and passed without much comment by those present. This I have checked on and can vouch for, because the gentleman I checked with was present at the convention and was also at the general meeting when the agenda item was submitted. If all this is true, and it was an item submitted by the VK5 Division, how else could the VK5 delegate vote? Shall we wait and see the minutes? The remedy for this sort of thing is simple—don't leave the meeting too early, stay a while after the entertainment and hear the official business of the Division discussed, and then become indignant. I have been doing this for years, that is why Council is always flattering me by calling me "The trouble maker." Me a trouble maker? Well, did you ever?

Talking along these lines, I have for many years tried my utmost to make the pages of my favourite technical magazine printed in VK2, but all to no avail. I did cherish the thought when the "A.R." magazine committee made their classical blunder of 1964-65 and awarded me the Higginbotham Award, that at last my palsy-walsy Pierce 2APQ would relent and give me a brief mention, but no, nothing doing, still the old ignore, and I am now convinced that the only way I can achieve fame and notoriety will be to make the "Forum" my objective! Being such a quiet, modest, unassuming sort of shrinking violet, I feel this somewhat beyond me. Oh well, I can always become a VK2. What's that?—they would not have me—Sez you!

Met Cec. 5BZ the other day and he suggests that he might have to make another trip to the U.K. to talk to his friend over there, because he certainly can't talk to him on the bands these days, not even on c.w. With the thought in mind that John 5KX had sneaked off into the night making for that direction without waiting for me to carry his bags. I immediately made such an offer to Cec., but he did not appear interested, so it seems my trip to the U.K. will have to wait. Hold on, my crystal ball tells me somewhat hazily through the mists that Muriel 2AIA and the OM 2CM are leaving for Europe next year, I wonder—could my dainty figners, plus my elegant arms, be put to the pleblan task of carrying their bags, or even going as first footman? Nothing venture—nothing win!

The notes close this month on a tone of sadness. Happening to glance at the sample log sheet in last month's magazine, the listener's log by the way, I was horrified to see that the first sample log submitted contained my call sign, a poor signal report, and indignities of indignities, the mode of operation—s.s.b. Seizing my quill I immediately wrote a stiff letter on cardboard to the VK3 President, complaining of the insult, only to find that further on in the same magazine the VK3 President was none other than Ken 3AFJ—Pincott to me! As I slowly tore up the letter, I could not but think just how harsh fate could be. All of my friends and wellwishers scattered throughout the land naturally wrote or rang up on the telephone to compliment me on "getting with the strength," or to reproach me for letting the a.m. boys down, and naturally Comps 5EF was mentioned. Just think of the future—Pincott, President—Pincott, Publications Committee — Pincott, Pin Pricker—and last but by no means least Pincott, Pooh!

73-de-5PS—PanSy to you.

# TASMANIA

Well, another R.D. Contest has come and gone, and if you haven't sent off your log yet you had better get it in the mail tonight. It is not to be postmarked later than the 6th September.

Ian 7ZZ is now established in his new shack (down the back yard) and apparently has it quite comfortable, more so than the verandah anyway, that is if you consider comfort with "on air" time.

Lee 7KC now has a solid state s.s.b. rig on the air, and although I have not heard it myself, I am told it is quite a f.b. sig. Ted 7EJ has a similar unit under construction, and at the time of writing is tossing up whether to have a fully solid state unit of a valve final. Further details when available or when he makes up his mind.

Talking of duck talk, Bob 7OM is now the proud owner of a Japanese s.s.b. rig, and reports indicate it is indeed a very nice piece of equipment, and an excellent performer.

Friend Ted 7EB put in an appearance at the August General Meeting, and looks much better (is that possible) after his three weeks' sojourn in VK3. Hope you continue to stay okay Ten when you get back to work.

Thanks are due to Bob 7KZ for volunteering as a broadcast officer, and no sooner did he offer than he was bunged on. but as a true Amateur he rose to the occasion on the Sunday (had time for breakfast first, too) and did his part in fine style.

Phone call tonight informed me that associate Hugh Hutchinson (think that's right) from Hamilton, is off to Vancouver in early September, may we take this opportunity to wish you all the very best Hugh, hope to see you back here some day.

Enough for this month, but please—don't forget to post that log. 73, Geoff 7ZAS.

### NORTH-WEST ZONE

There is an old Chinese proverb, "He that dobs his neighbour in shall have hell fire and brimstone sent down upon his soul in revenge" or something like that anyway. The whole truth of the matter was that yours truly went along to the last annual general meeting with all good intentions but, whether it was the aroma of sausage rolls filtering through from the supper room that did it I will never know, but when the election of officers came up the fact was that not only was I quickly on the job of seconding a proposal to nominate George 7XL as Secretary again, but also dobbed poor old Max 7MX as Treasurer for a further term of office. Thinking that these were two jobs I had managed to wangle out of, when all of a sudden, this bombshell hit me with being landed with this task of zone correspondent—so with a scanty education behind me (I didn't like to let on to the meeting that I left college at the early age of eight years, hardly by that time being able to read or write!!) I will endeavour to do my best for the next twelve months.

The meeting was a huge success. Thirty persons, including visitors, being present—that I can accurately verify because it is my self-imposed task as assistant dishwasher-upper to Ray 7ZRS to prepare supper.

As I said before, George was elected Secretary and Max Treasurer. However, for one moment I thought that I may have done the wrong thing in dobbing Max in because the learned gentleman suddenly hushed the meeting with the sad news that the Treasurer's report was very grim. I thought perhaps that he had embezzled the club funds and was about to make a full confession, but apparently he had thought about that idea once or twice but there just wasn't enough funds in kitty to run off with! So chaps, let's all pull our weight this next year and help the Zone along by paying your 5/- zone fee.

After general business was cleared up with, all members were entertained with some very good films, ably shown by that genius of mechanics, no other than Sid 7SF. One film being the photographing of the surface of the moon by Mariner IV. Anyway, to cut a long story short while the hushed audience had their cake-openers wide open in awe with the last photos of the lunar surface before the moment of impact, a house fly crawled across the screen and a voice in the front row uttered out—I knew it, there is life on Mars after all!!

I didn't have time to lay hidden mikes and don disguises to catch much gossip, but what I heard during supper varied from such conversations about salt encrusted insulators causing band noise in coastal areas—you can't expect a million dollar view and no band noise as well, Max!! There is a rumour that 7XL is about to purchase a piece of commercial equipment—and that isn't duck talk either or is it? The only news I got from the Burnie end was that Ken 7AI is almost ready for his full flying ticket—we may soon have a mobile airborne signal flying above our midst. Ken 7KH is thinking seriously about radio-controlled golf balls to clinch the coming golf championships next week, while Bob, Winston and Harry Young in the v.h.f. gang are getting ready for the summer DX, which prompts me to ask a very personal question, Harry. My, you have put on condition! I did, too, after I first got invested with ye olde order of the Ball and Chain!!

Well, as I said before, I didn't have time to really bring out any scandal but hope to keep you all posted next month. 73, 7MS.



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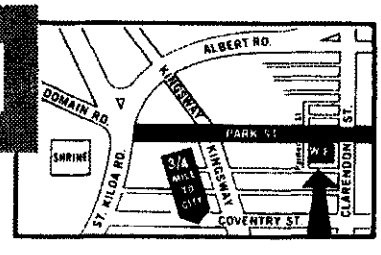


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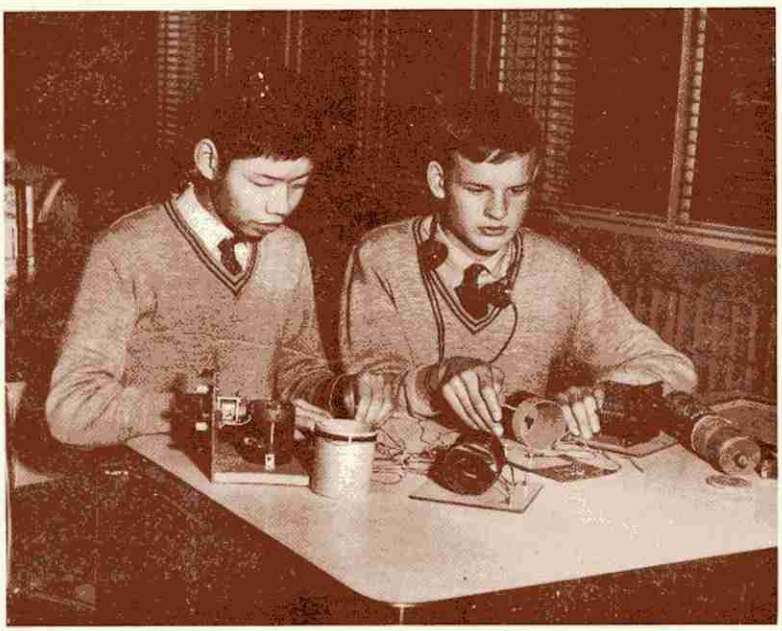

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## OUR COVER

Cheng Ann Cheok and Norman Salmon, of the Royal Victorian Institute for the Blind Youth Radio Club, working on one of the projects they had to complete to gain their Elementary Certificates.

Photo courtesy of "Herald," Melbourne.

## FEDERAL COMMENT

★

Elsewhere in this issue are details of the 8th Annual Jamboree-on-the-Air which is to be held this year on October 16-17. Here is an opportunity for Amateurs to provide the means of allowing these Scouts, Girl Guides and Cubs to participate in a most enjoyable get-together.

In return you will (a) hear some very interesting items about the Scouting movement; (b) enable some lasting friendships to be made or continued; (c) gain some friend for, or possibly even new members to, Amateur Radio; (d) get the operating bug again possibly, if you have become inactive.

This idea was conceived some eight years ago at the Jubilee Jamboree at the Sutton Coalfield, England, when a number of the scouts present, who were also Amateurs and headed by a Mr. Les Mitchell, decided to keep a sked at the same time in the following year and renew the friendships of the Jamboree. Since then the idea has grown into a very popular and useful event, and each year some thousands of scouts look forward to conversing, and exchanging ideas, with members of other troops, be they in neighbouring towns or other countries. They need your help to do this.

Remember, it is not necessary to work DX stations—local and interstate contacts, as well as overseas contacts, have proved to be very enjoyable, especially if they are S9 signals. Thus v.h.f. and h.f. operators can all participate—any few hours you can give within the allotted 48 hours will be appreciated by these young people and their organisers; you will also enjoy it, as some of the subjects discussed are most interesting.

Last year over 350 Australian Amateurs took part and there were stations operating in over 70 countries around the world. This year the founder, Les Mitchell, using his call sign GB2LSR, at Hulthom, England, will be there on 14,250 Kc. (between 1900 and 2300 hours E.A.S.T.), the official World Scout Bureau stations, VE3WSB, will be there operating three stations in Canada, VK3WI will be broadcasting an official opening at 2000 hours E.A.S.T. on Saturday, 16th. Will you be there to help?

We would commend this event to you. Why not contact your local Scout group or Divisional Organiser now? The small effort involved will be amply repaid by the appreciation shown by the scouts.

FEDERAL EXECUTIVE, W.I.A.

## CONTENTS

# GETTING RESULTS ON 2 METRES F.M.

*A. J. STEWART,* VK3ZFS*

THIS is an attempt to assist those Amateurs using ex-commercial equipment on v.h.f. nets. As about 200 A.W.A. sets are in use, this type is of major importance, but the basic comments apply to all makes of units.

The MR3A Carphone Junior is the most popular type and will be dealt with specifically. Note that the MR10 receiver is identical to the MR3A.

Before you start, make sure that you have at least + 150v. h.t. and, particularly if you are operating from 6v., check that full heater voltage is applied to tubes.

It is absolutely essential that, at all times when tuning the receiver, the limiter current be read with a meter. As the receiver tuning approaches optimum, there is a decrease in audio noise output. The same thing also occurs when the tuning is well off, only a meter tells the true story.

If you do not have access to a v.h.f. signal generator, then this problem is solved by using the transmitter and sufficient multiplier stages to give suitable signal strength.

**RECEIVER**

Essential is a multi-meter. If the basic movement is 0-1 mA., 100 ohms coil resistance, then your readings should be as follows:—Trip., 500-700 μA., no signal; 1st Lim. 0.06 mA., no signal; 2nd Lim., approx. 0.1 mA. These test points are shunted with IK ohm resistors so that the readings do not measure actual current.

**R.F. STAGE**

VI 6AK5, with present day trends of cascode and nuvistor stages, it seems to be inefficient. However, extensive checks reveal that a good 6AK5 will equal other types of "front ends."

The grid and anode coils need only be squeezed up to tune 144 Mc. The anode and screen dropping resistor (R2) was originally 15K ohms ½ w., this should be replaced with 27K ohms 1 w. as best results are obtained when the anode voltage is 40v.-50v.

In some units the 6AK5 will oscillate when the aerial is disconnected. This does not distract from performance in any way and provided it stops when the aerial is re-connected it should be disregarded.

It is recommended that the 1 megohm grid resistor of the 6AK5 be exchanged for two 470K ohms resistors as shown in Fig. 1.

The grid/cathode of the 6AK5 are used as a diode rectifier. Using as sensitive a meter available (500 μA. will do) you have the ideal tune-up indicator.

There is a small amount of r.f. leakage and capacitive coupling in the aerial change-over relay, so the meter indicates maximum r.f. output from the final and it is a simple matter to tune up for maximum.

* 11 Woodstock St., Mt. Waverley, Vic.

**1st MIXER**

V2 6AK5. The grid coil will resonate on 144 Mc. when squeezed up but the L/C ratio will not allow optimum results as the tuning C (C5) will be too large.

This coil should be replaced with one of the same number of turns wound on a ¼" i.d. Do not attempt to increase coupling to the 6AK5 anode coil.

**2nd MIXER**

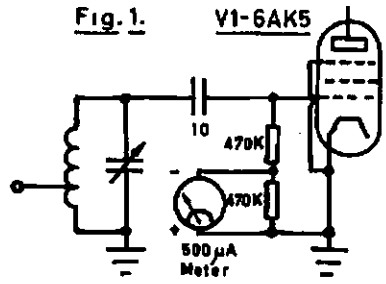
V3 6AU6. The first i.f. T3 should be adjusted on a weak but steady signal for maximum limiter current.

**OSCILLATOR AND MULTIPLIER**

V5 6AU6 V4 6J6. Adjust the trip. grid current for maximum with the top slugs of T6 and L2. These are the two coils adjacent to V4 and V5.

The two "air" wound coils under the chassis are T2, they should be squeezed up but do not increase the coupling. Adjust the two trimmers of T2 and the secondary of T6 (the under-chassis slug) using a weak but steady signal.

Fig. 1. V1-6AK5




**2nd I.F.**

T4 to T9 inclusive will be dealt with as a group. A strong word of warning must be given about the indiscriminate use of the screwdriver on these stages.

The passband characteristic for the three i.f. stages is obtained by the use of double-tuned, over-coupled transformers. 2 Mc. is the centre frequency.

For the Amateur, the most practical alignment method is to use the damped alignment procedure. In this method the winding of the transformer not being tuned is shunted with a 5K ohms resistor, e.g., to tune the primary of T7 shunt 5K ohms across the secondary and tune the under chassis slug for maximum limiter current.

This procedure may seem a little involved at first, but is actually quite easy and results will be good.

Disable the receiver oscillator by removing the crystal. Plug in an 0-1 mA. meter to Jack CF2 designated 1st Lim.

Inject the signal generator output to the 2nd mixer grid using only sufficient signal amplitude to indicate about 0.2 mA. 1st Lim. current.

The signal generator must be accurately set on 2 Mc., modulation should not be used.

Fit two alligator clips on the 5K ohms resistor and clip this across the secondary of T9, adjust the primary slug of T9 (under the chassis) for maximum limiter current. Then clip the 5K ohms resistor across the primary of T9 and adjust the secondary (top of chassis) for maximum limiter current.

T8, T7, T5 and T4 should then be adjusted by the same method, but never use too high or too low a level of signal injection.

**1st LIMITER**

V9 6AU6. This stage is designed to limit at a grid current of approx. 0.8 mA. While the no signal or standing current is approx. 0.06 mA.

It also functions as a doubler stage, so the anode circuit is resonant at 4 Mc. Yes, you did read it correctly, doubling the i.f. frequency. The advantages are that the class "C" multiplier stage assists limiting action and that double the radiated deviation is fed to the discriminator.

**2nd LIMITER**

V10 6AU6. This stage is designed to limit at approx. 0.14 mA. while the standing current is approx. 0.1 mA., so that only a small increase of signal input will operate the 2nd limiter.

L3 may be adjusted for maximum 2nd limiter current on receiver noise with no signal input.

**MUTE**

V11 6AV6. With no signal input the second limiter is not operating and the residual noise is coupled through 100 pF. to the grid of V11.

This noise is amplified, rectified and filtered by the network of 470K, 33K ohms and 0.05 μF. This d.c. is applied to the grid of the first audio amp. V13 to cut-off this stage.

The 50K pot is adjusted to set the threshold of operation so that no or reduced audio noise is heard when no signal is incoming.

When a signal is received and the second limiter operates, the noise output in the limiter anode circuit is reduced or eliminated, there is no cut-off bias and audio output is normal.

Note that the value of C57 1000 pF., C55 100 pF. and R27 470K ohms are designed so that only high frequency noise is applied to the grid of V11.

**DISCRIMINATOR**

VI2 6AL5. The primary of T10 is the only adjustment that can be made using maximum receiver noise output.

The ideal meter to adjust the discriminator secondary (T10) is 25-0-25 μA. Plug it into Jack CF4 (discrim.), with a known accurate 2 Mc. signal input to the i.f., adjust the secondary of T10 (top slug) for zero.

A v.t.v.m. will do nicely or you could use a microammeter, reversing the leads until zero current is indicated. This method is slow but accurate.

If you still don't have the necessary equipment, don't despair. All you have to do is carefully adjust the top slug for the best possible audio quality. Be sure you adjust only on a known accurate signal.

**AUDIO**

V13 6AV6, V14 6AQ5: These stages are quite straightforward. Note, de-emphasis is accomplished by R40 1 megohm and C66 100 pF.

Receiver and transmitter use FT243 crystal sockets for the metering points, then obviously an old FT243 crystal case could be used. A suitable plug can be made with a block of bakelite approx. 5-16" x 1" about 3" long, with two pins (nails!) spaced ½". It is worth the trouble as test prods don't fit too well and usually fall out, adding to the confusion.

**TRANSMITTER**

This basic circuit is used in almost all A.W.A. equipment likely to be in the hands of Amateurs.

Crystal multiplication is by 36 for both high and low band sets, 4051.5 Kc. x 36 will give 145.854 Mc.

Low band conversion should be made using × 24. To do this change the last tripler to a doubler.

**V16 12AU7:** One section of this tube acts as an amplifier of the audio input signal, feeding the second section operating as a rectifier to develop forward acting grid control bias for the constant output amplifier (6BA6).

**V19 6BA6 Constant Output Amp.:** This tube is fed audio via the set deviation control (100K) and the "parallel T" network of 220K resistors and 630 pF. condensers. This gives a rising frequency characteristic of 10 db. in the range of 1 Kc. to 3 Kc. for the transmitted audio pre-emphasis. This constant output amp. tube ensures that full modulation is maintained over a wide range of audio input levels. A very careful check should be made to eliminate leaking condensers, the screen bypass 0.05 μF. and resistor 1.8 megohm should be replaced by modern, stable types.

**V15 6AU6:** It is a modified Pierce oscillator in the output circuit of which the f.m. signal is produced in conjunction with the modulator V17 6C4.

If you decide to install multi-channel switching, it will be necessary to change the circuit slightly to allow for the increased circuit capacity due to extra wiring. See full circuit.

The tuned circuits of L4 in the 6AU6 plate lead and L5 coupling the 6AU6 anode to the 6C4 anode, are generally called "phasing coils" and serve to eliminate the "a.m." component from the buffer amp. circuit. If the "a.m." component is high, distortion due to intermodulation, etc., will be high and not adequately eliminated in the following class "C" multiplier stages. The circuits are broadly resonant at approximately 0.707 of the crystal frequency used.

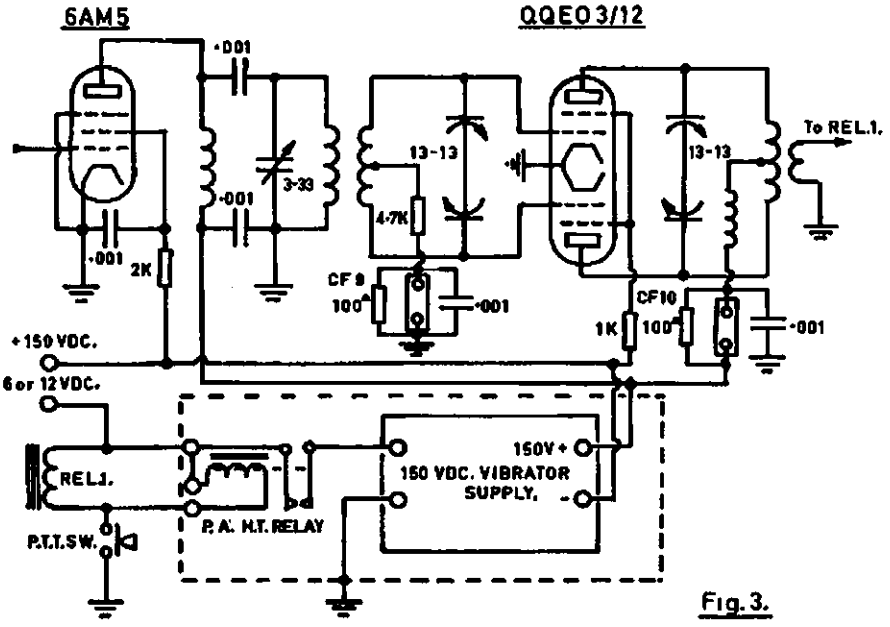


Fig. 3.

**Multiplier Stages:** 12AU7 - 6C4 - 6C4 are easily tuned by peaking the grid current of the following stage. Using an 0-10.0 mA. meter range, readings should be approximately:—

| | |
|---|---|
| 1st Doubler Grid | 1.3 mA. |
| 1st Tripler Grid | 1.8 mA. |
| 2nd Tripler Grid | 1.5 mA. |
| 2nd Doubler Grid | 2.2 mA. |

The **MR3A** was originally fitted with a 6J6 final, but most have been converted to use a QQE03/12. See Fig. 3.

| | 6J6 | QQE03/12 |
|---|---|---|
| Anode Volts | 150 volts | 150 volts |
| Anode Current | 30 mA. | 40-50 mA. |
| Grid Current | 15 mA. | 0.8 to 1 mA. |
| Grid Resistor | 470 ohms | 4700 |

**POWER SUPPLY**

This is quite conventional and is easily adapted for 6v. or 12v. H.t. should be at least +150v.

Many Amateurs will consider an increase of r.f. power output, the obvious change is to increase the final h.t. to about 300v.

If you are financial, then just replace the internal vibrator supply with a transistor supply. If you are like the author and the "d.b." rating forbids transistors, my answer may be of interest. An extra 150v. h.t. is added to the internal 150v. supply on transmit only. Be sure that your extra 150v. supply is above ground (see Fig. 3).

If you make this change, couple the additional supply to the transceiver using a plug and socket. Then make a "captive" plug so that the transmitter can be used with the internal 150v. h.t. only.

When 300v. h.t. is used some difficulty may be experienced in obtaining sufficient grid drive, even with 300v. on the 6C4 anode. A change as shown to a 6AM5 (Fig. 3) will give plenty of drive.

Full Schematic Circuit of MR3A is featured on pages 14 and 15

**ERRATUM**

In the circuit diagram on page 15 of this issue, the 8 μF. condenser on the receiver h.t. line from the relay should be on the other side of the 40 ohm resistor.

**SUMMARY**

Keep in mind at all times that it is your ability to copy weak signals that counts and that high or low limiter currents actually mean very little.

(Continued on page 7)

**RECEIVER FREQUENCIES**

| Signal In | 1st I.F. | 2nd I.F. |
|---|---|---|
| 145.854 Mc. | 22.5504 Mc. | 2.0 Mc. |

↑

123.3036 Mc.

× 6

20.5504 Mc.

× 2

Xtal 10.2753 Mc.

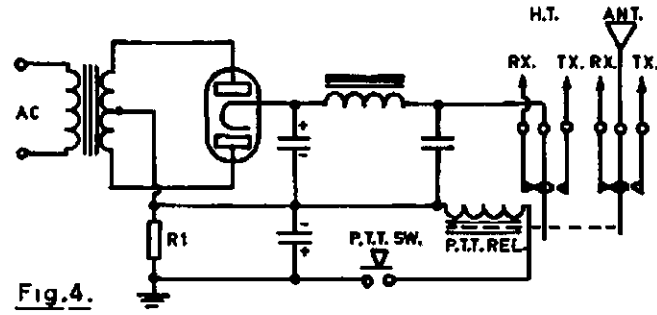
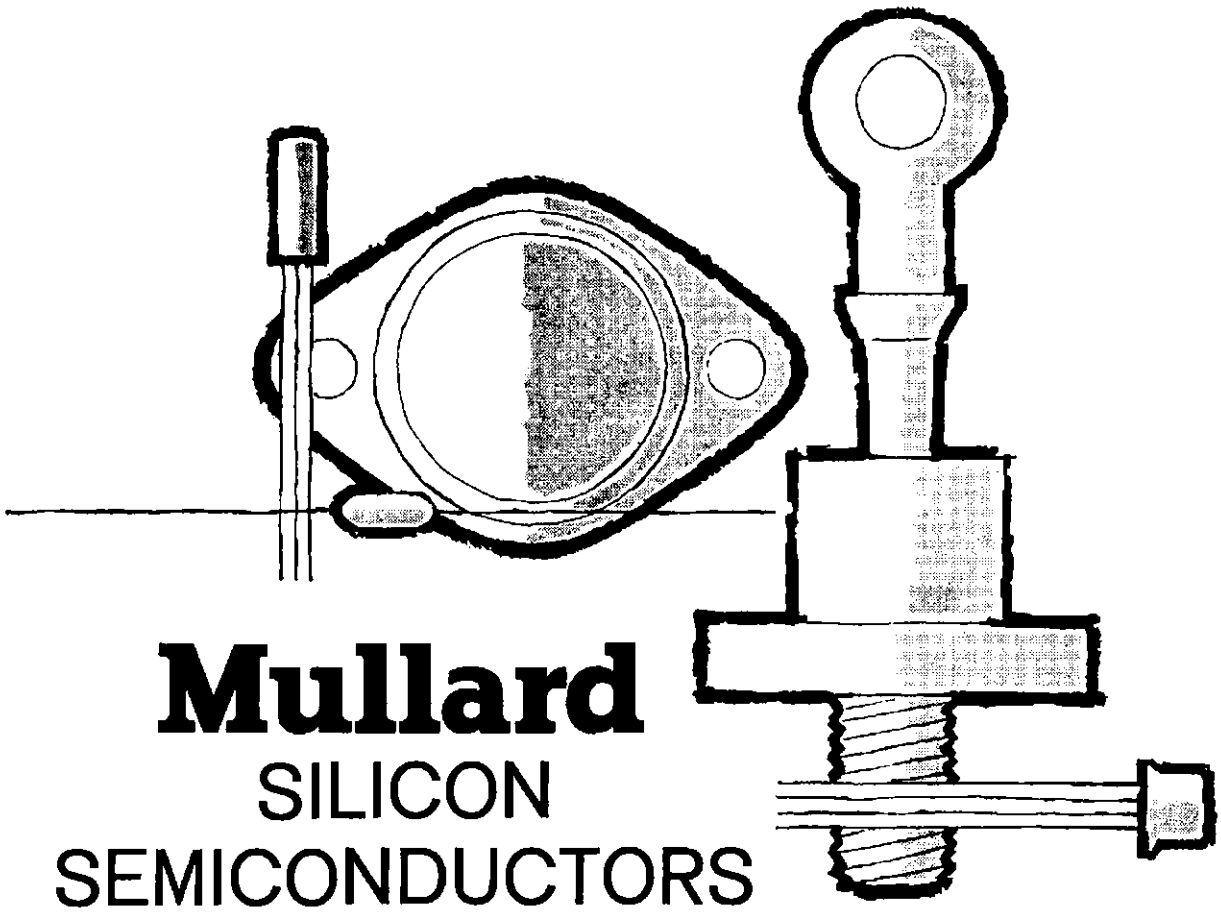


Fig. 4.



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# THE ANTALO*

## TWO METRE HALO WITH PARASITIC ELEMENTS

*ROBERT W. BANTA, K8PBA*

At this time of ever-increasing activity in the v.h.f. region of the spectrum, some serious thought has been devoted toward increasing the useful radiated power from a halo-type antenna. Heretofore, the only way that gain has been realised with antennas of this type has been by stacking driven elements. The antenna shown in the photos consists of a single driven element, and 16 parasitic rings, placed 8 above and 8 below the driven element on a common mast. The overall diameter is 10½ inches, and the total height is 33⅜ inches. The driven element is fed with coaxial transmission line, and the system may be easily adjusted for low s.w.r. on the line.

The name "Antalo" is a fusion of the words "antenna" and "halo." Measurements that I have made using Hewlett-Packard signal generator and v.h.f. attenuators and a receiving antenna at a distance of one mile show gains of as much as 10 db. over a reference halo, in the pattern shown in Fig. 1. Maximum gain is along a line drawn from the supporting masts through the gaps in the elements. Several others have duplicated this antenna with highly satisfactory results.

The completed "Antalo." The driven element is the double ring at the centre.

The "Antalo" aloft on its supporting mast.

### CONSTRUCTION

There are no special hard-to-get items required for the Antalo, and construction is simple. Most of the work will already have been done if you buy ⅛-inch aluminium clothesline that is in a roll 10½ inches in diameter. The rings are merely cut already bent to size for use as the parasitic elements. The only other materials required are a piece of pipe at least 5 feet long and not smaller in diameter than ¾ inch, two pieces of Plexiglas or similar insulating material, and some machine screws.

Two turns, plus about 6 inches, of the aluminium wire are needed for the driven element. A 6-32 spade lug is slid on to the wire approximately to its centre. The lug is used as one of the supports for the driven element. The wire is bent into the form shown in Fig. 2. A loop of 5/32 inch inside diameter is bent at each open end of the wire.

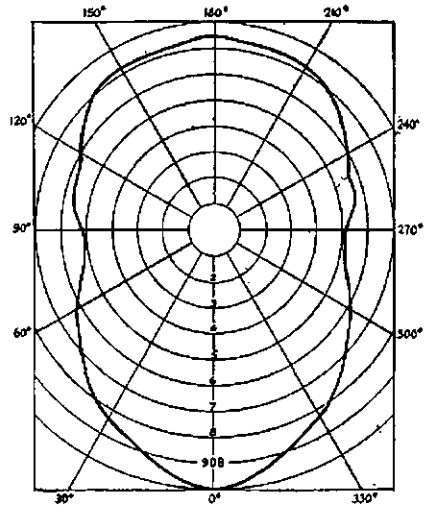


Fig. 1. Field pattern of the Antalo antenna on 145.342 Mc. and at a distance of 1 mile. Gain figures are in reference to a standard halo.

An insulating mounting plate for the driven element is made by cutting and drilling a piece of ½-inch Plexiglas sheet as shown in Fig. 3. The element is attached to the insulator with the spade lug at the upper ¼-inch hole, and 8-32 machine screws through the terminal loops of the wire at the bottom pair of holes, as indicated.

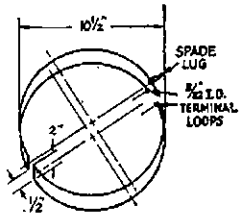


Fig. 2. The driven element is made of ⅛-inch aluminium clothesline, bent to form a double loop with a gap at the front.

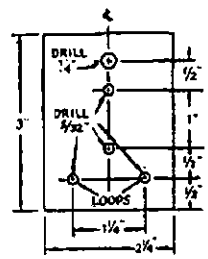


Fig. 3. The insulating mounting for the driven element is made from a piece of ⅜-in. Plexiglas, cut and drilled as indicated.

A spacer is cut from ½-inch Plexiglas rod to fit between the folded ends of the driven element, as shown in Fig. 4. A similar spacer could also be made from ⅜-inch sheet material if the rod is not available.

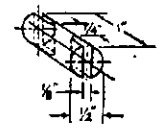


Fig. 4. The spacing insulator for the driven element may be made from a piece of rod or sheet of Plexiglas or other good insulating material.

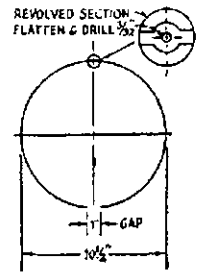


Fig. 5. The parasitic rings are also of ⅛-in. aluminium clothesline, flattened at the centre for mounting, as shown in the detail.

For the parasitic elements, 16 rings of the aluminium wire with a 1-inch gap are cut as shown in Fig. 5. A flat spot is hammered in the wire at a point diametrically opposite the gap, and drilled as indicated in the detail sketch.

The top end of the pipe mast is drilled and tapped according to Fig. 6. The three larger holes are for mounting the driven element with its Plexiglas insulator. The parasitic elements are attached directly to the mast without

(Continued on page 7)

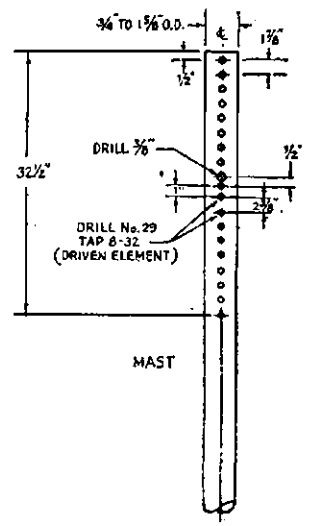


Fig. 6. Sketch showing drilling pattern of the mast. Except as indicated, holes are made with a No. 43 drill and tapped for 4-40 machine screws, and are spaced 1⅞ inches apart. The mast section should be of aluminium or steel, and at least 5 feet long.

* Reprinted from "QST," December, 1964.

# MODIFICATION OF BENDIX COMPASS RECEIVER

*REV. BRO. P. L. ELLIS**

The changes were devised to obtain maximum selectivity from the set which has one stage of i.f. amplification at 110 Kc. The idea of the cathode follower was gleaned from an article in "Electronics World" dealing with noise suppression, and the voltage doubler detector will be familiar to readers of "Radio Television and Hobbies."

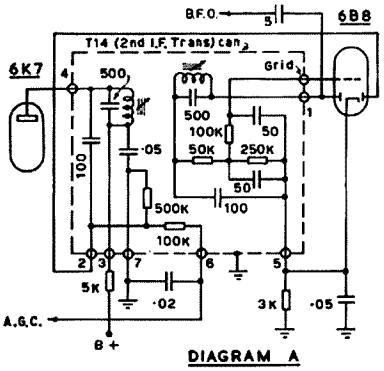


DIAGRAM A

By inspection of the original circuit (diag. A) one will notice that the primary of the last i.f. transformer is loaded by the a.g.c. diode and its network of resistors, while the secondary serves the usual audio diode. This loading causes the "Q" of the transformer to be considerably reduced, with adverse effects on the set's selectivity.

Diagram B shows modifications to lessen these effects. The a.g.c. circuitry is removed from the primary and the secondary is fed to the grid of the cathode follower. The effective input impedance of this unit is extremely high, thus avoiding the heavy damping of the original circuit components.

The r.f. choke is a home-made unit. The coils from two old capacitor-tuned i.f. transformers were used. These were wound on solid wooden formers. The formers were drilled through the centre, and so cut, that the four windings could be assembled on a thin wooden shaft, and spaced something less than ¼" apart. By joining the coils in series a choke with an inductance several times greater than 2.5 mH. was available. This value was considered advantageous as the i.f. to 110 Kc.

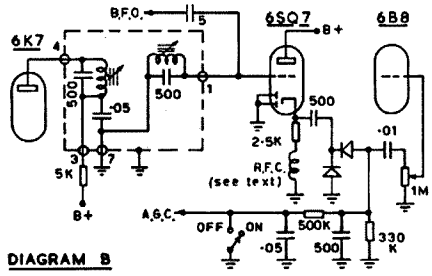


DIAGRAM B

The voltage doubler detector more than compensates for any losses inherent to the cathode follower. By correct orientation the germanium diodes of the detector will produce a negative d.c. voltage across the audio load and this can be used as the a.g.c. voltage.

The b.f.o. injection now goes to the grid of the cathode follower. It was found necessary to earth the a.g.c. line when listening to c.w. or s.s.b. as the a.g.c. considerably reduced sensitivity when the b.f.o. was active.

The component values shown in the circuit may not necessarily give optimum results. They were used simply because they were on hand and worked. Nevertheless, the cathode follower is the significant unit in the modifications, and the improved selectivity was obvious on first trial of the receiver. Needless to say I have no "selectivity figures" to offer; but the results were well worth the modicum of work required.

—Rev. Br. P. L. Ellis.

* St. Patrick's College, Goulburn, N.S.W.

☆

*Technical Correspondence—*

## RE LOW NOISE FIGURE CONVERTER FOR 2 MX

Editor "A.R.," Dear Sir,

The footnote to my article "A Low Noise Figure Converter for Two Metres" states that the addition of a second GE7077 grounded grid amplifier lowered the noise figure of the converter from 4.5 db. to 2.5 db. In order to alleviate any bewilderment about this statement an explanation may be considered necessary.

It may seem paradoxical that the addition of an identical amplifier stage should improve the noise figure so markedly, but it should be noted that the overall noise figure depends on not only the r.f. amplifier noise figure but also on the mixed noise figure.

The formula for this relationship is:

$$F_{TOTAL} = F_1 + \frac{F_2 - 1}{G_1}$$

where $F_{TOTAL}$ is the overall noise factor.
$F_1$ is the noise factor of the first stage (in this case the r.f. stage).
$G_1$ is the power gain of the first stage.
$F_2$ is the noise factor of the second stage (the mixer).

Note also that Noise Figure = 10 $\log_{10}$ noise factor.

It can be seen that if $F_2$, the mixer noise factor, approaches or exceeds the power gain of the r.f. stage $G_1$, the overall noise factor will be degraded. This was in fact what happened with only one r.f. stage. Addition of a second r.f. stage will increase $G_1$, thereby reducing the term $(F_2 - 1) \div G$ to a negligible amount, bringing the overall noise factor of the converter very close to the noise factor of the r.f. stage alone.

After completion of the converter, and the measurement of the n.f. it is apparent that if a grounded cathode r.f. stage had been used to obtain a higher power gain an improved noise figure on 4.5 db. would have been obtained for the single r.f. stage. However, it would appear that the application of valves for this type of equipment is nearing an end with the availability of v.h.f.-u.h.f. type transistors, on the local market. An excellent article introducing this "new look" in converters appeared in August '65 "A.R."

—C. J. Hurst, VK5HJ.

# AMATEURS TO PLAY HOST TO THE YOUTH OF THE WORLD

During the week end of October 16-17, Radio Amateurs from 70 countries will open up their "Ham shacks" to members of the Boy Scouts' and Girl Guides' Associations for the Boy Scouts International 8th Jamboree-on-the-Air.

Since 1965 is International Co-operation Year, organised by the United Nations, the Boy Scouts World Bureau proposes to dedicate this year's Jamboree-on-the-Air to international co-operation and goodwill. The commencing date, 16th October, is particularly appropriate, as it has been selected by the Food and Agriculture Organisation of the U.N. for their "Mobilisation of Youth Appeal" in connection with the Freedom from Hunger Campaign.

If you are one of the "300 plus" Australian Amateurs who were able to give a few hours of your time to help these young people last year, then you aer no doubt looking forward to this year's "event" as eagerly as they.

If you have not participated in Jamboree-on-the-Air before may I suggest you give it a go. An adult Scouter will be in charge of each Group and he will arrange a roster of Scouts and Guides to visit your "shack" over the week end at times to suit you, and in groups depending upon the size of your "shack."

The rules are very simple and were explained in the September issue of "A.R." The call sign is "CQ Jamboree" or on c.w. "CQ Jam."

This is not a contest and there are no prizes given for the most contacts although a participation certificate will be issued by the Boy Scouts' Association to every Amateur and Youth Group who send in a log of stations and Scout Groups contacted to Jamboree-on-the-Air Branch Organiser, c/o. Boy Scouts H.Q. of your own particular State. Log sheets and all other relative information are available from any Scout Group.

In past years many Short Wave Listeners have participated in Jamboree-on-the-Air. They, too, will receive a participation certificate if they send in log of stations and Scout Groups heard during the week-end.

We are particularly interested in receiving photographs of your station rig with Scouts and Guides participating in Jamboree-on-the-Air to forward to the World Scout Bureau in Canada.

Last year a photograph of a Victorian Scout Group participating by the courtesy of a Victorian Amateur, VK3AHJ, was chosen as the front cover piece for the 8th Jamboree-on-the-Air World Report which was sent to the 70 different countries around the world who took part in this "event."

This was great publicity for both the Australian Radio Amateur and the Australian Boy Scouts' Association.

So let us, the Radio Amateurs of Australia give these young people the opportunity to talk and make friends with other young people throughout Australia and the world and introduce them to our hobby of Amateur Radio and Electronics.

—Jack Nicholson (VK3AAN), Victorian Branch Organiser, Boy Scouts Association.

# RESULTS ON 2 MX F.M.

(Continued from page 3)

If you can obtain 20 db. of noise reduction with a 0.5 $\mu$V. input signal then your work has not been in vain and you will easily read that weak signal.

The presence of vibrator hash, ignition or impulse type noise indicates that your receiver is not operating correctly. It should be possible to operate f.m. gear of this type in extremely noisy locations without suppression where "a.m." contacts would be impossible.

It is relatively easy to operate this type of equipment from a.c., but there are several points to keep in mind. The receiver should not have more than +170v. of h.t., but more could be applied to the transmitter. The p.t.t. relay requires a low d.c. voltage, this could readily be obtained with a silicon rectifier from the filament supply.

The accompanying circuit (Fig. 4) answers all points quite nicely but be sure that R1 (Fig. 4) will dissipate the power adequately and when transmitting, there is not excessive dissipation in the p.t.t. relay coil.

Remember, that this carbon microphone voltage is derived from the h.t. —ve., so care must be taken to prevent power supply hum from getting into the audio.

The following f.m. net frequencies are in regular use in VK3:—

52.525 Mc.
145.854 Mc.
146.000 Mc.
146.146 Mc.
435.000 Mc.

MR10 socket wiring details:—

| Control Unit | Tx/Rx |
|---|---|
| 1.—L.t. active | 1.—Tx. fils. |
| 2.—Trans. control | 2.—Rec. fils. |
| 3.—Rec. control | 3.—Channel s/w. |
| 4.—Output common | 4.—Mute |
| 5.—3 ohm spkr. output | 5.—Output common |
| 6.—Spare | 6.—3 ohm output |
| 7.—Mic. active | 7.—Bias |
| 8.—P.t.t. control | 8.—P.t.t. relay |
| 9.—Rec. h.t. plus 150 v. | 9.—Trans. h.t. plus 300 v. |
| 10.—Bias | 10.—Rec. h.t. plus 150 v. |
| 11.—Mute control | 11.—Mic. active |
| 12.—Earth | 12.—Mic. supply |

## CONCLUSION

Don't despair about f.m. as all you have to do here in VK3 is to barely get on the air and there are least 100 experts just waiting to help.

☆

# THE ANTALO

(Continued from page 5)

insulation. These elements should not be mounted until the driven element has been adjusted.

## ADJUSTMENT

A 2-metre transmitter of the 2- to 5-watt variety is desirable as the signal source, and an "in-the line" type of standing-wave indicator should be inserted in the RG-8/U transmission line to the driven element. Adjust the transmitter frequency to the centre of the desired range. The spacing between the open ends of the driven element is then adjusted for minimum reflected power. When this adjustment has been found, "Q Dope" is applied to the Plexiglas spacer to fix the spacing at this point. The parasitic elements should be mounted now, and the gap spacing of each element adjusted for minimum s.w.r., starting with the elements closest to the driven element and working outward from there.

The author wishes to express his thanks to W8DQR, W4ZNV and K8TGH for their assistance, and W8UPB and W1ICP for their encouragement. ●

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# NEW CALL SIGNS

JUNE, 1965

VK2ZU—J. H. Frazer, 4 Cropley Street, Rhodes.
VK2AAS—R. F. Woolley, King's Road, Federal.
VK2ANQ—A. Milner, 2 Elouera Road, Avalon Beach.
VK2AVX—P. F. Goldsbrough, 16 Duke Street, East Gosford.
VK2ZJD—J. M. Bennett, Married Quarters 15, Victoria Barracks, Paddington.
VK2ZMU—A. W. Mothersole, 78 Aberdare Road, Cessnock.
VK2ZPS—P. J. Vandersleesen, 20 Yanko Avenue, Waverley.
VK2BCP—I. P. Cork, Glenview, Wollomombi.
VK3AFZ—J. F. Ferguson, 57 Surrey Road, South Yarra.
VK3ZEW—J. L. Jones, School of Radio, R.A.A.F. Base, Laverton.
VK3ZGE/T—A. J. Johnson, 45 James Road, Ferntree Gully.
VK3ZII—A. R. F. McDonald, 38 Thompson Street, Sale.
VK3ZOJ—Rev. J. M. O'Kelly, St. Joseph's Presbytery, Warragul.
VK3ZSP—G. L. Porter, School of Radio, R.A.A.F. Base, Laverton.
VK3ZWP—W. B. Pywell, 26 Laing Street, Mont Albert.
VK3ZWS—W. K. Slater, 44 Fowler Street, Coburg.
VK4ZLO—L. A. Davies, 14 Noeline Street, Dorrington, Brisbane.
VK5MM—L. D. McKenzie, 3 Eric Avenue, Black Forest.
VK5NT—N. Tebneff, 14 Willingale Avenue, Lockleys.
VK5PT—Third Goodwood Radio Club, 51 Frederick Street, Clarence Park.
VK5ZBF—R. G. Henderson, 22 Andrews Road, Elizabeth Downs.
VK5ZBK—E. J. Kenny, 52 Penno Parade, Belair.
VK5ZDV—R. K. Von Sanden, 19 Herbert Street, Plympton Park.
VK5ZWG—G. N. Wicker, Station: 61 Swaine Avenue, Rose Park; Postal: 7 Philpott Avenue, Paradise.
VK8DI—B. J. Burns, 897 Kerin Place, Rapid Creek, Darwin.
VK6LV—Christian Brothers College, Franklin Street, Leederville.
VK6ZBP—P. R. Beck, 1 Rawson Street, Subiaco.
VK6ZEV—M. J. Vellnagel, 233 Mill Point Road, South Perth.
VK6ZFB—M. H. Baker, 8 Gunee Road, City Beach.
VK6ZFC—R. J. Campbell, 3 Hardy Street, North Perth.
VK6ZFS—N. D. Stephen, 24 Dunblane Road, Floreat Park.
VK7ZBL—B. Kelly, 29 Park Street, Wynyard.
VK7ZPD—P. R. Dowde, 77 Talbot Road, Launceston.
VK7ZMW—M. A. Wood, Walton Street, Huonville.
VK7KZ—R. J. Geeves, 47 Bowden Street, Glenorchy.
VK9FE—F. E. Earley, C/- Box 301, Rabaul, T.P.N.G.
VK9TB—E. W. Bastow, 8 Agoa Street, Port Moresby.
VK9ZEV—C. S. Schulz, C/- Posts and Telegraphs, Rabaul, T.P.N.G.

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KB6CY is now on the air and the address for anyone desiring a QSL is through Honolulu at the following address: Robert York, KB6CY, Bendix Field Engineering Corp., 3131 Nimitz Hwy., Suite 210, Honolulu, Hawaii, 96819. Bob also has complete logs for KS6BN and will QSL anybody that wants one.

## CONTEST CALENDAR

**2nd/3rd October:—**
VK/ZL Oceania. Contest—Phone Section.
W.A.D.M. Contest—C.W.

**9th/10th October:—**
VK/ZL Oceania. Contest—C.W. Section.

**16th/17th October:**
Fourth R.S.G.B. 7 Mcs. DX Contest Phone Section.

**23rd/24th October:—**
CQ World Wide. DX Contest—Phone Section.

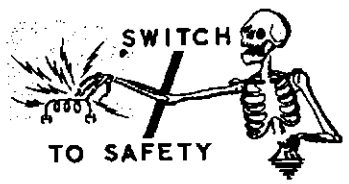
**23rd/24th October:—**
VU2/4S7 DX. Contest—Phone Section.

**30th/31st October:—**
VU2/4S7 DX. Contest—C.W. Section.

**6th/7th November:—**
Fourth R.S.G.B. 7 Mcs. DX Contest—C.W. Section.

**27th/28th November:—**
CQ World Wide. DX Contest—C.W. Section.

**Mid December/Mid January:—**
Ross A. Hull Memorial Trophy. V.H.F. Contest.






## A. R. R. L.

Associate Memberships (and renewals) are available by forwarding £2/14/- (plus 6d. interstate cheques) to:

Business Manager, W.I.A.,
49 Cookson Street,
Camberwell, E.6,
Victoria.

This includes the regular arrival of

"QST"

# ONE-TRANSISTOR TOP BAND CONVERTER*

## TO WORK WITH ANY MEDIUM-WAVE RECEIVER

*B. J. P. HOWLETT, G3JAM*

OF the three main points at which one can have the local oscillator to convert the 160 m. band to medium wave, namely:

(1) Oscillator above signal frequency;
(2) Oscillator above IF but below signal; or
(3) Oscillator below IF and below signal,

the writer believes that the most difficult is the first case. Besides giving reverse tuning, the 2nd channel lies near the 49 m. broadcast band. full of high power transmissions, and short-wave breakthrough could become a severe problem.

The choice seems to lie between Case No. 2 and Case No. 3. Taking some typical values:

| | No. 2 | | No. 3 | |
|---|---|---|---|---|
| | A | B | A | B |
| Osc. .. .... | 1100 Kc. | 950 Kc. | 800 Kc. | 600 Kc. |
| IF .. .... | 700-900 | 850-1050 | 1000-1200 | 1200-1400 |
| 2nd Ch. | 200-400 | 100-100 | 200-400 | 600-800 |

Number 2B is definitely out, and one can look at it two ways. The IF range includes the oscillator frequency. Alternatively, the 2nd harmonic of the oscillator falls in the 160 m. band. In fact any oscillator frequency between 900 and 1000 Kc. is automatically ruled out. However, frequencies HF of this are quite in order up to about 1250 Kc. when the main receiver will reach the LF end of the band coverage.

No. 3B itself is workable, just. The third harmonic of the oscillator falls at 1.8 Mc. and the 2nd harmonic at its IF equivalent. Oscillator frequencies between 600 and 667 Kc. are out for the same reason—harmonic falls in the band. And that leaves a broad section 667 to 900 Kc. in which to play around, so Case No. 3A is near-enough in the middle of the optimum section.

It is fortunate for Londoners that the corresponding IF range does not include any powerful local stations; other parts of the country may not be so lucky.

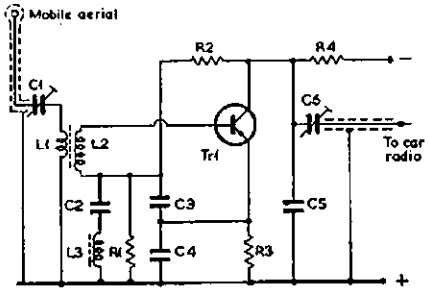
The writer has actually tested using all the investigated possibilities, and has confirmed all the possible reasons for rejection. As a result, 820 Kc. was chosen for the local oscillator, giving a tuning range of 980-1180 Kc. (2nd channel 360-160 Kc., which admittedly includes Droitwich, but this station is no problem in S.E. England).

### CIRCUIT

The great care in choosing the IF range was well worth the trouble, as only a single OC44 frequency changer was required in the end, connected in a Clapp circuit with high-Q coils knocked up with 34 g. wire on cast-off fragments of rod aerial ferrite! It was found important to avoid diffused-junction transistors of all kinds, for two reasons:

In the first place, it is desirable not to have any gain on short waves proper; and if there is no appreciable gain at higher frequencies there is less tendency for the oscillator waveform to become distorted. The local oscillator was adjusted so that it starts readily but gives near enough a sine wave on an oscilloscope.

Stage gain is slight, but the frequency change action introduces very little noise, and when used with a good centre-loaded whip a Pye hybrid type car radio sounded just like a proper Top Band receiver. Matching out is done with C1 and matching in with C6. The series-tuned input greatly improved reception when used with the regular car aerial but performance is not very impressive under those conditions.




Circuit of the transistor converter described by G3JAM. The choice of local oscillator frequency and the IF is discussed in the text. This simple arrangement will enable almost any medium-wave receiver—car radio, transistor portable or domestic BC set—to give coverage over the 160-metre Amateur band.

C1—30 pF. Philps trimmer.
C2, C5—0.001 μF.
C3, C4—0.005 μF.
C6—100 pF. comp., trimmer.
R1, R3, R4—2,700 ohms.
R2—15,000 ohms.
Tr1—OC44, or similar.

Notes: For L1 and L3 use single-layer winding on off-cuts of ferrite-rod aerial material, adjusting turns experimentally. For L2, 8 turns of insulated wire over-wound on L1.

Used in the home station with the same centre-loaded whip, but working into a CR-100, it was extremely difficult to tell when the converter was in use, so the comparison had to be by listening carefully for MW breakthrough. There is a little such down in the South-East, the strongest being Hilversum III. (Since writing this, one of the D.I.Y.S. stations has appeared in that section of the MW band!)

The writer would like to add that the input tuning does not have to be removed when using a centre-loaded whip; two series tuned circuits in series with one another still tune to the same frequency—the better one virtually takes charge. In fact, it all all helps in keeping out unwanted QRM.

### CONCLUSION

Writing in the past tense does not imply that the unit no longer exists. It was built for and is used by a friend—the writer has no vehicle. Sturdy construction and secure bonding of earths will help to make the unit long-lived and reliable whether used on a 9-volt dry battery (consumption 0.8 mA.), or on the 12-volt car battery (consumption just over a milliamp).

On the car battery, consumption is so small that it is hardly worth the effort of fitting a switch!



* Reprinted from "The Short Wave Magazine," February 1965.

# ROSS HULL MEMORIAL V.H.F. CONTEST, 1965-66

The Federal Contest Committee of the Wireless Institue of Australia invites all Australian and Overseas Amateurs and Short Wave Listeners to participate in this annual Contest which is held to perpetuate the memory of Ross Hull whose interest in v.h.f. did much to advance the art.

A Perpetual Trophy is awarded annually for competition between members of the W.I.A. in Australia and its Territories, inscribed with the name and life's work of the man whom it honours. The name of the winning member of the W.I.A. each year is also inscribed on the Trophy. In addition, this member will receive a suitably inscribed certificate.

**Objects:** Australian Amateurs will endeavour to contact as many other Amateurs in Australia and Overseas under the following conditions:

**Date of Contest:** From 1401 hrs. G.M.T. 11th December, 1965, to 1359 hrs. G.M.T. 16th January, 1966.

**Duration:** Any **consecutive** 216 hours (9 days) within the dates mentioned above, this period to be at the choice of the operator.

### RULES

1. There shall be three main sections to the Contest:
   (a) Transmitting, Open, 52 Mc. and higher;
   (b) Transmitting, Phone, 52 Mc. and higher;
   (c) Receiving, Open, all bands, 52 Mc. and higher.

2. All Australian and Overseas Amateurs may enter for the Contest whether their stations are fixed, portable or mobile. If portable or mobile operation is used, this to be stated, giving the general location of such operation.

3. All Amateur v.h.f. bands may be used, but no cross-band operating is permitted. Operators are cautioned against operating transmitting equipment on more than one frequency at a time, particularly when passing cyphers. Such operation may be grounds for disqualification of a contestant.

4. Amateurs may enter for any of the transmitting sections.

5. Only one contact per band per station is allowed each calendar day.

6. Only one licensed Amateur is permitted to operate any one station under the Owner's call sign. Should two or more operate any particular station, each will be considered a contestant and must submit a separate log under his own call sign.

7. Entrants must operate within the terms of their licences.

8. **Cyphers:** Before points may be claimed for a contact, serial numbers must be exchanged and acknowledged. The serial numbers of 5 or 6 figures will be made up of the RS (telephony) or RST (c.w.) report plus three figures commencing from 001 for the first contact and will increase in value by one for each successive contact. If any contestant reaches 999 he will start again with 001.

### SCORING TABLE

| Distances Between Stations | 52 Mc. | 144 Mc. | 432 Mc. | 576 Mc. | Higher |
|---|---|---|---|---|---|
| Up to 10 miles .... | | | | | |
| Over 10 and up to 25 miles .... .... | | | 1 | 2 | 5 |
| Over 25 and up to 50 miles .... .... | | | 2 | 5 | 10 |
| Over 50 miles and up to 100 miles .. | 2 | 1 | 5 | 10 | 15 |
| Over 100 miles and up to 200 miles .. | 5 | 5 | 10 | 15 | 20 |
| Over 200 miles and up to 300 miles .. | 10 | 5 | 15 | 20 | |
| Over 300 miles and up to 500 miles .. | 5 | 10 | 20 | | |
| Over 500 miles and up to 1000 miles | 1 | 15 | 30 | | |
| Over 1000 and up to 1500 miles .... | 1 | 20 | | | |
| Over 1500 and up to 2500 miles .... | 5 | 30 | | | |
| Over 2500 and up to 3500 miles .... | 10 | | | | |
| Over 3500 and up to 5000 miles .... | 15 | | | | |
| Over 5000 miles .... | 20 | | | | |

9. **Entries** must be set out as shown in the example, using only one side of the paper. Entries must be postmarked not later than the 14th February, 1966, and clearly marked Ross Hull Contest, and addressed to **Federal Contest Manager, Box N1002, G.P.O., Perth.**

10. **Scoring** for all sections will be based on the attached table. Contestants will have to agree between themselves as to the distance between their stations. Such distances must be shown in the log entry as shown in the example. Failure to make this entry will invalidate the particular claim. Some typical distances are given in the attached table.

11. **Logs:** All logs shall be set out as in the example and in addition will carry a front sheet showing the following information.

Name.....Call Sign.....
Address .....Section.....
.....Claimed Score.....

Operating period:
From .....hrs. G.M.T. ...../...../.....
to ..... hrs. G.M.T. ...../...../.....
i.e., 9 consecutive days.

Highest score over a 48 hours period was..... points.

Operating period:
From .....hrs. G.M.T. ...../...../.....
to.....hrs. G.M.T. ...../...../.....

Declaration: I hereby certify that I have operated in accordance with the Rules and Spirit of the Contest.
Signed.....
Date.....

**Note:** Entries on the front sheet must be clearly shown in block letters.

12. The right is reserved to disqualify any entrant who, during the Contest, has not observed the regulations or who has consistently departed from the accepted code of operating ethics.

13. The ruling of the Federal Contest Manager of the W.I.A. will be final. No dispute will be entered into.

14. **Awards:** Certificates will be awarded to the winners of each section in each VK and Overseas Call Area. The VK contestant who returns the highest score in the transmitting section and who is a financial member of the W.I.A., wil have his name inscribed on the Trophy which will be held by his Division for the prescribed period. His Certificate will be suitably inscribed. In addition a special certificate will be awarded to the Contestant, who shall not be the Trophy winner, and who returns the highest scoring log covering a period of any 48 consecutive hours (2 days) within the contest duration, such period to be nominated by the contestant. This period must be within the duration of the contest, but need not be within the main 9-day period. The period chosen must be stated on the front sheet—refer Rule 11.

### RECEIVING SECTION

1. Short Wave Listeners in Australia and Overseas may enter for the Contest, but no transmitting station may enter.

(Continued on next page)

**EXAMPLE OF TRANSMITTING LOG (Brisbane Station)**

| Date/ Time G.M.T. | Band Mcs. | Emission Power | Call Sign | RST/No. Sent | RST/No. Rcvd. | Dist. Miles | Points Claim |
|---|---|---|---|---|---|---|---|
| 24th Dec. 0100 G.M.T. | 52 | A3 (a) 50 watts | VK7ZAI | 59001 | 59004 | 1110 | 1 |
| 0110 G.M.T. | 52 | 50 watts | VK4NG | 58002 | 57051 | 330 | 5 |
| 0230 G.M.T. | 144 | A3 150 watts | VK5ZK | 56003 | 55043 | 990 | 15 |
| 0235 G.M.T. | 144 | 150 watts | VK3ZJQ | 45004 | 46021 | 850 | 15 |

**EXAMPLE OF RECEIVING LOG (Perth S.w.l.)**

| Date/ Time G.M.T. | Band Mcs. | Call Heard | RST/No. Sent | Station Called | Distance Miles | Points Claim |
|---|---|---|---|---|---|---|
| 2nd Jan. 1000 G.M.T. | 52 | VK5ZDX | 59221 | VK8KK | 1330 | 1 |
| 1025 G.M.T. | 52 | VK2ZCF | 58195 | VK6ZAA | 2040 | 5 |
| 1110 G.M.T. | 432 | VK6ZDS/6 | 57061 | VK6LK/6 | 60 | 5 |
| 3rd Jan. 0500 G.M.T. | 144 | VK5ZHJ | 44102 | VK6ZCN | 1330 | 20 |

2. Contest times and logging of stations on each band are as for the transmitting sections, however, there is no 48 hours sub-section.

3. To count for points, logs will take the same form as for transmitting sections but will omit the serial number received. Logs must show the call sign of the station heard (not the station worked), the serial number sent by it, and the call sign of the station being worked.

Scoring will be on the same basis as for transmitting stations, i.e., on the distance between the Listener's station and the station heard. See the examples given. I is not sufficient to log a station calling CQ.

4. A station heard may be logged only once per calendar day on each band for scoring purposes. but additional reports will be of value to the F.C.M.

5. **Awards:** A certificate will be awarded to the highest scorer in VK. Other certificates may be awarded by the Federal Contest Manager depending on conditions and activity.

### GENERAL NOTES

The contest period has been altered in line with suggestions made by many contestants and an extra certificate will be awarded for the best score over a 48-hour period in accordance with a motion passed at the 1965 Federal Convention. However, the 9-day winner is not eligible for the 48-hour award. Also changes have been made in the Scoring Table to accommodate some of the alterations suggested by the VK6 Division at Federal Convention.

Since only a small number of logs are received for the Receiving Section, only one Certificate will be awarded this year unless extra activity warrants otherwise.

It is suggested that contestants obtain a large-scale map of Australia and of their State and measure out the distances involved in contest contacts that are not given herein.

Contestants are reminded that times **must** be shown in G.M.T. in accordance with Institute policy to foster the use of G.M.T. where practicable. Failure to observe this rule will be grounds for disqualification.

Comments concerning the Contest, with particular reference to: Duration of Contest, Points Scoring System, Rules of Contest, would be appreciated by the Federal Contest Manager.

### DISTANCE TABLE

| | Syd. | Canb. | Bris. | Melb. | Hob. | Adel. | N. Zea. | Dar. | Perth |
|---|---|---|---|---|---|---|---|---|---|
| Sydney | 0 | 160 | 460 | 460 | 660 | 710 | 1300/1500 | 1950 | 2040 |
| Canberra | 160 | 0 | 600 | 290 | 530 | 670 | 1300/1500 | 1930 | 1940 |
| Brisbane | 460 | 600 | 0 | 860 | 1110 | 990 | 1500/1700 | 1790 | 2240 |
| Melbourne | 460 | 290 | 860 | 0 | 400 | 400 | 1500/1700 | 1930 | 1720 |
| Hobart | 660 | 530 | 1110 | 400 | 0 | 710 | 1300/1500 | 2280 | 1880 |
| Adelaide | 710 | 670 | 990 | 400 | 710 | 0 | 1900/2100 | 1620 | 1330 |
| New Zealand | 1300/1500 | 1300/1500 | 1500/1700 | 1500/1700 | 1300/1500 | 1900/2100 | 0 | 2550 | 3000/3200 |
| Darwin | 1950 | 1930 | 1790 | 1930 | 2280 | 1620 | 2550 | 0 | 1650 |
| Perth | 2040 | 1940 | 2240 | 1720 | 1880 | 1330 | 3000/3200 | 1650 | 0 |

## A £1's WORTH OF TAPE TOOK THE PHOTOS OF MARS

A length of "Scotch" magnetic recording tape worth about £A1 was used on July 14 to send home to the world photographs of the planet Mars.

Mariner Four, the spacecraft which was on schedule when it flew past the red planet had travelled 350 million miles since it was launched last November. Aboard the vehicle, 138,000 components had functioned for some 5,500 hours in space.

Such industrial firms as North American Aviation, General Electric, Lockheed Missiles and others were included on the list of Mariner's contractors. More than 60 sub-contractors provided 21 million dollars worth of hardware and instruments. More than 1,000 other firms provided another 19 million dollars worth of procurements.

But in the end Mariner Four's photographic success depended on the ability of that one strip of magnetic tape—thinner than a razor blade, and not quite as wide as a pencil—to record and faithfully reproduce photographs of Mars. The tape was 3M Company's "Scotch" Brand Instrumentation Tape, which was also used in Ranger Eight and Ranger Nine to record and reproduce thousands of photographs of the Moon.

As Mariner Four passed within about 5,600 miles of Mars, a single television camera took 21 black and white pictures. Two at a time, the pictures were stored on the tape in digital form for later playback. This was necessary because, while picture data is recorded at 10,700 binary digits (bits) per second, the radio transmission rate from Mars is an extremely slow 8.33 bits per second. The slow transmission is needed to achieve reasonable picture quality over the 150 million miles (241,397,000 kilometres) of communications distance.

Tape length was held to 330 feet (100.584 metres) by the recorder's ability to operate at the extremely slow speed of one one-hundredth of one inch (.0254 cm.) per second. The unique recorder, built by Raymond Engineering Laboratory Inc. (of Middleton, Connecticut, U.S.A.) was turned off after recording each pair of pictures and was turned on again to record the next pair.

The instrumentation tape used in the spacecraft and on the ground recorders was designed to withstand severe heat. During manufacture of the Mariner Tapes, 3M engineers passed them through 65 specific tests and later subjected them to 35 more.

Playback of the pictures—which took 8 hours 20 minutes for each picture—began 13 to 15 hours after the last picture was taken. Back on Earth, the telemetry transmission of the photographs and engineering information was received on much the same kind of 3M tape. A 3M Mincom recorder/producer was among other ground equipment, to record transmissions from the spacecraft. Photographs were reproduced by running the ground recorded tape through a video kinescope system in much the same manner as Ranger Nine's Moon pictures were processed.

# Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

### COST OF OVERSEAS EQUIPMENT

Editor "A.R.," Dear Sir,

I sincerely trust that this letter will not be considered in the light that I am "having a go" at any particular agent or importer, but rather that of someone seeking genuine information on the price difference of Radio Materials in their country of manufacture and that obtaining here.

When visiting England last year I was privileged to go through the works of Messrs. K. W. Electronics, at Dartford, and was given leaflets, etc., covering many of the pieces of equipment I saw being manufactured, and would like to take as an example the price difference between England and Australia of their K.W.2000 Transceiver, for which I give the following figures:

| | | | |
|---|---|---|---|
| **Price in England, with Sales Tax:** | | | |
| K.W.2000 Transceiver | £170 | | |
| Power Supply Unit, a.c. or d.c. | £29 | | |
| Total cost | £199 | | |
| Equivalent Price in Australian £s. | £212 | 10 | 0 |
| Power supply unit, a.c. or d.c. | £36 | 5 | 0 |
| Total cost | £248 | 15 | 0 |
| Importer's Sale Price in Australia | £337 | 12 | 6 |
| Power Supply Unit, a.c. or d.c. | £56 | 7 | 6 |
| Plus 12½% Sales Tax | £49 | 5 | 0 |
| Total Cost | £443 | 5 | 0 |

Do not let us overlook that the **English** price quoted does have their Sales Tax included and when exported this Sales Tax is not applicable. Assuming that the Sales Tax in England is 12½% it would appear that the **total retail export price** would be in the region of £217/10/- Australian £s. But let us not forget that the importers do buy at **wholesale price**, which would, I feel, include a fair and reasonable profit for them.

It would be most interesting to hear the importers' answer to the question of how the cost to the public of this piece of gear more than doubles itself on its journey. The further information as to shipping costs, insurance and import duty would of course be a clear pointer as to where the difference lies.

Whilst one is quite prepared to pay a reasonable price for an article one does rather baulk at price differences of this nature, and one can only assume that the unfortunate purchaser of Radio Equipment, at this margin of difference between **wholesale cost** and **retail sale**, does so in ignorance of its original cost.

Please accept my assurance that I am in no way connected with any Import or Radio business in any way and am merely seeking to have, what is to me an inexplicable mystery, explained.

—C. Whalley, VK6KK.

### R.D. SCORING

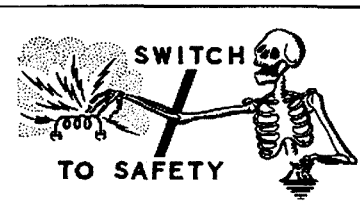
Editor "A.R.," Dear Sir,

On. the eve of the 1965 R.D. Contest it is appropriate to query the reason for the Contest Committee denying VK1 an independent scoring status.

As the reason seems to defy logical deduction, an explanation would be of interest. Rightly or wrongly, VK1 is a separate call area covering a population of 86,000 plus. It is home to more Amateurs than VK7, 8 and 9 combined, and in my view should operate on the same basis for scoring as every other Division.

Perhaps the committee can explain? If there is no reasonable explanation, the scoring table for next year should be revised.

—Col. Harvey.



# SIDEBAND

By Phil Williams VK5NN.

This month we have two unrelated topics to discuss, the first is the screen grid supply for a multitube linear amplifier, and the second, a well-timed design and layout for a phasing type s.s.b. generator.

## SCREEN SUPPLY FOR A MULTI-TUBE LINEAR AMPLIFIER

Linear amplifiers using television line-output tubes in parallel are becoming increasingly popular with the sideband operator who requires a small linear, i.e., physically small, which still packs a punch, but does not require large, high voltage components to provide the anode supplies.

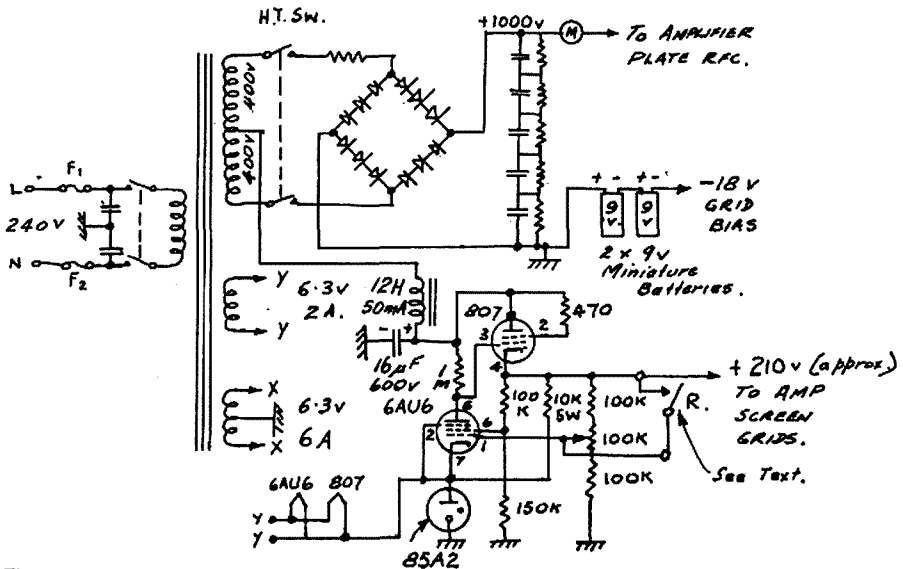



Fig. 1.—"Tetra Linear" Power Supply incorporating regulated screen grid supply and battery bias.

The main benefit to be derived from the change is that plate loading is less critical to adjust. With the "VR tubes in series" regulator, it was found that wrongly adjusted amplifier loading (too lightly loaded) allowed the plate voltage to swing down below the screen voltage, so that the latter demanded excess screen current which the previous arrangement could not supply. This would extinguish the VR tubes, give a violent change in output voltage to the screens, and this gave a "rough" sound on speech peaks.

Several of these amplifiers have been described in "QST" and the R.S.G.B. Bulletin, and the one I am using was described in May, 1964, "Amateur Radio." This amplifier has performed very well as published, but an improved method of regulating the screen grid supply for the four EL38/6CN6 pentodes has proved to be worth while, so the amended power supply circuit diagram is published below.

This effect could be adjusted out by increasing loading, but the loading was a little more critical than I wanted. Like most Amateurs I tolerated this, but what really set me searching for improvement was a report of hum modulation on the speech, which I thought could have come from the bias supply or screen supply in the linear amplifier. After these modifications the amplifier performance was much improved but the hum still remained, to be discovered later in the microphone case earthing lead.

During the renovations the bias supply was the first to be treated, and two cheap transistor radio 9 volt batteries were obtained from the local chain-store food market. These have not shown signs of wilting in 15 months of service and a quick test in a radio showed that they are still quite good on load. A grid current test with the linear at half plate voltage showed that bias voltage is maintained with reverse battery current, i.e., grid current on speech peaks.

The same could not be said for the screen voltage, so the screen regulator shown in Fig. 1 was incorporated, straight from the A.R.R.L. Handbook. My 6AU6 is actually a 6SH7 (same characteristics) so this tube and the 807 now occupy the socket positions previously used for the VR105 regulators. A new B7G miniature valve socket accommodates the 85A2.

The spare relay contact on the linear T/R relay was used at "R" to lower the screen voltage to about 100 volts when receiving. This reduces the standing current in the linear to a very small amount, and reduces heating when not transmitting. This is kind to the transformer which is rated to supply only 80 watts from the 400-0-400 volt winding.

On a variable resistance load task the regulator supplied 90 milliamps before dropping out, but your linear should not require this unless you have a dozen or so tubes in parallel.

It is interesting that Max VK4DA is using a similar screen regulator, which has given me a chance to "taste the difference" in my receiver. There is a difference—quite a worthwhile improvement.

## AN IMPROVED PHASING S.S.B. GENERATOR MODULE

This improved version of the well-tried phasing sideband generator derives its improved performance as much from layout as from the subtle changes to the circuitry.

The r.f. phase shift bridge circuit, balanced modulators and output combining circuits are mounted on a small piece of matrix board about 4 in. x 2 in. Mounting is behind or below the two balance potentiometers which are side-by-side on the front panel or chassis as you wish. The pot connections poke through the holes shown approximately with black dots, and the components wired to the circuit diagram in the locations shown on the diagram or as near to it as practicable with the bits and pieces you have.

The following notes will help to explain why things are arranged as shown. This circuit was for a 9 megacycle generator, and it is essential to shield all oscillator components, valve, output coil, and crystal, to reduce carrier leakage to later circuitry. The oscillator output link had four turns on a 24-turn plate coil wound on a 7 m.m. former. The 70 ohm co-axial cable feeding the r.f. bridge should be short and earthed only as shown. The cold r.f. point "C" on the bridge is floating at audio voltage from Audio 2, and the hot r.f. point "D" has also Audio 1 applied to it. It may seem odd to have a 0.005 mF. capacitor in one r.f. lead and 0.003 mF. in the other, but if you look at the two 1000 pF. mica condensers across the output circuit you will see that these are in parallel with the 0.003 mF. to earth via the output coil and RFC, as far as the Audio 2 signal is concerned.

The important feature of this r.f. phasing bridge is that the audio signals are fed to C and D, i.e., top and bottom of the bridge, and the r.f. signals 90 degrees apart, are obtained from A and B, correctly phased with respect to C, which is also the balanced point of the output circuit. In most other circuits you have seen, you have noticed audio leads connected to the A and B points, or condensers in series with the bridge ratio arms. Such arrangements can degrade both balance and phasing, and the improvements resulting from this circuit can be as much as 10 db.—i.e., from say 30 to 40 db. of suppression in some cases.

The 5K balance pots with the two 680 ohm resistors in parallel, give a vernier adjustment which stays put better than the usual 1K pot alone.

The complete assembly should be screened from unwanted r.f. pick-up, and mounted where the diodes will not become unbalanced by temperature changes.

Diodes for double balanced modulator duty must be matched, and I have found that purchasing two pairs of matched OA79's intended for f.m. discriminators, is highly satisfactory.

The r.f. chokes shown are small t.v. peaking chokes usually wound on small resistors of several thousand ohms. To open circuit the resistance I have simply broken one end off and (after scraping away the wax) cemented the pieces back together again with epoxy resin cement, allowing several days to fully set.

The audio signals travel from their transformer secondary windings, through the bridge resistors, balance pots, diodes, and the output coil, and back to earth via the 0.5 mH. RFC at EA. The circuits back to EA1 and EA2 should be wired, preferably.

Lo, the output coil should be resonated at the output frequency with the tuning slug very nearly in the centre of the coil, to get good coupling to the co-axial output link, which is only a screened single turn. Since Lo is only six turns on a 7 m.m. former, some very small 50 ohm co-axial cable is recommended for making the link. It is a "fiddley" job to assemble this, but the result is worth the trouble. Earth the link directly as shown, and couple the output to a reasonably high-Q tuned circuit at the mixer grid.

Attention to both design and construction detail pays well with phasing type exciters. These tips may help you to get that little "extra" out of your rig, in the way of carrier and unwanted sideband suppression.

Next month's Sideband notes will deal with the post-phasing amplifiers, and conclude with notes on adjusting phasing exciters. This will conclude the series on phasing generators.

73 for now, Phil 5NN.

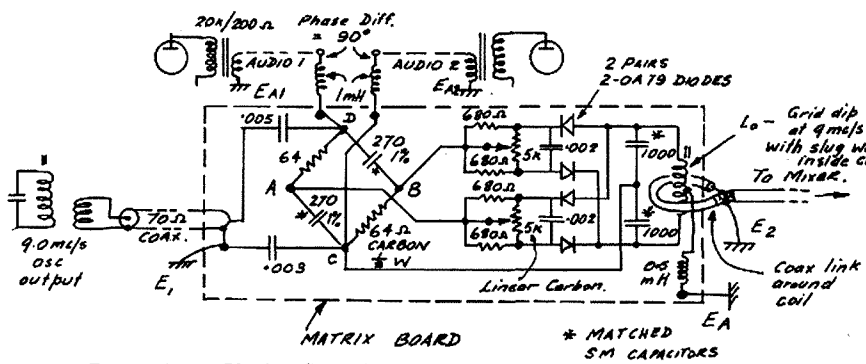
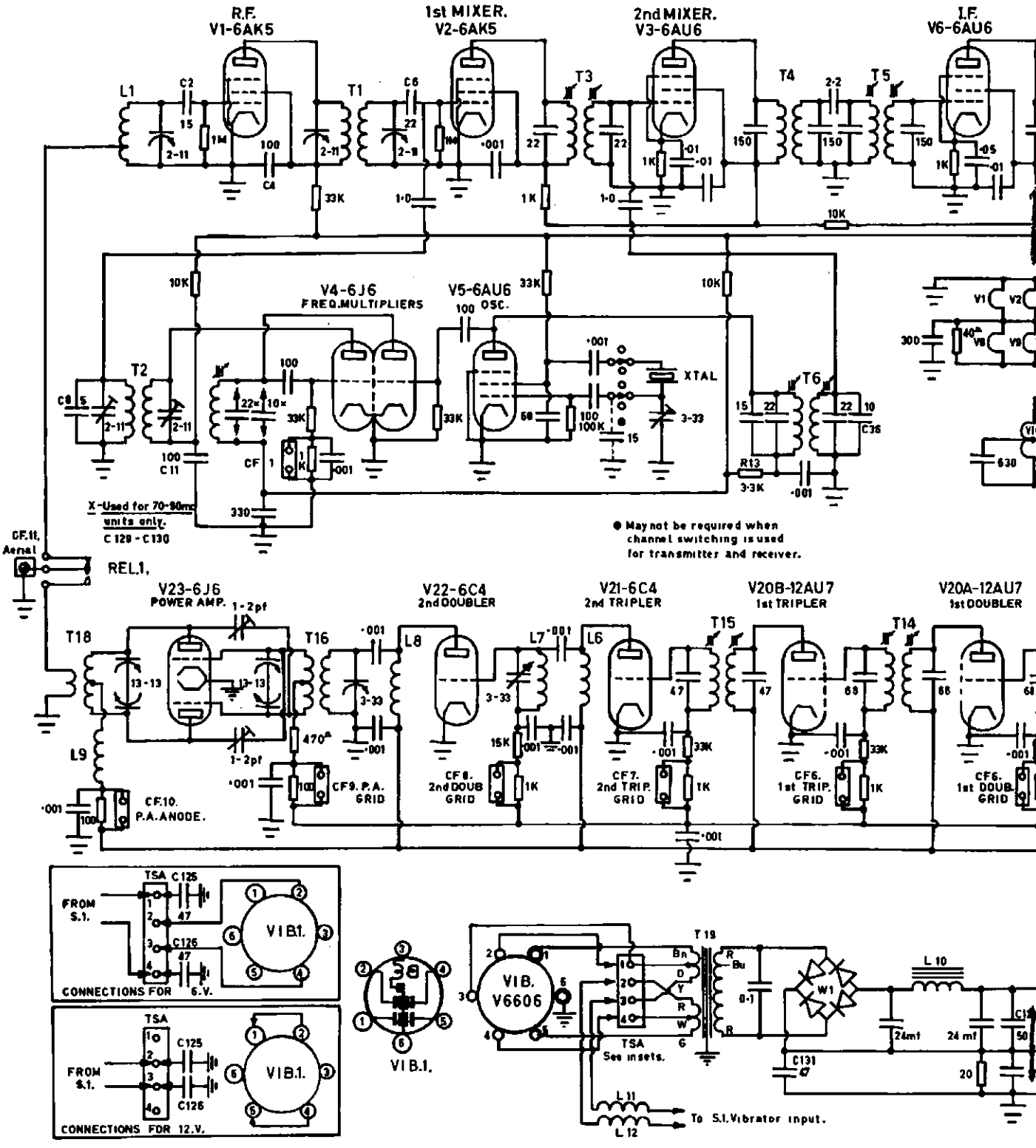
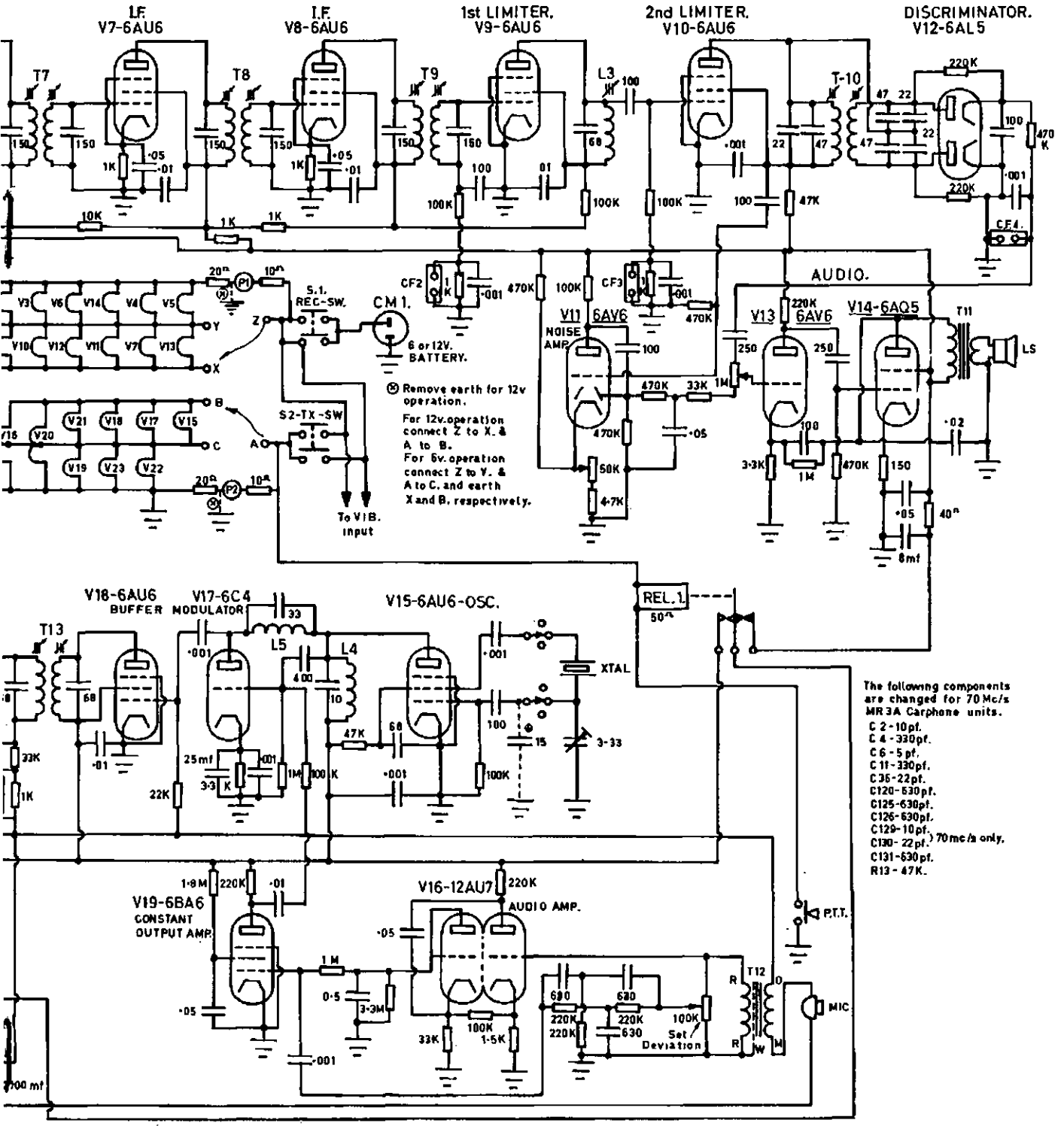



Fig. 2.—9 Mc. Phasing S.s.b. Generator Module constructed on matrix board.




MR3A HIGH BAND F.M. CA

Article on the modifications to this unit will be found on pages 2 and 3.




ARPHONE JUNIOR CIRCUIT.

**Note**: The plate load resistor of V16 should be 10K and not 220K as shown.

# RULES: 1965 "CQ" WORLD WIDE DX CONTEST—Oct. 23-24, Nov. 27-28

**CONTEST PERIOD**

Phone: Starts 0000 G.M.T. Saturday, October 23.
Ends 2400 G.M.T. Sunday, October 24.

C.w.: Starts 0000 G.M.T. Saturday, November 27.
Ends 2400 G.M.T. Sunday, November 28.

**BANDS**

Contest activity will be in the 1.8, 3.5, 7.0, 14, 21 and 28 Mc. Amateur bands.

**TYPE OF COMPETITION**

1. Single operator.
   (a) All Band.
   (b) Single Band.
2. Multi-Operator, Single transmitter.
3. Multi-Operator, Multi transmitter.
   (a) Multi-operator will be judged on all band operation only.
4. Inter-Club. (Local DX clubs.)

**EQUIPMENT**

There is no limit to the number of transmitters or receivers used, and competitors may use the maximum power permitted under the terms of their licence.

**NUMBER EXCHANGE**

1. Phone stations will exchange 4 numerals, the RS report plus their Zone.
2. C.w. stations will exchange 5 numerals the RST report plus their Zone.
3. Stations in Zones 1 through 9 will prefix their Zone number with Zero (.01, etc.).

**POINTS**

1. Contacts between stations on different continents will count three (3) points.
2. Contacts between stations on the same continent but not in the same country, will count one (1) point.
3. Exception: Contacts between stations in the North American continent only will count two (2) points.
4. Contacts between stations in the same country will be permitted for the purpose of obtaining a Zone and/or Country multiplier but no QSO points will be credited.
5. Only one contact per band with the same station will be permitted.



**MULTIPLIER**

Two types of multipliers will be used.

1. Multiplier of one (1) for each Zone contacted on each band.

2. Multiplier of one (1) for each Country worked on each band.

**SCORING**

1. The score of each single band will be the sum of the Zone and Country multiplier for that band, multiplied by the total contact points on that band.

2. The total all band score will be the sum of Zone and Country multipliers of all bands, multiplied by the sum of the contact points on all bands.

3. Those sending in logs for a single band will be eligible for a single band award only. If a log is sent in for more than one band, indicate which band is to be judged, otherwise it will be judged as an all band entry.

4. A station will not be eligible for more than one award.

5. Single operator contestants must show a minimum of 12 hours of operating time to be eligible for an award. If a contestant operates on more than one band and wishes to be judged for a specific band, he must show a minimum of 12 hours on that band.

6. Multi-operator stations must show a minimum of 24 hours of operating time to be eligible for an award.

**ZONES AND COUNTRIES**

The CQ Zone map and the A.R.R.L. and W.A.E. country lists will be used as standards. The continental boundaries used for W.A.C. will also be recognised. Should any question arise as to the positive location of a station the official definition will be final.

**AWARDS**

Certificates will be awarded for each section of the contest as follows:

1. To the highest scoring single operator station on each single band.

2. To the highest scoring single operator station on all bands.

3. To the highest scoring multi-operator station in both divisions, single and multi-transmitter.
   (a) In each country.
   (b) Each call area of the United States.
   (c) Each Zone in Australia, Canada and the U.S.S.R.

4. Awards to multi-operator stations will be for all band.

**DISQUALIFICATION**

Violation of the rules and regulations pertaining to Amateur Radio in the country of the contestant, or the rules of this contest, or unsportsmanlike conduct, or taking credit for duplicate contacts in excess of 3 per cent. of the total number of contacts made, will be deemed sufficient cause for disqualification.

**LOG INSTRUCTIONS**

1. In keeping a log, fill in Zone number and country, only the FIRST TIME it is contacted.

2.: Use a separate sheet for each band and a tally sheet or report form.

3. Keep all times in G.M.T.

4. All contestants are expected to compute their scores. Logs should be checked for contact duplications and proper point credit before they are submitted.

5. Make sure name and address is clearly noted on each entry, PRINT or TYPE.

6. Each contestant must sign a pledge that all rules and regulations have been observed and that the report is a true one.

If official forms are not available, use a duplicate form as indicated. The size is 8½ x 11 in. with 40 contacts to the page.

8. Copies of the Zone Map, log sheets and report forms are available from CQ, address listed below. Send a large self-addressed envelope, with sufficient postage. In the case of overseas stations, I.R.C. coupons are acceptable. Indicate quantity of sheets required.

**DEADLINE**

All entries must be post-marked NO LATER than December 1, 1965, for the phone section, and January 15, 1966, for the c.w. section. In rare isolated places the deadline will be made more flexible. Send logs directly to CQ W.W. Contest Committee, 14 Vanderventer Avenue, Port Washington, L.I., N.Y. 11050. (Indicate Phone or C.w. Section.)

## VK RESULTS IN THE 1964 "CQ" W.W. CONTEST

**Phone—Single Operator:**

| | Band | Total Score | QSO | Zones | Countries |
|---|---|---|---|---|---|
| *VK2KM | 21 | 16,568 | 150 | 17 | 21 |
| *VK2APK | 14 | 93,086 | 325 | 35 | 74 |
| VK2WD | 14 | 15,458 | 94 | 25 | 34 |
| VK2AKF | 14 | 12,803 | 101 | 18 | 33 |
| *VK3ATN | A. | 182,055 | 401 | 67 | 92 |
| *VK3TL | 14 | 40,362 | 162 | 32 | 61 |
| VK3HL | 14 | 17,667 | 106 | 24 | 39 |
| VK3XB | 7 | 1,282 | 28 | 9 | 7 |
| VK3KS | 7 | 360 | 20 | 4 | 2 |

**C.W.—Single Operator:**

| | | | | | |
|---|---|---|---|---|---|
| *VK2GW | A. | 323,050 | 641 | 67 | 108 |
| VK2PV | A. | 58,776 | 217 | 38 | 55 |
| VK2RA | A. | 2,296 | 32 | 13 | 15 |
| *VK2APK | 14 | 116,982 | 424 | 26 | 71 |
| *VK3AXK | A. | 49,476 | 243 | 38 | 38 |
| VK3TL | A. | 10,887 | 66 | 20 | 37 |
| *VK3RJ | 21 | 9,612 | 94 | 15 | 21 |
| *VK3ADB | 7 | 15,660 | 170 | 13 | 16 |
| *VK3XB | 3.5 | 1,443 | 49 | 7 | 6 |
| *VK4SS | A. | 7,950 | 55 | 26 | 27 |
| *VK4EL | 21 | 16,297 | 131 | 20 | 23 |
| *VK4SD | 14 | 15,181 | 114 | 19 | 28 |
| *VK5TC | A. | 87,498 | 364 | 37 | 52 |
| *VK5WC | 14 | 12,324 | 95 | 22 | 30 |
| VK5KO | 1.8 | 6 | 1 | 1 | 1 |
| *VK7SM | A. | 62,608 | 240 | 38 | 53 |

**C.W.—Multi-Operator, Single Transmitter:**

| | | | | |
|---|---|---|---|---|
| *VK5ZP/VK5NO | 914,742 | 1188 | 91 | 176 |

Note.—Certificate winners are indicated by *.

☆

# VU2'4S7 DX CONTEST '65

The Amateur Radio Society of India and the Radio Society of Ceylon invite Amateur radio stations in all parts of the world to participate in the second VU2/4S7 DX Contest. The object of this contest is to work as many VU2 and 4S7 stations as possible during the two week-ends.

The contest periods are: Telephony, October 23 and 24; C.w., October 30 and 31. The commencing time in each instance is 0600 G.M.T. Saturday, and the finishing time 0600 G.M.T. Sunday.

There shall be three main sections to the Contest: (a) Transmitting—telephony; (b) Transmitting—c.w.; (c) SWL—phone and c.w.

All Amateur frequency bands may be used but no cross band operation is permitted. Stations entering both sections must submit separate logs.

The serial number will comprise RS or RST report plus three figures, which may begin with 001 for the first contact, and which will increase in value by 1 for each successive contact.

Scoring: For DX stations other than VU2/4S7s: Two points for each contact on a specified band with VU2/4S7 stations and one point for each contact on a specified band with the rest of the world.

Logs: DX Stations: (a) Logs should contain date, time (G.M.T.), call signs of stations contacted, band, serial nos. sent, serial nos. received and points. Different logs must be used for each band. (b) The summary sheet should show call sign, name (in block capitals) and address, details of equipment, total score by showing total points for all bands. Sign the declaration that rules and regulations were observed.

Logs and accompanying summary sheets should be sent to: The Radio Society of Ceylon, Contest Committee, P.O. Box 907, Colombo, Ceylon, and should be post-marked not later than November 30, 1965.

Awards: DX Stations: Certificates will be awarded to each country (call areas in W/K, JA, SM, UA, VK, ZL, etc.) on the following basis: (a) top scorer using all bands; (b) top scorer using one band; (c) to those with minimum contact requirements, to be determined by conditions and activity prevailing.

SWL Section: This section is open to all members of any SWL Society in the world. The rules are the same as for the transmitting section but no transmitting station is allowed to enter this section.

To count for points, logs will take the same form as for the transmitting section and should contain date, time (G.M.T.), call of station heard, serial no. sent by the station heard, band and points claimed. Scoring is on the same basis as for the transmitting section and the summary sheet should be similarly set out.

# S W L

Sub-Editor: Don Grantley, WIA-L2022.

### S.W.L. COMMENT

The outstanding feature of Amateur Radio this month was the R.D. Contest, and to those Amateurs who made this particular contest so interesting for the listeners we extend our thanks. Having been out of the past three or so R.D. Contests I cannot but help notice the vastly improved standard of operating from those taking part. This is to be commended, not only from the view of the transmitting side, but from the point of the listeners taking part. It would be unfair on my part to name any particular transmitting sttaion as being the best on the band, but I owe a lot of points to fine operating from 5NO and 3MO on phone, whilst with such operators as 3RJ, 3BG, 2EO, 3XB, etc., operating c.w., I just wouldn't dare make a choice of best operator. All I can say to these chaps is thanks fellows, it was a fine contest and we look forward to hearing you all again in the VK-ZL.

From the ranks of the s.w.l. groups come many of the DX men of the future, and these boys will learn their operating habits from what they hear on the air. There is no better place to learn than in a contest, and we look to the operators of today to maintain a high standard for these youngsters to learn from.

### CONTESTS

Our next contest will be the VK-ZL DX Contest. This one is our own DX event, and it is held in very high esteem by the DX men throughout the world. I urge as many of our listeners to enter, for there is much really high-class DX to be heard, and rarely do you close your log without a new country. As well as this, entries have been lagging over the past few years, and for the sake of those who spend so much time and energy in preparing this event we should where possible enter a log. Full details in August "A.R."

### NEW SOUTH WALES

Little to hand from this group, and it would seem that there is not a lot of listener activity up here. A letter from Mac Hilliard L2074, who at the present time is on holidays at Nambucca Heads. Like most of us P.M.G. types, Mac has to arise early and needless to say the Collins is usually in action before he leaves for work. S.s.b. sigs. heard on 7 Mcs. by him in the early hours include GW3, SL, DL and many other European countries including a number such as UB5 and YU on c.w. New confirmations for him include KR6 and UP2.

From Chas. Aberneathy we note that activities have been drastically curtailed due to Mrs. Aberneathy's sudden admission to hospital. L2022, another bad trot in the R.D., curtailing listening time to 6½ hours, most listening here has been done in the evenings where some really good loggings have been made from stations in the Pacific on 20 metres at about 0700z. Listening to the c.w. segment of 7 Mcs. reveals a host of stations operating in the evenings, mainly from W land and thereabouts but nothing to note on any other band. A new confirmation from VK4TE.

### VICTORIA

Firstly, over to Ian Woodman for the official bulletin. The group is having great success with their broadcasting committee who read the notes for s.w.l.'s on the Sunday broadcasts. This experience could prove helpful to these members when they get their tickets. We hope to see all members attending the construction nights on the second Friday of each month, and the general meeting on the last Friday.

Roger Harrison L3158 now with receipt of a card from OA4PD has another zone and country confirmed. Roger is another of our chaps who have their L.A.O.C.P., and can be heard on 6 metres, also 576 Mcs. using the call. 3ZRY. On the listening side he reports plenty of W's on s.s.b., also an occasional G on 80 metres, the only band available to him at the present time. From Greg Earl an increase in his listings with several new cards take him up closer to the 100 confirmed mark. Keep at it Greg.

### ERRATUM
### AUSTRALIAN S.W.L. CENTURY CLUB AWARD

Your attention is drawn to an error—a vital one—in para. 2.3 of the "Requirements" of this award, published in Sept. "A.R." (page 11). The date should have read "1st January 1946" not "1966."

Para. 2-3 should now read: 2.3. The commencing date for the award is 1st January 1946. All loggings made on or after that date may be included.

### SOUTH AUSTRALIA

First note comes from Alan L5065. At 15 years he must be one of our youngest listeners but with QSL's to hand from HK, VS5 TI, W, OA4, 9M8, KG6, etc., it would seem that Alan is another keen and capable s.w.l. on the way up. From Tim L5067 we note another one of our members sitting for the next L.A.O.C.P. All the best and hope the No. 19 works out okay.

### WESTERN AUSTRALIA

Allan Taylor L6029 has been busy on 20 and 15 metres with PY, EA3, FR7, FB8, PJ8, CX9 and XE on the former, whilst on the latter band he logged UA1, HM1, LX, 9K2, LA, to name a few. Geoff Taylor L6030 had no luck on 15, but heard 4X4, ET3, WA8, W's, HS, DL, VU2 and VR2 on 20 metres. Bryan L6028 logged ZD8, WA, XE, VE8, 7Q7 on 20 metres but like most of us found I5 not over populated. 9K2, EP2 and JA0 were logged on that band.

### TASMANIA

Our only news from this State comes from Greg Johnson, who gives us a good report on band conditions over there. On 80 metres he logged all VK States except 9 and 0, plus W's, ZL and YJ. Plenty of QRN and power line noise marred Greg's listening on this band. On 40 metres W's, VE's and G's were coming in amongst the commercial QRM. 20 metres proved good to the American continent, but poor to Europe, whilst 15 metres was spasmodic, but when open Greg says its terrific, manly to W, VE and the Islands. Nil on 10 metres.

### HERE AND THERE

In preparing these notes it is inevitable that some letters will arrive after the notes have been commenced, and it is for this reason that I have included this additional paragraph or so this month. Mails have been delayed due to the transport strike in VK2, consequently some news must arrive after normal closing time. First in this batch comes from Warwick L3211, who has jumped a few steps up the ladder as a result of QSL's from W5HWR/VP9, ZS5WE, HP1MN, YJ8BG and OH2BS. Studies at the "Uni." keep him busy, but time is still found to explore his pet band, 20 metre s.s.b. segment. Warwick is another of our young chaps who uses his own home-brew rx, and a very substantial one at that.

Next we hear from Afton L2136/4, who has just returned from a 7 weeks' trip around the gulf country. Two more confirmations, one from TI3EG, and the second from OA4PH take him to 104 confirmed. A reward for patience—it took Afton 10 years to score a card from Peru. Band conditions at Atherton, where his home station is, were the worst ever for the R.D., in fact, nothing has been lodged on any band other than some local s.s.b. on 80.

Back to Chas. Aberneathy for a quickie. The VK2 s.w.l. group have bestowed quite an honour on Chas., by re-allocating to him the listener's number L2001, previously held by the late Barney Smythe.

Finally, to close the personal notes for this month we have the results of Eric's L3042 doings over the past few weeks. On 160 he heard VK3's ADS, AFU, AYQ, BX, GK and VK5KC and 5RO. On 80 his loggings consist of a number of JA's, one at 1045z, whilst on 40 c.w. Eric has submitted a list which sounds like a DX man's dream, DJ, CM, CO, DU, JA, KG6, MP4, OH, VR, UC2, UF8, UAO, UD6, UR2, YV, etc., whilst on 20 metres much the same list applies, with VS9OC, 5W1AZ, 9M6DH prominent in the evening hours. Inwards QSL's were CR4BB, DM, HK3AVK, OA4FM, UA1 (on 80), also UA3KAO, UA0KKB, UA1KAG on the same band. 5A5AD is a newie taking him to 290 confirmed, whilst VS9, 5B4, YV, 4X4, UQ2 plus several others made a good month for him. A card was received from ZL3OX for a 1.8 Mc. report to round the month off.

### CARD SWAPPERS

One JA s.w.l. has just sent Eric a dozen different JA s.w.l. cards, all seeking his. None of those received have one bit of writing on them. This morning, together with Eric's letter, I received a similar batch, and they will get similar treatment to the lot 3042 collected. They will be returned to the sender without a card from this QTH. This practice is getting out of hand, and I urge you fellow s.w.l's to ignore this business of bulk swapping, or if you must send them a return card make sure that they are cancelled before you send them on. Card exchanges between our own chaps who are in regular contact is quite in order from my point of view, but beware of the chap who requests a pile from you.

### GENERAL NEWS

From Eric L3042 comes the news that our former stalwart c.w. type s.w.l. Dave Jenkins is now on the air with the call VK3ABR. Dave will make his mark on the DX ladder when he gets fully set up, in the meantime listen for his key on 40 and 80 metres. Congratulations, Dave.

Look twice at any station using the call VE2UQ. He has been pirating the licence holder's call and is suspected of operating from Europe. So if you hear this strong signal coming through when the Europeans are belting in, then it is a near certainty that you are listening to a pirate.

On the DX front, one who is noted for his prompt replies to s.w.l's where an IRC is added is XW8AZ, Box 402, Vientiane, Laos, at least that was the case a short while ago. Noticed on 20 metres c.w. a few nights ago operating from the Gilbert Islands our old friend VR1BZ. Another who QSL's 100 per cent. to s.w.l. reports is KZ5TD, who uses the I.S.W.L. bureau.

### S.W.L. REPORTS TO W LAND

There is a very strong rumour floating about the s.w.l. circle to the effect that the A.R.R.L. will not handle, and does in fact destroy, s.w.l. cards and reports sent via its bureau. This is denied most emphatically in a past issue of "Monitor," the official journal of the International Short Wave League, which says, "Contrary to a current rumour the A.R.R.L. does not destroy all s.w.l. cards it receives, but it takes a lot of time and trouble in sorting them and then distributing them to the local bureau. The trouble is that many individual Amateurs do not keep in touch with their local bureau, so cards lie there for three to four years then have to be destroyed. So please don't blame the A.R.R.L., who are doing all they can, the individual stations are the offenders."

So there you are chaps, maybe that explains why we often have such long delays in getting replies from the States.

On the general subject of QSL'ing, I would like to add a word on behalf of those hard-working and dedicated QSL managers who act on behalf of the DX man. To those of you who avail yourselves of their services, it is always appreciated when an I.R.C. to the overseas man or a s.a.e. to the VK manager is included with your card or cards. I cannot praise too highly the service I personally have received from our VK QSL managers, and also the only other two I have utilised, W2CTN and Jock White of ZL fame.

### QSL LADDER

Never fear, chaps, I have no intention of deleting this feature. How could I even if I wanted to, for nearly every letter I get requests that it remain. And now on to this month's, a careful perusal of which will reveal a few changes, notably that Eric has gone further ahead.

**S.W.L. DX LADDER**

| | Countries Conf. | Countries Hrd. | Zones Conf. | W States |
|---|---|---|---|---|
| E. Trebilcock .... | 290 | 293 | 40 | 50 |
| P. Drew .... .... | 169 | 259 | 37 | 39 |
| D. Grantley .... | 128 | 285 | 39 | 35 |
| A. Westcott .... | 104 | 159 | 34 | 11 |
| W. Smith .... .... | 99 | 188 | 30 | 7 |
| L. James .... .... | 95 | 191 | 33 | 15 |
| R. Kearney .. .... | 94 | 149 | 32 | 8 |
| M. Hilliard .. .... | 93 | 241 | 33 | 14 |
| G. Earl .... .... | 93 | 163 | 33 | 16 |
| N. Harrison .... | 63 | 183 | 32 | 38 |
| A. Raftery .. .... | 45 | 164 | 24 | 10 |
| B. Prosser .. .... | 34 | 164 | 12 | 5 |
| R. Harrison .... | 21 | ? | 18 | ? |
| B. Macintosh .... | 20 | 63 | 17 | 4 |
| T. Corbin .. .... | 13 | 34 | 9 | — |

# V H F

## 52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Quite large numbers of Amateurs enjoy the use of net frequency operation, particularly those who operate mobile. In last month's "A.R." I listed all the frequencies known to me. This has raised many queries as to why there are so many different frequencies worked particularly on 6 m.

It is to my way of thinking unfortunate that the DX properties on 6 cannot be more fully utilised, by aligning all our frequencies or to provide at least one common calling or working frequency right throughout VK. As the mobile operator is around quite a considerable period during the day, the chances of observing an opening are far easier with stations operating on one frequency, than scattered throughout the band. From a mobile point of view two hands on the wheel is a safe way to drive. The receiver being locked to one frequency does allow one to concentrate on driving with listening a secondary occupation.

So once again I enter this plea to all those who operate mobile—and fixed. A single calling frequency is as good, if not better, than any beacon. This has been proved on dozens of occasions during the last season between VK3, VK4 and to VK5 when dozens of contacts were made with operators on the net frequency here in Melbourne.

Availability of crystals for a particular frequency are usually the reasons for starting other frequencies and of course is a legitimate reason. However, here in VK3 we have an excellent source of net frequency crystals both receiver and transmitter for a very reasonable price—not beyond the average Amateur which provide an excellent beginning to a "National Net Frequency" usable in any State.

ZL will hold a field day, probably on Sunday, Dec. 12, 1200 G.M.T., Dec. 11 to 1200 G.M.T., Dec. 12. All v.h.f. bands will be used but details have not been finalised. During Dec. a VK3 Field Day will be held, I believe on the third Sunday.

A visitor to Melbourne and other States last month was Rod 6ZDS. Had the pleasure of meeting him and learning of v.h.f. activity in VK6. He met quite a few Amateurs in Melbourne including 432 Mcs. enthusiasts who provided Rod with quite a few ideas to use on his return and the VK6 users of 432 can look forward to some further efforts to increase the records from that direction.

73, 3ZCP.

### NEW SOUTH WALES

By the time these notes appear there will be several of the "Mobileer" project 2 metre transmitter/receiver units on the air. After some on-air tests the constructional details will be prepared and interested parties will be advised.

The v.h.f. section to the R.D. Contest seemed to go over well but it would be hard to judge because of the State section running with it. It does appear, however, that some system of being able to work a station more than once during the 24 hours would have to be devised to keep interest alive. The State section to the contest was again won by Tony VK2ZCT from Newcastle.

The next major group activity as mentioned last month will be over the New Year week-end on 2 metres. By now most of the interstate centres have been advised of the contest committee's (VK2) plan for the week-end. Details elsewhere. 73, Tim 2ZTM.

### VICTORIA

**Band Reports:** 6 metres is still very active at week-ends and although no DX has been worked some signals have been heard which could fall into this category.

2 metres is very active and some country stations are worked during the evenings. The most consistent being Bill 3ZEF (Bendigo) and Alan 2ZEO (Deniliquin). Some Melbourne stations recently heard a JA on 2 metres, in fact, it was Frank JA2MO maritime mobile, off the east coast of Victoria, who managed to work at least one Melbourne station using c.w. both ways as Frank cannot modulate his 2-metre transmitter.

A very strange signal has been heard on 144.3 in Melbourne over the past few months, the strength varies from 3 to 8 or 9. This signal appears to be emanating from the newest t.v. station in this city. The same t.v. station is VK3 6 metre beacon (on 51.75 Mcs.).

## V.H.F. CONTEST/FIELD DAY

The object of this notification is to inform you of a large scale contest/field day to be conducted by the V.H.F. Group in New South Wales over the New Year holiday period.

It has been found in the past that some very good DX on the 2 metre band can be worked during sunrise. Last New Year a field event was held during the week-end and more than a dozen different field locations were used. Again this year the Group will be running a 3-day event and expect that there will be many field stations operating throughout the State. To make it more interesting and to provide even better chances of DX we would like to suggest that Interstate stations could also take part. This could either be organised by the V.h.f. Groups in each State or by groups of operators going to their own favourite mountain.

The contest is usually run on a points-per-mile basis and will be run in 4-hour segments. There is of course no need for Interstate operators to do likewise for if there are enough stations operating then the whole event could develop into a nation-wide attempt to work and set DX records.

It has been suggested that the times will be the following:—

Saturday, 1st Jan., 1700 to 2100 E.S.T. (0700 to 1100 G.M.T.—1/1/66). Sunday, 2nd Jan., 0500 to 0900 E.S.T. (1900 to 2300 G.M.T.—1/1/66); 1100 to 1500 E.S.T. (0100 to 0500 G.M.T.—2/1/66); 1700 to 2100 E.S.T. (0700 to 1100 G.M.T.—2/1/66). Monday, 3rd Jan., 0500 to 0900 E.S.T. (1900 to 2300 G.M.T.—2/1/66).

On both the Sunday and Monday morning between 0400 to 0500 E.S.T. (1600 to 1700 G.M.T.) skeds will be made with New Zealand stations. This time has been picked as the sun will be about half-way across the Tasman and some good inversion layers, etc., may exist. As the sunrise moves across Australia the same conditions could exist, so both South Australian and Western Australian openings are possible.

The same general use could be made of the midday and sunset time periods. If you or your own group are interested we would like to hear from you with the following details: Name, address and call sign, proposed location, frequency of operation and expected time of operation. This applies to either home or field stations. The VK2 Group will act as the collection point of operational details and will keep groups and other Amateur news systems informed. As this is such a large-scale activity it will be impossible to obtain all details. Please start the ball rolling in your area as it is only about four months away. Please reply to Tim Mills, VK2ZTM, Box 342, P.O., Crows Nest, N.S.W.

—Tim Mills, VK2ZTM.

The August meeting of the VK3 v.h.f. Group was attended by some 50 Amateurs and friends and were really engrossed by John Hickson, of Anodeon, with his talk on transistors. Among the topics he spoke about was the treatment of the junction and the methods of testing to produce the various types of transistors required today. John also showed some standard circuits used for testing transistors.

The 2 metre fox hunts, which are held on the fourth Wednesday of each month, are becoming more popular than ever, possibly because one of our keen participants has been donating prizes to the winner each evening. The prizes range from a QQE06/40 down to a humble bag of capacitors, and he only knows the prize when the evening's results are announced. Also it is fast becoming the practice for the fox to put on coffee and biscuits to the hounds after the evening's chase has finished. 73, Cyril 3ZCK.

### QUEENSLAND

What has happened to the concept of the term net frequency? In line with the policy of the VK4 v.h.f.'ers, VK4 adopted unofficially net frequencies of 53.032 a.m. and 52,525 f.m. However, as each month passes, the number of "uniform" net frequencies is increasing. At last count there were at least ten and now VK2 seems to be about to add to the list with a new set!

Some important occurrences last month included first VK4 432 Mc. t.v., reception of TVQ in Japan and a band opening to JA land at 7 a.m. on 29/8/65.

During the Remembrance Day Contest at least 20 v.h.f. stations in Brisbane operated and exchanged numbers. Lloyd 4ZLO was heard operating portable from TVQ-O, using their antenna and his 2 metre signal from the channel's antenna was S8, 55 miles away.

Let's hear some comments on net frequencies through these columns. 73, Peter 5ZPL.

### SOUTH AUSTRALIA

Activity it would appear within VK5 is confined to mobile operation on the net frequency of 52.042 megacycles. Mobiles heard on the net are respectively, VK5s, ZDX, ZK, ZKA, BQ, ZAP, CL, ZGV, ZIS, ZCH, ZQ, ZDA, ZAG, ZDY, ZEX, ZMJ, ZEP, ZGF, ZDR and ZHJ.

No reports of interstate DX are to hand, but reports of Channel 0, Melbourne, are reasonably regular.

An excellent boost to Amateur Radio is the planned television demonstration for the Royal Adelaide Show by George 5ZEY and Maitland 5AO. Elaborate preparations have been made for two outside telecasts, which has necessitated the pooling of all equipment at their disposal. The majority of their equipment is home-built, no mean feat for the the average Amateur.

A fleeting visitor to VK5 has been Rod 6ZDS en route to a scientific conference in VK7 land.

Events that have taken place in recent months that have been unreported are a 6 metre scramble on June 27 with Robert 5ZDX again triumphant with Jim 5ZGV and Trevor 5ZTM in close pursuit. July 3 saw a successful 2 metre fox hunt undertaken by nine participating cars. Bob 5ZDX was the eventual winner with Colin 5ZHJ and Garry 5ZK obtaining respective positions.

Before the next fox hunt the VK5s participating in the hunt plan to overhaul Bob's speedometer, as the accuracy of same appears suspicious on such occasions.

July 25 saw a 2 metre scramble eventuate with Edwin 5ZTS the winner with Bob 5ZDX and John 5ZJH obtaining the latter positions.

73, Colin 5ZHJ

### TASMANIA

Activity in VK7 has kept up well during recent months despite the lack of reporting. No interstate DX has been worked since the April 2 mx openings. On this occasion 7ZAH at Ulverstone was keeping regular skeds with VK3. On each night, over a period, signals were heard: if barely readable at night, contact was possible in the early morning. There are several reports of July 6 mx DX.

A remarkable increase in operation has been noticed in the south since the arrival of a number of 53.035 Mc. mobiles. Very seldom does a CQ call go unanswered; even through the day. Most often, however, the reply is from 7ZAV. Mobile to mobile distances of 20-30 miles are common. Thanks go to 7ZAI for the conversion of these sets.

In the north main activity is on 2 mx. Around Launceston and in the area between Latrobe and Wynyard there should be a number of new stations for the DX season. During June and July VK3 t.v. signals suggested openings but no contacts resulted.

Stations will be aiming at the 432 Mc. record book this year. Col 7LZ has had a series of contacts with VK3. Kevin 7ZAH is building high power equipment. A contact between two "hilltop" stations, 7RL and 7ZAS, 110 miles apart, was recorded—the latter station used only mod-osc. equipment.

Rod 6ZDS was a visitor to the A.N.Z.A.A.S. Conference and gave the August v.h.f. Group meeting interesting information on VK6 v.h.f. activities. 7ZAO.

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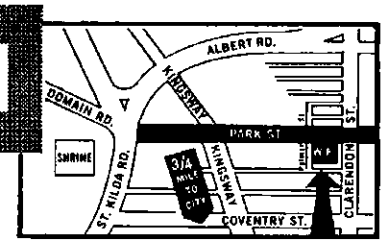


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# YOUTH RADIO CLUBS

From two and a half States (we have taxation without representation in VK1) come thought-provoking stories of how an interest in Radio can do something to make the hard lot of blind people a little easier. The VK3 enthusiasts looking after the Royal Victorian Institute for the Blind Youth Radio Club lead the way. Two members of the club have passed Elementary—Cheng Cheok, aged 18, who comes from Singapore, and Norman Salmon, aged 14. The presentation of the certificates was made by Cyril Minns, VK3AUM, who is himself blind, while Federal President Max Hull helped by attending and presenting two sets of screwdrivers from Turner Industries. Congratulations go to instructors Ron Everett, Bruce Whitehead and Bob Whally.

In VK2 Rex 2YA assures me that moves are on the way to help blind lads, although not nearly as far advanced as in VK3. Here in VK1 we are trying to help a young man who is not only blind but has also lost both hands. Many hours of radio theory have been put on tape and he has become a keen S.W.L. and tape-recorded music enthusiast, using his feet. (Does anyone have a receiver of the class of an AR88 for a fair price?)

The whole question of participation beyond the s.w.l. stage by the blind (and other handicapped people) needs careful thinking. It would be wrong to lower qualifications too far and allow anybody to buy a transceiver and turn knobs merely to gossip, but on the other hand the physically handicapped are not to be thought of as inferior citizens and they have proved in many countries that they can experiment in some fields of Electronics.

An interesting development in Y.R.S. is the formation of Postal Groups. Keen youngsters who have no club available can now write to a Postal Group Leader for advice. Mona 2AXS has a group, and three others are led by Susan 2BSB, Roger 1RD, and John Thyrd, who are recent graduates of Y.R.S. and obviously carrying on the right spirit. Volunteers are wanted (in VK2) to be godfather (or godmother) to electronic orphans. Other Divisions might consider this if they have not already.

It is very pleasing to see the growing awareness of Y.R.S. amongst business firms and electronic organisations. Many are making donations and offering (naturally) job preference. Anodeon gave £20 worth of parts to the Institute for the Blind. Overseas Telecommunication donated £10. International Correspondence School has donated a programmed course. Several others I know of in VK3 have helped in various ways but do not want to be mentioned. They are all aware of a good thing.

Club news from VK3 is interesting. Mr. J. Beasley, of B.W.D. Electronics, lectured to Christian Brothers on the C.R.O. and its many uses in medicine, physics and electronics, and is willing to lecture to any club with ten Leaving or Matric. students. Geelong East Tech. School has 24 members, most about to try Elementary. Greythorn High (three years in existence with success in Elementary and Junior) is planning an even bigger open-day exhibition and is proud of having constructed about 15 pieces of apparatus for the Science Lab. Essendon Grammar goes well with assistance from Bill Allen. Morwell High back in operation with instructor Mr. W. Waldron. Passes in Elementary at Yallourn Tech. by Chris Goddard, C. R. Flood, Peter Suda, L. de Vriss and Bernard Murphy. New clubs are Bayswater High and Chanel College (Geelong). Y.R.S. news will be in the 3WI broadcast on first and third Sundays. Total of clubs in VK3 is now 25. Looks like VK2 has a challenge!

News from Christmas Island indicates that antennae have a chance of outnumbering palm trees. Don Reed 9DR reports that four members attempted A.O.C.P. recently — two fully successful and two others missed one part. They even have a new Chinese technician from Singapore who has started a Chinese language course in Radio.

I must mention a local success, Andrew Davis 1DA has obtained W.T. Operator (Grade 3), and Ross Steele (of Lyneham, also) has R. T. Operator (Grade 3). Andrew is the first of Y.R.S. types to gain both W.T.3 and R.T.3.

VK2 news is plentiful as usual, thanks to Jim 2ZCW and his consistent large newsletter. At Kingsgrove North, Bruce Lewis has R.T.3 and Junior and will be applying for D.C.A. Trainee Course next year. At Sydney Teachers' College, Mr. Maurice Coleman has started A.O.C.P. course, hopes to attempt it in January. At Australian School of Pacific Administration, Mr. Roy Clarke reports that the equipment of the late John Moyle has been made available for training purposes with the student teachers who will be going to New Guinea next year. Kyeemagh Sea Scouts had storm damage to their Scout Hall and a power transformer was a casualty from rain but a donation has replaced it. At Kiama High, they are wondering how to take delivery of two 50-ft. telephone poles, but the club tx is almost ready and they expect two A.O.C.P. candidates next year. Dorrigo High Club has been out of action in sympathy with Mr. Brown, the instructor, ill in hospital. Ryde High now has a club under Mr. Brian Fowler of the Manual Arts Dept. (formerly at Ibrox Park High). Fort St. High, with instructor Mr. John Weir of the Science Dept., reports some about to sit for Elementary. Punchbowl Boys' High Club is planning a big exhibit for the School Fete. Marist Brothers (Pagewood) are still enrolling members.

P.S. (to my good friend 5PS).—Can't we lure you out of VK5 to make contact with the outer world? What about coming to our VK1 Easter Convention? 73, Ken IKM.

David VK3ZZZ and Kevin VK3ZNQ operating the Swinburne Electronics Society station during "open day."

(Block courtesy "Contagious," Journal of the Swinburne Technical College.)

# YOUTH RADIO SCHEME

Members of the Wireless Institute of Australia will have at least a knowledge that such an activity as the Youth Radio Scheme has been inaugurated by direction of the Federal Executive. However, only those directly concerned with the application of the Scheme to the various Radio Clubs will be aware of the precise details of aims, organisation and administration. It is hoped that a series of regular insertions in "Amateur Radio" will rectify this situation and make W.I.A. members sufficiently informed on these matters to enable them to assess the advantages of the Youth Radio Scheme as an adjunct to Institute operations.

Accordingly, the following objectives are presented for the benefit of readers:—

(a) To develop in young people an interest in Radio and Electronics, which can be pursued as a vocation or as a hobby throughout life;
(b) To provide Secondary School students with a hobby activity which will reinforce their school studies in Mathematics and Science;
(c) To guide into vocations in Radio and Electronics young people who, through participation in Youth Radio Scheme activities, will enter those employment fields with interests and aptitudes already established;
(d) To assist present and future Club Leaders and Instructors by providing ready-made programmes of theoretical and practical instruction;
(e) To co-ordinate the activities of present and future Youth Radio Clubs and to promote co-operation and interchange of ideas among Club Leaders;
(f) To combat juvenile delinquency by providing an absorbing hobby activity which will ensure that members of Youth Radio Clubs are too busy to engage in anti-social acts;
(g) To co-operate with Schools, Colleges and Youth Movements in the development and fostering of Youth Radio Clubs;
(h) To give encouragement and recognition to Youth Radio Club members who attain certain specified standards of skill and knowledge of Radio and Electronics;
(i) To increase the membership of the Wireless Institute of Australia by encouraging former Youth Radio Scheme members to become financial Institute members.

### RADIO PROFICIENCY CERTIFICATES

To provide incentives and to give due recognition to Y.R.S. members who demonstrate specified skills and knowledge, the following Radio Proficiency Certificates are available:—

(i) Elementary Radio Certificate,
(ii) Junior Radio Certificate,
(iii) Intermediate Radio Certificate,
(iv) Senior Radio Certificate,
(v) Advanced Radio Certificate,
(vi) Radio Telephony Operators' Certificates (3 grades),
(vii) Wireless Telegraphy Operators' Certicates (3 grades),
(viii) Radio Instructors' Certificates (2 grades).

Further Certificates are contemplated for Morse Code Instructors and Morse Code Examiners, but to date these have not been implemented.

These Radio Proficiency Certificates are available not only to Y.R.S. members but also to Associate Members of the Institute and to financial members of affiliated Adult Radio Clubs. It is felt that many A.O.C.P. candidates being trained by Clubs will have been away from school for considerable periods and may have lost the art of written expression under examination conditions. By presenting themselves for the awards listed above, such Club members will gain valuable experience and so enhance their chances of success at A.O.C.P. level.

Further details of organisation and administration are given in the Form YRS/1 "Administrative Details." Copies are available from Rev. Bro. Kinsella, C/o. School for Blind Boys (St. Edmond's), Wahroonga, N.S.W. Please send a stamped and addressed envelope together with sixpence in stamps to cover production costs.

(Next. month details of Form YRS/2—"Elementary Radio Certificate Conditions"—will be published for information of "A.R." readers.)

### STOP PRESS

The August issue of "Break-In," the journal of N.Z.A.R.T., contains full details of the newly developed Youth Radio Scheme in New Zealand. A quick perusal reveals close resemblance to the Australian scheme, with a reduction in the number of Radio Proficiency Certificates offered to Y.R.S. (N.Z.) members.

All members of the Australian scheme offer sincere good wishes to those associated with the New Zealand effort and hope that some form of inter-scheme co-operation may be developed to stimulate added interest.

# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL QSL BUREAU

The Guayaquil Radio Club has issued the certificate W.H.C. (worked HC) which it grants to the Radio Amateur who verifies contacts with a minimum of five HC districts from HC1 to HC8. There is also a de luxe W.H.C. certificate for those who have worked all eight districts since 1950. The certificate has been designed with the Ecuadorean Coast motif and drawn with vignettes of the Island of Puna in the era of the famous Incas, and reveals a vigorous expression of folklore art existing in the Guayas Province. Cards should be mailed to the Guayaquil Radio Club, P.O. Box 5757,, Guayaquil, Ecuador, or you may send a certification of your local Radio Club.

The I.A.R.C. writes: "Thank you for your participation in the I.A.R.C. celebration of the I.T.U. Centenary. I.A.R.C., established at the new I.T.U. headquarters in 1962, is especially proud of this activity in which so many Amateurs participated." The 1965 I.A.R.C. Convention was held on 18th and 19th September, and included a repeat of the operation of I.A.R.C. stations with calls 4U1ITU through 4U6ITU.

The Central Radio Club of Bulgaria advises that as from July 1, 1965, fees are required for issuing of the Bulgarian awards for Radio Amateurs as follows: RDS—6 IRC's; SDS—5 IRC's.

Any Amateur who contacted the City of Beira in Mozambique between 14th and 22nd August last is entitled to an award. Applications with log entries and a QSL for the CR7 station should be sent to: Delegacao da L.R.E.M., P.O. Box No. 1234, Beira, Mozambique. IRC's accompanying the log will be appreciated. Active stations now in Beira: CR7AJ, AV, BV, CP, CZ, DQ, EL, FH, GB, GO, HC, ID and LU, and eventually: CR7AK, DI, IT and IW.

Amateur Licensing in Korea: The Ministry of Communication has issued detailed regulations for the Amateur Service. Amateur operator licences are given to Korean citizens who pass an examination and demonstrate ability to send and receive code. Station licences are granted only to licensed operators and permit communication between Amateur stations. There are three available classes of Amateur licence—3rd class, 2nd class and 1st class. Each has different requirements, the first two being the simplest and consequently conveying limited privileges as to frequencies and output power available.

The limited privileges for different classes are as follows: The 1st class licensees may use all Amateur bands and modes and have maximum power output of 100 w. The 2nd class licensees may use all Amateur bands except the 14 Mc. band and have maximum power output of 50 w. And there are no special limitations of the modes. The 3rd class licensees may use A1 on portions below 8 Mc. and all modes on portions above 50 Mc. and have maximum power output of 10 w. and transmitters to be crystal controlled.

Ted Ironmonger G8PO is returning to Australia again towards the end of 1965 and will be located in Sydney. He will again take out a VK licence.

—Ray Jones VK3RJ, Manager.

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## NEW SOUTH WALES

This month is the start of the convention season in VK2 with both the Hunter Branch and South-West Zone over the long week-end. These will be followed in a few weeks by the Illawara Section at Wollongong and then the Blue Mountains Section during November. In late November the Division is intending to hold a family picnic day. Details later.

The general meeting for October will be on the 22nd with a lecture at W.I.C. by Mr. Allan Morris from D.C.A., and his subject will be Magnetic Amplifiers. This will be followed in November (26th) with a lecture by Hans Ruckert, 2AOU, entitled "How I Built My s.s.b. Transmitter."

The Federal Constitution Committee has been meeting regularly. Some repairs and painting have been carried out to the front section of Wireless Institute Centre over the last few weeks.

The Dural committee reports that some new members have been added. Some W.I.C.E.N. exercises will take place soon and will make use of the Channel B f.m. unit installed at VK2WI. John 2IQ has moved to the west and the work he started in compiling a list of those interested in vehicle call letter plates will be carried on by John 2ZJD, C/o. Wireless Institute Centre.

The disposal section of the Division is still adding to its range of new equipment and they are pleased to note the increasing interest being shown by both country and Interstate Amateurs. A small catalogue covering the range of items stocked is available and this may be had by writing to and enclosing a 9 x 4 stamped self-addressed envelope—W.I.N.A.P., C/o. Box 342, P.O., Crows Nest, or to the Disposal Section, Wireless Institute Centre, Crows Nest.

The second sub-edition of Amateur Guide material will be available during the month and is intended to be used by those who already have the first part. This section will cost 6/- post paid. Address inquiries to Amateur Guide, Wireless Institute Centre, Crows Nest. Make monies payable to the W.I.A. Further stocks of the first part should be available next month (10/- post paid) but you will be advised next month. 73, Tim 2ZTM.

### HUNTER BRANCH

Contrary to popular belief, the rumour that the reason for the non-appearance of the notes for two months was due to me having collided with a fast-moving post while driving at 15 m.p.h. under the Cardiff subway while in contact with 2ZL, is absolutely and positively untrue. The fact of the matter is that I badly gashed my typing finger while helping that well-known fisherman, Frank 2APO, mend some holes in his net. As a result of this accident my otherwise unblemished record as a projectionist at meetings was rather sullied when the low quality machine went into reverse and the film caught fire. Except for some minor difficulties with the rewind mechanism on the same low quality machine and some reversed images on the screen, everything went well at the September meeting of the branch when 42 members, associate members and visitors were present to hear some budgetry facts given by the President. Those who were present will be pleased to learn that the budget priced tickets sold very quickly at three for 2/-. In addition, Gordon 2ZSG told us of the second success in the State v.h.f. R.D. Contest for Tony 2ZCT. It is a delight to know that a local member has won this event for the second time and also to be informed that the XYL, Marcia, is buying him a surfie bar for the top of the car, as a present.

But as far as presents go, almost all the chaps enjoyed Father's Day and some were given most useful gifts—832s, beam rotators, brooms—and one member was presented with a most unusual item; and from outside the family. It was a large cork stopper inscribed "to be used to refloat the Admiral's Barge—which was scuppered." And while near the water you may be lucky enough if at Toronto to buy—at bargain prices—some fibreglass fishing rods, nearly new and neatly wrapped with wire. Just the thing for catching those rare DX fish I am told, the owner having replaced them with some new ones from the U.S.A. Or, by journeying further towards Wangi, you may chance to see the Venetian Blind Dipole, strung between two poles quite near the house of Paddy 2AXU, who, by the way, was at the meeting last month to meet the boys. His new transmitter did not quite materialise, but he is saving his hard-earned pennies which he hopes to convert directly to cents on February 14, if the bank does not find out first. He read all about how to do this on the wall of a well-known hostelry in Cook's Hill at the invitation of the landlord, who says he'll be glad to do business at the new rate of exchange. It is a pity he has to have the chart to help him with the conversions.

On the v.h.f. front, great things are afoot, what with s.s.b. on two metres and all. Even Bill 2ZK has taken enough time off from the test tube and blast furnace to get a receiver going on this band. And that's not all—he can hear 2AWX—and he rejoices, which is not the most usual reaction, that others display, I mean. Being the holiday season, several members have forsaken two metres to go on their holidays and get away from it all. But they haven't forgotten their friends and Kev 2ZKW is reputed to be buying the harbour bridge to bring back for Mac 2ZMO to use as a coat hanger. Won't he be pleased. Bill 2ZWM is at Teagardens and has taken the rig with him while John 2ZJG is about to start his annual siesta—where I cannot tell.

Two bob Maschette had a strange thing happen the other day while flying his Sabre near Darwin. He had the good sense to land and partake of the refreshments offering. A large man with a blue pencil behind his ear walked up to the same bar with a crocodile on a string walking beside. He asked the barman did they serve Editors at this hotel. The dispenser of beverages replied that there was no discrimination at his establishment whereupon the large man with blue pencil and crocodile replied, "Good, then I'll have a schooner and my friend here wants an Editor."

From latest reports received there are two wel-known chaps lining up for the October exam. This will be a good thing and perhaps they'll present their black patches and cork legs to the branch museum—we already have several. Tiring of winning awards in the s.w.l. field, the v.h.f. specialist from Booragul has entered another field, pearl-diving for the army.

Some of the scores put up in the R.D. Contest were rather remarkable—one YL operator working her set all night for the grand total of eight contacts. After that she connected the aerial. At the club, Allen Legge worked very hard and ran up a good score but the supply of midnight oil was pretty low at the end. It looks as if Bill 2XT may have come in first about this area with 2AKX a remarkable last—again.

Les 2RJ is now OC s.w.l.'s in the Muswellbrook territory and hopes to do something clubwise soon. Tas 2GV is on the air again after finding one of the feeders in the western paddock while Merv 2MW is still a mighty signal on s.s.b. I hope you'll not forget the November meeting when President Frank has lined up some interesting information to be given by one of Mr. Mullard's men, the first of a series of three lectures on the same core subject. The time and date are 8 p.m. on Friday, 5th November, in Room 6, Clegg Building, Newcastle Tech. Please you guys, no fireworks. See you. 73, 2AKX.

### CENTRAL COAST AMATEUR RADIO CLUB

The last meeting of the Central Coast Amateur Radio Club was held on Friday, August 20, at the School of Arts, Gosford. Twenty-six members turned up on a rather cold night to hear a talk on the construction and use of capacitors in radio by Roy Robinson, of Ducon. His talk was instructive and interesting and plenty of questions were fired at him at the conclusion. It is surprising that this component can be smaller than a threepence, or taller than a man and still perform the same job. He thought that mica condensers were the most reliable. He said that components last longer if used continuously and, therefore, did not recommend lovely trips overseas for two or three months as on your return the t.v. set is liable to give trouble.

Phil Levenspiel, 2TX, moved a vote of thanks for Roy and mentioned a very vivid memory of having received a "belt" from some old capacitors which had been lying on a dusty shelf for months—the occasion happening years ago.

There was some discussion on members joining the 146 net which is in general favour, and more will be said about this later. All members realise the importance of this net and its possibilities during a civil defence emergency.

A recent visitor to the district was Clive Cook, 4CC, and son Peter. They were having a very pleasant trip mobile and met several of the local Amateurs.

Lindsay Douglas, 2ON, leaves in a few days' time for a two months' business trip to Canada, England and the U.S. During his

### SILENT KEY

It is with deep regret that we record the passing of:

VK3AWS—W. R. C. Stevenson.
VK2WJ—W. J. Peell.

free time he hopes to meet some of the Amateurs he has talked with on the air. Half your luck, Lindsay.

As usual, I will add that visitors are welcome at the C.C.A.R.C. meetings which are held at 7.30 p.m. on the third Friday of each month at the School of Arts, Gosford. This is located near the Post Office. 73, 2AXS.

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# VICTORIA

**Council Meeting, 24/8/65.**—Items considered included the Annual Dinner on 5th November. The menu submitted was approved and the cost of £2/12/6 per head finalised.

The insurance cover for W.I.C.E.N. operators was discussed and it was agreed to accept the quote of an insurance company to increase the benefit to bring them more in line with the new Workers' Compensation Act.

It was agreed that the Collins receiver be overhauled, as its performance has not been up to standard for some time.

Doug Pinson has gone overseas for 12 months and for the time being Ken 3ACS has undertaken the task of correcting correspondence course papers, but if anybody cares to relieve him of this task it would be greatly appreciated.

The next Federal Convention is to be held in Brisbane next Easter. Council gave preliminary thought to the desirability of sending an observer, but did not reach a decision, as it was felt this decision could be left for a couple of months. In the meantime Council would like suggestions on agenda items.

It was decided not to hold a State Convention this year. Normally it is held in the first half of the year, but with the last Federal Convention in Melbourne it was considered that too much work would fall to the usual "few" if we tried to hold two conventions close together. The last half of the year is taken up with Jamborees, W.I.C.E.N. exercises, Zone Conventions, etc., which will keep us fully occupied, hence no State Convention this year.

The tape recorder used for Sunday night broadcasts has been condemned by all who have had to use it, and by many who have only listened to it. As a result it has been decided to look for a suitable replacement—not easy with all the r.f. that floats around at 3WI.

The Disposals Committee has built up a large stock and will shortly arrange a "hand out."

**September General Meeting** was held 1/9/65 to a packed house (5PS please note). The minutes of this meeting make interesting reading. For example, they read: Apologies, Nil; General Business, Nil, in fact, nil anything. Nobody wished to waste time on such mundane matters, with such an interesting lecture in the offering. We were fortunate to have Mr. Keith Gibbs from Defence Standards Laboratories to speak to us on the subject of Lasers. Judging by the large number of questions asked everybody thoroughly enjoyed the evening. If you want to hear some really good questions, listen to those asked by our younger members. The things these young fellows know today will really astound you.

Next month, Don Seedsman will tell us of his tour of duty in Antarctica, and we hope to see you then.

For November we hope to have a representative from one of the fire-fighting authorities to speak on measures to be taken for self preservation in emergencies in which W.I.C.E.N. personnel could be involved. It is hoped that all W.I.C.E.N. operators will come along.

### MOORABBIN AND DISTRICT RADIO CLUB

The Club's notes for last month were omitted from "A.R." due to your scribe being incapacitated with quite a good dose of winter 'flu, I should have taken to the wanderings of Alf 3LC and Bob 3SK, who both migrated to VK4 to obviously miss the winter ills. Apparently the winter has also taken tolls of our remaining members, why, there was even a very strong move to arrange for adequate heating in the clubroom at the depth of the winter months. It is admitted that it gets mighty cool some nights, but you should hear our heated arguments, it is enough to make anyone's blood run hot, must be those French films.

My co-editors this month consist of Ken 3ZNJ, David 3ZOP with the support of Trevor 3ZTJ, from the other side of the town. Something remarkable happened just before we decided to get down to business, managed to have a QSO with George 3XJ, on 2 f.m. Sure was a rare bit of DX, George, but nice to hear that signal. Might make a bit of a broad statement here, I reckon we worked you before Val 3OT! It is a couple of months now since I have asked Val how many stations he has worked on f.m.

Now, a bit of DX. Should say DX-pedition to VK2. Ken 3ZNJ recently visited VK1 and VK2. An exciting time was had by all on top of the Blue Mountains where VK2s were granted the rare opportunity to work 3ZNJ on 2 f.m. It was a case of queue up, or shut up. It was all right while this lasted, and after enjoying the hospitality of VK2s, and a fox hunt, ended up on the other side of the town, the one with the coat hanger, but the horrible story goes, someone tampered with the lemonade with disastrous effects. Graeme, ex-3ZMQ, is now in VK2, operating under the call of 2ZQM. Another old member of the club is Jock (was 3AFF), now operating under the call of 1LF.

A big auction was recently organised over in 3ZOP territory. A lot of useful junk was sold to permit 3ZOP to garage his new car. Now let's see, how many more months until November, and the ball and chain for 3ZOP. Peter 3ZPC has been rather quiet the last couple of months, and Bob 3ZRD just has not been heard at all. Lindsay 3ZNS is in bed with the measles. Hal 3ZOO appears to be the most active of club members, on 2 f.m. and a.m. Heard some mention that a 6 metre converter may be on the drawing board in the shack of 3ZOO. Adrian 3ZCM is active on 6 metres.

And what has happened to Peter 3APD? Col 3XV has been active on the construction side with a recently built panadaptor. Stan 3ZE is still amongst the big time, working DX with the s.s.b. rig. John 3ZCB is now back on 2 a.m., but we are not certain if it is the same gear or re-built. Bob 3ZZO has now graduated to the d.c. ranks—the new call is 3AXE. Ted 3XS is quietly working on a 2 a.m. rig and it is expected that the 3XS call may shortly be heard on this band.

Morton 3ANG is active on 2 f.m. and 2 a.m. and worked 3ZNJ the other night, big time, fully 400 yards. Ron 3RN is another club member active on 2 f.m. Fred 3ARK has decided, after much listening, to build a super de luxe home-brew receiver. That is, after the present project is completed. Fred should soon be joining the ranks of the quackers with a sideband rig; it is believed that it is just about to be fired up, so look out. Neil 3ZRT is still heard occasionally on the late late show on 2 a.m. and is presently examining the finer points of transistors. Percy 3MX has been heard on 20 metres. Ken 3ACS is still quietly operating on the top end of the band with s.s.b., was heard knocking them over on the R.D. Contest until some cad jumped his frequenzia. Harold 3PW has been assembling some rotating mechanism for a quad which he intends to build and then attack the DX.

The W.I.C.E.N. exercise, held during September, saw approximately 20 club members participating, operating both h.f. and v.h.f. gear.

Club meetings during the past few months have been actively supported. The August meeting was an introduction to decimal currency with a talk by Peter 3XK on the change to decimals on 14th February, 1966, and the problems associated with this change. After the talk concluded there was an auction of surplus gear donated by David 3ZOP, the difference being, the bidding was conducted in decimal currency. From the spirited bidding it appeared members know the value of an "oxford scholar," you just try them and see. It is proposed that in the future all white elephant nights will be dealt with in decimal currency. So beware the unwary.

Over the last couple of months, the club has continued to run its monthly Social Evenings. These have been held at Kevin's 3ARD and Ron's 3RN homes. October will see a busy month for the club. The general monthly meeting will be held on Friday, 15th October, at the Club Room, Black Rock. Visitors are always welcome, and any information can be obtained from Harold 3AFQ.

The club will be arranging a display of equipment at the Sandringham Technical School on Saturday, 2nd October, and will be operating portable on the h.f. bands and 2 metres f.m. and a.m. The club will be participating in the Jamboree-on-the-Air, to be held 16/17th October, once again working portable on all bands and will be looking for contacts.

To complete the month, a social will be held at the home of Ken 3ACS on Saturday, 30th October. 73, 3XK.

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# QUEENSLAND

The September meeting of the Queensland Division of the Wireless Institute of Australia was held in the Social Services Rooms, Berwick St., Valley, Brisbane, on Thursday night, 2nd Sept., with a good attendance of Councillors, and with Lawrie 4ZGL in the chair.

A new duplicating machine has been acquired and this will improve and facilitate the issuing of our Official Bulletin, "QTC." Considerable savings in printing bills will also result, as forms, letterheads, etc., can be produced very efficiently and cheaply.

Don 4DZ showed the Pennants secured for 1965 Sunshine State Contest. These will be presented to the Brisbane winners 4VX and 4ZLO at the September general meeting.

Pat 4PJ reported on the W.I.C.E.N. exercise held on Sunday, August 28. Things are shaping well and further exercises are planned for the near future to have everything running smoothly.

Lawrie 4ZGL will be away for a month on holidays and our worthy Secretary (Peter 4ZPL) has undertaken to attend to the publication of "QTC," along with his other duties.

Disposals equipment, consisting of v.h.f. receivers and transmitters for f.m., were balloted for and winners will be notified in "QTC." There are a few further receivers or transmitters available for ballot next month, and there is some other interesting gear in the offering.

Queensland Division members and visitors from Interstate are reminded that they are cordially invited to attend any or all of our

## OBITUARY

**W. J. (John) PEELL, VK2WJ**

It is with the sincerest regret that the VK2 Division advises of the passing, on Monday, 30th August, of John Peell, VK2WJ.

John was a pioneer member of the W.I.A. (N.S.W.) and had devoted a lifetime to radio communications, both as a profession and an absorbing hobby. He commenced his career with A.W.A. as a marine radio officer in 1922, and served at sea for many years.

In 1932 he transferred ashore to the Coastal Radio Service, and ultimately became Supervising Technician in Charge of the receiving equipment at Sydney Radio, La Perouse. When the new Overseas Receiving Centre for O.T.C. (Aust.) was built at Bringelly in 1954, John was the logical choice for its first Station Manager.

Despite his responsibilities in managing the largest and most complex receiving centre in the Commonwealth, John still found the time and enthusiasm to continue as an active Amateur, both on h.f. and v.h.f. and was a keen "Mobileer." He also had the happy knack of getting on with his staff, and succeeded in making Bringelly a contented station.

John will be sadly missed by all his many friends in VK2 and our sincere sympathy is extended to Mrs. Peell and his bereaved relatives.

**VIC. WESTERN ZONE.**

## CONVENTION

will be held at

## WARRACKNABEAL

on

## SUNDAY, 10th OCTOBER

A Scramble will be held during the afternoon.

Transport to and from Aerodrome provided.

Contact us on 3565 Kc. at 2000 hours on Wednesdays; or VK3EF and VK3AKW to tell us you are coming.

Council meetings, to join in discussion and see their Council at work.

Activity in VK4 has increased somewhat this last month, quite a few new commercial transceivers are coming on the air and several of the real Amateurs have completed their own gear. Quite a deal of activity on 80 and 40 these evenings, with a bit of DX breaking through on 40 now and again. Twenty metres starting to open again, been really good on a few nights, and the week-end of 3rd and 4th Sept. saw a real full band most times.

About half a dozen of the DX boys have their gear in A1 order with new beams, new quads, and new pieces of wet string all set to knock over the DX as it appears.

The 10 metre net on Wednesday nights starting at about 8.30 p.m. on 28.6 Mcs. is a really lively sewing circle. Interstate boys are asked to watch this frequency each week-end and when the breakthrough comes break in and join the club. This should not be hard, but a couple of fellows in the net forgot to take their finger off the p.t.t. switch, hi.

73, Reg, 4VX.

### THE IPSWICH AND DISTRICT RADIO CLUB.

This is a very busy body, they have their own piece of land, have it cleared, and are now planning how they can finance a good radio shack for their official club station, XK4IO. VK4IO also takes call-backs on Sunday mornings after the VK4WI news broadcast.

### BUNDABERG AMATEUR RADIO CLUB

W.I.C.E.N. Activities: The W.I.C.E.N. Group of the club held a field day at Bingera Weir early last month. This was the first outing for the group and numerous teething troubles presented themselves. With this experience behind them another W.I.C.E.N. exercise is to be held the week-end before our meeting, and members of the group are keeping the soldering irons hot this week in an endeavour to get an 80 metre signal (a.m.) out from Coona Beach. They also hope to be operating on 40 and 6 metres.

The group consists of Rusty 4JM, Joscelyn 4JJ, Bill 4ZWS, Roy 4ZWR and John 4XC. The XYLs and harmonics are taken along on these outings and from all reports a good relaxing and pleasant day is enjoyed by all, in fact, they could be the proving grounds for future club field days.

R.D. Contest: A quick muster reveals that at least seven logs will be presented to the judges from members of the club. This is a big improvement on previous years, but there are still a few who could make that little extra effort—maybe next year our effort will be a maximum performance.

Practical Night: The third Wednesday of each month is practical night for club members at the clubrooms. The present project is a 6 metre tx for the club.

Visitors to our QTH this month were Peter 4PJ, who spent a few days with his XYL and harmonics at Bargara, and meeting a few of our club members. Les 4XJ also passed through on holidays on his way up north. Les, an ex-President of our club, always drops in to say hello when around our QTH. His mobile rig (s.s.b.) usually gives us plenty of warning of his whereabouts.

Six Metre Hook-up: This hook-up takes place two or three nights weekly with 4ZWS, 4ZWR, 4XC, 4JM, 4XRW and 4JJ on the net. This seems to be a popular rag-chew hook-up, and it wouldn't surprise to hear more on this band in the very near future.

A few 20 metre antennas are showing up around the place. Lee 4FC is away on 20 and going very well with it, too. Rusty 4JM has plans well in hand for a Quad on 20 to replace his present vertical.

### TOWNSVILLE AND DISTRICT

Well, the R.D. Contest has again come and gone. I thought that this year there seemed to be not so much interest taken as formerly, as I did not hear so many on the bands, maybe it was the conditions that prevented me hearing them. Only the final scores will show the true facts. Very glad to see that Charlie 4BQ hit the four century mark with his totals. He certainly puts in a lot of time at this special Contest.

This time I received my "A.R." before typing the notes. Do not know whether it was the Postal Dept. or the W.I.A. chaps I have to thank.

Very pleased to say that I also looked into the crystal ball like PanSy, only that mine was clear and not clouded. I see that the previous invitation to him to drop in for a "cuppa" with the XYL Club in Sydney may be withdrawn as he may have got the call signs mixed. But take a tip never get your girls' names mixed (see column 3, page 23). Knowing Muriel 2AIA will have a great laugh, only hope that Marc 2CM will really invite him to carry the bags. What say you Verle 2MR.

The foregoing only shows that I read all the correspondents' notes as that way I get to know just where the chaps are that I have not worked for many a long day.

The local Amateurs do not seem to be on the air like the old times, apparently waiting for the conditions to really open up. I know that in my locality I cannot hear them unless their beams, quads, etc., are in my direction. As I type these notes Merv is about to leave on his annual holidays to Brisbane. This time he hopes to attend the monthly meeting and meet as many of the boys as possible.

A few of the "Z" boys are going to try and master the key to get the full ticket, as there is practically no activity on their bands of 6 and 2 metres. So here is hoping that they soon get the right to be on the DX bands.

Still wonder if the par in my notes, August "A.R.," wil bear fruit and we can work third party to the lads in the Armed Services overseas? What about some of you chaps in the north dropping me a line or two about what is doing—14.7 and 3.5 Mc. does not seem to favour short haul contacts, as I never hear any of you on the air. 73, Bob 4RW.

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## SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division for August was held in the clubrooms to a very representative gathering of members and visitors and took the form of a display of members' home-constructed gear. The meeting opened some 20 minutes late, the reason for this being somewhat obscure, and the first hour or so was taken up with the normal business of the Division, including a discussion on the question of the membership fees being raised, and also a discussion on the matter of the radius to be decided for country membership. Although there was a lot of fencing and sparring going on over the increased fees question, it was obvious from the start that all present believed that an increase was inevitable, and at the same time quite justified, and so finally it was passed unanimously, bar one, and the same went for the country members' boundary.

The display and description of members' gear then was ushered in, and while I must admit it always gives me a terrible feeling of inferiority to say so, the gear displayed this year reached an all-time high, both in quality and quantity, so much so that it is becoming increasingly difficult to distinguish the Amateur gear from the professional, which is all to the good, being in itself a boost for Amateur Radio these days.

The equipment displayed, in order of presentation, consisted of a 6 and 2 metre mobile transmitter, modulator, power supply and converters, built and described by Colin 5ZHJ; a high impedance v.t.v.m. by Ron 5ZDC; a 52 Mc. transistorised walkie-talkie by Edwin 5ZTS; a 6 and 2 metre transceiver by Peter 5ZKA; a 6 and 2 metre transmitter, again by Peter 5ZKA; a s.s.b. transmitter for 6 metres by Bob 5ZDX which was, incidentally, a project for promoting s.s.b. on these frequencies and the outcome of the v.h.f. lectures; a transistor modulator for mobile work by Jim 5ZSJ; a v.f.o. for a Galaxy transmitter by Gilbert 5GX; and last, but by no means least, a standing wave bridge by Tom 5TL.

This splendid display of know-how and industry gave the judges plenty of headaches, but they finally agreed upon the winner as the 6 and 2 metre mobile transceiver presented by Peter 5ZKA, with Ron 5ZDC as runner-up with his v.t.v.m. All of these gentlemen are to be congratulated on their efforts towards making the display the success it undoubtedly was, and also on the skill and ingenuity possessed by them all. Although I am not in a position to comment, and realise how wide open I am leaving myself for a kick-back, just glance over the above list and see the ratio of three letter calls to two letter calls—and then pause and think.

The meeting concluded, with much haste and speed, at the witching hour of 11 p.m., with the caretaker's Alsatian dog bounding up the stairs two at a time, and the members bounding down the stairs four at a time—I managed six steps once—and everybody quite unanimous that a good time had been had by all.

Speaking personally, I hate these nights. I have said it before, and I will probably say it again. After viewing the gear displayed, with its professional finish, to say nothing of the description given by the builder, I always wend my way homewards with a terrific inferiority complex, and it takes me almost a week to stop myself from tearing down my Amateur licence from the shack wall and jumping on it, my only compensation being that at least I am honest enough to admit it, if only to myself.

John 5LV came up to me at the meeting and gave me a message from a certain s.s.b. identity who resides at Broken Hill. I refuse to give his name because I know he only sends such messages down to me in the hope that I will be annoyed and embarrassed. You and your s.s.b.—I hope your mechanical filter gets blocked up and bursts.

Bob 5ZDX, in describing his s.s.b. rig for 6 mx, threw out an open offer to lend the said rig to all and sundry with the view that it would show just how easy it was to go s.s.b. Only goes to show what a hard battle my mob have—nobody goes around offering to lend an a.m. rig to anybody. What chance have I got?

Noticed in "QST" for July the beaming face of my old sparring partner, none other than Freddie 5FH, who had been visiting A.R.R.L. Headquarters. Freddie used to be OE1FH back in 1938, and his main claim to fame in VK5 was an antenna that ran all up and over the Adelaide foothills, with consequent oodles of signal strength in the right direction for DX. Can't understand it, Fred must have had a mental blackout just before he left for overseas, otherwise I know for certain he would have let me carry his bags—one bag anyway!

Jack 5LR has at last managed to get his new transmitter to declare its allegiance to Comps 5EF. However, all is not yet lost, it still is firmly sticking to me on the other bands, owing allegiance to Comps on 7 Mc., but definitely turning him down anywhere else. Jack is by no means perturbed and confidently boasts that it is only a matter of time when I go overboard, but never fear, I still have a couple of sleeves up my trick!

Well, the R.D. Contest has again come and gone, and once again it was its usual success from all points of view. At any time, since its inception, I have only tried for the nominating five contacts, just to be a multiplier, but this year it looked like me giving it a miss for the first time due to my having a nasty head cold, and a decided disinclination to leave the warmth of my couch of virtue. However, realising that my non-appearance on the band would bring great cheer to the hearts of quite a number of contestants who would be able to relate with evident relish that the "old So-and-So" was at last showing signs of packing up, I fought back gallantly and dragging my weary body down to the shack, I managed to collect my usual nomination contacts for 1985. I only went on 7 Mc., as usual, and thought the conditions around 3 p.m. were well down on previous years, so much so that I only worked one VK3, and the rest were VK2s and a solitary VK7. In view of the fact that I am comparatively unknown in those States, and am always treated with studied ignore by those who condescend to recognise me, I had quite a peaceful contest, although I must admit I missed the usual coarse and sometimes insulting remarks that I have come to expect from VK3s in the contest. Nevertheless, little apples will grow again, and by next year the usual coarseness and insults will re-appear in the contest. And to think that I was once their President, if only for ten minutes! It is an ungrateful world, but what can one expect, look who they have as President now!

Garry 5ZK has had to return to VK2 for more computer information, and naturally this prevented him from entering the R.D. Contest, although it is being freely rumoured that next year he will be good for an astronomical score, possibly with the help of the above-mentioned computer. I am not too sure if the computer will just help in adding the score, or will throw in a few CQs for good measure. Time will tell.

Tom 5TL, "Uncle Tom" to you, now has his tower up in the air, thanks to 5TY, 5TU, 5SX and 5MM, who arrived after it was safely up in the air, but anyway his intentions were good, and as it has not fallen down at the moment of writing, it can now be safely assumed as up for good. The nearby residents are very pleased, because when the pilots of the jets see the majestic structure they veer away, with consequent diminishing of the noise that has been nearly driving them off their rockers of late. There is some suggestion of a public subscription being raised for "Nunky Tom," but I doubt it, and anyway, he being a member of the VK5 Council I will fight it tooth and nail, just from habit.

Rodney 5SX has shifted into the same area as Uncle Tom, and will be another source of QRM to our Federal Councillor (Geoff 5TY), much to his disgust. When he first had this area almost to himself he was on v.h.f., now he is a "square," he trips over QRM right and left. My heart bleeds for you OM. Can I talk anyone else into moving into the area?

Brian 5BI has erected his pipe mast at Cowell, only to find that he was the principal entertainer on the household t.v. set. He has taken some appropriate action in relation to the booster installed on the t.v. antenna with

beneficial results, and peace has again returned to the 5BI domicile. Brian moved quick and fast to cure this situation—the booster was bought out of "her" own money to improve reception. Need I say more?

George 5VB was to be found hard at work the other night trying to complete a transmitter for 28 Mc., because he had been contacting South Africans on another band and they had asked him if he could fire a signal on that band. The results of the project have yet to be announced, but knowing George, I expect a favourable report.

Wonder just what Pete 5FM has to say on the price of fish these days? About a year ago he acquired a boat, and his first comment on the success of the venture was that the price of the first few fish was very big. Have not heard anything as to whether the price of fish is now lower or higher, and strangely enough, neither have I seen or smelt any unexpected parcels of fish on my front doorstep since the launching of the boat—I wonder why!

At the conclusion of the July meeting there was the usual dignified exit from the clubrooms of members, but among the scramblers and shovers was one who did not seem entirely at ease, to wit, Garry 5ZK, who had made the screamingly funny discovery that he had locked his car with the keys inside. After the hysterics had somewhat subsided, he was in a position to appreciate all the free good advice offered by all and sundry, and when last seen was in the process of removing the whip aerial from the roof of the car, and looking for volunteers to go down the mine, or so I presumed. I decided to leave at this juncture, after all, my figure may be athletic and pliable, but I draw the line somewhere, and supposing I were to be stuck halfway—wouldn't I have made a fine Aunt Sally! I presume he finally arrived home—no news is good news.

Heard Vic 5JH, Bill 5ZD and Howard 5XA in a three-way contact on 7 Mc. the other evening, and they were three busy little bees if ever there were. Vic, with his coin and stamp collections, to say nothing of radio; Bill, who was apparently in the throes of calibrating a frequency meter or the like; and Howard was about to leave for the finals of the table tennis at the end of the QSO—apparently there was some family representation—and Howard and XYL were off to cheer or jeer as the occasion demanded. Did they win, Howard?

I thought I detected the signal of Jim 5FO floating through the ionosphere during the R.D. Contest, but the QRM was pretty dense at the time and I have never been sure. I suppose Rae was standing behind him with the whip, urging him on!

Talking of the R.D. Contest. I only worked one of my regulars this year. None other than Jeff 2AHM of Wentworth. For some strange reason, I always hook him for my first contact or so, and have been doing this for several years now.

Have been wondering for years what had become of Clarrie 5KL, a v.h.f. veteran of many years in VK5. Anyway, from a letter read out at the general meeting, it would appear that he is about to transfer to another State or somewhere. I did my best to find out where, but nothing doing. It is years since I have seen or heard him on the air, but on his day, he was decidedly active.

Our genial Secretary, John 5JC, who loves to pounce on me every time I open my mouth at the meetings, announced at the last meeting that for some reason or other, in the letter that he had received concerning this year's Jamboree-on-the-Air, there was no reference to any VK5s who were active in last year's shindig. John was cut to the quick at such a state of affairs, in fact at one time I thought he was about to break down and sob on the shoulder of the nearest Councillor. However, with a superhuman effort he pulled himself together and finished the letter. That such wickedness could be! VK5 out in the cold. Tut-tut. I detect the hand of Ken 1KM in this somewhere!

Apparently the R.S.G.B. Handbooks have been selling like hot cakes, because Uncle Tom 5TL informed all and sundry at the meeting that he was fresh out of supplies, and that it might be two months or so until the next batch arrives. No doubt about Tom, he is a salesman of class, probably one of those fifty-pound-a-week types that I read of in the daily paper.

Harry 5MY arrived at the meeting equipped with a roll of plans, and quite looking the perfect Treasurer, apparently in case anyone wanted a definition of the proposed new country subscription areas and their boundaries. Not being called upon to use them, apparently threw him off balance, because he left them behind on the Council table. Hope he was able to find his way home without them. When are you going to use that modulation tranny, Harry?

The old-timers in VK5 read with regret of the passing of Bill (6DX), especially in view of the fact that he was once a VK5 himself. Bill is remembered as a "hard case" by many of us, and stories of his antics in his early days in VK5 are legion. I myself well remember picking up a Tattersall Sweep result sheet at that time drawn in Tasmania, in which a Bill Barber was shown as winning the first prize with a syndicate named "Pusra," a name that in turn puzzled and then convulsed many thousands of people throughout Australia who contributed to the sweep. Knowing Bill as I did and under the assumption that it was he, it did not take me long to unravel the mystery of the strange syndicate name, and I have always felt that such an attempt at humour, dubious as it may be, summed up Bill's complete outlook on life, happy and carefree as he was. Have you got it yet?

On the way out of the meeting on my way home I bumped into a young man who had been attending another meeting in the building, and as we sorted ourselves out he said to me: "Do you still do magician tricks, Mr. Parsons, Sir?" Although this rang a bell somewhere, I was somewhat at a loss to place him, and when he explained his remark I really began to feel quite old. It appeared that he was a relation of mine, and the last time he had seen me he was only about six years old or so, and it was at a city church where his young brother was being christened. He reminded me of the fact that he was decidedly restless at the church during the christening and at the suggestion of my XYL, I entertained him with some tricks of magic, the main one being able to swallow a penny and then take it out of my ear. Apparently my act was quite a successful one, and he sat entranced, as quiet as a mouse, until I made the fatal mistake of giving him the penny as a reward for being so quiet. Yes, you have guessed it, he immediately swallowed the penny, and for some unknown reason he could not get it out of his ear like I did! Whacko, do you think there was any confusion—and my XYL blamed me for the whole lot—running true to form again. Anyway, I was pleased to meet him again, although it did make me feel a little old. I told my XYL when I arrived home, and all she said was, "Yes, I remember him, and also the incident. I never felt so ashamed in my life, it was all your fault." There's gratitude for you!

Did a little slumming this month—went up in frequency on the 7 Mc. band, but went down in my own estimation—to wit I did a little snooping on the s.s.b. gang. Heard Ken 5KC and Reg 5QR in mobile contact one lunch hour, and although it hurts me to say it, the signals and the slick operating was most impressive. However, don't take this statement as a sign of weakening!

Also heard Gilbert 5GX in contact with a VK3, also good signals, the VK3 being on a.m., which only goes to show that Gilbert cares naught for protocol—if you get what I mean!

Nobby 5WK was heard in contact with Martin KX6BQ, although the QSO did not last long because of QRM this end, which leads me to ask, why do the s.s.b.-ers keep lobbing on the stations whilst they are talking to each other, apparently trying to get into the act. There may be no sideband, but brother, is there any QRM on the frequency, but then of course I am only an ignorant a.m.'er, and possibly not up in modern techniques or good manners. Incidentally, they piggy-back their DX contacts. Why in my day, to piggy-back a contact was considered to be akin to eating peas with one's knife. Tut-tut, the Duke wouldn't like that Sir!

Had a talk with Ray 5RK at the meeting, and said that I had not heard him for some time. Sure enough, as happens so often, I heard him on c.w. a couple of days later, and can honestly say I picked the fist before I heard the call sign. Nice copy, Ray, even I could write it down word perfect.

Clarrie 5ZCN at the moment of writing is kicking up his heels in VK3, despite the warnings that I gave him as to what happens to VK5s found in that area. Poor old Clarrie, he is a little naive, he really believes that the VK3s are a decent lot of blokes. Brother, will he learn the hard way. Please treat him gently if you penetrate his disguises, we need him back here again some time, if only to hear how he makes out.

You may or may not believe it, but during each month I receive a little mail from various people, some in praise, some in condemnation, some with gossip and some with red hot news, and occasionally one with a clue to a coming or past event of considerable importance. One such letter this month told me that my never-ending battle with Pincott 3AFJ gave him considerable interest and, at times, amusement. He went on to say that my immortal boast "that anything Pincott could do, I could do better," definitely intrigued him, especially in view of his latest attempt to put one over me. This statement worried me considerably, because I was under the impression that he and I were breaking about even in scoring over each other, despite the s.w.l. sample report for the R.D. Contest which had me reported as being on s.s.b.—how low can he get?. Anyway I immediately got in touch with one of my agents planted right in the middle of the Publications Committee, who wrote back to say that he knew of no new dirty work at the cross roads. However, he added a postcript to the effect, and I quote, "Did you hear about the new arrival in his household—Janet, 7 lb. 11 ounces, on the 23/7/65?" Well, what do I do now, "Anything he can do, I can do better." Joan, how could you do this to me? I thought we were friends and buddies. I told my XYL the news, and also just what my legion of fans in the Amateur Radio world would expect of me, but the hysterical laughter which greeted my announced plans for the future, somewhat damped my enthusiasm and boded no good for chances to get even with my arch enemy from VK3. The trouble with me is that I always fight clean, such unfair tactics never enter my mind! Woe is me.

73, de 5PS—PanSy to you.

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## WESTERN AUSTRALIA

Sorry, chaps, for missing out on two editions, but have been twice laid up and on both occasions unable to execute my duty to VK6. Once more Remembrance Day has passed. I do hope that you all enjoyed the contest. To my disappointment I was unable to even listen.

Had reason to visit Kattaning just recently, this being my first time in that town I decided to look the place over. Well, one of the most interesting sights was to be found at the QTH of Herb 6XO. "Aerials," gosh, I never thought it was possible to fit so many radiators in one back yard. Herb's harmonic is a keen listener and quite enthusiastic at radio construction. When he gets his ticket, "where will he be able to operate, Herb?" Certainly no room for more aerials.

Note quite an amount of commercial rigs operating in VK6, one in particular having passed through three or more stations within a fortinght before being owned. "Still, it has not been on its second round yet." Hope by now the NCX rig has finally come to rest and remains new, "straight from the carton."

Note that 15 and 10 metres now quite active, well that's how it seems although I've only been paying attention since Saturday, 4th. Never mind, I'll be camping for the next two weeks, situated out east in the tiger country, so during the evening we will sure be tuning old 80 metres and listening with much interest. 73, 6KN portable.

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## TASMANIA

The last general meeting was very well attended by some thirty odd members, including Bob 7OM, who has now returned to his homeland after a spell in the land of the bananabenders. Our lecture after the business part of the meeting was given by a gentleman from I.B.M. on computers. After a brief talk, two films were shown, and I think everybody present had his eyes opened. Heard one chap say "he thought he'd buy one to keep the kids quiet on wet days." Only 300 grand worth for the accessory. (What it is to have money!)

Ian 7ZZ and family are, at the time of writing, holidaying (again) on the mainland, VK5 land this time. I've no doubt he'll be looking up quite a few VK5 boys while he is there.

This year's Hamfest, which will be held at the usual spot at Campbelltown, again at the latter part of November, should be our best one yet. The North-western boys are to be our organisers, and from the rough programme they sent in, it looks like everybody will be catered for—OMs, XYLs, YLs and harmonics. Besides having a good programme, the other essential, of course, to make it a real success, is a good roll-up. So what about it? Come along this year, have a few eyeball QSOs, join in the fun, and give the others the pleasure of your company. Your bulletin will give you full details, and all visitors will be most welcome.

The month of August (seems a long time ago) saw Hobart as host to scientists from all over the world, who were here for the A.N.Z.A.A.S. Conference. Among those attending, was one Rod VK6ZDS, who made himself known, met a few of the local boys, worked some of them, enough to get a valid R.D. log at least, and attended a v.h.f. group meeting, where he was appointed guest speaker for the evening. Rod spoke on v.h.f. activity in VK6, including a rundown on aerials, gear, etc., and various DX-peditions which have been held out of Perth. We trust

you had a good trip home, Rod, and enjoyed your all too short stay in VK7. Maybe we'll see you again some time over here, or at least work you on 6 metres. I had better get a better aerial first though (hi).

73, Geoff 7ZAS.

### NORTH-WEST ZONE

Well, chaps, by the time this goes to press (unless the Editor decides otherwise) you will all have known how each of you had fared in the R.D. Contest. All we can say at this stage is that we hope that everyone put in their log and tried their best. I for one went flat out for 24 hours—apart from a horrifying experience at approximately ten minutes past six; or I should say 0810 G.M.T. Saturday, when the antenna change-over relay refused to function, but which I am pleased to relate I managed to loosen up by using ordinary engine oil, not having any Servisol handy—I thought the R.D. was as good as ever. One thing that impressed me most this year was the lack of seething heterodynes one usually has to contend with—attributed no doubt to the greatly increased population of s.s.b. participants. Also being in the fortunate position of owning a transceiver, one didn't have to perform the octopus act of using a dozen arms to go from receive to transmit.

However, in spite of all this, we in the North-West didn't do as well as expected, attributed to unforeseen circumstances as I am about to relate.

Firstly, there was the woeful tale of Sam 7SM, just imagine the scene—Sunday afternoon, time approximately 1 p.m.—the a.c. power goes off and did not come on again until 4.30 p.m.!

Then there was the unfortunate clashing of events that befell Ken 7AL—now Ken usually tops the N.W. zone score but unfortunately had to forego any thought of Ham radio that week-end on account of his final flying exam. Anyway, Ken, let's all cross our fingers and wish you the best of luck.

Another sad story was that of Ken 7KH. Now as I mentioned in last month's notes, Ken used a radio controlled golf ball very successfully to qualify for the semi-final in the golf championships—however, something went amiss with the gyro-operated r.f. derived putting mechanics or something—and sadly to relate that gold cup won't be standing on his mantelpiece, and to make matters worse, nor will the phone certificate grace his shack wall for '65—anyway, Ken, let's see you back on the air next year with a vengeance.

I haven't heard very much of Max 7MX lately on the bands, but I did happen to run into the old boy the other day at his place of employment. After dragging me into a corner and telling me the latest joke from the stock exchange he then said that his interest in Ham radio had not diminished but merely that his attentions at the moment were wholly directed on his stereo hi fi amplifier system.

George 7XL as you all know by now has bought a commercial s.s.b. transceiver and a very nice looking bird it is too. I bet you never ever thought that one day a remark you made once would ever apply to yourself, George? Then just read paragraph 5 of your correspondence to the editor of "A.R." in December 1961 notes!! Anyway tycoon or not I'm with you all the way!!

Associate Ian Ellings has built himself a nice little converter which he uses ahead of an ordinary mantel set. I haven't had the opportunity of seeing it yet Ian, so what about bringing it along to the next social meeting and showing the boys.

Reg Polden has also been bitten by the construction bug, this time it is a transistorised rx. It won't be long now Reg before you will be able to hear all that rare DX.

Ray 7ZRS has changed his vehicle—from beetle to 4-wheel drive. I believe there are 135 willing horses under the bonnet. Now that you have the whip antenna installed Ray, it is only a matter of getting your morse and then you will be all set to go mobile.

Looks like there is yet another convert to s.s.b.—none other than that master of the key, 7SM. I believe Sam with his 20 w. has over 200 countries and 4,000 QSL cards to his credit. I would hate to think of the chaos down at the QSL bureau when you pound the key using 300 watts of c.w. or 400 watts of s.s.b., Sam.

Don't forget the Jamboree-of-the-Air on the 16th of the month—see your local Scouting Group and give the lads your support.

73, David 7MS.



## HAMADS

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**FOR SALE:** Type 3 Mark 2 Tx Rx with P/S, Mod. and Speaker, all self-contained, in carrying case 19 x 13 x 10 in. deep and with 4 coils, 10 xtals in 7 Mcs. and 7 xtals in 3.5 Mcs. bands, battery and a.c. cables, Morse key and xtal mike, £35 complete. Geloso v.f.o. in metal case with separate P.S matched for above, £10. BC Car Radio and P.A. system with 6V6 P/P output, speaker and 12 volt genemotor P/S, £12 (has facility for external mike). X/M P/S—2 on one chassis (a) 550 volt (b) 400 volt, well filtered, £5. 144 Mcs. 10 element Yagi Ant as per v.h.f. Handbook, complete with 70 feet 300 ohm open wire feeder, £3/10/-. "Z" match Ant coupler, in metal case, £1. 5 ft. 6 in. P.M.G. type Rack, £1. Remington Typewriter, in good condition, £12. And lots of other items, condensers, coils, relays, etc. No reasonable offer refused. Want to Buy: 12 v. Battery Charger. A. W. Chandler, VK3LC, 1536 High St., Glen Iris, Vic. (50-2556).

**FOR SALE:** 150 watt 80 to 10 metre a.m. transmitter; 400 w. s.s.b. with 80 and 20 m. s.s.b. exciter. Comprising 10 units. Double dexion shelf rack. 813 amplifier, class C, class AB2, regulated screen, shielded case. Geloso v.f.o., 6146 exciter, 80 to 10 m. 150 watt modulator class B 811's, 2A3's driver. W2EWL phasing exciter, 2 band (no case). 5 power supplies, relay control, final and modulator supplies, hi-cap filter, relay power supply. All housed in crackle cabinets. New parts used throughout when built, £125. Woden modulation transformer UM3, 120 watt, brand new in box, £10. Ferguson vibrator transformers VT106, 6 volt/300 v. 75 mA., as new, 10/- each. D. V. Scott, VK3DY, Johnston St., Maffra, Victoria.

**LAFAYETTE** HE80 Comm. Rec., tunes 550 Kc. to 30 Mc. and 48 to 54 Mc., a.m., f.m., s.s.b, perfect condition, complete with instruction book. £79. VK3AOK, P.O. Box 60, Mt. Waverley, Vic. (560-9168).

**NEW** Swan SW350, still in factory sealed carton, with set of new 240v. a.c. power supply components. £250 the lot. VK2ID, Fred Adams, Box 9, P.O., Wentworthville, N.S.W.

**PYE** IIIA 10 Watt a.m. Mobile, modified for 53.032 Mc., 12 volts, transistor power supply, £25. VK3AOK, P.O. Box 60, Mt. Waverley, Vic. (560-9168).

**SELL:** Collins S Line, as new. Complete s.s.b. Ham Station with power supply, mic. and spkr. Reasonable offer for quick sale. VK2BRW, 44-7701.

**SELL:** Hallicrafters SX28 Rcvr., 240v. a.c., 100 Kc. Calibrator, Product Detector, Fast-slow a.v.c., voltage regulated, mods. professional, complete instruction book; f.b. s.s.b. rcvr., £65. AR88LF Rcvr., 74-550 Kc. and 1.5-31 Mc., S Meter, spare tubes, recently overhauled and aligned, panel needs redressing otherwise f.b. performer, £45. Central Electronics 10B s.s.b. Exciter, 10 w. p.e.p., 160-10 Mx, 9 Mc. phasing unit, 5 Mc. remote v.f.o., some Xtals, spare set audio xformers (cost £6), 110 xformer, comprehensive handbook, £35. Jones Micromatch s.w.r. commercial indicator, 200 uA. meter, built-in home-brew 52 ohm coupler, compact unit, works fine, £4/10/-. SCR522 Transmitter only with tubes, unmodified, £7. Will freight. VK3IB, Box 35, Dimboola, Vic. All enquiries answered.

**WANTED:** Beam Rotating Motor and accessories for lightweight Tribander. Reply Harry Kinnear, Sandara Court, Mt. Eliza. 78-71119, all hours.

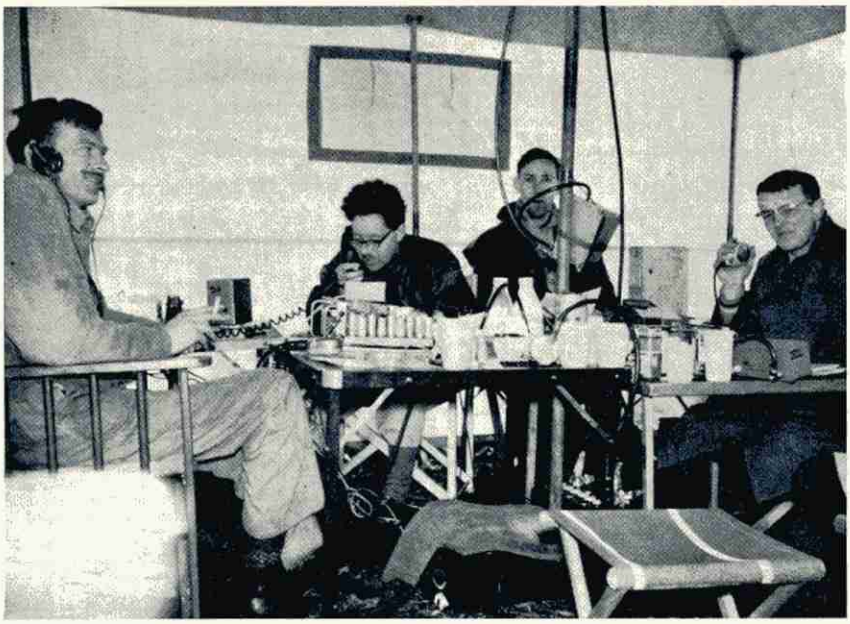
**WANTED:** Gill motor or similar device to rotate a beam and/or direction indicator for the same. VK3AIE, R. S. Tucker, 40 Panoramic Rd., Nth. Balwyn, E.9, Vic. 85-4815.

**WANTED:** One inch C.R.O. or one inch tube on its own, for use as modulation indicator. VK3AXE, 383 Warrigal Rd., Burwood, Vic. (Phone 28-2326.)

**WANTED:** Service Manual for TR1936 v.h.f. transceiver. M. S. Odell, L3251, 42 Kooyong Road, Caulfield, Vic.

**WESTON** 50 Watt Base 6 m., a.m., modified for 53.032 Mc., 2E26 final, 807 modulators, comp. instruct. manual, wired for extended local control, £35. VK3AOK, P.O. Box 60, Mt. Waverley, Vic. (560-9168).

# AMATEUR RADIO



Vol. 33, No. 11

NOVEMBER
1965

2/6

Registered at G.P.O., Melbourne, for transmission by post as a periodical

# NEW VALVES AT BARGAIN PRICES

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A3 | 2/6 | 10 a £1 | 2C42 | 15/- | | 6B8 | 7/6 | 3 a £1 | 6R7 | 7/6 | 3 a £1 | 7C7 | 5/- | 5 a £1 | 57 | 5/- | 5 a £1 | EF39 | 5/- | 5a £1 |
| 1A5 | 5/- | 5 a £1 | 2C46 | 15/- | | 6BE6 | 15/- | | 6SC7 | 7/6 | 3 a £1 | 7E6 | 3/6 | 7 a £1 | 58 | 5/- | 5 a £1 | EF50 (VR91) | | |
| 1C7 | 3/- | 7 a £1 | 2D21 | 12/- | | 6BQ5 | 17/- | | 6SF5 | 7/6 | 3 a £1 | 7W7 | 2/6 | 10 a £1 | 717A | 7/6 | 3 a £1 | and socket | 3/6 | |
| 1D8 | 7/6 | 3 a £1 | 2X2 | 5/- | 5 a £1 | 6C4 | 5/- | 5 a £1 | 6SF7 | 7/6 | 3 a £1 | 12A6 | 3/- | 7 a £1 | 725A | 20/- | | EF70 | 5/- | 5 a £1 |
| 1F5 | 10/- | | 3A4 | 22/- | | 6C6 | 5/- | 5 a £1 | 6SH7 | 4/- | 8 a £1 | 12AH7 | 5/- | 5 a £1 | 808 | 10/- | | EF72 | 5/- | 5 a £1 |
| 1H5 | 7/6 | 3 a £1 | 3S4 | 10/- | | 6C8 | 10/- | | 6SJ7 | 12/6 | | 12AT7 | 7/6 | 3 a £1 | 830B | 15/- | | EF73 | 5/- | 5 a £1 |
| 1K4 | 5/- | 5 a £1 | 3V4 | 15/- | | 6CM5 | 25/- | | 6SK7GT | 20/- | | 12AU7 | 15/- | | 866 | 25/- | | EF86 | 26/- | |
| 1K5 | 5/- | 5 a £1 | 5U4GB | 14/6 | | 6CW4 | 25/- | | 6SL7WGT | 12/6 | | 12AV6 | 7/6 | 3 a £1 | 954 | 5/- | 5 a £1 | EL41 | 10/- | |
| 1K7 | 5/- | 5 a £1 | 5V4G | 17/6 | | 6CW4 | socket | 5/- | 6SN7GT | 10/- | | 12BE6 | 7/6 | 3 a £1 | 955 | 5/- | 5 a £1 | EY91 | 5/- | 5 a £1 |
| 1L4 | 5/- | 5 a £1 | 5V3GT | 13/9 | | 6F8 | 5/- | 5 a £1 | 6SQ7GT | 22/- | | 12C8 | 5/- | 5 a £1 | 956 | 5/- | 5 a £1 | QQE03/12 | 47/6 | |
| 1L5 | 10/- | | 6A6 | 7/6 | 3 a £1 | 6G6G | 7/6 | 3 a £1 | 6SS7 | 7/6 | 3 a £1 | 12J5 | 5/- | 5 a £1 | 958A | 2/6 | 10 a £1 | QQE03/20 | £3/5 | |
| 1LN5 | (CV781) | | 6AB7 | 10/- | | 6G8G | 26/- | | 6U7 | 7/6 | 8 a £1 | 12SA7GT | 10/- | | 1016 | 20/- | | QV04/7 | 25/- | |
| | 5/- | 5 a £1 | 6AC7 | 7/6 | 3 a £1 | 6H6 | Metal | 3/6 | 6U8 | 17/- | | 12SC7 | 5/- | 5 a £1 | 1025 | 5/- | 5 a £1 | RL18 | 7/6 | 3 a £1 |
| 1M5 | 5/- | 5 a £1 | 6AG5 | 5/- | 5 a £1 | 6J5GT | 10/- | | 6V4 | 11/4 | | 12SK7 | 5/- | 5 a £1 | 1626 | 5/- | 5 a £1 | UL41 | 7/6 | 3 a £1 |
| 1P5 | 5/- | 5 a £1 | 6AQ7 | 12/6 | | 6J6 | 10/- | | 6V6GT | 16/- | | 12SQ7 | 5/- | 5 a £1 | 1620 | 5/- | 5 a £1 | VR53 | 5/- | 5 a £1 |
| 1Q5 | 5/- | 5 a £1 | 6AJ5 | 7/6 | 3 a £1 | 6K7 | 5/- | 5 a £1 | 6X4 | 10/- | | 12SR7 | 5/- | 5 a £1 | 5763 | 28/- | | VR102 | 5/- | 5 a £1 |
| 1R5 | 10/- | | 6AK5 | 15/- | | 6X8GT | 12/6 | | 6X5 | 13/- | | 19 | 5/- | 5 a £1 | 6021 | 10/- | | VR136 | 2/- | 12 a £1 |
| 1S2 | 18/- | | 6AL5 | 14/- | | 6L7 | 5/- | 5 a £1 | 7A8 | 2/- | 11 a £1 | 30 | 5/- | 5 a £1 | 9004 | 5/- | 5 a £1 | VR137 | 2/6 | 10 a £1 |
| 1S5 | 16/- | | 6AM5 | 15/- | | 6N7 | 5/- | 5 a £1 | 7C5 | 5/- | 5 a £1 | 47 | 5/- | 5 a £1 | EA50 | 2/- | 11 a £1 | VT78 | (6D6) | 5/- |
| 1T4 | 10/- | | 6AM6 | (EF91) | 10/- | | | | | | | | | | ECC85 | 20/- | | VT127 | 5/- | 5 a £1 |
| 2A5 | 7/6 | 3 a £1 | 6AS7GT | 20/- | | | | | | | | | | | ECH33 | 20/- | | VT501 | 7/6 | 3 a £1 |

Packing and Postage 5d. per Valve.

## COPPER WINDING WIRE

**4 oz. Reels**

| | | | |
|---|---|---|---|
| 16 B & S Enamel | 6/6 | 26 B & S Enamel | 9/6 |
| 18 B & S Enamel | 8/0 | 28 B & S Enamel | 12/6 |
| 20 B & S Enamel | 9/6 | 30 B & S Enamel | 13/6 |
| 22 B & S Enamel | 10/- | 33 B & S Enamel | 15/0 |
| 24 B & S Enamel | 10/6 | 39 B & S Enamel | 27/- |

## TV BALLUN

ABI. 300 TV Ballun ..... 17/6

## COAXIAL CABLES

UR67 50 ohm ⅜ in. diam. coaxial cable, 1/0 yd. or 25/- per 25 yds. roll. 10/- postage.
UR43 50 ohm 3/16 in. diam. coaxial cable 15/- per 35 ft. roll.
UR71 72 ohm ¼ in. diam. coaxial cable, 1/6 yd. or £1 per 27 yds. roll.
**All above cables are in as new condition.**

## GRID DIP OSCILLATORS

Lafayette TE-18 G.D.O. 8 Bands, Plug in Coils, 360 Kc.-220 Mc., 240 volt ..... £19/15/-
Leader LDM-810 G.D.O. 2-250 Mc., 6 Band, Plug-in Coils, 230 volt ..... £22/5/-

## ADEL NIBBLING TOOL

Designed to cut round or square holes in sheet metal, with instructions ..... 75/-

## ALIGNMENT TOOLS

Jabel No. 4 Alignment Tool Kits. All popular sizes, 4 Tools in Plastic Pouch ..... 12/-

## COAXIAL CONNECTORS

**AMERICAN TYPE**

| | |
|---|---|
| PL259 Coaxial Plug | 9/0 |
| 4087-1 Coaxial Plug (PL259, PTFE) | 14/6 |
| SO239 Coaxial Socket (Suit PL259) | 9/- |
| 4802-1 Coaxial Socket (PTFE) | 14/8 |
| C32-14 Coaxial Dble. ended female Cable Joiner (PTFE) | 17/0 |
| UG175U Adaptor for PLT59 to suit ¼ in. Cable | 2/9 |
| C32-17 Coaxial "T" Piece suit P1259 | 23/3 |
| **BNC Series:** | |
| UG 88 C/U Coaxial Plug (PTFE) | 15/9 |
| UG290/U Coaxial Socket (PTFE) | 12/6 |
| **Belling Lee Type:** | |
| Coaxial Plug (Suit ¼ in. Cable) | 4/- |
| Coaxial Socket | 3/6 |
| Coaxial Socket (flush mount) | 3/6 |
| Coaxial Cable Joiner (female) | 4/- |

## SPECIALS

| | |
|---|---|
| Polymax Unbreakable Stand-off Insulators, ½ in., 1/-, 1 in., 1/6, 1½ in., 2/6. | |
| Aegis 2.5 mH. RF Chokes | 4/9 |
| 230 volt Clear Neon Bezels | 8/3 |
| Sato 3280 Bezels, ⅜ in. diam., 6-8 volt. Red, Green, Blue, Yellow, with globe 4/6 each | |
| Sato 3280 Globe, 6-8 volt | 1/3 |
| Acme C33-2 Microphone Plug | 4/3 |
| Acme C33-2 Microphone Socket | 4/3 |
| Sato Sub-miniature 5-pin Coil Former 7005 | 4/- |
| Sato Standard 4-pin Coil Former | 4/- |
| Transistor Earphone Plug and Jack | 3/6 |
| Ring, Tip and Sleeve Microphone Plugs | 7/6 |
| Cartridge Type Panel Fuse Holders | 3/6 |
| Mullard 1 henry Choke | 22/6 |
| 1000 ohm Trimmer Pots, miniature | 4/- |
| 1000 ohm Slider Resistors | 4/6 |
| 100 ohm Slider Resistors | 4/6 |
| Sato 530 ¼ to ¾ Universal Joint Ceramic | 4/- |
| Banana Plugs and Sockets, red or black, 2/- pr. | |
| Belling Lee Microphone Plugs and Sockets ¼ in. cable | 2/6 pair |
| Sato 216 Type Battery Clips | 2/6 |
| MTC71/OC71 Transistors, 7/6 ea. or 8 for £1. | |
| Sato Subminiature Bezels, 8-8 volt, No. 3280, complete with globe. Red or black, 4/- | |
| GLORIA Extension Speakers (Plastic) Contains 4 in. Speaker and 12 ft. wire | 50/- |
| RESIN CORE SOLDER, 16 gauge. | |
| 40/60, 1 lb. packet | 18/- |
| 60/40 1 lb. packet | 22/- |
| SCOPE Soldering Irons, 6 sec., Standard | 45/- |
| SCOPE Soldering Irons, de luxe stainless steel barrel | 50/- |
| MINISCOPE Soldering Iron | 45/- |
| BIRKO Soldering Iron, 6 second | 39/6 |
| TRANSFORMER, suitable Scope or Birko | 50/- |
| Mixed Bag of NEW Resistors, Condensers, Potentiometers, 30 Popular Types. $1 or 10/- a bag. | |
| Mixed Bag of 20 NEW Polyester and Styroseal Capacitors. All Popular Types. $1 or 10/- a bag. | |
| Mixed Bag of 20 NEW Polyester, Paper, Mica, Ceramic and Plastic Condensers. All Popular Types. $1 or 10/- a bag. | |
| 1 Henry choke for Mullard Tachometer | 22/6 |
| OA91 Diodes | 3/6 |
| OA210 power diodes | 8/6 |
| High impedance Headphone | 25/- |
| Crystal Ear piece for Transistor Radio | 6/6 |
| Crystal Lapel Microphone | 12/0 |
| BM3 Pencil Type Crystal Microphone | 50/- |
| Stand for same | 25/- |

## 122 AERIAL SETS

24 ft. high. Eight 3-ft. rods, ¾-in. diam., guy ropes and pegs, etc. **£3**, for rail.

## RF COILS

| | |
|---|---|
| RC2 Midget RF Iron Clad | 10/- |
| RC4 Standard Medium Gain | 10/- |
| RC5 Standard High Gain | 10/- |
| RC6 Midget Rienartz Coil | 10/- |

## AERIAL COILS (Q Plus)

| | |
|---|---|
| AC2 Aerial Coil, Midget | 10/- |
| AC3 Aerial Coil, No. 2 Band Pass | 10/- |
| AC4 Medium Gain Standard | 10/- |
| AC9 Standard No. 2 Band Pass | 12/- |

## OSCILLATOR COILS

| | |
|---|---|
| 01 IRS on 100K Res. 455 Kc. IF | 5/- |
| 02 IRS, 6J8, 1A7, etc., Midget | 10/- |
| 04 ECH33-6AN7-X61M-6AE8 Midget | 10/- |
| 05 6SA7 Midget | 10/- |
| 07 6J8/6A8, etc., Standard | 10/- |

## IF's Q PLUS

| | |
|---|---|
| IF 14-15 S. and Gen. Pur. 1900 Kc. | 12/- |
| IF34 10.7 Mc. Wide Band (FM No. 1) | 17/6 |
| IF35 10.7 Mc. Wide Band (FM No. 2) | 17/6 |
| IF36 10.7 Mc. Ratio Detector | 17/6 |

## SHORT WAVE COILS (Q Plus)

| | |
|---|---|
| SWA16T 16-50 metres, Aerial | 7/6 |
| SWR16 16-50 metres, RF | 7/6 |
| SWR16 16-50 metres oscillator | 7/6 |

or £1 per set.

## SPEAKERS

**Brand New. Bankrupt Stock. Well-known Make.**

| | |
|---|---|
| 8 in. Twin Cone, 10 w. 15 ohm V.C. | £3/19/6 |
| 5 in. Twin Cone, 4 w. Tweeter 15 ohm V.C. | £2/5/- |
| 6 in. Speakers, 3.5 or 15 ohm | 42/- |
| 3 in. Speakers, 3.5 ohm | 32/- |

## MICROPHONE CONNECTORS

| | |
|---|---|
| Microphone Plugs, P.M.G. Type Standard | 4/- |
| Socket to suit above | 8/0 |
| Transistor Radio Type Plug and Jack, 3/6 pr. | |
| 4 pin small speaker plugs and sockets, 1/9 pr. | |
| Ampenol 2-pin connectors | 5/- pr. |

**LOG BOOKS 6/6 each,** postage 1/-
**CALL BOOKS, 6/- each,** postage 1/-.

# HAM RADIO SUPPLIERS

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We sell and recommend Leader Test Equipment, Pioneer Stereo Equipment and Speakers, Hitachi Radio Valves and Transistor Radios, Kew Brand Meters, A. & R. Transformers and Transistor Power Supplies, Ducon Condensers, Welwyn Resistors, etc.

# "AMATEUR RADIO"

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA. FOUNDED 1910

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★

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★

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## OUR COVER

W.I.C.E.N. repeater, mobile and link set-up at Mt. Alexander, 20 miles south of Bendigo. Left to right: VKs 3ZIS, 3ZCO, 3ZEL, 3ARZ.

## FEDERAL COMMENT

★

Over the past year or two the emergence of the Youth Radio Scheme can reasonably be ranked as one of the more dynamic occurrences within the Institute.

From our point of view it can reasonably be assumed that the Y.R.S. member of today will become the active Institute member of the future and that, by the process of natural selection, some of these future members will eventually shoulder the vital administrative work of our organisation.

But might it not be to our advantage if we pondered on the wider implications involved? Especially the part now played by the local radio club or society. Most of these radio clubs—and there are eighty-six of them listed in last year's Call Book—came into existence because there was a need for a local organisation to cater for the gregarity, sociability and educational needs of the Amateur. Services which at times the Institute is often ill equipped to supply on a local basis.

Once formed there exists a strong probability that some of the members of such clubs will also become Institute members and what better place to find people who must—if the Institute is to remain viable—carry part of the burden of running it?

The A.R.R.L., the R.S.G.B., the N.Z.A.R.T.—to mention but a few of the better known national Amateur organisations—exist by virtue of their local branches and clubs. Conceptually they are the co-ordinating bodies which exist primarily to guide, foster and speak for the local "chapters."

Perhaps we would do well to consider the many advantages our Institute now enjoys because of the existence of the local radio clubs and how much greater these advantages might be if we actively supported the formation of more of them.

HAROLD L. HEPBURN, Federal Vice-President, W.I.A.

## CONTENTS

# Mullard
# TRANSMITTING VALVES FOR SSB

## ARE YOU DISSATISFIED WITH YOUR A M RIG?

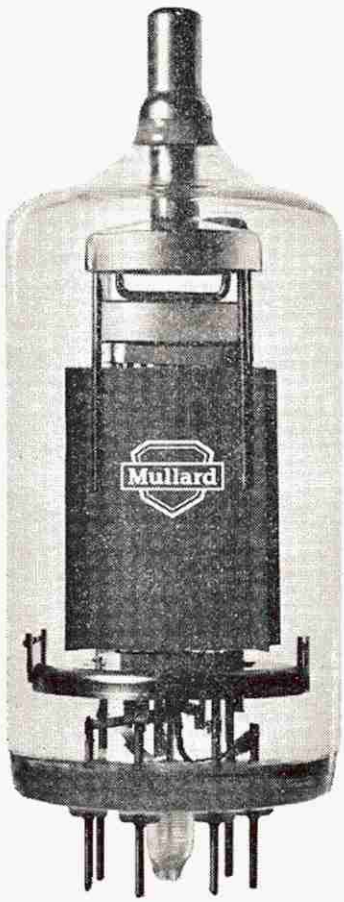
With a suitable multi-band exciter followed by a linear amplifier selected from the range of Mullard Transmitting Valves listed below, you can join the growing ranks of sidebanders and get your fair share of DX!

### LINEAR RF POWER AMPLIFIER SSB SUPPRESSED CARRIER SERVICE

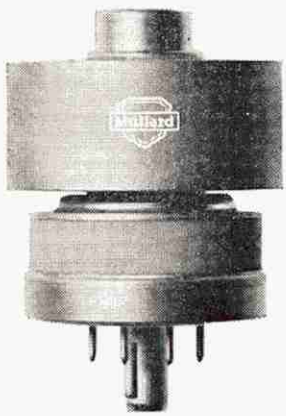
| Valve Type Number | $V_a$ | $I_{a(o)}$ | P (load) (driver) | PEP (out) |
|---|---|---|---|---|
| | | mA | W | W |
| QV06-20 | 600 | 26 | 0.25 | 46 |
| QV08-100 | 750 | 130 | 1.5 | 220 |
| QV08-200 | 600 | 150 | 1.5 | 240 |
| QV2-250C | 2000 | 100 | 1.5 | 300 |
| QY3-65 | 3000 | 15 | 1.0 | 130 |
| QY3-125 | 3000 | 23 | 1.0 | 228 |
| QY4-250 | 4000 | 50 | 1.0 | 454 |
| YL1150 | 600 | 100 | 1.0 | 109 |

*More detailed information on these valve types may be found in the Mullard Technical Handbook, Volume 3.*

The following types are used extensively in SSB transceivers of American manufacture and are now available from Mullard for maintenance purposes—
**6DQ5 6HF5 8236**




YL1150




QV2-250C

**Mullard-Australia Pty. Ltd.**

35-43 CLARENCE STREET SYDNEY, N.S.W. 29 9856
123 VICTORIA PARADE COLLINGWOOD, N.S. VIC., 41 6644
Associated with MULLARD LIMITED LONDON

M167

# CORRECT WAY TO MODIFY PYE REPORTERS MK. 1 AND 2

*BARRY WOOTTEN,* VK3AK, and CYRIL MAUDE,† VK3ZCK*

A NUMBER of articles dealing with the Pye Reporter Mk. 1 and Mk. 2 have been quite regular in appearance over the past months, and in collaboration with Cyril VK3ZCK, I hope to help those who either worked and altered their own units, or had someone else do it for them, or intend doing it in the near future to do a complete check of both tx and rx. Cyril will give details of the coils and component alterations, including a circuit diagram of the N5A test set.

## MODIFICATIONS TO UNIT PRIOR TO TUNE UP

### MODIFICATION TO COILS

L1—6AK5 V1 Grid coil (53 Mc.), 11 turns, tap 2½*

L2—6AK5 V1 Plate coil (53 Mc.), 7 turns.

L3—6AU6 V3 Grid coil (45 Mc.), 8 turns, tap 2-3†

L4—6AU6 V2 Plate coil (37 Mc.), 9 turns.

L5—6AU6 V4 Plate coil (12.5 Mc.), 12 turns.

L12—Antenna Link, unchanged.

L13—6J6 V10 Plate coil (53 Mc.), 11 turns.

L14—6J6 V10 Grid coil (53 Mc.), unchanged.

L15—6AQ5 V11 Plate coil (53 Mc.), 5 turns.

L16—6AU6 V12 Plate coil (26 Mc.), 20 turns‡.

* Tap position can be varied if the need be to improve signal.

† Tap position should be varied as described under tuning up.

‡ In some sets this coil need only be 15 turns, but in all cases the fixed capacitor 5 pF. and any others across coil or from pin of V12 to earth should be removed, and all tuning done with an iron dust slug. The wire used in the coil should be of such a gauge that it just fills the space between the slugs.

**Do not at this stage touch the neutralising capacitors.**

### MINOR CIRCUIT CHANGES NEEDED TO IMPROVE PERFORMANCE

V9 6AQ5, the receiver audio and modulator tube. The two cathode resistors, 470 ohms and 150 ohms, should be transposed so that the 150 ohms resistor is on the cathode and the 470 ohms goes to earth.

V11 6AQ5 doubler/driver. The 100K screen resistor can be reduced to 27K to improve drive to the p.a. tube.

The 220 ohms w.w. resistor on the cathode of V10 6J6 should not be altered as it provides protective bias to the tube.

If it is necessary to replace the double button carbon mike with a single button type, the 25 µF. 12v. condenser be shorted out and the mike connected between black and white leads.

One way of increasing the h.t. supply is to replace your 12 v. vibrator with a 6 v. version of the same type but connecting a 14 ohm w.w. resistor between the field pin and battery.

Another way of getting increased drive to the p.a. tube is to replace the 6AQ5 V11 with a 6DL5 adjusting the heater balance resistors accordingly. If increased r.f. output is required remove the 6J6 valve, the two neutralising condensers and the 7-pin socket, enlarge the hole to take a 9-pin ceramic or similar valve socket, connect L14 to pins 1 and 3 and L13 to pins 6 and 8, the heater lead is then connected to the centre tap (pin 9) and pins 4 and 5 are earthed. Connect the 220 ohm bias resistor to pin 2 and a 1500 ohm ½ w. resistor to pin 7, and modulated h.t.

Plug in QQE02/5 adjust heater balance resistor accordingly. This will give about three times the r.f. output for the same d.c. input. The use of a QQE03/12 is not recommended as it places undue strain on the power supply.

V1 receiver r.f. amplifier tube can be replaced with the following tube without any circuit modification. M8100 a ruggedised version of the 6AK5 or the triode 6GK5 or 6FH5 which may require neutralising.

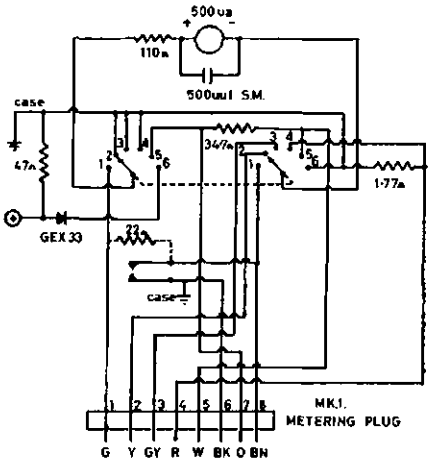



FIG.2. N5A WIRING DIAGRAM

Switch positions:—
1—Receiver tune.
2—Oscillator drive.
3—N.C. Mk. 1.
4—P.a. grid drive.
5—P.a. plate current.
6—Field strength meter.

## ALIGNMENT OF RECEIVER

It is best before doing this to make these checks first.

1. Check the audio output of the rx. This is common practice, and numerous methods are used. After satisfying yourself that the audio is all right.

2. Check the 2nd i.f. strip. To do this touch the end of a screwdriver to

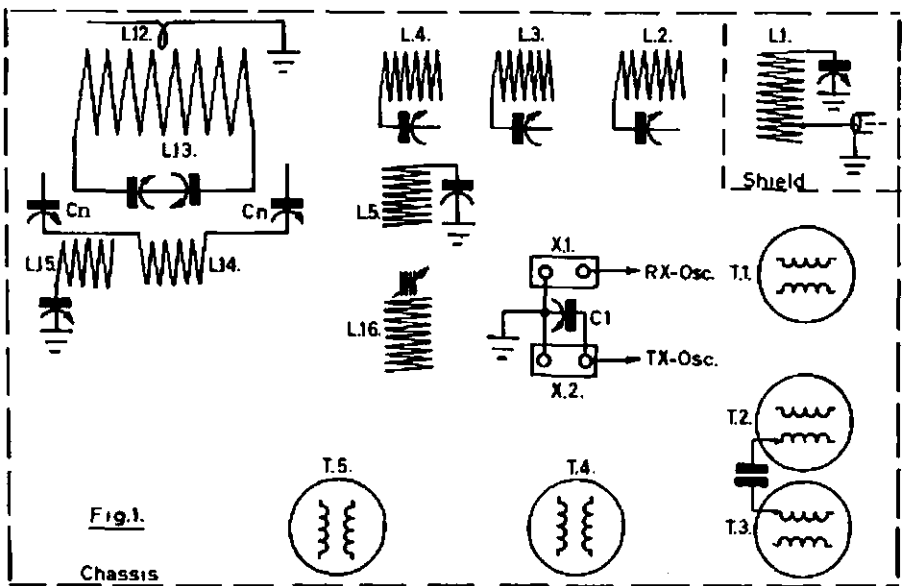
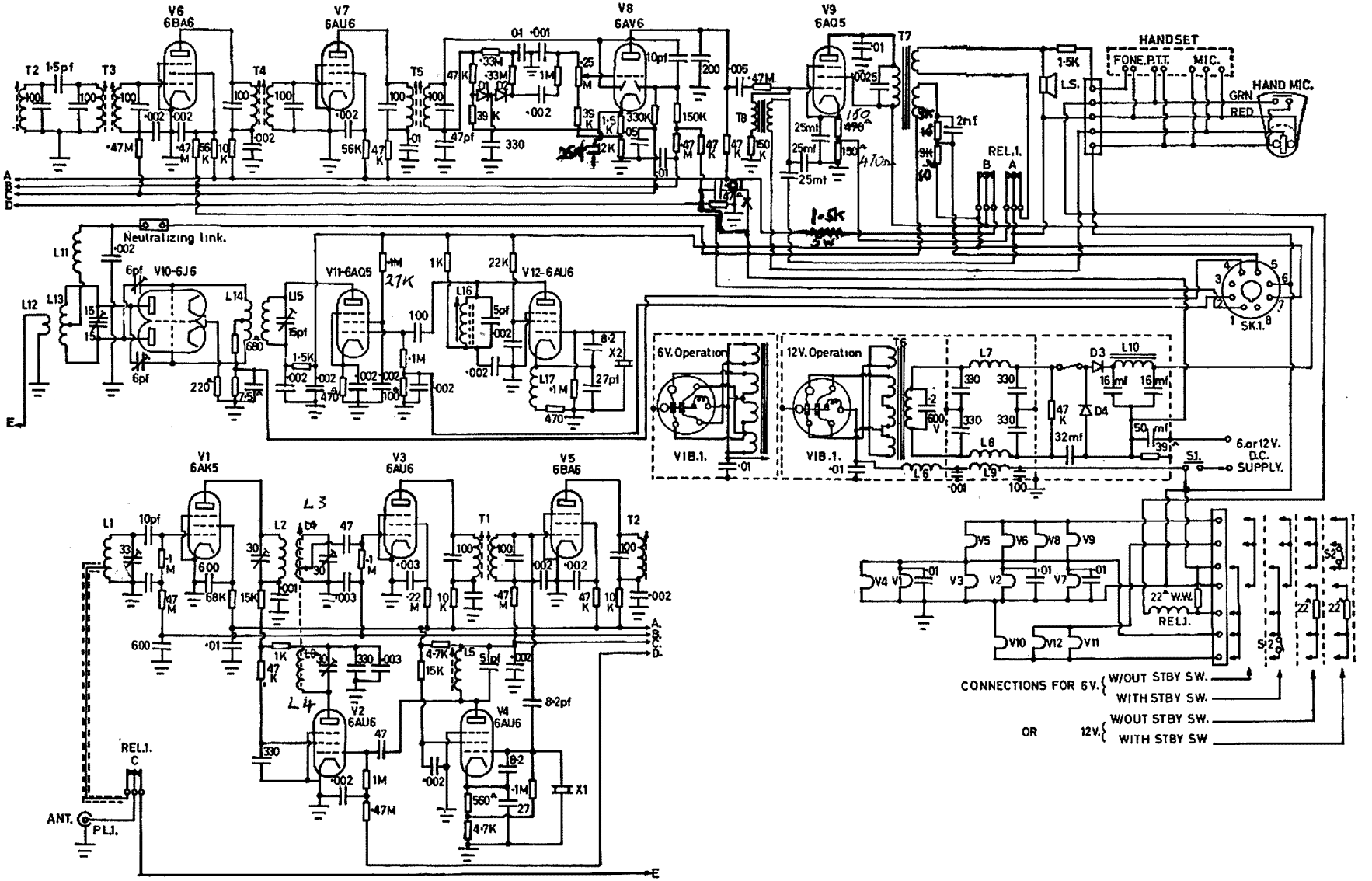



Fig.1.

Coil Locations and modified winding data.

L1—53 Mc., 11 turns.
L2—53 Mc., 7 turns.
L3—45 Mc., 8 turns.
L4—37.5 Mc., 9 turns.
L5—37.5 Mc., 12 turns.
L12—Link, unchanged.
L13—53 Mc., 11 turns.
L14—53 Mc., unchanged.
L15—53 Mc., 5 turns.
L16—26 Mc., 20 turns.
X1—12.533 Mc., Rx Crystal.
X2—13.258 Mc., Tx Crystal.
C1—3-30 pF. zeroing trimmer.
CN—Neutralisation trimmer.
T1—1st i.f.t., 15.4 Mc.
T2-T5—2nd i.f.t., 2.9 Mc.

* 8 McKenna St., Avondale Heights, Vic.
† 2 Clarendon St., Avondale Heights, Vic.




CIRCUIT OF PYE REPORTER

the grid of he 2nd mixer (V5 pin 2). This should produce reasonably loud clicks in the output. If nothing is there, check all valves in the i.f. section.

3. Check the 1st i.f. This is much the same as the former, the end of a screwdriver to the grid of the 1st mixer (V3 pin 2). Once again response should be noticed.

The equipment used in aligning the units will undoubtedly be varied, but if an accurate signal generator is available the better the results will be.

A multimeter is also required unless you can beg, borrow or steal an output meter whose load can be adjusted to 3-3.5 ohms.

Set the range of the multimeter to the lowest a.c. range (0-1 volt if yours goes that low) and connect across the voice coil of the speaker, taking care neither lead shorts to the frame, this will cause feedback in the rx and an audio spark will result.

Right, you have all these, here goes.

### 2nd I.F. ALIGNMENT

Feed the output of the signal generator (2.9 Mc.) via a 2200 pF. condenser to the grid of 2nd mixer (V5 pin 2). Check the frequency of the signal generator against a crystal marker oscillator. To produce a zero beat, loosely couple the oscillator to the grid of V5, turn off the modulation from the signal generator, and as you tune either side of 2.9 Mc. you will hear when zero is reached. Remove the marker oscillator and turn it off. Set the depth of modulation to 30% at 400 $\mu$V. on the signal generator.

Turn volume control down as you increase output of generator. Align primaries and secondaries of T2, T3, T4 and T5 to resonate on 2.9 Mc. Maintain output from generator so the a.f. does not exceed 25 mW. (approx. 0.3v.).

Unscrew primary cores of T2, T3, T4 and T5 fully. Primary cores are on the underside of chassis.

Tune T5, T4, T3 and T2 secondaries (top slugs) in that order for maximum a.f. output, repeat, with reduced signal generator input to approx. 0.3 volt a.f. output.

Tune primary of T5, T4, T3 and T2 in that order for maximum output, keeping the output "constant" by reducing signal generator input.

Adjust signal generator output for 25 mW. (0.3 volt). Re-peak primary of T3 (top) for maximum output.

The sensitivity should be between 120-200 $\mu$V. for an output of 25 mW. (0.3 volt).

Increase the signal generator output by 6 db. (X2) and detune the signal generator on either side of the carrier, until output reads 25 mW. (0.3 volt) again. This should be between 13 Kc. off tune. (13 Kc.-18 Kc. for 60 Kc. i.f., 26 Kc.-32 Kc. for 120 Kc. i.f.) Increase the output of the signal generator 60 db. (X 1000). Detune the signal generator until 25 mW. (0.3 volt) is obtained, bandwidth should be 42-60 Kc., 84-120 Kc.

If re-adjustments are necessary, repeat operations as many times as is required to obtain correct results.

As quite a lot of the units will be a little worse for wear and if these results are not obtained, check the valves in the i.f. section for low emission, especially the 6AV6.

### 1st I.F. ALIGNMENT

Tune signal generator to the range covering up to 16 Mc. Feed the output via a 2200 pF. condenser to grid of V3 pin 2, adjust signal generator to crystal frequency + 2.9 Mc. = 15.433 Mc. Adjust top and bottom slugs in T1 for maximum a.f. output.

Some units have two Philips' trimmer condensers fitted. Tune the one nearest to LI first. Re-check the adjustment of the signal generator, and adjust a.f. output to 25 mW. (0.3 volts). Sensitivity should be within range of 5-18 $\mu$V.

A long process? Well, you are halfway there. This alignment is where the overall sensitivity comes from. Now on to the r.f. section.

### R.F. SECTION

Care must be taken here as wrong peaks from the signal generator can be picked up. If you have a friend, whose unit is already converted, you will save some time. For those who have to do battle alone, these personal hints will help. This is where an accurate signal generator pays off.

Tune the signal generator to the required frequency 53 Mc. If you are using ordinary shielded cable, discard, and fit a length of 52 ohm co-axial RG58AU to the signal generator. Feed output of signal generator to antenna socket, and tune to maximum output. Check your modification again, also change-over relay. When all is O.K. and you have found that you made no mistakes, turn audio control flat out.

The friend with his unit can have first go. Depress the mic. p.t.t. switch (hoping he did not forget to use a dummy load on his tx), now adjust harmonic amplifier anode tuning (C9 across L3), here you should start to hear the tx. If necessary reduce audio and tell your friend to shift his tx further away, now tune mixer grid tuning (C10 L4). The noise from the tx should be getting quite loud now, so tune r.f. anode and r.f. grid tuning condensers (C7 L2 and CI L1) and after replacing your speaker and output meter you can now do a final peak with the signal generator.

Let's go back to the lone battler. Right, tune output harmonic amplifier tuning (C9, L3) slowly and put your ear near the speaker, an audio note should be heard. If not, leave in about two-thirds mesh and adjust mixer grid (C10 L4), the audio should be quite noticeable here. If necessary reduce signal generator input and adjust r.f. grid tuning (C7 L1) together.

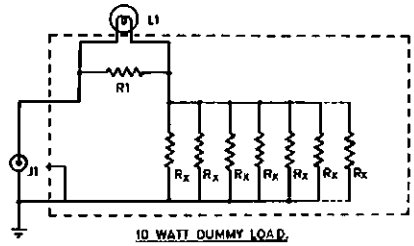
Now check tuning of signal generator and go over all condensers and peak to maximum a.f. output. Check tap on r.f. grid coil (L1) and after making sure the tap is optimum, and the frequency O.K., check the sensitivity. This should be between 1-3 $\mu$V. If this is not so, check the peaking of the r.f. section, and the valves. An M8100 can replace V1 and you should reach the sensitivity figure.

The oscillator coil L5 can now be adjusted. This has little effect on overall gain. Some inform me that they cannot get a peak, don't worry, tune the slug in the coil, and if you notice an increase, good.

Well. that's the rx. A point I would like to mention here is that a lot of Hams have hotted up the power supply and shorted out the 1.5K w.w. h.t. dropping resistor to increase rx h.t. This is quite O.K., but the 6AK5 (V1) plate and screen volts should not exceed the limits. If it is necessary, increase the 15K R4 and 68K R3 V1 anode and screen resistors to maintain correct volts, about 120 volts on plate. If the M8100 is used this is most necessary. The M8100 is a premium quality 6AK5 and gives excellent results used here.

## TRANSMITTER SECTION

This should present no problems, if the coil modifications as listed have been followed. Before we go any further, for those who are a little more ambitious than others, may I humbly recommend the building of the N5A, this might take up some time, but in the long run will be more than worth it.




10 WATT DUMMY LOAD.

39 ohm or 50 ohm feeder:
R1—39 ohms 3 w.
Rx—150 ohms 1 w. carbon resistors (seven resistors).
L1—12 volt 2 w. pea lamp.
75 ohm feeder:
R1—39 ohm 3 w.
Rx—300 ohm 2 w. carbon resistors (six resistors).
L1—12 volt 2 w. pea lamp.
J1—Antenna connector.

Unit should be enclosed with connector at one end and lamp at the other. Case should be earthed to connector as shown.

If you wish, a multimeter can be used. I will list typical readings with the N5A as well as a multimeter.

Those with the multimeter can either use the metering socket and earth or take their reading direct to the metering points.

Position 2, oscillator drive. This is measured at the junction of R54 (100K) and R56 (IK) in multi grid circuit. The reading should be approximately 60-80 $\mu$A. on N5A and 100 $\mu$A. on multimeter.

Position 4, multiplier drive. This is measured at junction of 680 ohm and 7.5 ohm w.w. in grid circuit. Reading approx. 100-120 $\mu$A., and 50 $\mu$A.

Position 5. This reads p.a. plate current measured across R42 (10 ohms). Reading approx. 100 $\mu$A. and 700 $\mu$A.

A dummy load should be used on the output. I have included a circuit and description of a unit that is quite OK to use. In fact, it is a copy of a commercial unit.

With the dummy load in place, press the mic. p.t.t. switch. Now tune L16,

(Continued on Page 23)

# A LOW COST TILTABLE MAST AND TOWER

*P. E. PLAYSTED,* VK3APH*

IN these days of low sunspot activity a rotatable array on the DX bands becomes very desirable. The principal objections the average Amateur has to getting a rotatable array up are probably: 1, cost; 2, reluctance to make the necessary numerous antenna adjustments at a dangerous height above terra firma.

The mast and tower described attempts to overcome these objections. The cost in materials was approximately £15, to which should be added the fee for hiring a 150 amp. arc welder, welding rods and a few other sundries.

The illustration should make the design details fairly clear, and the author would be happy to answer any queries relating to its construction.

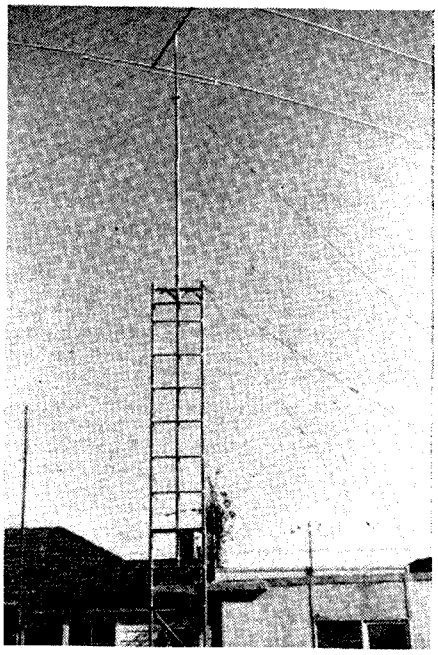
Do not let the arc welding involved discourage you, firstly obtain an instruction book (5/- from most suppliers of welding gear) and get a thorough understanding of the basics, then spend an hour or so practising on odd pieces of pipe, etc. You will soon become proficient.

**Materials required for mast and tower:**

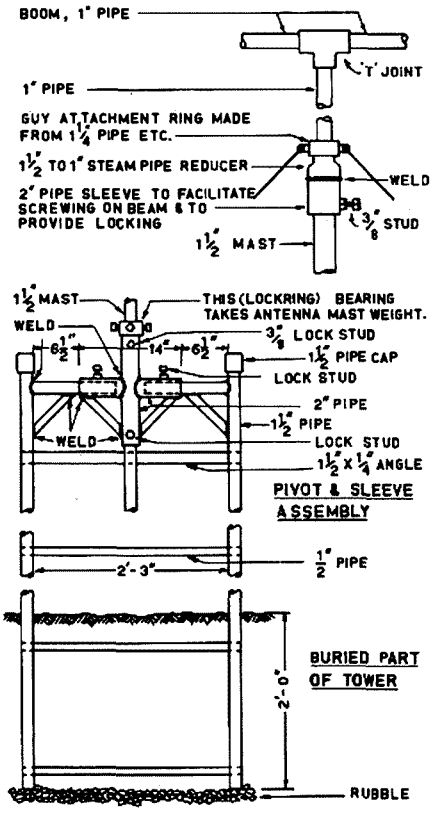
3 lengths of 1½" water pipe (medium gauge).
1 length of ½" water pipe (medium gauge).
4 feet of 2" water pipe.
5 feet of 1½" x ¼" angle iron.
Sundries.

* 34 Jordon Gr., Glen Waverley, Vic.

It was decided to top the mast with a two element yagi using the popular plumbers' delight type of construction. The array is 36 feet in height and when tilted over comes down to within 6 feet of ground, making the inevitable adjustments and modifications a very simple matter indeed, compared to working at the top of even a collapsed telescopic tower.



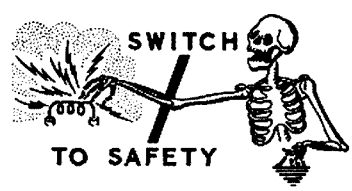
For those who may be interested in the 20 metre yagi used, the boom consists of 1 in. water pipe with a centre T joint and 2 feet of 1 in. electrical seamless conduit butt-welded to the ends of the boom to support the elements. The elements are constructed from 2 lengths (16 ft.) 1 in. o.d. dural tubing, 3 lengths (16 ft.) ⅞ in. o.d. tubing at a cost of approx. £7/10/- for the dual. The elements were cut for 14.2 Mc., i.e., director 32 feet, driver element 34 feet and spacing of 0.1 wavelength.




VK3APH TILT-OVER MAST & TOWER

Total beam weight including 5 feet of 1 in. water pipe mast is 40 lb. At present, the array is fed with 600 ohm line with a quarter wavelength matching transformer to a T match, and providing many enjoyable QSO's with local and overseas Hams.





# TWO-BAND V.H.F. CONVERTER

*ROY F. LESTER,* VK2ZRL*

THIS converter is the result of efforts to overcome some of the problems peculiar to v.h.f. mobile operation in the Sydney and South Coast area of VK2.

Basically the problem was:

(a) to operate 6 and 2 m. mobile with easy band changing;
(b) to operate on 2 m. without Channel 5A Wollongong occupying most of the bottom megacycle of the band.

I had been fortunate enough to acquire a 46 Mcs. crystal. Used in a six metre converter to tune 52 to 54 Mcs., this gives a tunable i.f. of 6 to 8 Mcs. It occurred to me that I could also use the first harmonic of the xtal osc. (92 Mcs.) in a two metre converter, tuning 144 to 146 Mcs., the i.f. in this case being 52 to 54 Mcs. By feeding the output of the 2 mx converter into the 6 mx converter I would then have double conversion on 2 mx. This double conversion would, I thought, help to keep out the interference from Chan. 5A.

After a little experimentation, the circuit shown here was decided upon, and has proved to be a fine mobile converter.

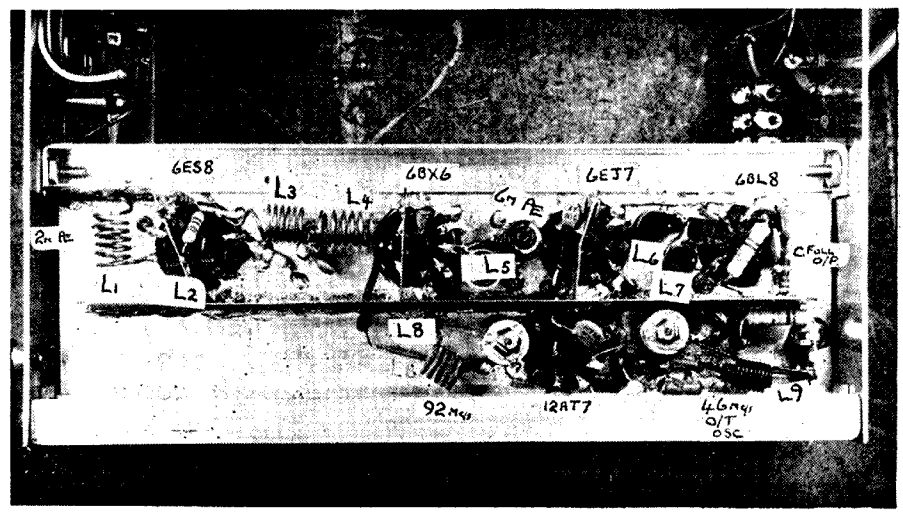
The 6 mx converter consists of a 6EJ7 r.f. amplifier, 6BL8 mixer and cathode follower, and half 12AT7 as a Robert Dollar type xtal osc. On 2 mx a 6ES8 is used as a cascode r.f. amp., 6BX6 mixer and the other half 12AT7 is a doubler. The block diagram shows the general arrangement. Tube types may be varied to suit your junk box or favourite circuit.

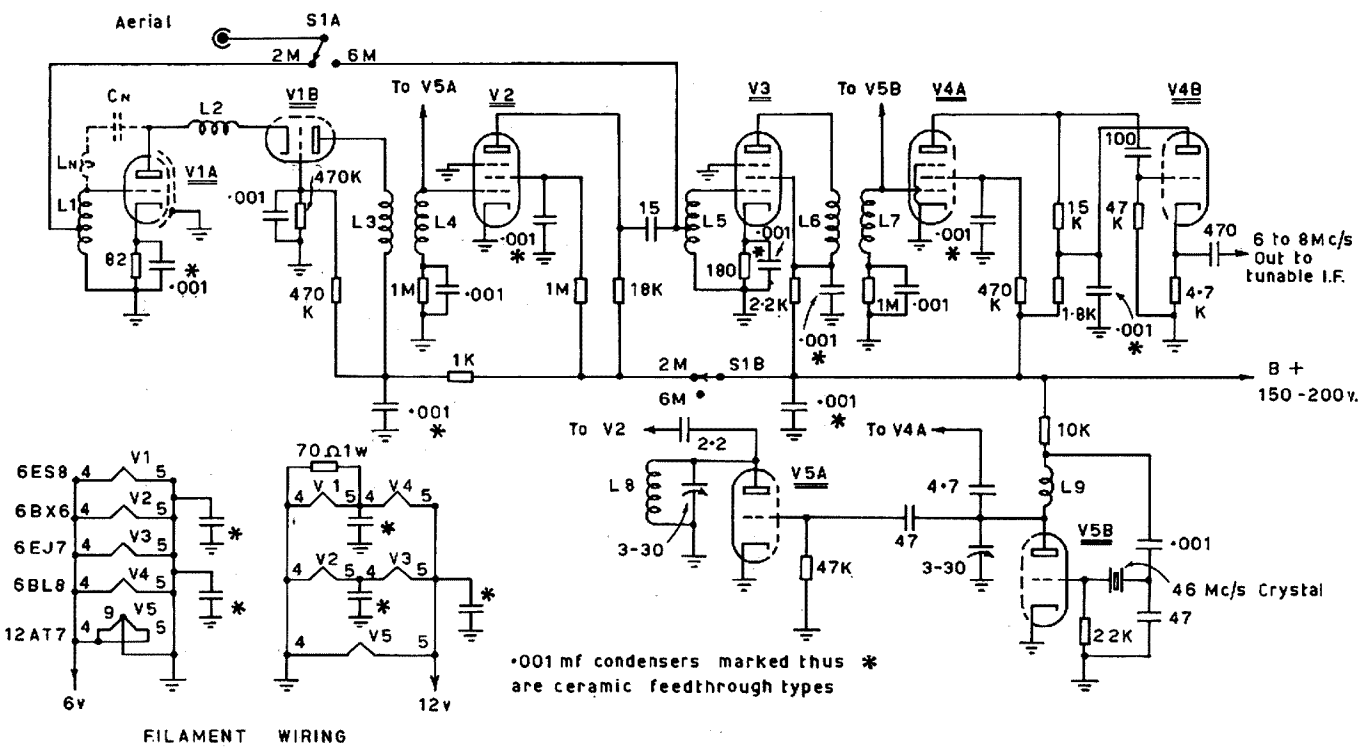
The 6EJ7 6 mx r.f. amp. is an excellent valve, but as it has quite high gain, proper attention must be paid to by-passing and shielding. (Other suitable valves would be 6AK5, 6CB6, 7 pin, 6BX6, 6EH7, 9 pin, but if using any of these types don't forget to add a suitable screen resistor and by-pass.)

It will be noticed that no h.t. is applied to the 12AT7 doubler stage. This stage is used as a form of diode multiplier and will give all the injection needed.

I did not find it necessary to neutralise the 6ES8, but if required Ln and Cn, shown dotted in diagram, may be added.

* Flat 70, Block 11, Villawood Road, Villawood, N.S.W.




2 BAND V.H.F. CONVERTER

My converter was built on a piece of tinplate 9 in. x 3 in. and the layout and shielding can be seen in the photographs and layout diagram. Use was made throughout of ceramic feed-through condensers so that de-coupling resistors, cathode resistors, etc., could be mounted above the chassis, thereby saving space below.

No detailed construction notes have been given here as I think most Amateurs have their own ideas. The photos and diagrams show the parts layout quite well and reference to recent articles in "A.R.," "QST," etc., will help those who are unfamiliar with v.h.f. techniques.

To tune up the converter, first apply h.t. and switch the band-switch to 6 mx. Adjust the overtone osc. trimmer for proper overtone operation, then the 6 mx coils may be peaked for flat response over the band. Now turn the band-switch to 2 mx, peak the 92 Mcs. trimmer for max. injection, and adjust 2 mx coils for flat response from 144 to 146 Mcs., best signal-to-noise ratio, etc. If g.d.o. is available, check the frequency of all coils before applying h.t. The overtone osc. coil should resonate at a frequency a little higher than the crystal frequencies.

A 52 Mcs. coil was originally wired into the 2 mx mixer plate circuit, but it proved to be very sharp and had a damping effect on the 6 mx aerial coil when tuned spot-on. It has been removed and replaced with a resistor and a small condenser coupling to the 6 mx aerial coil. As there is plenty of gain in the following sections, this worked out very satisfactorily.

Band-changing switches the aerial to the appropriate converter and applies h.t. to the 2 mx r.f. amp. and mixer when on 2 mx. For most of my mobile work I use only one aerial. This is a quarter wave-length on 6 mx, used as a three-quarter wave-length on 2 mx.

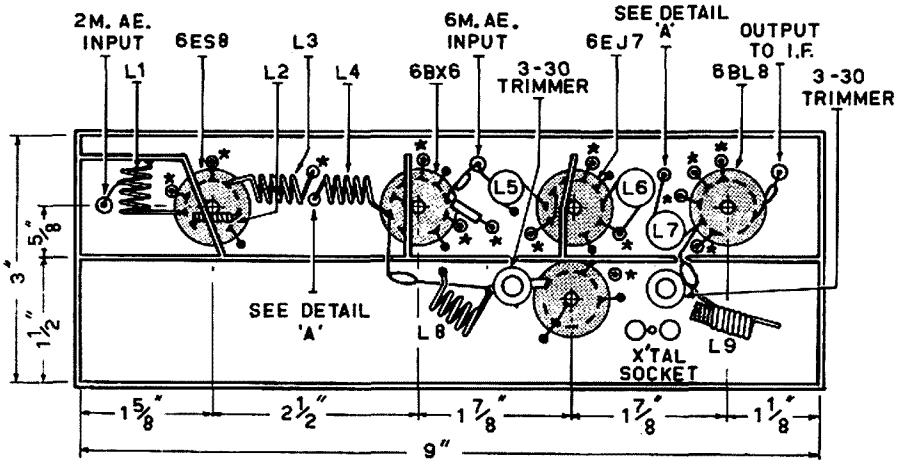
### COIL DATA

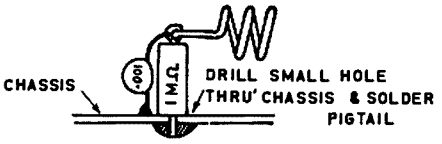
L1—7 turns $\frac{3}{8}$" diam., tap at 4 t., 20 g.
L2—10 turns $\frac{1}{8}$" diam., 26 g.
Ln—12 turns " diam., 26 g.
L3—6 turns $\frac{3}{8}$" diam., 20 g.
L4—5 turns $\frac{3}{8}$" diam., 20 g.
L5—8 turns $\frac{1}{4}$" slug, tuned former, tapped at 3 turns, 26 g. enam.
L6—9 turns $\frac{1}{4}$" slug, tuned former, 26 g. enam.
L7—8 turns $\frac{1}{4}$" slug, tuned former, 26 g. enam.
L8—4 turns $\frac{3}{8}$" diam., 20 g.
L9—9 turns close wound on $\frac{1}{4}$" ferrite slug taken from t.v. i.f. type former.

In operation this converter has proved to be almost free from spurious beats and adjacent channel interference. When operating in high signal strength areas close to Chan. 5A there is still some 5A in the first 100 Kcs. of the band, but none elsewhere and no "birdies" are evident.

Another possibility with this type of circuit would be to use a 47 Mcs. xtal, 50 to 54 Mcs. would then tune from 3 to 7 Mcs. The injection to the 2 mx mixer would be 94 Mcs. (2 x xtal freq.) and the output from the 2 mx section would be 50 to 54 Mcs.

My thanks to Gordon Aiton for the excellent photographs.



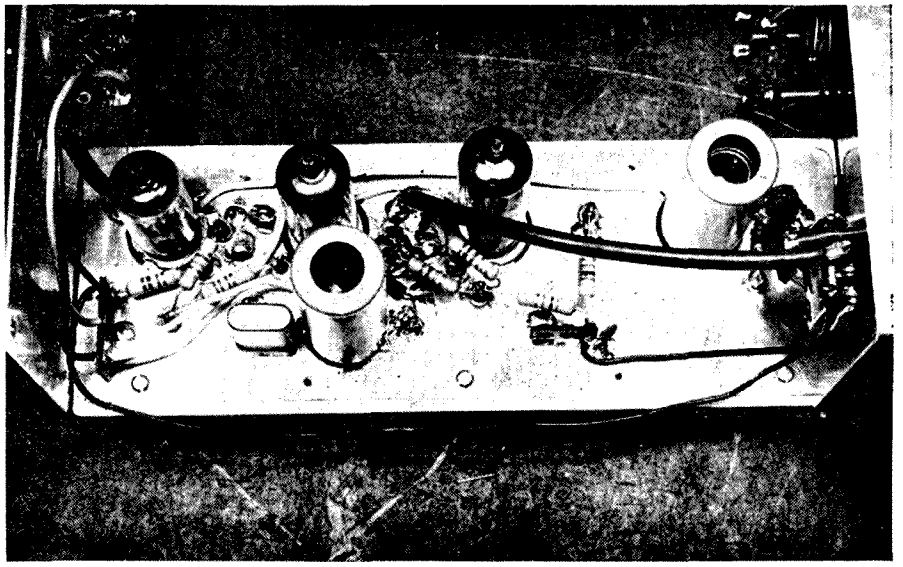




DETAIL 'A' SHOWING METHOD OF MOUNTING GRID RESISTORS FOR V2 & V4

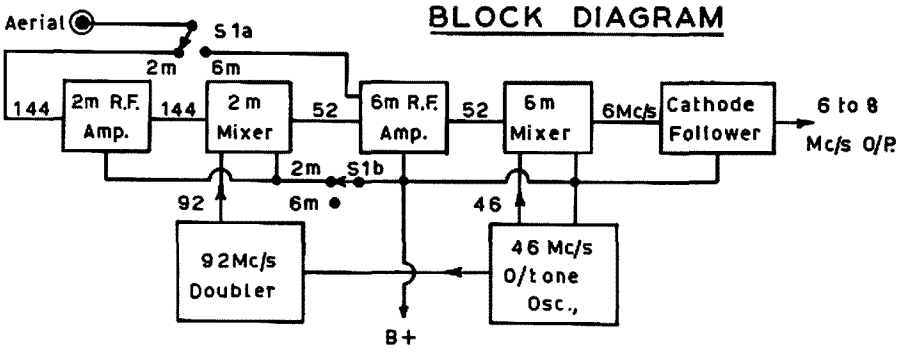
Shielded compartments made from light gauge tinplate, brass or copper (not aluminium) and soldered to chassis (ditto, heavier gauge). Before fitting, drill holes to take L2 & for leads from osc. section to mixer grids. Leads shown thus —●, soldered to chassis. Components marked * are ·001 mfd. feedthrough condensers.

## 2 BAND V.H.F. CONVERTER

Layout diag., underneath view.



## BLOCK DIAGRAM



# A SILENCER FOR P.E. CHARGER UNIT

*E. C. MANIFOLD,* VK3EM*

HAVING procured an "outboard marine" P.E. charger plant for W.I.C.E.N. and other purposes, it was found that the original silencer was far from satisfactory for our requirements. In fact, it just about sent us "up the wall" with the sharp explosive exhaust noise.

Even when a 30 ft. extension lead was obtained, the noise still was penetrating enough to be annoying, and this meant that something had to be done before it was required for any other exercise.

A few minutes with a pencil gave rough outline of what would be necessary for a start, and from there it would be a bit of "cut and try."

Rough reckoning indicated that in size it would have to be near to the capacity of the cylinder and a little more if possible, but as the space available is limited, without spreading out past the rest of the unit, it meant that the silencer would have to be turned to the vertical plane.

This has been done and reference to the drawings will show the sizes and positions of the various pieces.

The outer case slips down over the drilled pipe, and the ¼ in. bolt drops through the top hole and screws down into the plugged end of the pipe. The plug was made from a piece of mild steel rod turned down to size and drilled, then tapped to take a ¼ in. Whit. thread bolt.

For obvious reasons ¾ in. B.S. pipe has been used for the inside section, firstly the pipe was available, also the ¾ in. B.S.P. elbow, and lastly so were the pipe threading dies—obviously the choice.

This quite apart from the fact that the outlet of the unit's exhaust (original system) is screwed for ¾ in. B.S. pipe.

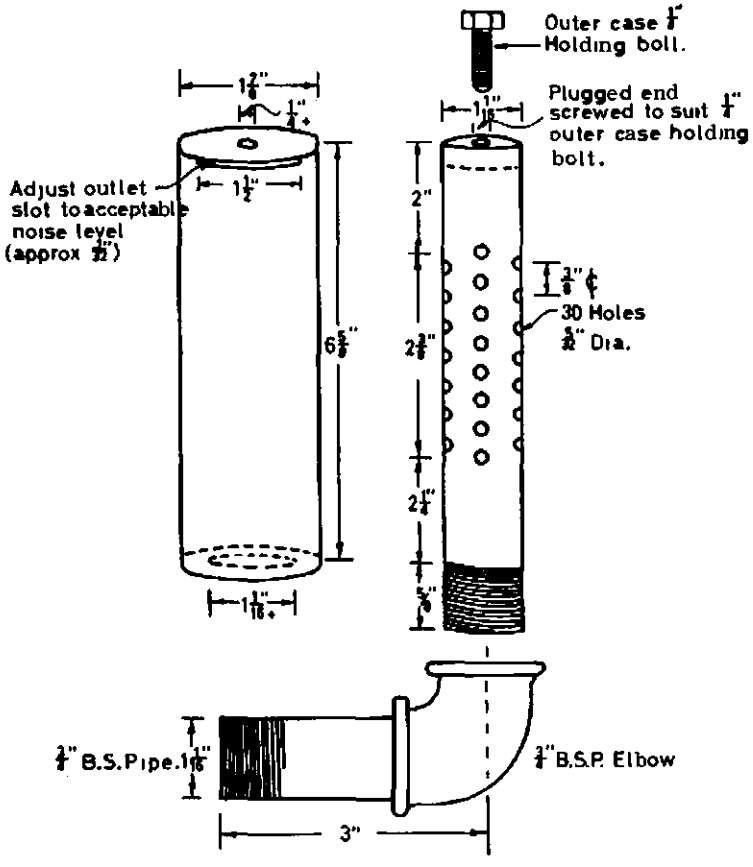
After construction of the various parts, assemble them in the following order, first obtain some graphite grease, and paint the threaded end (of the short elbow pipe end) before screwing into the exhaust port from the engine, to ensure that if necessary it can be removed when service to the engine is required, but don't tighten too tight.

Then paint the end of the drilled pipe and screw into the elbow, after which the other case can be dropped into position and the holding bolt graphited and tightened down firmly but not to an excessive amount (remembering that at some time service will be required) and tightening things too much with the heat and corrosion from the engine usage will make it a hard job to remove.

Finally, with the engine running, adjust the size of the exhaust slot at the top of the outer case to give a noise more like a "choof" rather than the explosive "crack" of the original "pong box."

There have been three of these made and fitted to date with complete satisfaction, as the main noise now is engine noise, and moving away from the unit approximately 20 feet, no direct exhaust noise can be heard, only the engine and the generator whine, which are quite acceptable while copying signals from the radio gear.

Note.—Outboard marine engines and Johnson Chore Horse are similar. With Briggs & Stratton engines a modified installation may be required, but the silencer would be satisfactory for engines in the ½ to ¾ h.p. group.






* 267 Jasper Road, McKinnon, S.E.14, Vic.

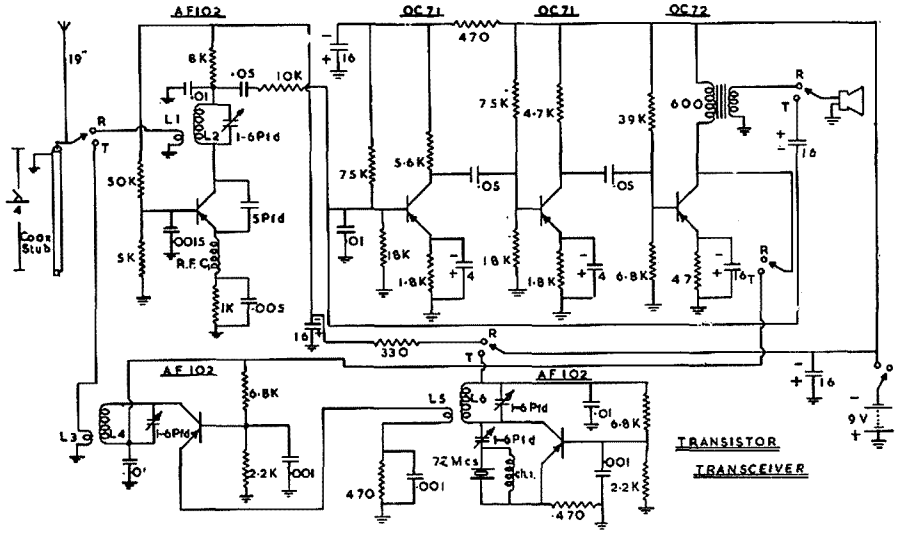
# A TRANSISTOR TRANSCEIVER FOR 144 Mc.

*HARRY BURTON, ZL2APC*

WHEN I decided to go to the 1964 Convention at Christchurch, it seemed that with no vehicle in which to transport any gear I would be unable to announce my presence in Christchurch to those v.h.f. operators I had worked from Wellington. After some cogitation the idea dawned of constructing a hand-held transistorised transceiver for 144 Mcs.

Various periodicals such as "QST" were consulted to ascertain the state of the art in such devices, but not much information was found on transistorised gear for that band. However, the designs available were useful guides. The next thing considered was the availability of suitable low-priced transistors. Type AF102, manufactured by Mullard, was found to be available at a reasonable price. The manufacturer's data claims that this type of transistor has a gain of 13 db. as an amplifier at 200 Mcs. It appears to be very suitable for use on two metres. Three such transistors are used, one in the receiver and two in the transmitter. Three audio transmitters are required, two OC71s and one OC72, making a total of six transistors in the complete unit. The operating controls are reduced to the minimum, an on/off switch and a transmit/receive switch. The input to the final is approximately 30 milliwatts.

**This article was originally published in "Break-In" during January and February. The author has since made modifications to suit Australian conditions. It is the modified version now published.**




## THE TRANSMITTER

The transmitter is quite simple, although crystal controlled. It comprises a crysal oscillator on 72 Mcs. followed by a doubler. The doubler final is collector modulated in an analogous fashion to plate modulation of a vacuum tube final. The purists may shudder at the modulation of a frequency multiplier, but let them shudder.

The 72 Mcs. crystals may not be found in everybody's junk box, but they are probably available on the Australian market, and also from firms such as Texas Crystals Inc. of U.S.A. if the necessary dollars can be found. My crystal came from the latter source.

The choke CH1 is necessary to ensure that the crystal oscillates on its 5th overtone as intended. This choke, together with the stray capacitance of the crystal holder, should resonate at about 2 Mcs. above the operating frequency of the crystal, thereby presenting a high parallel impedance at that frequency. At other frequencies the crystal will be shunted by a low impedance and this will prevent oscillation on the fundamental or other frequencies. My crystal exhibited a tendency to oscillate on any frequency except the correct one until this choke was added.

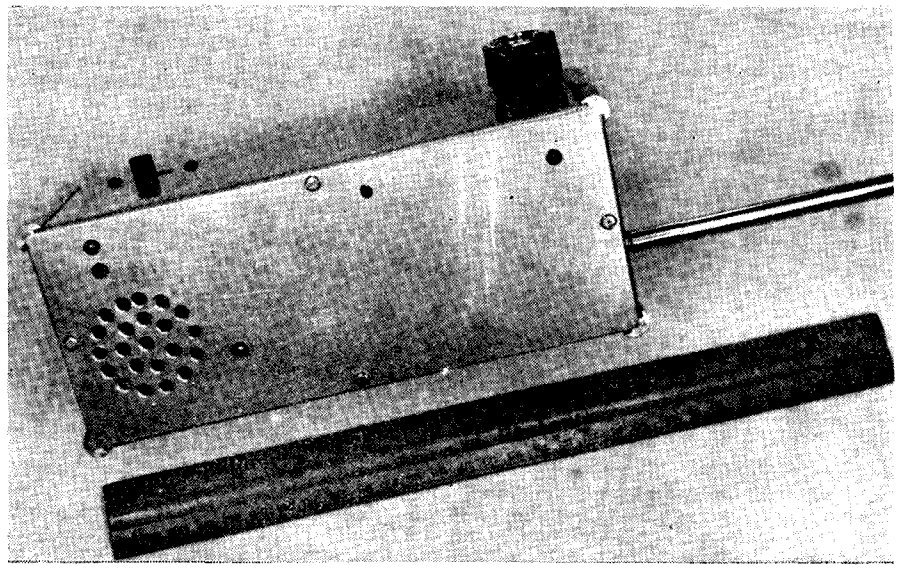
The series trimmer coupling the crystal to the collector controls the feedback and should be adjusted to the minimum value which gives reliable starting of the crystal controlled oscillation.

The doubler final operates in the common or grounded base mode, equivalent to grounded grid in vacuum tube circuits. A link couples the emitter of the final to the oscillator tank, and the resistor-capacitor combination between the cold end of the link and earth seems necessary to give good frequency multiplying efficiency. Some forward d.c. bias is applied to the base of the final. The tank circuit in the collector of the final is link coupled to the aerial via the transmit/receive switch.

To avoid radiation of unwanted signals on 72, 216 and 288 Mcs., a shorted quarter-wave co-axial stub is connected across the feed point at the base of the whip aerial. This stub will present a very high parallel impedance at the frequency for which it is cut, i.e., 144 Mcs., and a low shunt impedance at 72, 216 and 288 Mcs. to attenuate these frequencies. The length of the stub is 13½ inches approximately for solid dielectric co-axial, but the length should be adjusted for minimum reduction of the output at 144 Mcs.

## THE RECEIVER

The receiver makes use of a super regenerative detector for the maximum



of efficiency consistent with simplicity and low cost. Before decrying the use of such an elementary receiver, it should be remembered that there is not much point in hearing what you cannot work as could be the case with the combination of a better receiver and a few milliwatts of transmitter power such as is used here. The ranges of receiver and transmitter as described appear to be roughly compatible. Most work with the unit has been done to fixed stations running considerably greater power and equipped with beams and good receivers.

No super regeneration control is shown. A 50K potentiometer in series with the 50K resistor forming part of the base bias network of the AF102 could be tried as a regeneration control. The 5 pF. capacitor coupling collector and emitter, and the emitter r.f. choke are variables to experiment with if good super regeneration proves difficult with certain transistors.

The 8K resistor in series with the collector tank is the load resistor across which the audio voltage is developed. The 0.01 uF. bypass may seem large, but is designed to bypass the quench frequency voltage to prevent it overdriving the audio section. A 10K resistor in series with the 0.05 uF coupling capacitor and a further 0.01 uF. bypass to earth at the base of the first audio transistor are further elements in the quench frequency filtering.

No external tuning control is fitted, but the co-axial trimmer used for receiver tuning may be reached by a screwdriver inserted through a hole in one of the panels of the case. My unit was peaked on 144.2 Mcs. and has received stations anywhere in the first megacycle of the band without retuning.

If optimum receiver performance is required it is suggested that an external regeneration control and an external tuning control both be incorporated.

## AUDIO SECTION

This section is quite straightforward. Two cascaded OC71 voltage amplifiers drive an OC72 as a class A audio output stage on receive, and as a Heising modulator on transmit with the OC72 output transformer operating as a modulation choke.

The time constants of the interstage coupling circuits may seem unusual for transistors, but good low frequency response was not required.

A ZC1 moving coil earpiece is used as a speaker on receive and as a microphone on transmit. This unit has an impedance of about 60 ohms.

There is no audio gain control on either receive or transmit. These facilities could be provided if desired at the complication of the transmit/receive switching. A spare pole of the transmit/receive switch could be used to select one or the other of two preset potentiometers of the solder-in type arranged at the input to the first OC71.

Since the OC72 modulator draws 10 mA., it is by far the biggest individual consumer of battery power. Some experiments have been carried out with a form of amplifier known as sliding-bias class A. In this type of amplifier the forward bias on a transistor is arranged to increase with the signal to increase the current flow through the transistor. Some economy of power consumption is achieved at the price of more complication and higher distortion. This system has not been adopted in the present unit.

## MECHANICAL CONSTRUCTION

For the actual wiring assembly, use is made of material known as Vero Board. This material comprises a phenolic board about 1-16 in. in thickness upon one side of which are parallel strips of copper each 3-32 in. wide and spaced apart by 3-32 in. Every 3-16 in. along the copper strips a hole is pierced through both copper and phenolic board. This material is a do-it-yourself printed wiring substitute. I used a piece of board 5 in. by 2¾ in. with the copper strips running horizontally across the smaller dimension. To use, proceed as follows:

Let the top strip be an earth strip or rail. Allocate the next strip down the board to be a main h.t. or supply rail. The next strip will be decoupled h.t., the next the collector rail, the next the base rail, the next the emitter rail, and the next a further earth rail. The pattern will then repeat. A length of copper strip on each rail including four or five holes will suffice for wiring each stage.

The copper strip is severed between the next two holes with a sharp knife on all rails except earth and main h.t. rails. This technique allows more than one stage to be built across the width of the board. There is no point in breaking up the earth and h.t. rails.

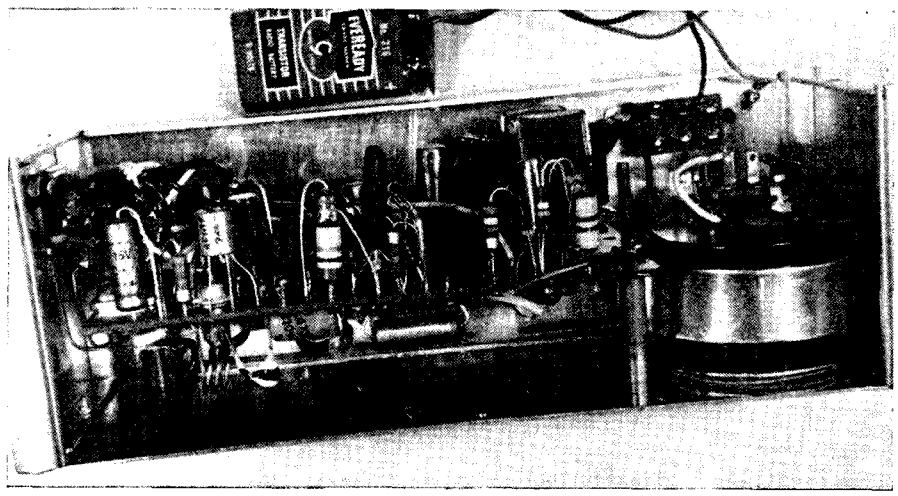
As the pattern is repeated down the board all earth rails should be jumpered together and bonded to the case. The latter may be accomplished by using long ½" screws passing through enlarged holes in the earth rails and metal spacers for mounting the phenolic board on one of the panels of the case.

Components such as the trimmer capacitors and the crystal socket may be mounted on the board with a little ingenuity. All coils are under the board, that is on the side where the copper strips are. This keeps them away from most of the components which are on the upper side of the board.

The case has the dimensions 7½" by 3" wide and 2½" deep. This is larger than necessary but gives adequate room for all components without cramping. The corners are made from material in the Widney Dorlec range of constructional material. This material comprises an aluminium alloy rod 13-32" in diameter with two longitudinal slots at 90°. These slots are of a width to accept 20 gauge aluminium sheet as a sliding fit.

The two sides and the two ends of the case have at each end of their lengths a portion which fits in the slots of the rods. Each side-piece and each end-piece of the case has a ¼" fold-over top and bottom. The top and bottom panels are held in position by P.K. screws into the fold-overs. These P.K. screws hold the whole assembly together.

When the top and bottom panels are removed it is possible to withdraw the corner rods if desired. The catalogue number of the rod is DL222 in the Midget range.




The all-up weight of the unit, including battery, is 1½ lb.

## MISCELLANEOUS

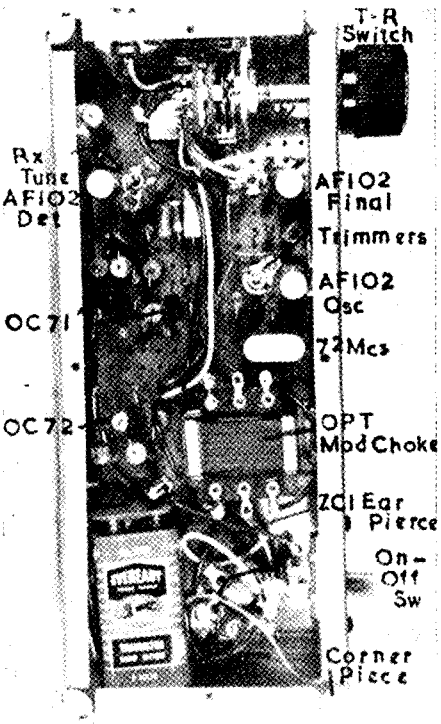
The transmit/receive switch requires a four-pole two-position switch. I used a six-pole two-position wafer switch of Japanese manufacture, two poles being spare. One pole is used for aerial changeover from the receiver to the transmitter. A second pole removes h.t. from the super regenerative detector and applies h.t. to the crystal oscillator. A third pole couples the h.t. feed point of the final to the collector of the OC72 on transmit. A fourth pole disconnects the ZC1 earpiece from the secondary of the OC72 output transformer, allowing the latter to function as a modulation choke, and connects the earpiece to the base of the first OC71 via an isolating capacitor.

Since the impedance of a ZC1 earpiece is nominally 60 ohms, no input transformer is required to match it to

the base of the OC71 in order to achieve a good level of modulation. The output transformer originally used a push-pull OC72 to 3 ohm voice coil type with only one half of the primary used. This gave a bad mismatch on receive and the transformer was subsequently dismantled and rewound with a turns ratio of about 3 to 1. This gives an impedance ratio of 9 to 1 and therefore the ZC1 earpiece should present a transformed impedance of around 500 to 600 ohms at the collector of the OC72.

An alternative solution to rewinding a transformer would be to use a standard OC72 to voice coil transformer, a midget 3 ohm speaker instead of the ZC1 earpiece, and a further transformer to step up the impedance of the speaker when serving as a microphone to match it to the base of the first OC71.

The power source is the standard 9 volt transistor battery type 216. With a current drain of 15 mA. on receive and 23 mA. on transmit, these batteries do not last very long.




For the aerial a Japanese replacement whip is used which extends to a little more than the desired quarter wavelength of 19". A simple slide switch is used for on/off. The OC72 output transformer used has a core cross section of ½" by 5-16" with a winding length of ⅝". In its rewound form there are 375 turns on the primary and 120 turns on the secondary of 32 s.w.g. enamelled wire.

The tuning capacitors are Philips tubular trimmers with ceramic insulation. The electrolytic capacitors may be 12.5 volt or 16 volt working. The paper and ceramic capacitors may be low voltage types.

**Construction Hints.** Do not overheat any of the components, particularly the transistors when soldering them in position. Soldering to the Vero Board is easy with a clean hot iron.

One tip for working on transistor equipment. When soldering, always have the piece of gear isolated from earth wires or leads such as those from test equipment, since small leakage currents flowing from or to your soldering iron through a transistor can ruin it as you solder it in position.

Beware of injecting too much energy into transistor circuits from a closely coupled grid dip oscillator. Tuned circuits with transistors connected often exhibit poor dips when checked with a g.d.o. This is because the transistors are not "dead" like cold valves and conduct on the potentials induced from the g.d.o. The poor dips encourage tight coupling, sometimes with unfortunate results.

### ADJUSTMENT

Adjustment of the receiver to the desired part of the band is simple and obvious. If super regeneration is not readily achieved, a little judicious fiddling with valves may be required as suggested earlier. Perhaps another transistor could be tried.

The transmitter adjustment on my unit was done by listening for the second harmonic of the crystal oscillator on a 144 Mcs. receiver and adjusting the two trimmers in the oscillator for good output as seen on the receiver "S" meter or magic eye, and consistent starting of the oscillator. The final was peaked up with the whip extended, also by the use of a receiver equipped with a signal strength indicator.

### COIL DATA

L1—1 turn, 7-16" diam.
L2—2½ turns, 7-16" diam.
L3—2 turns, 7-16" diam.
L4—3 turns, 7-16" diam.
L5—2 turns, 7-16" diam.
L6—7 turns, 7-16" diam.

All coils are air wound with 22 s.w.g.
RFC1—30 turns to fill ½ watt resistor.
CH1—18 turns to fill ½ watt resistor.
Prune to resonate with crystal holder at 74 Mcs.

### RESULTS

The performance has exceeded expectations. Best two-way contact using the whip aerial was from the Port Hills, Christchurch, to Ashburton—a disance of approximately 50 miles. The signal report from Barry ZL3AR was readability 5 and strength 4. I have a QSL for the contact to show unbelievers.

#### REFERENCES

"QST," February 1960, page 20.
"QST," June 1963, page 44.
"QST," March 1964, page 37.
"Electronics World," November 1962, page 39.
"Wireless World," May 1962, page 241.

# 8236 POWER PENTODE FOR S.S.B. TRANSCEIVERS

The demand for a higher power output replacement for the 6DQ5 is catered for by the 8236. For initial equipment, however, the Mullard preferred range of s.s.b. valves is recommended. Readers are referred to the table in Outlook, Vol. 5, No. 5, page 52, which shows the Mullard range of s.s.b. valves and to which the YL1150 is the latest addition.

Comprehensive technical information on s.s.b. transmitting valves may be found in Volume 3 of the Mullard Technical Handbook.

The 8236 is a high perveance, high dissipation, beam power valve which is rated and tested for use as an r.f. power amplifier. It may also be used as a series regulator and as a general purpose power valve. In most cases the 8236 will function as a high dissipation, direct plug-in replacement for the 6DQ5. In r.f. service up to 30 Mcs. the 8236 will handle 200 w. input and deliver 141 w. to the load. Because of its high perveance design, these conditions can be obtained at the relatively low anode voltage of 900 v. Its carbon anode and hard glass envelope permit continuous operation at 50 w. anode dissipation.

The 8236 is available from stock and tentative data are given below:—

### TENTATIVE DATA 8236 POWER PENTODE

**(Linear r.f. power amplifier in Class "AB1" s.s.b. Service with suppressed carrier.)**

**Maximum Ratings:** Absolute maximum system for frequencies up to 30 Mcs.:

| | | | |
|---|---|---|---|
| Anode voltage | 1400 | V | DC |
| Grid No. 2 voltage | 250 | V | DC |
| Grid No. 1 voltage | —150 | V | DC |
| Anode current | 300 | mA | DC* |
| Anode dissipation | 60 | W | |
| Grid No. 2 dissipation | 3.2 | W | |
| Bulb temperature | 250 | °C | |
| Maximum Grid No. 1 circuit resistance | 30 | kΩ | |

**Typical operation with two-tone modulation:**

| | | | |
|---|---|---|---|
| Frequency | 30 | Mcs. | |
| Anode voltage | 1000 | V | DC |
| Grid No. 2 voltage[1] | 160 | V | DC |
| Grid No. 1 voltage[2] | —66 | V | DC |
| Zero signal anode current | 25 | mA | DC |
| Zero signal Grid No. 2 current | 1.0 | mA | DC |
| Effective r.f. load resistance | 2.8 | kΩ | |
| Maximum signal peak r.f. grid voltage[3] | 66 | V | |
| Anode current | 170 | mA | DC* |
| Average anode current | 116 | mA | DC |
| Grid No. 2 current | 5.0 | mA | DC* |
| Average Grid No. 2 current | 2.5 | mA | DC |
| Average Grid No. 1 current[4] | 0.01 | mA | DC |
| Power Output | 115 | W* | |
| Average Power output | 57.5 | W | |
| 3rd Order Intermodulation Products[5] | —25 | db | |
| 5th Order Intermodulation Products[5] | —33 | dB | |

* At peak of envelope.

[1] Preferably obtained from a well-regulated source.

[2] Preferably obtained from a separate, well-regulated source.

The peak signal voltage should be equal to the D.C. grid voltage.

[4] This value is the approximate grid No. 1 current due to initial electron velocity effects when the grid is driven to zero volts at maximum signal.

[5] Referenced to either of the two tones and without the use of feedback to improve linearity.

# NEW CALL SIGNS

JULY, 1965

VK2FV—R. M. Marsden, Station: 11 Trafalgar Road, Tuross Heads; Postal: 43 Houston Road, Kingsford.

VK2PP—M. D. Legg, 144 Kendal Street, Cowra.

VK2WP—W. H. Jones, 51 Canonbury Grove West, Bexley North.

VK2ADJ—E. W. Jinks, 1 South Street, Broken Hill.

VK2AFI—P. E. Stayte, 3/71 Evaline Street, Campsie.

VK2AHC—D. Clift, Flat 1, The Swifts, 66 Bower Street, Manly.

VK2APG—F. W. Fowler, Station: 38 West Street, Fivedock; Postal: P.O. Box 50, Brickfield Hill.

VK2ZAF—J. L. Harrison, 20 Bishop Avenue, West Pennant Hills.

VK2ZGW—G. L. S. Wilson, 31 Ada Street, Katoomba.

VK2ZHE—R. G. Friend, 7/22 Beauchamp Street, Marrickville.

VK2ZJF—P. J. Fackender, Kanahooka Road, Dapto.

VK2ZKJ—J. T. Kalopedis, 24 Walton Street, Blakehurst.

VK2ZQM—G. V. Comber, Station: 94 Onslow Street, Rose Bay; Postal: Yellow Cabs Co., Darlinghurst.

VK2ZQT—A. F. Butler, 127 Manchester Road, Gymea.

VK2ZTE—R. A. Adams, 37 Bardwell Road, Bardwell Park.

VK2ZUB—B. Unsworth, Wyee State Mines, C/o. P.O., Doyalson.

VK2ZTC—Sydney Teachers' College Radio Club, Sydney University Grounds, Newtown.

VK2ZZD/T—D. Downie, 38 Broad Street, Croydon Park.

VK1DA—A. Davis, 10 Hovea Street, O'Connor, A.C.T.

VK1VB—V. F. Burman, 10 Dawson Street, Curtin, A.C.T.

VK3AEI—D. G. Hallam, C/o. O.T.C. Radio Station, Fiskville, via Ballan.

VK3AEJ—G. W. Brain, Federal Street, Rainbow.

VK3AZH—K. J. Horsfall, 76 North Road, Reservoir.

VK3AZN—Z. H. Vanderven, 43 Clow Street, Flat 4, Dandenong.

VK3ZIT—R. L. Head, Box 50, Mundara, Seymour.

VK3ZIV—H. C. Allan, 21 Leonard Street, Heidelberg.

VK3ZKU—D. N. Mew, Bamawn, via Rochester.

VK3ZOZ—D. L. Godfrey, 10 Alexandra Avenue, Moe.

VK3ZPX—R. K. N. Wilkins, 118 Mont Albert Road, Canterbury, E.7.

VK3ZQB—D. C. Baxter, "Hildathorpe," Clarke Road, Pearcedale.

VK3ZRE—J. L. Gardiner, 10 Lingwell Road, East Hawthorn.

VK3ZTH—J. T. Higson, 24 Stapley Crescent, Chadstone.

VK3ZWV—R. F. Fenner, 9 Chestnut Street, Carnegie.

VK4AI—A. E. W. Williams, Flat 2, 29 Gregory Street, Clayfield.

VK4DV—M. T. Deakin, 17 Nelson Street, Wulguru, Townsville.

VK4LS—L. B. Simpson, 414 Wynnum Road, Wynnum.

VK4NP—N. F. Wilson, 111 Richmond Street, Gordon Park.

VK4OG—R. E. Gunnourie, 34 Gregory Street, Toowong.

VK4YY—G. R. Crosier, 48 Algoori Street, Morningside.

VK4ZWM—W. McGowan, 66 Alderson Street, Newmarket.

VK5IL—B. G. Bell, 8 Flower Street, Elizabeth Downs.

VK5LW—J. R. Godson, Station: Block No. 6, Kroen's Landing, Walkers Flat; Postal: 53a May Terrace, Ottoway.

VK5XF—R. A. Ford, 27 Donnington Road, Elizabeth North.

VK5ZPD—P. L. A. Burton, 85 North Terrace, College Park.

VK5ZQB—H. Dittloff, 12 Essex Avenue, Clovelly Park.

VK6EP—D. J. Pannell, 72 Hare Street, Kalgoorlie.

VK6XY—A. M. Keightley, Johnston Street, Wickepin.

VK6ZDR—R. C. Speer, Station: Warburton Road, Bridgetown; Postal: P.O. Box 71, Bridgetown.

VK6ZER—M. G. Shooter, C/o. Agricultural High School, Narrogin.

VK6ZFD—J. C. Gouteff, 45 Powell Street, Joondanna.

VK7FR—F. A. C. Richards, 170 Westbury Road, Launceston.

VK7ZMC—M. C. Hooper, 182 Melville Street, Hobart.

VK9JO—J. F. O'Toole, C/o. O.T.C. Cable Stn., Cocos (Keeling) Is.



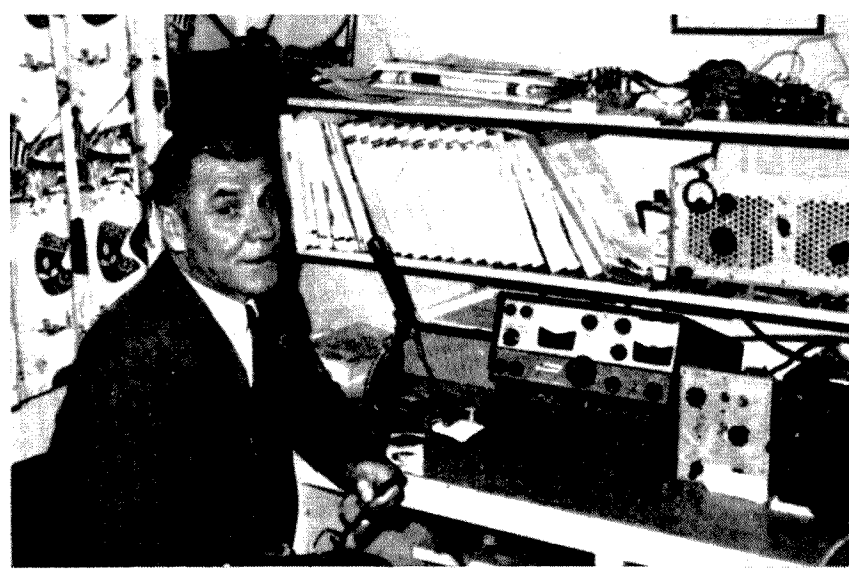
## ROSS HULL MEMORIAL TROPHY V.H.F. CONTEST

from **12th Dec., 1965, to 16th Jan., 1966**

All v.h.f. operators are invited to participate.

## SIDEBAND SKETCHES

## DUDLEY NOURSE, VK2DQ



On obtaining the graven image of "The Voice of the Ramparts of Democracy," alias VK2 Delightful Quality of Broken Hill, it was considered appropriate to commence this series.

As a pre-war exponent of the "pump-handle" method of communication, which he continued for the R.A.A.F. for some years (note that the said handle is still visible in the photograph), Dudley's tracks were traversed by a quacking duck over 10 years ago, when he became a foundation member of the 80 metre "Sewing Circle," still apparent at the top end of the band.

Although a keen do-it-yourself man, Dud. has put aside phasing networks, mechanicals and McCoys, and emptied the shack "ginger jar" to buy a Swan, which gives him time on the air plus enough to experiment with his Deltahet.

The 2DQ log records details of experiments, conversations and data, all in shorthand—quite the most comprehensive in VK, I should imagine.

Dud. was behind the scenes for the May, 1964, Sidebanders' Convention at Hamilton,

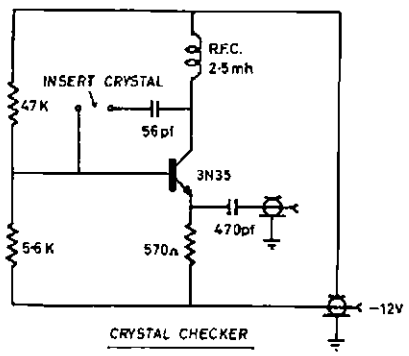
# A TRANSISTOR CRYSTAL CHECKER

*T. MITCHELL,* VK5TH*

THE Crystal Checker illustrated was intended as a go/no-go and frequency measuring device and was not designed to be used as an activity tester. Oscillation can quickly be checked by feeding into a c.r.o. with a reasonable high frequency Y amp. response. Output is sufficient to trigger a Hewlett Packard frequency counter.

The device is an invaluable aid for crystal grinding. The crystal plug-in connections on the tube bases are arranged so that almost any crystal will plug in-circuit in any orientation. The extra capacity introduced should not affect accuracy for practical Amateur applications.

The battery pack consists of nine nickel-cadmium 50 m/AH. cells inserted in a patent drug phial with a B. & C. co-axial connector. These cells are available at about six shillings each and if charged carefully should last some years.




The transistor, a 3N35, is a v.h.f. tetrode (silicon NPN) extracted from disposals equipment and used as a triode in a Pierce type circuit. Simple "rule of thumb" calculations suggested by the Mullard "Reference Manual of Transistor Circuits" resulted in a collector current of 1 mA. Output from the emitter into a high impedance c.r.o. varies from 100 to 500 millivolts, depending on crystal activity and c.r.o. Y amp. frequency response.

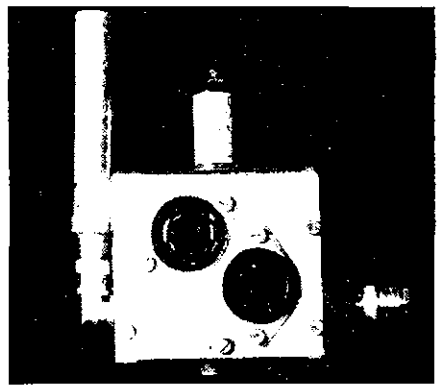
The circuit is not the ultimate in design but a practical arrangement requiring minimum components. Note the absence of a tuned circuit.

I have used this circuit with various transistors in two Amateur band converters and a 1 Mc. oscillator for a projected Deltahet type receiver. No trouble has been experienced with harmonic or unwanted oscillations, although I concede their presence is likely.

* 11 Station Place, Alberton, South Aus.

Although no meter is yet incorporated, the following figures are submitted. A 0-500 μA. meter was inserted directly in the base of the transistor. The no-signal base current was 15 μA.

| Crystal freq. Kc. | Base Current μA. | Type of Crystal |
|---|---|---|
| 22,000 | 170 | Miniature sealed can |
| 15,407 | 120 | Vacuum Sealed |
| 8,902 | 260 | |
| 8,646 | 255 | |
| 8,327 | 240 | |
| 8,327 | 240 | |
| 8,327 | 240 | |
| 7,406 | 240 | |
| 7,406 | 240 | |
| 7,406 | 240 | |
| 8,332 | 240 | DC11 |
| 8,332 | 100 | |
| 8,332 | 80 | |
| 7,610 | 240 | |
| 7,610 | 230 | |
| 2,853 | 40 | |
| 2,460 | 80 | |

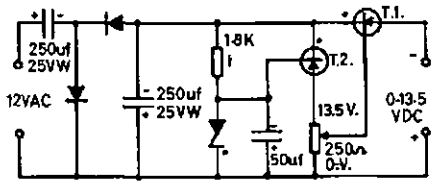


I would suggest that the best approach for anyone wishing to build a similar checker for use as an activity tester would be to use any low power transistor classified as v.h.f. and incorporate a meter. Noting the tendency of base current to rise with frequency, calibrate against a commercial crystal activity tester using vacuum sealed crystals as standards.

# An Economical Transistor Power Supply

This very useful little power supply was built in about an hour to run a transistorised transmitter (on 2 mx f.m.) that was rather expensive to run on dry cells. Cost of components as purchased is about four or five sets of batteries. Since then it has also been used for running transistor radios and similar gear, testing power transistors and charging Nife cells.

The circuit uses a half-wave voltage doubler followed by a conventional transistorised voltage regulator (with zener diode voltage reference) plus capacitance multiplier. A portion of this output voltage controls the second OC74, giving zero up to the zener voltage output, fully variable.




* Red spot on case.
† Adjust to maximum allowable zener current.
Diodes OA210 or any diodes with forward current of 500 mA., and peak inverse voltage of 50 volt or more.
Zener Diode: Nominal 13.5 volt or as required.
Transistors: T1:OC74 on at least 12.5 sq. cm. of heat sink.
TC2:OC74.

As the emphasis was on simplicity, no overload protection was fitted. However, the regulation of the voltage doubler is so poor that at about 220 mA. output current there is insufficient voltage to maintain the zener action, regulation is lost and the output voltage drops sharply. Short-circuit current is less than 500 mA., which the OC74 presently in use has withstood on many occasions. But take note: this is considerably beyond its ratings of 310 mA., so keep a spare handy if you are careless. Also, if you can't afford numerous spares, don't take more than 50 mA. at less than 9 volts output voltage.

**PERFORMANCE**

Voltage range: 0-13.5 volt continuous.
Maximum output current: 200 mA. at 13.5 volt; 50 mA. at 6 volt.
Hum: 0.02% at 50 mA.
0.05% at 200 mA.
Regulation: —2% at 200 mA.

—D. M. Bennett, VK3ZRX.

# Book Review

**AMATEUR RADIO CIRCUITS BOOK (R.S.G.B.).**

As the title suggests, this is a book of circuits suitable for Amateur Radio constructors. A wide field of valves and semi-conductor applications is covered, but no text or descriptions accompany the circuits. Some are complete units, but most are of single stages.

Topics covered include antenna couplers, h.f. pre-amplifiers and converters, v.h.f. pre-amplifiers and converters, i.f. filters, mechanical filters, Q multipliers, product detectors, f.m. detectors, noise limiters, audio a.g.c., audio amplifiers and compressors, modulators, electronic keyers, T.R. switches, v.o.x., balanced modulators, mixers, linear amplifiers, power supplies, crystal oscillators, v.f.o's, v.x.o., marker oscillators, test equipment, h.f. and v.h.f. reflectometers, and transistor transmitters. The circuits are printed on excellent paper and the book is spiral bound.

This book should become a standard reference in every Ham shack.

**S.S.B. EQUIPMENT**

**(Reprinted from the R.S.G.B. Bulletin.)**

In this booklet G2DAF has described his Mark 2 transmitter and power supply, and his linear amplifier. His design is complex and he has definite ideas on the approach to a s.s.b. transmitter.

The unit described uses the filter method of sideband suppression, and has been designed so that either a low frequency crystal filter or mechanical filter, or a high frequency crystal filter, may be used.

Information is given for the construction and alignment of the crystal filters, and the reasons given for the choice of the various conversion frequencies.

Some may not agree with the author on his particular approach to a s.s.b. transmitter, but the booklet will be interesting reading for all interested in s.s.b., and particularly for those contemplating construction of a transmitter.

**RADIO AND TELEVISION RECEIVER CIRCUIT AND OPERATION (Revised Edition).**

**Alfred A. Ghirardi and Jess E. Dines.**

At the present time there are no really good textbooks covering t.v. servicing available in Australia. Most of those that are available are obsolete. Therefore, despite the fact that American t.v. operates on different channel frequencies, band width and scanning frequencies, this book should be welcomed by students and servicemen alike.

Compiled by the well-known American t.v. and radio authorities, Ghirardi and Dines, this edition has been completely re-written to take advantage of the many technical advances made since publication of the original edition. Written in an easy to follow style, with the text amply illustrated with graphs and diagrams, the book commences with basic communication theory and comprehensively covers modern radio and television, a.m. and f.m. receivers, the design and structure of basic receiver components, larger television tubes, colour television, high efficiency tuners, and transistors. To assist the student, each section ends with a set of review questions.

The chapters dealing with u.h.f. tuners, and colour television, may not be of immediate interest, but the section dealing with transistorised t.v. receivers is excellent and the book is almost worth buying for this section alone. The binding, paper and printing are of the highest quality and the Australian price of £5/5/6 for this 556-page book seems very reasonable.

Rigby Ltd., of Adelaide, are the sole Australian and New Zealand distributors and supplied the book for review.

**COMMUNICATION RECEIVERS (R.S.G.B.)**

This fine booklet produced for the R.S.G.B. by G2DAF must surely be one of the most comprehensive descriptions of circuitry suitable for a modern communications receiver yet published. The author is obviously an expert in this field and even though he has definte ideas or preferred circuits, he gives excellent arguments for his choice. The standards set for the finished receiver are equal to the highest priced commercial units, but the theory and construction portions of the booklet make no reference to transistors. This has apparently been brought about by a desire to use disposals parts and keep the cost down to a minimum.

An idea of the completeness of the booklet, which describes the preferred circuits for each stage of a receiver, is given by the attention paid to Miller effect in the i.f. amplifiers, and details of how to obtain linear calibration of the v.f.o. The third section of the booklet deals with a crystal locked converter for those who wish to use an existing receiver as the tuneable i.f.

In all, the booklet is a must for all those contemplating building, or modifying, a unit for use as a modern Amateur receiver.

**MATHS. FOR THOSE THAT HATE IT**

**Roy Hartkopf**

Although this book does not deal with radio, it should be good reading for most Amateurs—and not only because the author is a Melbourne Amateur. Mathematics is an essential part of radio, and for those of us who struggle every time we encounter a problem this book could be the answer. It does not set out to teach mathematics in the ordinary sense, but rather to give the ordinary person a basic understanding, in simple language, of some of the practical aspects of mathematics, and the use—or misuse—

At first I was not overjoyed at the thought of reading a book about mathematics, but after perusing the first chapter my natural aversion to mathematics was overcome to the point of avidly reading the whole book. Nothing in mathematics is sacred to Mr. Hartkopf, and he takes delight in exploding conceptions held by most laymen about the subject. As well, he writes in an extremely humorous and direct style, which is easy to read. For example, the first page includes "The statement that one plus one is two might seem at first sight a perfect example of a universal and at the same time absolutely accurate truth. Actually it is neither. When we get down to real objects we often find it is impossible to add them together at all. One cow plus one bale of hay might make a contented cow. It might even eventually add up to a couple of gallons of milk but it certainly doesn't add up to two cow-bales."

Commencing with a chapter entitled "One plus one is Nothing," the book progresses through, amongst other things, lunary counting, logarithms, graphs, trigonometry and calculus with the complex points brought down to earth and explained, often humorously, so that anyone can understand.

This hard-covered book of 250 pages is published by Rigby of Adelaide and sells for $7/6.

# Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

### ACKNOWLEDGMENT

Editor "A.R.," Dear Sir,

With respect to the Technical Correspondence published in the October issue of "A.R." with regards to my Low Noise Two Metre Converter article in September issue, I overlooked, in my haste to achieve the publisher's deadline, the acknowledgment to Jeff Vale VK5ZP for supplying the relevant technical details enclosed in the letter. For the purpose of completeness I hereby submit an acknowledgment to Jeff for his assistance on the explanation.

—C. J. Hurst, VK5ZHJ.

### COST OF OVERSEAS EQUIPMENT

Editor "A.R.," Dear Sir,

This is in reply to the letter by C. Whalley, VK6KK, in regard to the "Cost of Overseas Equipment."

If the retail export price of the Transceiver in question is about £A218, and if the importer receives a 20 per cent. discount, his cost will be about £190. Sales tax plus duty on these items comes to 46.5 per cent., therefore total cost will be about £280. Allow, say £5 for post. He sells the item here for £394, not including sales tax. That comes to about 38 per cent. profit. This is not excessive.

Consider another example. Our Exposure Meters, which are convertible to high sensitivity microammeters, cost $1.50 retail in the U.S.A. We get 10 per cent. discount. Cost is therefore A12/2. Sales tax plus duty is 52 per cent., therefore delivered cost is 18/5. 20 per cent. of them, however, are defective, raising the price effectively to 23/-. Postage adds about 8 per cent. We sell them for 30/6 or 32/6, depending on inherent sensitivity; about 50 per cent. of each. This comes to an average profit of about 24.5 per cent. This is not excessive.

From this profit we have to pay a secretary and technician, and the manager is fortunate to get something left over, which he promptly puts back into new stock, because of the enormous capital investment necessary in any expanding enterprise.

Mr. Whalley must realise that "Overhead" is not a term invented by greedy capitalists, but comprises a considerable part of the cost of business activity. We used to share reservations similar to those expressed by Mr. Whalley, but this business quickly educated them out of us. Importing can be a hazardous and difficult activity, and most importers well and truly earn the profit they obtain. Private individuals who have tried it for themselves have often been quick to agree with this opinion.

—R. L. Gunther, Manager, Electronics Associates.

Editor "A.R.," Dear Sir,

Your correspondent Mr. C. Whalley, VK6KK, in his letter published in the October issue has directed his remarks to my company and has criticised importers like ourselves for making excessive charges in importing equipments, thus greatly magnifying the cost in overseas countries when compared to Australian selling prices.

I have been involved in importing Eddystone receivers since about 1935 as the Australian agent for Stratton and Co. Ltd., makers of these receivers. I have also been hamming it since 1928. Therefore I can speak with some degree of authority both as a Ham as well as an importer.

As VK6KK states, there is a great deal of mystery surrounding the importation of overseas equipments. To be really understood, one must be directly connected with the problem as my company is. Mr. Whalley has overlooked, for instance, the fact that customs duty must be paid on all imported goods when making out his financial sum of charges.

In answering this letter I feel that I would serve a universal purpose if I quoted a typical calculation as to what it would cost an Amateur if he were to write over to say Webbs Radio in London and order an Eddystone EC.10 transistorised communications receiver to be shipped to Australia and deliver. Sales. or purchase tax, does not come into this consideration please note.

| | | | |
|---|---|---|---|
| Amateur net price in U.K. (no sales tax) | £48 | 0 | 0 |
| Packing case, say | 1 | 0 | 0 |
| Bill of lading, export formalities, etc. | 3 | 0 | 0 |
| Sea freight to Australia including insurance | 4 | 4 | 0 |
| | £56 | 4 | 0 |
| Add exchange to convert to Aust. currency 25½% | 14 | 6 | 8 |
| | £70 | 10 | 8 |
| Customs duty: Flat charge per receiver, £5 | £5 | 0 | 0 |
| Plus 27½% on £48 sterling | 16 | 11 | 5 |
| | £92 | 2 | 1 |
| Clearing through Customs agent (raising of Customs entry), wharfage charges, delivery to QTH, etc., say | 5 | 0 | 0 |
| | £97 | 2 | 1 |
| N.B.—R. H. Cunningham Pty. Ltd. selling price to Amateurs | £95 | 19 | 9 |

Importers usually depend on a commission or discount to make their margins upon which to operate the business. I must explain, however, that Eddystone receivers are sold direct to the end user and additional profit margins are not provided for further handling houses. The policy of this company therefore does not necessarily conform to that of other organisations.

In addition to the service my company renders fellow Hams in bringing overseas equipments into Australia we also provide pre and after sales testing and service. A direct buyer must carry these functions himself of course.

I trust this explanation helps to clear up the "inexplicable mystery" as Mr. Whalley calls it.

—R. H. Cunningham, Managing Director, R. H. Cunningham Pty. Ltd.

# SIDEBAND

By Phil Williams VK5NN.

### AUDIO PHASE SHIFT NETWORKS

For phasing exciters one of the most critical assemblies is the audio phase-shift network, usually a resistance-capacitance network giving two outputs of equal amplitude 90 degrees phase shifted with respect to each other, over a frequency range of 10 to 1. For speech frequencies the band covered is from approximately 300 c.p.s. to 3000 c.p.s. with a maximum error of plus or minus 2 degrees. Some networks have been developed which will provide this standard over a much wider range, a typical example of which is the "Dome" network which works with a 50 to 5000 cycle range, which is good enough for medium quality music or "entertainment" transmission. Sometimes "band-splitting" has been used with two of the 10/1 frequency range networks, using say 80 to 800 cycles on one network and 800 to 8000 on another, recombining the two bands to provide an 80 to 8000 c.p.s. channel. It may be argued that this may be done much more readily with filters, but the filter solution is not as easy as it appears at first, since the phase changes which occur within the pass-band of narrow band-pass filters (particularly some mechanical filters) cause undesirable characteristics in the received signal, and even though amplitude distortion is minimised, the signal does not sound "natural" unless special attention is paid to this matter of phase distortion.

It has been possible to purchase suitable audio phase-shift networks locally, and these have generally proved satisfactory. I know of several Amateurs who have had the misfortune to import phasing networks, only to find, after months of poor reports, that a faulty network has been sealed up inside a metal envelope, and although this is not the usual experience, some information as to what to expect or how to check that the unit and associated circuitry are doing the job, may be of assistance to the Amateur trying to get his phasing exciter operating at its optimum.

Figure 1 shows the circuit diagram of the well-known Central Electronics type PSI network together with its "two-sevenths" input voltage divider, and the post-phasing amplifier necessary to present equal, but quadrature-phased speech signals to the two balanced modulators (which are supplied also with the quadrature-phased radio-frequency signals as described last month).

Several months ago the audio filter, limiting speech to below 3000 c.p.s. and the audio amplifier with restricted base response below 300 c.p.s. were described in these notes, so you may now be getting a clearer mental picture of the overall requirements for design and construction of an acceptable phasing-type single sideband generator.

If you use the 3 to 1 audio output transformer to drive through the filter to the "two-sevenths" resistive divider, then only those frequencies which the phase shift network can handle will be presented to it. This will eliminate the low frequency "crud" which is sometimes detectable in a phasing signal, and also the high frequency "whiskers" which "spit" over the other fellow's transmission on an adjacent channel.

There is nothing magical about the making of a good audio phase shift network. You will see that R1 and R2 are both 100K, and R3 and R4 133.3K. These do not have to be exactly these values as long as you can get two pairs of resistors within 1% of each other and in the ratio 4 is to 3. R3 and R4 may be made from 100K plus 33K in series, so this presents no problem.

The condensers, again, do not have to be exactly the values stated as long as C1 : C2 : C3 : C4 in the ratio 1 : 2 : 4 : 8. I have made quite good networks where the condensers were made up as follows:—

C1 equals 600 plus 25 pF.
C2 equals 1250 pF. equals 2C1
C3 equals 2500 pF. equals 4C1
C4 equals 5000 pF. equals 8C1

The only effect of the increase in C is that the frequency range of the network dropped slightly, to approx. 270 to 2700 c.p.s, over which correct phasing was obtained. If you have a deep voice this could be quite a help, but, on the other hand, an XYL operator could benefit by reducing the C, to about 550 pF., and the others in the same proportion. Another useful tip for building up these capacitors is to buy the largest size 1% capacitor you can get just below the value required, and build up to the value needed with say 5% capacitors; e.g., the 1250 condenser could be 1200 at 1% plus 39 at 5% plus 10 at 5%, which will give 1249 pF., i.e., well within the tolerance required.

Networks made this way will not fit into a metal valve envelope, but may be assembled on a small piece of bakelite matrix board or resistor strip, to produce an acceptable item.

Passing now to the port-phasing amplifiers, it is usual to employ the two halves of a 12AT7 double triode with transformers to step down from the plate load impedance fo 20,000 ohms to 200 ohms to feed the balanced modulators. There have been numerous complaints with these transformers due to the small gauge wire used on the primary, and many Amateurs have waited a long time for replacements. There are two solutions to this problem, both quite good. The first shown in Fig. 1a is to use transformers made from modified receiver output transformers. The best transformers are those not potted in pitch. I have used 7000 ohm/15 ohm speaker transformers. First remove the bobbin from the core, and strip off the 15 ohm secondary winding, counting the turns as you remove them. Next wind on another secondary of approx 2½ times the original. This gives a voltage step-down of about 9 or 10 to 1. Reassemble the core with no air gap, which is not needed since a 12AT7 draws only 3 or 4 milliamps. There will be two identical transformers needed, of course.

Since the transformer will need to perform at above 300 cycles/sec. only, and the originals were made to work to below 100 cycles, the primary inductance of the unit with no air gap is adequate to give fiat frequency response.

The second approach is to retain the post-phasing amplifiers without transformers for balancing and gain, and, with resistive plate loads follow them with a 12AU7 as two cathode followers. The arrangement is shown in Fig. 1b.

Adjustment of the gains of the systems to be equal is easily carried out by shorting the two input grids together at x and x¹ and with a pair of earphones connected between the outputs P and P, vary the balance control R7 until minimum output is heard in the phones.

An overall check on the performance of the whole amplifier may be made with the two outputs connected to the X and Y amplifiers of an oscilloscope. With XX, shorted, adjust the oscilloscope amplifiers to give a 45 degree slope straight line on the tube. A suitable signal source for these tests is a transistor radio at low volume about 6 inches from the microphone on the bench—select a male voice, e.g., reading the news, which should be akin to actual working conditions for your rig.

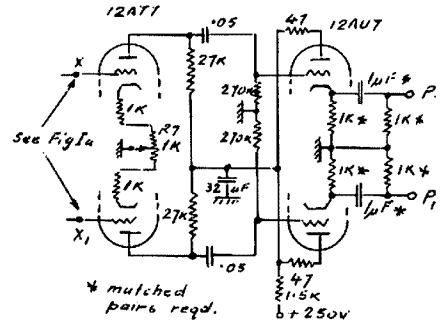



Fig. 1b.—Post-phasing amplifier using cathode follower output.

On removing the short from XX, the pattern on the oscilloscope should blossom into something like the full-face view of a "camellia," on speech, or a full circle with a line wave input. A good test is to explore your normal loudness range and various settings of the A.F. gain control (and clipper, if included). This will show you plainly if there is any distortion or flattening. This is a very quick and easy way to check a phasing exciter speech and phase shift unit at any time during its life should you suspect a fault or a flat tube. If you have access to an audio oscillator, a quick run through the 50 to 5000 cycles/second range will give you an idea of the way the phase shift network operates, and will demonstrate its limitations. 73, Phil 5NN.

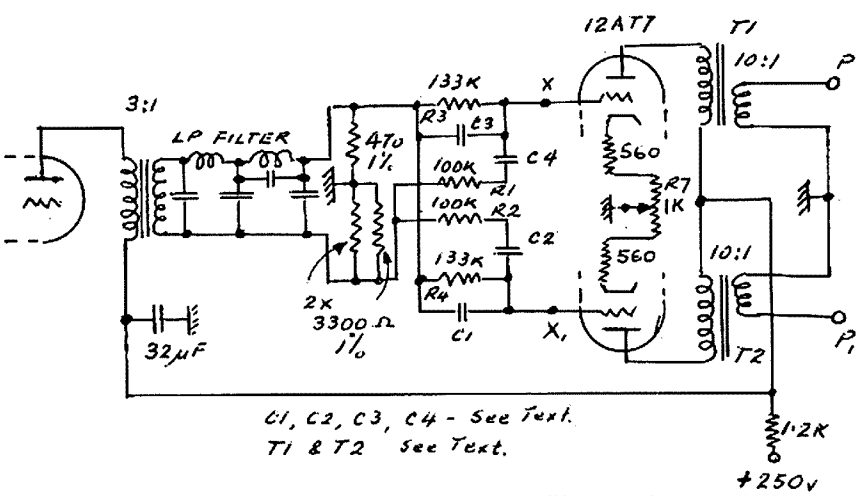



Fig. 1a.—Phase-shift network and post-phasing amplifier—transformer output.

## TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

Manuscripts should preferably be typewritten but if handwritten please double space the writing. Drawings will be done by "A.R." staff.

Photographs will be returned if the sender's name and address is shown on the back of each photograph submitted.

Please address all articles to the

EDITOR "A.R.,"
P.O. BOX 36,
EAST MELBOURNE, C.2,
VICTORIA.

# D X

## VP4, OA4, BV, ZM7, 7GI, FP, AC5, MP4, ZC6, TY2

Sub-Editor: ALAN SHAWSMITH, VK4SS,
35 Whynot Street, West End, Brisbane, Qld.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Conditions are improving. All the bands are open with particularly good DX on 40, 20 and 15 mx. 28 Mc. has been showing signs of life in the direction of U.S.A. around 2200z.

The l.p. circuits as yet are not good, but 14 Mc. via S.A. to Europe in the afternoons often has some good rare prefixes on it to chase.

Probably the most consistent paths as of now are to Europe on 40 mx from 1700z onwards. To Europe on 20 mx nightly 1200z. To U.S.A. on 15 mx daily from 2200z. South Americans are workable on 7 Mc. around 1030z and on 14 Mc. from 0300z. A short weak break through to South America on 21 Mc. sometimes occurs about 0300z.

Put on those phones. There's plenty to be heard!

### NOTES AND NEWS

**Indonesia /8F3:** It's a past event now, but if you are still wondering what the pile up was all about, Don Miller did get a permit and operated as W9WNV/8F3. If you managed a ten-second QSO, send the card to W4EC1.

**Georgia:** UF6UB is very active on s.s.b. 14,260 at 1930z might be good enough.

**Ascension Is.:** ZD8AR is expected to be on during Nov. and especially during "CQ" contest.

**Swan Is.:** KS4AB is reported active around 7010 Kc. Try about 0600z.

**Balearic Is.:** EA6BD on 14,030 at 2300z.

**Vatican:** HV1CN very busy on 14,275 at 2100z.

**Thailand:** HS1H on 14,105 at 1230z.

**Cocos Keeling:** VK9JO frequents 14,270 about 1200z.

**Marcus, KG6IF:** Try scanning the dial around 14,275 at about 0200z.

**China:** Maybe you worked BY4SK, if so QSL to Ack W4EC1. More operation from behind the bamboo curtain is expected by VS6OJ very soon.

**Fernando Do Norohna:** PY7ACQ is expected to open up from this rare one about the time this reaches your box, so keep an ear open for any pile-ups. No other info. available.

**Gough Island:** ZD9BC is awaiting s.s.b. equipment. Expect this mode of activity any time now.

**Albania:** ZA1AB very active on 14,025, but reported as a pirate.

**British Guiana:** VP3MV 21,400 s.s.b. at 1700z. QSL to W2UOX.

**Mongolia:** JT1AG said to be active on 14,035 around midnight our time.

**St. Pierre Is.:** FP8CA, 14,248 at 1700z.

**Carribean Stns.:** VP2KM St. Kitts, VP2AL Antigua, VP2SK St. Vincent, all using s.s.b. 14.

**U.S.S.R.-North Pole:** UP0L-13 on 14,030 about 0300z.

**Kazakh:** UL7FA 14,131 and UL7FB 14,043 0140z.

**Portuguese Guinea:** CR3AD, 14074 at 2300z.

**Malagasy Republic:** 5R8CB on 21,000 at 1800z.

**Rwanda:** 9X5CE, 14,255 at 1930z.

**Monaco:** WA6ZIQ reported delayed in his attempt to operate from 3A0.

**Jan Mayen:** This rare spot now has several operators both s.s.b. and c.w. Keep listening on 20 when the s.p. to Europe is open.

**Bahrein:** MP4BCC, 14,246, 1700z.

(Much of the above info. by courtesy of LIDXA.)

**Tahiti:** FO8BI is a regular on 21 and 28 c.w. mostly from 2200z.

**Korea:** Several HM's 1-5 are active on 15 mx dally from 2200z. HMIDE, HM1BB, HM2BV, HM2CR, HM5BF, HM5BZ are some.

**Caucasian Area:** Several U prefixes are usually workable each day from noon our time on 20 s.s.b. and c.w.

**Kuohing:** 9M8FS is good for WPX. 14,080 at 1400z.

**Cuba:** CO2BB, 21,050 at 2200z. Mostly working U.S.A.

**S.E. Asia:** W9WNV, Don Miller, currently signing HS Thailand. Several more rare prefixes are to come. Just listen for the big pile-up on all bands and modes.

**Central America and Indies:** Ken VK3TL reports 40 mx to this area very good around 1030z nightly. Some prefixes are CO2BB, VP3LP, VP4DS, VP5AR, HP1BR, etc.

### ACTIVITIES

Dud VK4MY (now settled on the Gold Coast from VK3) reports working the following on 14 c.w.: UB3BX 1343z, UA3KBO 1353, KG6SZ 0133, OK1FP 1333, UW0FK 0748, SP8YA 1320, OA8D/3 0455, XE1EK 0645, UW0IQ 0658, UA9DK 1314, UL7KBF 1343, L1BDE 0630, VE8BB 0640, UC2KMZ 1330, UC2AR 1350, also several others.

Ken VK3TL shows what good DX is available by the following report. He lists as worked on 20 mx: BY4SK, CE1DF, CE1DK, CE6EW, CR9AK, GB3WAD, GD3RFK, HM3CG, HP1BR, IS1RUA, JT1KAA, JT2AA, JY74, KG4AA, KG6SZ (Saipan), ON5AZ/LX, OH0NI, OD5BZ, OD5EE, OD5EG, PJ2CR, PJ2MI (Saint Maarten), VP2SK (St. Vincent), ZB2AL, 4W2AA, W9WNV/8F2. Worked on 40 mx: VP3LP, VP4DS (Trinidad), VP5AR (Grand Turk Is.), YJ8WW. Best QSL's received: EP2RV, SVIAT, 9X5MW, 9J2FF, CE0AG, FB8YY, 9J2VB, OD5AI, HB0AFM (Leichenstein), 7X2AM, 9L1JR, 0L1SL, 4X9HQ (QSO in 1962), 7Z3AB, VQ2DT, 9M8KZ, EP3RO.

Z equals G.M.T.

My grateful thanks to SWL Chas. Thorpe, L4021, who regularly contributes information on Oceania activities.

DX good listening, 73, A1, VK4SS.

## W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

### PHONE

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK5MS | 24 | 320 | VK2JZ | 61 | 240 |
| VK5AB | 45 | 312 | VK2ADE | 65 | 231 |
| VK6RU | 2 | 307 | VK4HR | 12 | 223 |
| VK6MK | 43 | 305 | VK6KW | 4 | 211 |
| VK3AHO | 51 | 301 | VK3WL | 14 | 211 |
| VK4FJ | 21 | 283 | VK2AAK | 58 | 208 |

**Amendment:**

VK2AGH 55 114

### C.W.

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK3KB | 10 | 331 | VK2AGH | 71 | 277 |
| VK2QL | 5 | 308 | VK2EO | 2 | 267 |
| VK3CX | 26 | 306 | VK6RU | 18 | 262 |
| VK4FJ | 29 | 300 | VK3AHQ | 79 | 260 |
| VK2ADE | 81 | 298 | VK3ARX | 68 | 253 |
| VK3NC | 19 | 286 | VK3XB | 75 | 247 |

**Amendments:**

| | | | | | |
|---|---|---|---|---|---|
| VK3YL | 39 | 246 | VK3RJ | 42 | 231 |
| VK4HR | 8 | 240 | VK3AXK | 30 | 204 |

### OPEN

| Call | Cer. No. | C'nt-ries | Call | Cer. No. | C'nt-ries |
|---|---|---|---|---|---|
| VK2ADE | 28 | 322 | VK2ACX | 6 | 300 |
| VK8RU | 8 | 312 | VK3NC | 77 | 287 |
| VK2AGH | 83 | 309 | VK3JA | 43 | 271 |
| VK4FJ | 32 | 308 | VK4HR | 7 | 264 |
| VK6MK | 74 | 307 | VK2VN | 18 | 247 |
| VK3AHO | 76 | 306 | VK7IZ | 23 | 242 |

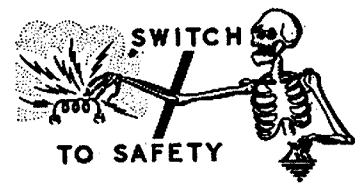
## 31st A.R.R.L. DX CONTEST RESULTS

### AUSTRALIA

| | Final Score | Multiplier | Contacts | Operating Time Hours |
|---|---|---|---|---|
| **C.w.:—** | | | | |
| VK5ZP | 397,758 | 66 | 1561 | 50 |
| VK2GW | 245,676 | 59 | 1388 | 65 |
| VK2EO | 190,512 | 49 | 1296 | 48 |
| VK2APK | 186,285 | 55 | 1129 | — |
| VK3AXK | 58,212 | 33 | 588 | 32 |
| XK5KO | 58,035 | 53 | 367 | 28 |
| VK2VN | 30,780 | 45 | 228 | 9 |
| VK2QK | 29,580 | 34 | 290 | — |
| VK3XB | 5,286 | 12 | 146 | 4 |
| **Phone:—** | | | | |
| VK2APK | 63,756 | 42 | 506 | — |
| VK3ATN | 41,595 | 47 | 295 | 10 |
| VK4LT | 11,934 | 26 | 154 | — |
| VK3XB | 1,242 | 9 | 96 | 4 |
| VK2PN | 342 | 6 | 19 | 2 |

### NEW ZEALAND

| | | | | |
|---|---|---|---|---|
| **C.w.:—** | | | | |
| ZL1AFW | 80,520 | 44 | 614 | 22 |
| ZL4BO | 12,070 | 17 | 245 | — |
| ZL1OY | 3,528 | 14 | 84 | — |
| ZL1QW | 360 | 6 | 20 | 2 |
| **Phone:—** | | | | |
| ZL1AGO | 59,633 | 49 | 406 | — |
| ZL4ML | 9,378 | 18 | 174 | 9 |




## CONTEST CALENDAR

**3rd/4th November:—**
Y.L.R.L. Anniversary Contest, phone.

**6th/7th November:—**
4th R.S.G.B. 7 Mc. DX Contest, c.w. section.

**20th/21st November:—**
2nd R.S.G.B. 1.8 Mc. Contest.

**27th/28th November:—**
"CQ" World Wide DX Contest, c.w. section.

**12th December:—**
ZL V.h.f. Field Day.

**12th December/16th January:—**
Ross A. Hull Memorial Trophy V.h.f. Contest.

**12th/13th February:—**
John Moyle Memorial National Field Day Contest.

## A. R. R. L.

Associate Memberships (and renewals) are available by forwarding £2/14/- (plus 6d. interstate cheques) to:

Business Manager, W.I.A.,
49 Cookson Street,
Camberwell, E.6,
Victoria.

This includes the regular arrival of

"QST"

## DON'T FORGET

**your VK/ZL Contest Log!**

Deadline for local contestants is **15th December, 1965.**

Deadline for overseas entrants is 15th January, 1966.

# V H F

## 52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

As you will observe, the notes are rather brief this time as VK2, VK3 and VK5 were the only parties interested enough in writing and unfortunately they did not arrive until late, which has restricted any survey being made. We hope that this will only be a temporary lapse and all will arrive promptly next month. Please time your notes to arrive by the 2nd of each month otherwise they cannot be considered.

What is your opinion of these notes? Are they serving a useful purpose in recording v.h.f. activity and opinion? With the difficulty in collecting news from the various Divisions would anyone miss this page if it were removed? Let's have your opinion—both from individuals and from the groups. If you think it is worth while let me know. The first five letters will be included for all those interested to read.

Don't forget to patronise the various field days now being organised for you. 73, 3ZGP.

### NEW SOUTH WALES

The Group meets regularly on the first Friday of the month. The November meeting will be on the 5th. The December meeting, which is the annual auction night, is on the 3rd, and the January meeting on the 7th will be a social night.

To the end of September there had not apparently been any worthwhile 6 metre openings.

The 6 metre "fox hunt" for October proved to be a win for the fox, 2ZTM, when the hounds could not find the "road" in the park. After the full event time had run they were called in.

The event for November will be on Wednesday, the 10th, with 2ZEV as fox.

The December 6 metre event will be on the 22nd. A small Christmas party will follow the event. Keith 2ZVL will be the fox.

### VICTORIA

It looks like the DX season has started with openings to VK4 on 6 late in the afternoon on Oct. 1 and 2. Reports of interference to television on Channel 0 have been reported on a number of occasions during the past month.

Many new stations are appearing on the band, particularly on the net frequencies both a.m. and f.m. Activity is increasing at the low end of the band with a number of the old regulars appearing.

Two is seeing its share of activity now the weather is improving and regular openings to Mt. Gambier and Deniliquin are keeping the locals happy.

The VK3 v.h.f. group has established a register of v.h.f. enthusiasts and welcomes all those interested and who are members of the W.I.A. to join. This may be done at any group meeting or by writing to VK3ZGP Len Poynter, 14 Esther Court, Fawkner, including name, address, call sign, telephone number and what bands you are active or interested in.

Field days in VK3 this season take place on Nov. 21 and Dec. 19, New Year week-end and during the N.F.D. in Feb. and March 19. See you there. 73, 3ZCK.

### SOUTH AUSTRALIA

Activity in VK5 is at last lifting itself from beneath the noise level and approaching the pre-Christmas activity level that is characteristic within the v.h.f. fraternity of VK5.

The outstanding v.h.f. event of the year and possibly for future years was the Amateur Television Display exhibited at the 1965 Royal Adelaide Show. The display, which was housed in the W.R.E. Pavilion, consisted of a television set receiving a programmed transmission from the QTH of George VK5ZEY. In order that entertainment value could be transmitted a special licence and frequency was allocated in the v.h.f. region. The majority of programmes televised emanated from the studios of George VK5ZEY. Entertainment value of excellent quality was provided at all times, and consisted of films, interviews, news and live broadcasts utilising the talents of local musicians of the modern variety.

Perhaps the highlight of the whole project was the successful conduction of two outside telecasts, one of a football match and the other of a model car racing circuit. From reports to hand the transmissions were of excellent quality, putting to shame the so-called professional quality dished out by the local t.v. stations.

The efforts applied to this exhibition by all concerned no doubt boosted the outlook of the community towards the radio Amateur. Those primarily responsible for this outstanding achievement were George VK5ZEY and Maitland VK5AO with assistance from John 5ZDZ, Rick 5ZFQ, Jim 5ZGV, Howard 5ZBE and Peter 5ZEZ.

Two-metre activity received a boost when the P.M.G. decreed that Port Pirie was a television "fringe area" and that Radio Amateurs were not responsible for any interference experienced by viewers, providing that reception of the local Channel 1 was not interfered with.

This would allow Jim ZMJ and John 5ZC to work into Adelaide, a path of 120 miles, on a more regular basis. No DX openings on 6 metres have been reported up till 30th September, although the reception of Channel 0 from Brisbane and Melbourne is regularly noted.

2-metre Scramble was held on Sunday, 26th September, with the eventual winners being Edwin 5ZTS and Brian 5ZBR. Considerable interest is being shown in Oscar IV although the re-transmission on 431,8 Mcs. has caught the unprepared on the wrong foot. 73, Colin, VK5ZHJ.

### VK8

Doug 8KK is to be active on 6 and 2 this season and is working on a 2-metre final.

Currently interested in "Moonbounce" with c.w. as the preferred mode, Doug has a tower to go up as soon as he can "blend" it into the skyline so that it is not noticed.

### ZL

On December 12 there will be a V.H.F. Field Day in ZL on all v.h.f. bands between 9 a.m. and 3 p.m. N.Z.T. (2100 G.M.T. 11/12/65 to 0300 G.M.T. 12/12/65). They will be on the lookout for VK contacts.

Bill ZL2CD reports steady v.h.f. activity.

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## V.H.F./U.H.F. STATE RECORDS — SEPTEMBER 1965

| | | | | | |
|---|---|---|---|---|---|
| **New South Wales:** | | | | | |
| 50 Mcs. | VK2ADE to VE7AQQ | | 8/4/59 | 7320 | Miles |
| 144 ,, | VK2ZMR to ZL2AAH | | 8/1/85 | 1410 | ,, |
| *432 ,, | VK1VP/1 to VK2ZPT | | 14/6/65 | 178 | ,, |
| 576 ,, | No claim | | | | |
| 1215 ,, | VK2ZAC to VK2ZCF/2 | | 4/3/63 | 46.8 | ,, |
| **Victoria:** | | | | | |
| 50 Mcs. | VK3ALZ to XE1FU | | 1/5/59 | 8418 | Miles |
| 144 ,, | VK3ZEA to VK4HD | | 27/12/61 | 954 | ,, |
| 432 ,, | VK3AEE to VK7LZ | | 15/1/65 | 282 | ,, |
| 576 ,, | VK3AKE to VK3ANW | | 11/12/49 | 80.7 | ,, |
| 2300 ,, | VK3XA to VK3ANW | | 18/2/50 | 9.0 | ,, |
| 3300 ,, | VK3ZGT/3ZGK/3 to VK3ZDQ/3 | | 14/12/63 | 63.5 | ,, |
| **Queensland:** | | | | | |
| 50 Mcs. | VK4ZAZ to KGERG | | 16/3/58 | 5305 | Miles |
| 144 ,, | VK4ZAX to VK7ZAO | | 27/12/61 | 1107 | ,, |
| 432 ,, | No claim | | | | |
| | No other claims | | | | |
| **South Australia:** | | | | | |
| 50 Mcs. | VK5KL to W7ACS/KH6 | | 26/8/47 | 5361 | Miles |
| 144 ,, | VK5ZHJ to VK8ZCN | | 8/1/65 | 1330 | ,, |
| 432 ,, | VK5AW to VK3AEE | | 13/11/64 | 226.5 | ,, |
| *576 ,, | VK5ZTM/5ZFQ/5 to VK5ZIS/5ZJH/5 | | 28/1/65 | 105.5 | ,, |
| 1215 ,, | VK5LA/5 to VK5ZCR/5 | | 4/1/62 | 1.0 | ,, |
| **Western Australia:** | | | | | |
| 50 Mcs. | VK6BE to JA8BP | | 30/10/58 | 5490 | Miles |
| 144 ,, | VK6ZCN to VK5ZHJ | | 8/1/65 | 1330 | ,, |
| *432 ,, | VK6ZDS to VK6LK/6 | | 30/5/64 | 33 | ,, |
| 576 ,, | VK6ZDS/6 to VK6LK/6 | | 15/12/63 | 101.2 | ,, |
| **Tasmania:** | | | | | |
| 50 Mcs. | VK7LZ to JA9IL | | 3/12/59 | 5426 | Miles |
| 144 ,, | VK7ZAO to VK4ZAX | | 27/12/61 | 1107 | ,, |
| 432 ,, | VK7LZ to VK3AEE | | 15/1/65 | 282 | ,, |
| | No other claims | | | | |
| **Papua Territory:** | | | | | |
| 50 Mcs. | VK9AU to KH6DBY | | 30/4/60 | 4312 | Miles |
| | No other claims | | | | |

## 96 ELEMENTS—HAND-HELD

This photo was received by Jim Stewart (VK3ZFS) from Jim Goding (VK3ZGG), who is at present in Massachusetts, U.S.A. This print was taken at the 73 Hamfest at Peterborough. It shows the prizewinning antenna in the antenna contest—96 elements on 432 Mc. You can imagine it was a problem because it had to be hand held, but they managed it OK. Jim first saw it amid and inverted on the top of a big old Chev. It looked like an enormous bedstead and completely occupied the whole surface area of the top of the car.

It was one of the successful antennae used in the first July Arecibo Moonbounce effort. Signals from Arecibo were so strong that one of the chaps operating the club station thought he would try a dipole. He made the little dipole (he's in the left foreground of the snap) on a co-ax receptacle and plugged it into the feed line—lo, they could still hear Sam!

# SWL

Sub-editor: D. Grantley, L2022.
Alexander Ave., Hazelbrook, N.S.W.

Recently I tuned in to the VK3 Divisional broadcast just as the s.w.l. news was being given. The presentation of this section of the broadcast was given by one of the YL members of the Group and as well as being well presented, it was a truly representative commentary of s.w.l. happenings in that State. The VK3 Division earns full marks for their co-operation with the listeners in this matter, whilst the Group itself are to be applauded for their part in this activity. On this subject I have a letter from the VK3 s.w.l. Group publicity officer who suggests that there may be many listeners who would care to do the actual broadcast of the s.w.l. news, if so, he would be pleased to hear from them at his home address: G. Lakatos, 127 Tennyson St., Elwood, to whom all material for the broadcast should be sent. To any of the listeners from other groups, reports of conditions and any interesting loggings will be appreciated for this news session.

### SWL DXCC LISTINGS

Following my report in September "A.R." of Eskil Erikkson's arrival at the 300 confirmed mark, several listeners have pointed out that there have been others who have reached this mark in the past. Alan Raftery tells me there was an I.S.W.L. listener who had 312 confirmed in 1962, and as Eskil's score is likewise based on the I.S.W.L. countries list, we must concede that the other chap reached 300 confirmed first. Peter Drew mentions three W's, one who has 336 heard and confirmed, whilst the others both in excess of 300. However, one of these is the well-known Roy Watte, who assists with W s.w.l. reports and has made his mark on the listening world on both sides of the Atlantic.

Roy is well in excess of 300 by the list he uses in his own country, whilst in the current edition of "Monitor," the official organ of the I.S.W.L., his position is 286 confirmed in 39 zones. Therefore it seems that once again we are beset by the problem of variations in the official countries lists published by the major Amateur societies and also those issued by certain American "Hobby" publications. One of these permits a mixture of commercial and Amateur QSL's for award purposes.

By the end of the year I hope to have copies of all the lists in use at present, and we will try and get a line on the correct position. It is possible that two have beaten Eskil to the 300 mark, but the fact remains that none of the VK boys have done so as yet but it won't be too long. More anon.

### COMMERCIAL DX

A couple of requests have come along for information to be printed on this section of the listening hobby. Now whilst I personally concede that this is a very interesting field, it is covered far more fully than I could ever hope to by Art Cushen in our national radio magazine. Art has a vast knowledge of the subject, and also has gear far in excess of anything any of our listeners could hope to have. We must remember also that the W.I.A. is primarily an Amateur organisation, and Amateurs in general have been treated rather harshly at the hands of these commercial interests in the matter of losing their frequencies, therefore I for one do not feel inclined to devote portion of this page to them. However, let me have your views on the matter, in the meanwhile I will certainly pass on to you anything of particular interest in this field.

Whilst on this subject I was talking to Mr. Bob Stokes, the S.W. Pacific representative for Trans World Radio, and he was interested to know that their Monte Carlo station gave good reception here in VK on occasions. At the time I spoke to Bob, T.W.A. were not aware that they were being heard down here, and it was suggested that any further reception reports could be sent to the station at 5 Rue de la Poste, Monte Carlo, Monaco.

### OVERSEAS DX NEWS

The following notes from "Monitor," MP4BEK will confirm reports for 40 and 80 only, unless a log extract of a more comprehensive nature covering several transmissions on other bands is received. From I.S.W.L. member in Malta, Dave Beagle, R.A.F. Sigglewi, B.P.O. Malta, comes a note that 9H1 stations reply by the bureau only, and if listeners want a direct report their cards should go direct to him plus an I.R.C. At present the call signs 9H1A to Z and 9H1AA to AD are active. Reports for IT1TAI should go direct to the operator at Box 300, Palermo, Sicily, and not to his QSL maanger who handles the expeditions only. ZA1GK and VP8XZ are believed to be pirates.

### VK3 NEWS

The highlight of the September activities was the visit to Lyndhurst transmitting station where the Group saw the antenna and transmitters associated with the Perth/Melbourne radio link, Australian time service, A.B.C. to inland Australia and the service to the French-speaking areas of the Pacific.

Once again congratulations are in order for VK3 member Greg Earl who topped the rx section of the John Moyle Memorial National Field Day. Don't miss the December meeting when the year will be wound up with a party.

### AROUND THE SHACKS

A big hello to our former sub-editor Maurie Cox, who has been out of the visible scene for too long, however, pressure of studies and other activities have curbed his attention to the hobby. Nevertheless Maurie has not lost interest, in fact his rx has recently been restored to its former A1 state, and with the G5RV antenna in operation L3055 expects to be back in harness once more.

Over to VK6 to Peter Drew L6021, who is pleased to note the DX on the improve in the west and with loggings such as UA2, GD3, OD5BZ, VK9VG, VK9JO, OA8D/3, YO-3LM, HC1MX, KG6SZ, YA4A, FR7ZD, VQ9J, CR8AE, FB8WW, PA0HBO and W9WNV/8F3. Peter is getting up the ladder. QSL's to hand include AC5H, EL8D, HS1HS, OA4OS, HM1AB, OZ7BW and DJ7FC (15 watts to a 40 metre dipole on 80).

Allan L6029 is also happy with improved conditions in VK6 where he has hooked on 20 metres KA2, VR2, UA4, KX6, HL9, KR6, OD5 and KJ6. It is interesting to note that Allan was able to log a ZE1 on 15 metres at 0730z. which though weak did indicate a possible improvement. (In passing, it was noted that this band has been open to Europe regularly from 0700z to 0830z in the Blue Mountains.) Allan's gear consists of a Murphy 160 and a R208 with a long wire 94 ft. long 40 ft. high running N./S., also a 3-element beam and a folded dipole for 20 metres.

A newcomer to me, and maybe to the page, is Ben L4024 whose gear consists of two Hallicrafters, a SX110 and a SX100 together with a Windom antenna 130 ft. long by 50 ft. high, also a 66 ft. long flat-top 50 ft. high running in the opposite direction, N./S. Ben has found the bands below their best but with occasional break-throughs on 10 and 15 metres.

One of our younger listeners, Geoff L6030, confirms the good reception in the Western State on 20 metres, and has entries from ZS1, 9M2, HK6, W, XE2 and KC6. Bryan L6028 reports loggings from XE, VE, W, KL7, LA9 and KG6 on 20 metres with the W's coming in on 15. Bryan recently received his first contest certificate, this being for his win in the VK6 section of the field day.

VK2 has produced another newcomer to the page in L2028 Brian Pickering from the Newcastle area. With his f.b. DX location plus an inverted V antenna we can expect some good reports from Brian. who is being assisted in his activity by 2ASJ and 2ZMC.

We learn that Brenton L5069 recently sat for his ticket and hopes he made the grade. These VK5 boys seem to be in good locations for DX, and no exception is Alan Raftery L5065 who despite concentrating on v.h.f. lately has done rather well on the lower frequencies. Most of his loggings have been from the Pacific, whilst some VK6's have been heard on 6 metres. His 8-metre gear consists of a 4-tube converter plus a folded dipole. Inward cards at his QTH include KG6NAA, HK3RQ, HK9KH, K3OKX, and YL ZL2JO.

Over the water to Greg Johnson of VK7 who has not been idle, his loggings on 7 Mc. s.s.b. between 1700 and 1800 were W's, KH6, OA4, G's, JA's, whilst on 14 Mc. produced BV1, DU, FK8, HB9, HC, HL, JA, KZ5, KS6, KJ6, KX6, KG6, KH6, KR6, KW6, OX3, OD5, PA0, TI2, TG8, UW3, VK5s 9 and 0, VP7, 4UI, 4W2 and 4X4. Greg gives the QSL address of 4W2AA as via HB9AET and OX3JV as SM7ACB.

Of particular interest to listeners will be the new low noise front end which Greg has constructed and used in the reception of the stations listed above. It uses a 6ES8 series cascode r.f., 12AT7 mixer, and 6C4 tunable osc. to give an almost silent front end. Should any of the listeners have problems with this type of converter you may drop Greg a line and he will willingly assist you. His address is Greg Johnson, 3 Inglis St., Newtown, Hobart.

Tim Corbin L5067 uses a home-brew rx, plus a No. 19 also a newly built 2 m. converter. Using dipoles on the h.f. bands and a 4-element beam on 2 metres. Tim has a set-up which should bring good results in the days to come.

Warwick L3211 has not been over active this month, but did manage loggings of KZ5, YV5, FK8, BV1 and other Pacific stations at about 0800z, whilst later in the evening at 12-1400z he logged quite a list of Europeans. Inward cards for the month were HP1AA, KG4BQ, VP7DD, CE0AG, HS1X, UA0SK, UR2KAA, KG6IG, F2SY, KR6GO and KR8TM.

At this QTH the going has been very good, as conditions on all bands have shown a marked improvement. Yesterday I had a break-through on 10 metres, and at one stage 15 was wide open to Europe in the early evening and to the near Asians in the morning. 20 has been at its best for weeks, and of course there are loads of DX stations on 40 if you have the patience to battle through the QRM. Best on 20 would be ZD8HL and FR7ZD whilst so many countries were logged in the fone section of the VK/ZL that I won't attempt to list them.

### QSL MANAGERS

As mentioned last month, the quickest and surest way to get a QSL is via a manager. At the present time there are a number of the more rare countries on the air, and many of them are handled by one of the hardest worked managers, W2CTN, J. Cummings, 159 Ketcham St., Amityville, N.Y., U.S.A. For reports on EP2RW, HK3RQ, KC6FM, VK9TG, VS9MB, ZD8HL, 9M6BM, YS0IM, DU1OR, KA2LD, KR6JZ and KW6EJ send your cards plus I.R.C. to this address, and your QSL's will follow. These stations are only a few of the many Jack handles, but I do not have the full list.

### PIRATE STATIONS

In every issue of the overseas magazines we read of stations who are operating without a licence, and here in VK we at times have had the same trouble. My last experience was only last week when I logged a call on s.s.b. VK9VG giving his QTH as Cocos Is., and his manager as Jim VK6RU. A card was sent at once to Jim, complete with a stamped envelope, but was returned with the comment that 9VG had returned to the homeland some time before I logged the call. Cases of proven (or suspected) pirate operation should be brought to the notice of the proper authorities, the P.M.G.'s Department, who have the facilities to track them down, or if you don't care to approach them, bring the matter to the attention of the W.I.A. We refer here to cases of illegal operation in this country, others do not concern us, but we like to know just which calls are illegal nevertheless.

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# Publications Committee Reports That . . .

Inwards correspondence up to first mail on 12/10/65 was received from VK5ZMJ, VK3ZFS, Ian Hunt and P. Gush. A technical article was received from VK5ZP. The letters from VK5ZMJ and Ian Hunt have been referred to Federal Executive.

Unfortunately the Call Book is again late. The final proofs have been sent to the P.M.G.'s Department for approval and printing should commence shortly. In checking the lists we found a number of incorrect addresses which could not be rectified because the licensees have not notified the authorities, or sent us a correction slip, which can be found in previous issues of the Call Book.

We suggest you check your call and address in the new book, and if it is not correct take corrective action immediately. (The gentleman in the "Baronial Mansion" please note.)

It is becoming increasingly difficult to produce "A.R." on time, due to the late arrival of notes. All correspondents are reminded that copy should be in before the 8th of the month, except in December, when the deadline is the first of the month. In future, copy date will be strictly enforced, and notes received after copy date will not be used.

# YOUTH RADIO CLUBS

Most "civilised" countries need a vigorous de-bunking of the sloppy sentimentalists who think that providing opportunities for young people means mere generosity of giving without the proper challenge and training in responsibility. The Duke of Edinburgh's Award is a wonderful idea and I hope to hear more of its success. Another excellent scheme is that organised yearly by the Science Teachers' Association in most States, going under the name of the Science Talent Search in VK3, having as its aims (a) to encourage science students to undertake independent research along lines of their own interests and encourage development of experimental techniques; (b) to encourage students to explain clearly and effectively both in writing and orally their purposes, methods and results. On their own merits, these Talent Search competitions have great success with a 1964 record entry in VK3 of 200 projects of high standard, and 1965 will be higher.

When this success is reinforced by the support of a big commercial firm such as A.W.V., the results must be far-reaching. A.W.V. organised "Operation Flip-Flop" in conjunction with the Talent Search. No less than 15,000 transistors were given away during the exhibition, with copies of the flip-flop circuit. Entrants were to construct the unit, answer several questions on its operation, suggest a purpose for it, and write 200 words on "The Place of Transistors in Electronics Today." The result was a feature story in "Radiotronics." The winner, Roy Francis, of Springvale High, produced an extremely well constructed model on matrix board and an excellent 200 words. The comment by A.W.V. is worth repeating: "Industrial sponsors, by offering such encouragement and assistance are helping both Australia and themselves to find the scientists and engineers that are going to be needed so urgently by this country in the years of development ahead." I can suggest a more effective way of distributing 15,000 transistors, but all honour to such industrial sponsors. Can each Division Council find some more? And in case any councillor anywhere happens to read this, I'll constructively ask some more questions. Have you supplied information (at least) to your Director of Secondary Education? Have you convinced the science lecturers at your Teachers' Colleges? Are you supporting a reasonable Novice Licence scheme, proved so effective in U.S.A.? (In case there are any rude remarks from PS, I do get an occasional answer!)

The foregoing is only one of the ways in which VK3 has been making great strides forward. They now have 25 clubs, a pleasing number of industrial sponsors (public and anonymous), and enough enthusiasts like Ken Matchett and Dave Buck to keep things going well. If they could only make a breakthrough at Teachers' College, they could overtake VK2 (now up to 42 clubs). I place great importance on convincing science teachers in training (through their college) that Y.R.S. will be of great benefit. Typical industrial sponsors in VK3 are Transistor Kits Pty. Ltd. (donation of a kit to highest mark in Elementary), Technical Book and Magazine (£3 order for highest mark in Junior), and Adcola Manufacturing Co. (quantity of soldering irons to be distributed throughout the States). Other sponsors are generous but prefer to be anonymous.

Rex 2YA should be looking after himself more, but he is very active as usual. He writes (he's one of my four readers!)—"attended Punchbowl Boys' High Fete Day yesterday and was pleased to see the Radio Club had a good display. They have the Kit Set operating well, with a great line-up of boxed units labelled with the various Elementary constructional projects. Mr. Strange is science master and all our way. Mr. Mudford is O.C. Club. Also went to D.C.A. Radio School Open Day—really good show indeed. Fine roll-up of parents, friends, students and Y.R.S. lads having a look-see. All very impressed. Attended Clemton Park Scout Hall last week—11 members of Canterbury Boy Scouts' Radio Club received Wirelessman's Badge, thanks to good work of Stan Burke 2EL. These lads will now be going for Y.R.S. Elementary. Am looking forward to taking part in Jamboree of the Air with Stan's s.s.b transceiver operating from the Scout Hall."

Y.R.S. is making an impression in many places outside its own circle of the converted. I hope you noticed mention in the last "A.R." of the N.Z.A.R.T. scheme, very similar to ours. They are keen on trans-Tasman co-operation and have offered a pennant for a VK competition. We have reciprocated. They do not expect to get off the ground much until 1966. There was also a write up of Y.R.S. in "Education News," the journal of the Commonwealth Office of Education, circulating at the higher level in Education circles. There was a small article in "Popular Electronics" several months ago, and the P.M.G.'s own magazine has given us some publicity.

The only Postal Group I have news of is the one organised by a local leader, Roger 1RD. A competition (Essay on "Rescue from Electric Shock") was won by Peter Hardiman (16), of Warrawee, who will receive a handy parcel with three transistors and other parts. Roger believes safety is very important in Y.R.S. training (again, Club Leaders please note!) and stresses both prevention and rescue.

It is pretty sure there are things afoot in VK4, 5, 6 and 7, but I haven't anything definite. It would help if I had a reader there. (Not you, PS, please!) 73, Ken 1KM.

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# YOUTH RADIO SCHEME

**THE ELEMENTARY RADIO CERTIFICATE**

To qualify for this award (issued by the Wireless Institute of Australia) a candidate must meet the following requirements and pass the specified tests:—

1. Must have been an associate member of the Wireless Institute or a financial member of an affiliated Radio Club or a registered member of a Youth Radio Club or a registered non-club participant in the Youth Radio Scheme for a period of at least one month;

2. Must produce a written statement or school report (in the case of a candidate who is still attending school) to show that he has gained passes in mathematics and science at his most recent school examination;

3. Must submit evidence to show that he or his parents hold a current Broadcast Listener's licence;

4. Must demonstrate ability to make workmanlike soldered joints and connections and must answer oral questions about soldering methods as applied to Radio and Electrical construction;

5. Must identify eighteen out of twenty radio components displayed on a table;

6. Must complete to a high standard of workmanship and performance three of the following projects: (a) a crystal set; (b) a Morse Code practice set; (c) a match-box crystal set; (d) a self-powered telephone; (e) a one-way telephone operating over a distance of 50 yards or between two rooms; (f) a continuity tester; (g) a laboratory demonstration unit relating to some topic in the science course associated with electricity, magnetism or electronics; (h) draw a set of three wall charts relating to topics prescribed for the Elementary Radio Certificate or to topics in the school science course associated with electricity, magnetism or electronics; (i) a project in the high school electrotechnics course approved by the Manual Arts Master (applicable to N.S.W. candidates); (j) three laboratory experiments relating to electricity, magnetism or electronics, to the satisfaction of the Science Master; (k) such other project of equal or greater difficulty as may be approved by the Club Leader;

7. Must submit a neatly compiled Radio Notebook containing all the information required for the study of the topics specified for this Certificate;

8. Must gain at least 70 per cent. of the possible marks in a written examination based on the following syllabus:—

(a) **An Introduction to the Youth Radio Scheme.** The Wireless Institute of Australia, aims and organisation, Amateur radio, Amateur licences, the Youth Radio Scheme, the Radio Proficiency Certificates, conditions for the Elementary Radio Certificate.

(b) **Elementary Electricity.** Simple notions of what electricity is, electron flow, simple wet cells, polarisation, the dry cell, connections in series, parallel and series-parallel, simple problems, the volt as a unit of electrical pressure, use of voltmeter, conductors, insulators and resistances, the resistor colour code, simple problems in recognition of values, colour bands, tolerances.

(c) **Elementary Magnetism.** Bar and horseshoe magnets, magnetic fields, lines of force, experiments with iron filings, laws of magnetic attraction and repulsion, electro-magnets, permanent and temporary magnets, how to make a simple bar magnet, what may cause a magnet to lose its magnetic properties? Use of magnets in radio components.

(d) **Circuit Symbols.** The shorthand of radio, British standard symbols for the following components: aerial, earth, fixed and variable capacitors, coil, germanium diode, headphones, single cell, battery, switch, carbon microphone, fixed and variable resistances, microphone transformer.

(e) **How to Make a Crystal Set.** Simple notions of radio waves, use of tuned circuit to select desired signal currents, changing frequency of reception, broadcast band limits, simple notions of modulation and detection, how magnetic headphones operate, differences between audio and radio frequency currents, notions of selectivity, practical considerations in making a crystal set, workmanship hints, aerials for crystal sets, various crystal set circuits, a match-box crystal set.

(f) **How to Make a Morse Code Practice Set.** Constructional details and operating principles of a simple buzzer, an electric bell, the Morse key.

(g) **How to Make a One-Way Telephone.** Constructional details and operating principles of a carbon microphone, simple circuits for one-way telephone operation, the microphone transformer, why is a battery needed in a carbon microphone circuit? limitations of one-way operation, use of calling bell or buzzer, circuitry, constructional details.

(h) **How to Make a Continuity Tester.** Purposes of a continuity tester, various types of indicator — lamp, buzzer, meter, headphone, circuits, constructional details and operation, practical usage in locating circuit and component faults.

(i) **Administration of Radio in Australia.** The Postmaster-General's Department, Radio Branch, licensing of radio and television receivers and transmitters, call signs, some non-Amateur services, penalties for unlicensed operation, Amateur call sign prefixes in Australian States and New Zealand, broadcast station call signs and locations.

**Note:** The written examination must not be attempted until all other tests and requirements have been completed.

The Elementary Radio Certificate at pass level will be awarded to candidates who gain from 70 to 79 per cent.; at credit level to those who gain from 80 to 89; honours level to those who gain from 90 to 100 per cent.

—R. C. Black, VK2YA,
Federal Co-Ordr. Y.R.S.

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# PYE REPORTERS

(Continued from Page 5)

crystal oscillator coil. The maximum reading is what we want. Pos. 2 on N5A.

Tune C76 on the multiplier drive. If you have an English version you will probably have two air condensers, butterfly type. The one closest to the tx oscillator is adjusted first, then the next. Also maximum here. Pos. 4 on N5A.

Now go to the p.a. trimmer C71 and tune for dip. This should cause the lamp in dummy load to light.

If it does not, check coupling coil L12. If too tightly coupled it will reduce the r.f. output, also if too loosely coupled. By adjustment, you should light the globe even with 1 watt r.f.

Go back and check tuning once again and when all is peaked globe should light at least half brilliance.

## NEUTRALISATION CHECKS

Remove crystal and tune p.a. condenser tuning through resonance. An r.f. voltmeter would be quite handy here. If dummy load or r.f. meter either lights or gives a reading, tune p.a. neutralising condensers (6 pF.).

## MODULATION CHECKS

Whistle into mike, globe should light more brightly. A multimeter, on a.c. range one side to check and the other on the h.t. point to the r.f.c. at p.a. should give a reading of 120-150 volts.

If you get no modulation, check top contacts of relay, looking from the underside of chassis, for faulty contact.

If modulation seems low, while whistling into mike, adjust mult. plate condenser, modulation should show a change here. Normally, this can increase the modulation quite a lot. Failing this, check output valve 6AQ5 (V9), also valves in tx.

# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL QSL BUREAU

The A.R.R.L. advises the following changes, effective immediately, in their QSL Bureau set-up:—

KV4—Virgin Islands: Graciano Belardo, KV4CF, P.O. Box 572, Christiansted, St. Croix, Virgin Islands, 00820.

W8/K8/WA8: Paul R. Hubbard, WA8CXY, 921 Market Street, Zanesville, Ohio, 43701.

Norm Gee, VK3EQ, toured Japan during October and met many of the hundreds of JA Hams, whom he had contacted over the years on 21 Mc.

Jack Van Lear, VK2IQ, writes: I am operating aboard the M.V. Sea Search off the W.A. coast and have given my QSL address as the VK2 QSL Bureau, due to the fact that I also hold the Call VK2IQ, and am a member of the W.I.A., N.S.W. Division. I first started to opertate with the call VE7IR/mm, (my home call) and as this ship is registered in Nassau I now have the call VP7DO.

The D.A.R.C. writes: There are reasons to inform you that D.A.R.C., member society of I.A.R.U. in the Federal Republic of Germany, is alone authorised to distribute QSL cards to our Radio Amateurs. The QSL address is and will be in future: D.A.R.C. QSL Bureau, P.O. Box 99, 8 Muenchen (Munich) 27, Germany.

The Yasme sails again! Not actually, but at least in spirit! The Yasme Foundation has been re-activated with some changes and additions to its officers. Its immediate objective is to sponsor the world-wide DXpedition activities of Iris and Lloyd Colvin. The present officers and directors of Yasme are: President, Danny Weil, VP2VB, etc.; Vice-president, Hal Sears, K5JLQ; Secretary (and QSL maanger), Bob Vallio, W6RGG; Treasurer, Ed Peck, W6LDD; Directors: Golden Fuller, W8EWS, Dick Spenceley, KV4AA, Charles Biddle, W6GN, Jack Drudge-Coates, G2DC, and Frank Campbell, W5IGJZ.

Iris Colvin, KL7DTB/6, and Lloyd Colvin, W6KG, departed on an extended DXpedition that is hoped to include operation from most of the rare and semi-rare countries of the world. Travel will be primarily by commercial aircraft. The gear includes a Collins 75S-3 receiver, 32S-3 exciter, 30L-1 amplifier and in most cases a Hy Gain triband beam (A 14AVS vertical is available as an alternate). Iris and Lloyd have already visited 96 countries and held 23 different calls. Written application has been made to operate in approximately 150 countries. Iris and Lloyd say they will go anywhere. The present operating plan calls for operation from Pacific areas, then the Middle East, then Africa.

Iris and Lloyd will operate on 7000-10, 14045-55, 21045-55 Kc. c.w., and for s.s.b. 7090-100, 14100-110, 21400 Kc., listening as directed. Only one QSO per band, per mode is requested. Time G.M.T. All QSL's answered. QSL address is The Yasme Foundation, P.O. Box 2025, Castro Valley, California, U.S.A.

—Ray Jones, VK3RJ, Manager.

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## NEW SOUTH WALES

Ted Whiting VK2ACD provided a very interesting and informative lecture on U.H.F. Radio Links as used by DCA in their point to point circuits, to the September general meeting. Ted, one of our well-known 20-metre operators, showed that he was well versed on subjects in the u.h.f. region, and who knows, we may yet have to find him a frequency on 2 metres.

The lecture for November will be given by VK2AOU on "How I Built My s.s.b. Transmitter," on Friday, 26th, at 8 p.m., at W.I.C.

The December general meeting will be on the third Friday (17th) at W.I.C. It will be a social evening and a film programme has been arranged.

On Sunday, 28th November, the VK2 Division will be holding a "family picnic day" at Lake Parramatta. The idea is to give the XYL and harmonics a day out and keep radio at a minimum. (When "Hams" meet is this possible?)

Divisional membership is growing slowly but we would like to see more. Twenty-three new members were admitted during September.

The QSL Bureau is still handling a record number of cards which seems to dispel any belief that activity is poor. At the present rate the bureau expects to handle 40,000 cards for the year.

Mr. Fin Stewart (C/o. Dalgety & New Zealand Loan, 15 Bent St., Sydney) is a collector of vintage radio and electrical equipment. He would like to get in touch with anyone of similar interests.

W.I.C.E.N. in VK2 is proceeding well with new interest, particularly in the v.h.f. region. Regular meetings have been held and take place on the second Friday of the month at W.I.C. The W.I.C.E.N. office bearers appointed include Secretary Peter Campbell VK2AXJ, Treasurer Don Miller VK2GN and Registrar Arthur Reynolds VK2ZBV, whose duty it will be to keep a list of all members of the net, address, phone number, type of equipment, etc., so that a plan of operations can be implemented quickly in an emergency. W.I.C.E.N. officer to council is Vic Cole, VK2VL.

The present plan is to form a group of mobile operators on 146 Mc. f.m. and 53 a.m. who can be despatched to any area within 100 miles of Sydney and be controlled either from Dural (VK2WI) or from six or eight base stations which have been built and are operating. Approximately 50 mobile stations will be operating in a few weeks.

The next plan will be to organise the country nets on 3.5 and 7 Mcs.

The September meeting of W.I.C.E.N. heard a lecture by Keith, VK2ZAU, on converting the Pye taxiphone to 6 metres.

Zone officers have been oppointed in three of the six areas in VK2 and it is hoped to fill the remainder in the near future. In Area 1 (North Coast) it is VK2AGE, Area 2 (North Western and New England) VK2BMK, and Area 5 (South-West) VK2AEC. The areas are the same as the Civil Defence zones (and used by W.I.C.E.N.).

A Zone 2 hook-up takes place every Tuesday evening at 2000 E.S.T. (1000 G.M.T.) on about 3600 Kcs.

These appointments will be important in the reorganisation of the VK2 W.I.C.E.N. system.

Blue Mountains. This section, which meets on the third Friday of the month, recently announced that they were transferring their meetings back to the old Council Chambers at Lawson.

An s.s.b. station was operated at the Dubbo Trade Fair on September 4 last. Using dipoles on 40 and 20, it provided the public with an opportunity to see Amateur Radio. The station was set up and operated by VK2's AZW, AKC and AMR.

Griffith Radio Club is again active with about 18 members. Max Brigg, who is a science teacher at the Griffith High School, is going to sit for his A.O.C.P. in the near future. Lectures at the club are being given by Ted 2AXD and Eric 2ALL and assisted by Stewart 2PL.

### HUNTER BRANCH

A funny thing happened to me on the way to the Convention. I saw an employee of the Paddy Maloney's Goat Department crawling about on the roof of the emporium of Marcus Clark in the Newcastle West area. The funny thing was that he told me that he was erecting an aerial for the inter-zone hook-up—a likely story. Seriously though, things went very well at the fourteenth Annual Convention of the Branch which was held during the six-hour-day week-end.

Activities commenced on Friday night with the homebuilt equipment competition which attracted eight competitors with a most varied and exciting array of equipment. Those taking part were: Bill 2ZWM—2 and 6 metre transmitter; Des 2ZDN—tri-band transmitter and receiver for 52, 144 and 432 Mc.; Mac 2ZMO—6 metre v.f.o.; John Bedford—timing equipment for hill climbs; Ian O'Toole—additive frequency meter; Tony 2ZCT—2 and 40 metre transistor receiver; Alex 2JZ—tri-band s.s.b. transceiver, and Les 2RJ—power supply. All told it became a very difficult task for the judges and members of the large audience of 50 to decide which item described best deserved the award for the night. So close was the voting that it was decided to award a joint prize to Tony 2ZCT and Des 2ZDN for the most praiseworthy effort.

The display at the equipment competition is a true reflection of the most worthwhile effort which has been made by members of the Hunter Branch. For the third year in succession members have shown that they can produce novel and technically efficient equipment built to a standard which would hold its own with Amateur constructed equipment anywhere. When it is considered that this work is drawn from a population of about 100, it is all the more commendable.

The Convention Dinner was held on the Saturday night at a new venue, the Drill Hall in King Street, where 82 were present to hear the guest speaker, Mr. Arthur Gabb, of the A.W.V. Company, speak on the latest developments in semi-conductor devices. The convention was officially opened during a hook-up with the South-West Zone using equipment lent by Bill 2XT. Ivan 2AIM was the speaker at this end and his counterpart was the president of the Tumbarumba Shire at the South-West Zone dinner. Although conditions were far from perfect the s.s.b. gear worked well and communication was established and maintained. Lionel 2CS proposed the toast to the Institute during which some otherwise deep secrets came to light. Ivan 2AIM responded on behalf of the N.S.W. Division.

Once again the venue for the Field Day was the park at Marmong Point on Lake Macquarie. The day was fine and a very good roll up of members and visitors ensured an interesting day for competitors and non-competitors. Transmitters were hidden in very obscure places and many were the winges of those who could not locate them. Some even claimed that they could not hear the signal. There is promise of an amended schedule next year to make provision for many more transmitter hunts with shorter distances to travel. This should prove popular with the visiting direction finders. Refreshments were supplied this year by the Westlakes Radio Club and it is hoped to make this a regular feature at future conventions.

During the school holidays, ten members of the Westlakes Club visited Sydney to be conducted on tours of inspection of the A.B.C. Forbes Street studios and the Amalgamated Wireless Valve works at Rydalmere. This was a good opportunity for the lads to gain first-hand experience of job possibilities in the electronics field. Most of them also completed the "operation Multiflash," organised by the Valve Company and they are hopeful of some good results.

As a result of the recent Convention, it may be necessary to place a restrictive points allowance on Sydney members driving Morris cars—green ones. That Andrews man now knows too much about the geography of the lakeside district and it appears that transmitters will have to become /MM to defeat him. Well, we'll see. Those who claim that all raffles are swindles should ask Margaret Lloyd, harmonic of Stan 2AYL, when I'm sure that doubters will be persuaded otherwise. Of course, competitions for transistor radios is another matter.

The latest call in the Branch area is that of Allen ex-6ZDM, once known by his acquaintances as "2-bob Maschette." He is now fitting in well with the new currency, being now worth only half the previous value at 2ZAX. He has even conned his friend Dave to join our ranks and we welcome him. And while speaking of ranks, there is the tale of the soldierly gent who said he was using a 75-foot vertical, lying on the ground. He'd, of course, forgotten his guy wires—but please don't you forget our December meeting—it is on Friday, 3rd, in Room 6, in the Clegg Building, Newcastle Technical College, Tighes Hill. And I shouldn't be at all surprised if there are some goodies and tea and coffee to be had—since it is nearly Christmas—by the courtesy of Bill 2ZL. Lionel may also be persuaded to show some more of the excellent slides which he gave us at the dinner. Shall I see you? 73, 2AKX.

## SILENT KEY

It is with deep regret that we record the passing of:

VK3ADM—D. E. McCarthy.

### BLUE MOUNTAINS SECTION

The B.M.S. of the VK2 Division will be holding their annual Field Day on November 21 and a full programme has been arranged This year it is hoped that members of the Y.R.S. and interested Boy Scouts will be able to participate in the field events.

The field day location will be at the Lawson Swimming Pool grounds, and registration will start at 10 a.m. The programme includes: 11.15 a.m., 144 Mcs. sniffer hunt on foot; 12.0, Lunch; 1.0 p.m., 144 Mcs. Hidden Tx Hunt; 1.30 p.m., Bus trip for the ladies; 2.15 to 2.45 p.m., 144 Mcs. Scramble; 3.0 to 3.30 p.m., 7 Mcs. Scramble; 4.15 p.m., Prize presentation.

Registration $1 for each member (including the family). There will be the usual ice creams, drinks, and hot water free. Lucky numbers and lucky dip.

Make November 21 your day for a trip to the mountains—the weather should be perfect. 73, VK2HZ.

### SYDNEY YLs

The Sydney YLs had an inspection of the D.C.A. communications at Mascot on September 6 with 16 in the party. A great deal of confidence in the safety of air travel was generated as a result of the visit. We had lunch in the Overseas Terminal where we could watch the big jets loading, so we had a thrill of travel without the attendant bother.

There is not much to report this month, as the school holidays slow down most radio activity. However, Hebe VK2AOK and Muriel VK2AIA were able to pay me a visit in the bush and Hebe brought her little red-haired daughter with her—Dia by name.

Verle VK2MR has been hit with the 'flu again but now that summer is here she will be on the mend I'm sure. I understand that Hebe has had a few words with Freda VK2SU lately. 73, Mona, 2AXS.

### CENTRAL COAST

The last meeting of the Central Coast Amateur Radio Club was held on Friday, September 17, with an attendance of 18. It had been planned to have some of the men talk about their "radio-activity" but there was so much business to discuss that only Frank Pearson VK2ACQ and Gordon Proctor were able to be heard. Frank showed some of his mobile aerials and has left on a four weeks' tour of N.S.W. and Victoria when he will contact other Hams along the way, as he is the State Liaison Officer of the W.I.A. Gordon showed some of the work that the students are doing.

Phil Levenspiel VK2TX has left on a tour of the outback which is to include a visit to the Simpson Desert and will no doubt have a lot to tell on his return. He is in regular contact with the home town and on the last report their group had made camp near the "DIG" tree of Burke and Wills. John Trewhella VK2RF, XYL Joy and harmonic Jill have just had a very enjoyable tour of the Warrumbungles, Lightning Ridge, Broken Hill. They said there were no opals in "them thar hills" but plenty of gorgeous scenery. They brought back some excellent colour slides which are bound to whet the travel appetite of anyone lucky enough to view them.

From all reports, Lindsay VK2ON is having an interesting overseas tour. Last bit of news was that he was in Scotland but did not appreciate 45 degree temperatures. There is no place like Australia when it comes to climate. We have everything from snow to the tropics and there is no need to have a passport if you want to go from one to the other.

We were very sorry to have to accept the resignation of Percy Day who has been our treasurer for the last year and a half. Percy has been a T.P.I. for many years but always made an effort to be active. He attended the radio classes held last year and was also the treasurer for the class. He did an excellent job and it is hoped that he will recover his health and continue bis interest in radio.

Alec VK2AAK is to be the QSL manager for the club and W.I.A. members who wish to make use of this service are asked to bring along their cards to the meetings.

Convention and Field Day time is upon us and this is a timely reminder that the Central Coast Field Day will be held at Gosford on a Sunday around the middle of February. This is the usual time but, as yet, a definite date has not been set. This is always a very enjoyable day with plenty of fox hunts, sightseeing tours for the XYLs and harmonics and any of the men who want to see some of the district. Last year we had the usual boat trip on Brisbane Water as well as a bus trip to the local beaches and scenic points. This year will be much the same but the bus trip will be on a different route. A delicious salad lunch is included in the overall cost, morning and afternoon teas, too. So you really get your money's worth at Gosford. We are always on the lookout for the people who travel the longest distance for that day and, of course, there is no need to say that all visitors and families are welcome. Hope to see a bigger crowd than ever this year—it's a good day for a family outing and everyone is catered for in a special way. 73, Mona 2AXS.

### SOUTH-WEST ZONE

Over the Six-hour-day holiday week-end on the 2nd, 3rd and 4th of October, the 13th Annual Convention of the South-West Zone was held at Tumbarumba. Visitors started arriving early Saturday and by lunch-time most were there. In the afternoon a visit was paid to Paddy's River Falls, one of the local scenic points. After this, several visitors paid a visit to the local trade fair.

In the evening the Dinner was held at the R.S.L. Hall with an attendance of over 50. At the end of the dinner a s.s.b. 80 metre hook-up with the Hunter Branch was made and Divisional President Ivan 2AIM at Newcastle (Hunter Branch) and Tumbarumba Shire President (Cr. L. G. Roth) exchanged greetings and together officially opened both Conventions. This is possibly the first time that such an opening has taken place. The evening concluded with some films of the Snowy Mountains Scheme.

On Sunday the field events took place at the Tumbarumba showground. Following the all-band scramble, there was a 2-metre hidden tx hunt. All present then enjoyed an excellent bar-b-que. The afternoon events included a second two-metre hidden tx hunt, a pedestrian tx hunt and a 2-metre fox hunt. During Sunday evening those who remained attended a slide evening when John 2EZ showed a collection of the Snowy Mountains Scheme taken from the air.

On Monday a small party went on a tour of the western side of the Snowy Mountains Scheme.

Members present on Sunday took part in the VK/ZL Contest from a portable s.s.b. station at the showground. Over 60 people took part in the week-end. Next year's Convention will be held at Wagga Wagga.

Those who attended included VK's 2ZAA, 2ZEX, 2AJO, 2EU, 2ZPI, 2ZTM, 2ACQ, 2ZE, 2EY, 2APQ, 2SW, 2EZ, 2ACZ, 2AWC, 2RS, 2AJI, 2AEC, 2AY, 2OU, 2ZOO, 2AVP, 1VP, 3ZU, 3ZKK.

Results: All band scramble: 1, Bob 2EY; 2, Don 2RS; 3, Frank 2ACQ. 2-metre Hidden tx hunt (morning): 1, Eddie 1VP; 2, Keith 2ZAA; 3, Sandy 2ZEX. 2-metre Hidden tx hunt (afternoon): 1, Sandy 2ZEX; 2, Don 2RS; 3, Tim 2ZTM. Pedestrian fox hunt: 1, Alf Bullock; 2 Leon Skeers. Fox hunt: 1, Sandy 2ZEX; 2, Kevin McLaughlin. Guess the frequency: Fred 2AJI. Call Sign raffle: Jack 2AY.

Thanks to the many trade houses for the excellent prizes.

The South-West Zone hook-up takes place every Monday night at 1000 G.M.T. on about 3580 Kcs.

The following regional Zone officers have been appointed for the South-West Zone (Area 5): Central Murray, Fred 2AJI, and for the Upper Murray, Trevor 2ACZ, for this year and John 2EZ after January 1.

## VK2 DIVISION

### FAMILY PICNIC

At LAKE PARRAMATTA,
on SUNDAY, 28th NOV., 1965.

### ANNUAL CONVENTION

On AUSTRALIA DAY WEEK-END,
at VK2WI, Dural.

### 2 MX DX WEEK-END

On 1st, 2nd and 3rd JAN., 1966.

Select a mountain, form a team, collect all your 2-metre gear together and join in with the VK2 operators who will be in the field over the New Year week-end.

### Blue Mountains Section ANNUAL FIELD DAY

On SUNDAY, 21st NOV., 1965,
At LAWSON SWIMMING POOL GROUNDS.

Refer VK2 Notes, Bulletin and broadcast for details.

# QUEENSLAND

### TOWNSVILLE AND DISTRICT

Once again the time has come around to try and find something to write about. Not having any club notes to tell about I find it hard to manufacture something to say. Maybe in the not too far distant future we will again have a club in the district. Then there will be no lack of interest to write about. Remembering that in the past while the club was functioning the editor had to re-condense what I had written about. So that the other scribes could get their fair allotment of space.

Since last writing a trip was paid to some of the boys in the far north. Harry 4HK hopes to get a custom-built rig and come on s.s.b., while Basil 4ZW is still in the throes of hatching a superb receiver guaranteed to bring in the DX that no one else can hear. Bert 4LB has built an audio oscillator to tune up his Viceroy. Now boasts that he has it right on the nose, not noise. Evie 4ZEF coming up this time for the sound barrier, all the boys are in your corner hoping that you make the grade. I personally know that the YLs in Sydney are hoping to work you under your own call sign.

Ken 4KT hoping to get on the air again in November, very busy at the present furthering his education. Best of luck with it Ken. Eric 4EL on 21 Mcs. on phone this time working the JA's and any others that care to call in. What a whale of a signal at this QTH.

Now that Seacom has a tower within ¼ mile of my tower, suggestions will be welcomed how best I could bounce a signal on the v.h.f. to the boys in the far north for reliable QSO. 73, Bob 4RW.

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# SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division was held to a well below average attendance of members in the clubrooms on the last Tuesday night of September. The reason for the below average attendance is hard to find, as the weather was on the mild side, the technical lecture for the night was of a high standard, and at the same time instructive and entertaining, but in view of the fact that I, in company with several well-known members of Council, was among those absent, I do not propose to pursue the subject any further!

The lecturer for the night was Mr. R. Mathews, Safety Officer for the Electricity Trust of S.A., who discussed at length the subject of mouth to mouth resuscitation and closed heart massage, together with an excellent film of American origin on the same subject, with Raymond Massey as the comperc, which at its conclusion saw quite a number of viewers a little green about the gills, due to its realistic presentation of the heart in close-up, side, front and rear.

Added to all this, as a grand finale, there were two mannequins, and an exciting mannequin with the exotic name of Resuscitanny, which were all used for practical demonstration, although I have been given to understand that Resuscitanny drew the largest queue of would-be learners, the reason for which entirely eludes me, but then this is only to be expected from one who has led such a sheltered life, to say nothing of my shy, modest and retiring nature.

The vote of thanks for such an entertaining evening was ably proposed by Keith 5KH, and the resultant applause from those present must have been music to the ears of Mr. Mathews, who undoubtedly went to a lot of trouble to demonstrate his subject.

Very little of interest came to light in the business section of the meeting, either Divisional or Federal, and the night came to a close at the ridiculously early hour of 10 p.m., much to the disgust of the caretaker's Alsatian, who had spent the early part of the night mentally digesting his usual 11 p.m. supper of tweed, or possibly pure wool pants seat! Incidentally, I resent the suggestion going the rounds at the end of the meeting, that it was a pity that I did not stop away from meetings more than I did, as the members could then get an early night's sleep. In my defence all I can say is, "I pays me subs. and I has me say," and the Devil "take the hindmost" or something along those lines. However, if this is not plain enough see me personally and I will be happy to make the

## JOHN MOYLE MEMORIAL NATIONAL FIELD DAY CONTEST, 1966

**12th February to 13th February**

matter clear in words of one syllable, with a dash of red!

One of the disadvantages of being considered something of a veteran in the radio game is the fact that at various times little bits of equipment begin to wear out and it is quite an emotional affair when one has to throw out a coherer, or a cat's whisker, or possibly a piece of galena crystal. It is like throwing out an old friend into the cold, cruel world, and is only done as a last resort when the said piece of gear really lets one down. Last month my crystal ball really let me down, and although I have had it since it was a 200 metre rock, I had no pangs of remorse as I ditched it over the back fence, never to return—I hope. The reason for the instant dismissal of the crystal ball was the fact that when I was idly gazing into it recently it distinctly showed me Muriel 2AIA and her OM 2CM as planning a trip to Europe next year, and with this early glimpse into the future I plotted, by suggestion, to be the lucky one whose dainty fingers and elegant hands might carry their bags, and passed on the thought to the VK5 column in the magazine for September. Imagine my surprise and horror to receive, on the day the "mag." came out, a telegram from VK2 as follows: "My XYL Verle 2MR says your dainty hands can carry the bags if I go to U.K. with Muriel 2AIA" —signed Marc 2CM—Well—did you ever—I have got my XYL's and OM's a trifle mixed—Tut-tut—Anyway, I must admit that the picture that I saw in the crystal ball was a trifle hazy, due to old age I expect, but even though it was an old and trusted servant, out it had to go. Just as well, probably, because it would not have been any good for this month, it is very dark in this cave in the hills, from whence I am writing these notes, and in which I intend to abide until the heat goes off!!! Nevertheless, I definitely have it in writing that Verle 2MR will permit me to act as porter for the trip she will take with her OM Marc 2CM to Europe—Dear, oh dear—Bang goes a couple of noughts off my salary from the magazine. Oh, by the way, my deepest thanks to all of my friends who could not get to me quickly enough to sympathise!!! with me over the crystal ball's mistake, little apples will grow again, don't step off that white line brothers, or you will be gone—and how!

Heard a voice on 7 Mc. the other day that I have not heard for many a moon, and strangely enough I picked the voice before I heard the call sign—and on s.s.b., too. None other than Ted 5MO, who incidentally told his VK3 contact that it was his first appearance on the band for 12 years or so. See—I can copy s.s.b.—despite rumours to the opposite effect.

I also heard on the same day, and on the same band, another voice that I have not heard for some time—to wit—Keith 5ZY. He was a regular on 7 Mc. every Sunday afternoon with his skeds with 3KE, but I understand that he now has these skeds mostly at midday these days. Nice to hear you OM. Do you still sit in the members' stand at the football?

Bill 5FR has a potent signal from his mobile outfit at my QTH. Heard him on 7 Mc. the other Sunday afternoon from Mount Lofty, in contact with a VK3, and his signal was the loudest on the band, and that's saying something.

Strangely enough I have been getting most of my information this month from listening to VK3 signals, this will have to be altered, but I heard a VK3 in contact with Don 5TM, although I could not hear Don—and later on I heard from the same source the name of Joe 5JO, and gathered from the conversation at the VK3 end that Joe was spending a little time at Currency Creek, the name of Hartford being mentioned, but not even a peep could I hear from Joe. What it is to be a man of leisure—How's the millions holding out, Joe?

Talking of men of leisure, Jack 5JS has joined that illustrious band of lucky individuals and can be heard banging the key at unusual hours and with a modicum of success DX-wise. Had a short visit from him and his XYL the other day, and they tell me that they are off to VK3 in the near future for the Big Bike race, and other attractions. Needless to say he laughed at my warning as to what happens to VK5's found at large in VK3 but time will tell. It does not do to ignore the gipsy's warning!

In these days of the over use of adjectives such as fabulous, colossal, etc., etc., I suppose I must get into the act by telling you if you want a few minutes of dizzy listening, tune into the sked between Jack 5LN and Athol 5LQ on 7 Mc. in the early evenings. One calls —no answer—the other calls—no answer—they both call together—still nothing doing, and eventually they hook up, but their troubles aer not over, Jim 5JK breaks in, gets their names mixed up, and again they both come back to him together, sign over, and a deathly silence settles in, to be relieved by Jim calling in someone by the name of Antonio, who fails to materialise, and everybody then packs up and goes off to the evening meal. Dizzy listening, that's an understatement, my XYL had to come into my shack and throw water over me to get me round to have my evening meal. Put me out of my misery, fellows, just who was Antonio, and where did he eventually disappear to?

Received a letter from Cliff 4QJ this month seeking some information on the Type 3 Mark 2, which, luckily for my reputation, I was able to forward to him. He was a bit on the lucky side because he nearly scrubbed himself off by telling me that his credentials could be vouched for by none other than my old sparring partner 4 Uncle Xray (Claude to you) now at Childers—what's that?—you don't know where Childers is—well, how ignorant can you be—What's that, where is it? —Well, er, er, er, shall we go on with the story? Anyway, his second boner was to tell me that he intended to use the Type 3 Mark 2 as a standby until he cleared up the strife in his s.s.b. rig, and hoped this would not put him beyond the pale. Well, how insulting can one get? Nice to meet you OM, s.s.b. or no s.s.b.!

Heard Burnie 5FB on 7 Mc. the other afternoon in contact with the inevitable VK3, and an FB signal he was putting out, too.

Murray 5HH is another mobile station that I have been hearing each evening as he wends his way homewards from his daily toil, and his signal at times pins my S meter hard over, and it is considered to be a little on the Scotch side.

The number of VK5's who are on the gentlemen of leisure list these days appears to be growing at quite a fast rate. Reg 5RR is one of the latest but he is a little different from the rest because to help him fill in his spare time he is now the "Mine Host" of the Kiosk at Hawthorndene, more delicately known as "Joan's Pantry." Drop in and see him if you are around that way at any time, and as you munch your pastie with mustard, or perhaps your pie with tomato sauce and custard, or whatever your appetite dictates, and have a chat with him on matters radio. By the way, he is not at all stuck up, s.s.b. or a.m., it does not matter to him, he will do his best to spill the coffee or tea in your lap. Real hot for s.s.b.

The pen has again been proved to be stronger than the sword, if Len 5ZF can be taken as a guide. Recently I put a paragraph in these notes that he was talking to Keith 5KH and seemed to have leanings toward s.s.b., but heard him saying the other night to a contact that s.s.b. was old hat and he now had taken up c.w. and a.m., and he sounded just as convincing as he did on the occasion when he was discussing s.s.b. Apparently my paragraph succeeded in its intentions.

Uncle Tom 5TL is at the moment of writing on his annual leave and will by now be heading for the home of the Wise Men of the East—to wit VK2. Understand he is driving over and coming back by train—Looks like some VK2 is going to find a cheap motor car somewhere in Sydney—or have I got the wrong angle? By the way, he has earned his holiday, his office has been in the hands of the builders, and what with holes in the walls, dirt and dust, electricians putting their feet through the ceilings, to say nothing of big, big, big spiders coming down through the hole thus made and having a look at Tom every now and again, he has almost been up the wall at times. The only thing that stopped him was the size of the spiders, he was frightened that they would grab him and hoist him up into the ceiling and dust him with salt and pepper and go to it. Bit tough, I reckon! Get it—bit tough—you know, he would be a bit tough to eat. Oh, all right—I thought it was clever.

Frank 5MZ at the moment of writing is in the Royal Adelaide Hospital, after having had ulcer trouble and consequent surgery. Understand he was a very sick little boy for the first week or so, but according to Carl 5SS whom I heard on the air, he is now on the way to his normal self. Once again my first intimation of his being sick came via a VK3, none other than Reg 3MZ who was rushing up and down the 7 Mc. band enquiring as to Frank's condition from all and sundry in VK5. A mighty signal, too, Reg., if I might say so. Anyway, hope all is well Frank, and hurry up and come home, the 7 Mc. band does not seem the same without the "Skeds."

It does not take them long to start playing up once they get away from my watching eye and ear, as is demonstrated by the message I received this week via Nobby 5WK from Bruce ex-5MC, now resident up there in Tennant Creek with the Geo-Peko Ltd. company as their maintenance officer. Yet, you have guessed it, he has gone s.s.b., and the smirk on Nobby's face, as he passed the message on, helped to rub it in. Bruce, how could you? and Pam, how could you let him lower the colours?

Someone said to me this week, "Haven't heard Johnny 5KO for some time, where is he these days?" I replied quite smartly that if he cared to listen on 7 Mc., in the c.w. section, most afternoons at least, he could hear that gentleman in contact with the W signals, and knocking them over as fast as they came along.

Phil 5NN, my local contemporary for the s.s.b. column in the magazine, paid me a visit this month to collect the R.S.G.B. magazines he had lent me. I forced him to take some 73 magazines away, all about s.s.b. Am I sinking?

Heard Gordon 5HM on 7 Mc. the other Saturday afternoon in contact with Nobby 5WK, and from this piece of news you can deduce that Gordon has joined the ranks of the s.s.b. mob. I gathered from what I heard that he has deserted me for about a month and is well satisfied with the results, although they tricked me a little, because apparently this s.s.b. racket has some inbuilt device that lets the operators know if anybody is reading the mail, as I had only just started to listen to them when they said, "Let's QSY down to 14 Mc.," and without as much as by your leave, or even excuse us, they tootled off and left me holding the bag—a.m. is never as rude as that!

Jack 5LR is still neither fish nor fowl, as I have said before. He is with Comps 5EF on 7 Mc., and with me still on the other bands, and although I have mentioned this before in the notes, my once strong army of followers is decreasing so rapidly that a couple of mentions on the same subject is now necessary to strengthen my morale.

Incidentally, I have been checking up on this s.s.b. racket lately, and I am beginning to wonder just how they manage to keep a contact going with all the noise and din created by the other stations trying to get into the act. They lob on top of the two stations in contact like a lot of spoggies lobbing on a wire fence. I suppose this technique is what Comps 5EF calls "getting with the strength," but to me, who was brought up in a very strict and circumspect manner in my early youth, it all sounds like what we used to call butting in. How do they know they are welcome?

Jack 5LN is another one to be heard on s.s.b.—why does this keep bobbing up all the time?—although to be frank with you I cannot say for sure if he was on s.s.b., or just in trouble, because on the two occasions that I have heard him, one on 80 mx and the other on 7 Mc., he was only on for a half a minute and then something went bang, and no more Jack. Athol 5LQ—give with the news—has he deserted us?

The Federal Comment in the September "A.R." by my old palsy-walsy Maxie-Waxie 3ZS—what's that?—a little more respect for our Federal President—Sorry, Mr. Hull, Sir, it won't occur again, Sir—anyway, Mr. Hull, Sir, that editorial in the September issue of "A.R." excited a lot of comment both on and off the air. Once again, Mr. Hull, Sir, well spoken, Mr. Hull, Sir, and more power to your quill, it carried the mark of a real leader. Thank you once again, Mr. Hull, Sir.

Keith 5KH, my favourite banker, he personally counts my bottles when I deposit them against my drooping account, brought me along a copy of Goddard News, which is a U.S. publication of the Public Information Office of the Goddard Space Flight Centre, National Aeronautics and Space Administration, in which is stated that the 1965-66 series of Goddard Scientific Colloquia begins on September 17 with a talk by Dr. Robert Roper, of the Planetary Radiations Branch, Laboratory for Atmospheric and Biological Sciences-G.S.F.C., National Academy Fellow of the University of Adelaide, Australia, who would discuss "Atmospheric Motions as Determined from Radio Meteor Tralls." All of which adds up to the fact that Bob 5PU will strut his stuff, and at the same time uphold the honour of the leading Division of the W.I.A. I thang you—I thang you!!!

In closing these notes for this month, I must refer to the wonderful boost to my ego, these chaps who leave VK5 and add to their fame and fortune in distant lands, really give. Just think, someone mentions Dr. Robert Roper, and I take it up with—"Young Bob, oh yes, many a discussion I used to have with him," this then becoming the signal for everybody to give me a second look, thus permitting me to give a short talk on the application and limitations of the radio meteor for determining atmospheric motions in the height range 80 to 100 k.m. Blime! did that come out of me, sorry to pinch your thunder Bob. How are the family?

In checking these notes before "putting them to bed," as the journalists say, I am struck by the almost montonous repetition of

s.s.b. in the paragraphs. This must cease forthwith, as instead of being anti, it looks as if I am more than pro, and even might be at the cross roads and about to desert a.m. Therefore, as from now I intend to refer when I unfortunately have to refer to s.s.b., to label it as "the thing," and in this way I will be able to keep the notes going without this horrible repetition. Why did they ever have to bring "the thing" into an otherwise quiet hobby? 73 de 5PS—PanSy to you.

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## WESTERN AUSTRALIA

We heard mobile Stan VK3ZE operating from Baledonia and heading in the direction of VK6 land, along with Stan is a companion, Mac, of whom I understand is ex of Menzles. Hope you enjoyed your tour of VK6 ehaps, also the liquid refreshments of Kalgoorlie, or didn't you try it Stan? If you got tangled up with 6DD and 6EP any old thing could happen.

Note a new call sign, VK6SW, congratulations Bill on the nice a.m. transmission and welcome to the 80 mx band, which is becoming very active again.

Len 6LG has been on the sick list up till 11th September. Sorry to hear this Len, we all hope you are O.K. now.

We have been hearing the voice of Alan 6AB from various shacks.

George 6GH is heading in the northern direction, both himself and XYL intend to enjoy the picturesque scenery and beautiful array of wild flowers that is to be found in the north at this time of the year, particularly in the Murchison area. I guess the camera and tele lens will be working overtime. Hope you strike good weather, George.

Have ideas that we may hear a station in operation some time soon from Leonora, "hurry up and get that ticket Brian."

At the September meeting of the Institute a rather interesting talk was heard from Cedric 6CD, the topic being on solid state transceivers, one in particular of 6 watt p.e.p. Noted also the wooden spoons were out as a few in particular discussed the future of some tx equipment soon to be available. However, a most enjoyable evening was had by all. 73, 6KN.

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## TASMANIA

Short and sweet this month, I'm afraid, folks, though I expect you are glad, and have not got a moan either!

The October General Meeting was attended by about 30 members and some half dozen visitors, including one, Ken 3AFJ, that well-known "gent" from Melbourne town, who sneaked into the clubrooms during the lecture and was not recognised until supper time, when Ted 7EJ muttered some profanity then shouted, "It's the VK3 President!" Trust you enjoyed your all-to-short stay in the Apple Isle, Ken, and hope we see you over here again in the not too distant future.

The lecture at the above-mentioned meeting was the second one given by Mr. Rod Sutherland, of the National Heart Foundation. Let's hope we may have a third lecture some time soon. I feel sorry for those members who missed it, both lectures have been most interesting and enlightening, and delivered so that the layman can understand the medical side of the situation. I think Len 7LE deserves a big pat on the back for the way he comes up every month with a most informative lecture on some subject allied to radio.

Another pair of visitors recently were Phil 5NN (the VK5 Federal Councillor) and Kevin 3ARD, who were here in connection with the generation of power (50 cycles) so I am told.

Our weather of late has not been the best from the Amateur's standpoint, winds in the 80 m.p.h. bracket and one gust of 93 m.p.h. recorded. Several local boys did not do so well, among aerials down were those of 7TX, 7EB, 7TA, 7ZMD, and yours truly.

There are two new Z calls to be heard locally (at present), they are Barry 7ZBJ and David 7ZMD, who were both successful in the July exams. Both lads are on 52 Mcs. at present, but it will not be long before other bands are "under their belts."

VK7WI now sports 50 watts on 6 metres, and xtal locked receiver, to a ground plane on the roof, and we hope soon to have a 522 set on 2 metres.

This year's Hamfest, to be held at Campbell Town on November 27 and 28, is a full State job, with the three zones all doing their share. The final success will depend of course on the weather, and you. Do your best and turn up with the family and the mobile rig. See you there. 73, Geoff 7ZAS.

### NORTH-WESTERN ZONE

The last social meeting of this zone was another very successful one with a large attendance in spite of the inclement weather. The meeting was devoted entirely to lectures and the first person to take the floor was Brian 7ZBE.

A blackboard was produced together with an ample supply of chalk, and when everything was organised Brian carried on with what was to be a very interesting talk on acceptor and rejector circuits.

After Brian had stepped down, Gerald Wade, a young associate with quite a bit of technical know-how gave a talk on a 2-metre converter suitable for mobile operation. Gerald even brought along his own masterpiece which he had built himself and which was beautifully constructed. With the aid of a circuit diagram Gerald showed the meeting the various stages of operation, etc.

The last lecture of the evening was given by none other than that genius of electronics and radio himself — George 7XL. George's subject was mobile antenna design and once again we were all entertained to a most instructive and interesting talk on one of George's pet subjects, complete with the actual working model of his 80-metre mobile whip together with its associated loading coils and matching Balun transformer.

After the lectures, supper was served a la 7ZRS/MS style. Among the crowd (it seems to be increasing every meeting) I noticed a new face—to wit, a visitor from Burnie, Jack Hillman. Welcome Jack and make yourself at home with the gang

It was during supper that I first noticed a rather learned looking gentleman, who turned out to be our worthy treasurer, Max 7MX, busily engaged in positioning a notice board in full view of all and sundry. Now this zone never having been privileged with owning its own notice board—it caused quite a stir and everyone pushed forward to have a gape—but soon receded rather quickly when they discovered a typewritten demand for zone fees together with a black list pinned on it. However, the message got home and a few paid up and had the satisfaction of seeing their names struck off the black list. I asked Max why his name was still on the list and he replied "So that you can have something to write about! !"

The evening concluded with a rather complicated piece of radio equipment being brought forward by the master-mind of mechanics, Sid 7SF. Now Sid being a bachelor, loves to fiddle with things and this is his latest dreamchild—I don't know whether you have even been inside Sid's shack, but if you have not the best way of describing it would be to say it resembles a certain well-known Hawthorn Radio mail order establishment. There must be just about every piece of ex-disposal equipment procurable stacked in that small room all waiting for Sid to lay his hand on to tinker with when his mood so decides.

Don't forget the Hamfest at Camobell Town this month—bring along your family and put your mobile outfit in the front seat even if it means having to shove your mother-in-law in the back, and make a day of it.

I will be there complete with powerful field glasses and various disguises to catch more gossip for the December notes—so until then good DX and pleasant rag chewing. 73, David 7MS.



# HAMADS

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**Extra words, 2d. each.**

Advertisements under this heading will be accepted only from Amateurs and S.w.l's. The Publishers reserve the right to reject any advertising which, in their opinion, is of a commercial nature. Copy must be received at P.O. Box 36, East Melbourne, C.2, Vic., by 8th of the month and remittance should accompany the advertisement.

ANY offers for B.C. Car Radio advertised in last month's ad.? Also for sale, Stromberg Carlson 3-speed gramo, motor, turntable and pick-up, £3. A. W. Chandler (VK3LC), 1536 High St., Glen Iris, Vic. Phone 50-2556.

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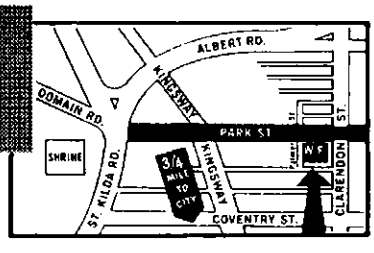


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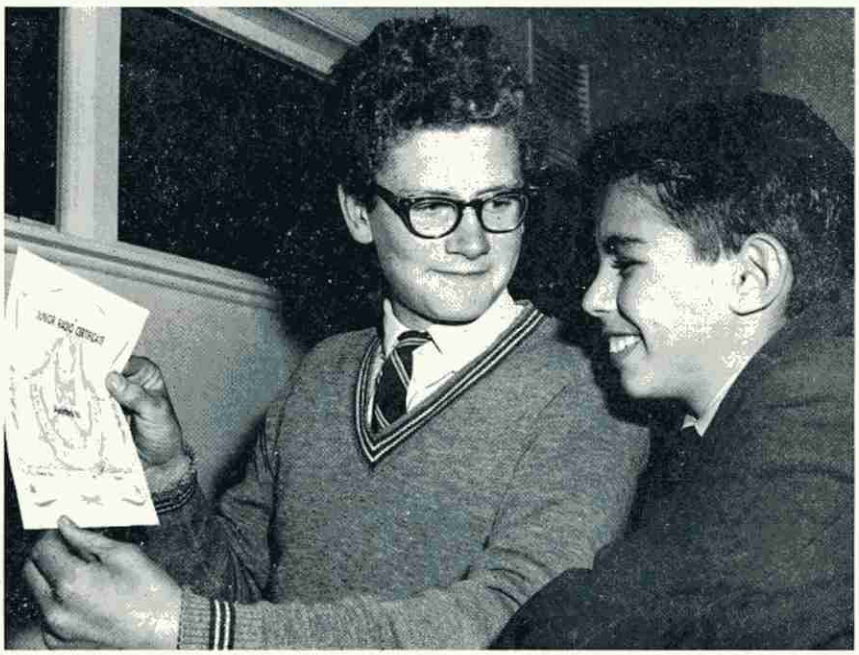

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## OUR COVER

Recipients of Y.R.S. Junior Radio Certificates, Greg Smith and Theo Todorob, of Gowrie Park State School.

## FEDERAL COMMENT

★

### "GREETINGS"

Well, well, it's Christmas time again and by the end of the month of December another year of Amateur Radio will have become history.

Looking back, it perhaps has not been a dramatic year for Amateur Radio on a world-wide basis, but, nevertheless, in various parts of the globe the Amateur Service has played its part in providing communication where emergencies have existed, encouraging and training young people into the science of radio, co-operating with the world-wide Scout Organisation and generally employing itself in the field of investigation and research for which it is internationally known and respected.

Looking forward one can envisage a great challenge to the Amateur Service—not only in continuing its unique system for spreading goodwill amongst Nations, but also in preparing itself more rigidly to proclaim and activate itself in the National interests of its environment. If it does not awaken to do this, then its future may well be at stake at the hands of technological progress and political pressures for a shrinking frequency spectrum.

This challenge is very real and must fall more to the lot of the younger up-and-coming Amateur than the old-timer who played his part in another and perhaps more exciting decade. The young Amateur must meet the challenge of a different order and progress rapidly into the technical process of developing—along with the back room engineer and scientist—the modern modes of communication whereby more channels-per-kilocycle become possible, and at the same time apply his Amateur Radio in the National interest of his country rather than completely subjugate his activity to the level of "an interesting scientific toy".

That the future security of the Amateur Service is assured, would be foolish thinking. Although its progress will essentially be in the hands of the younger generation who technically will be starting off where others have left off, the older and currently experienced Amateur can—and must—vitally contribute his effort to create, re-create and maintain an image for the Amateur Service with which no Government will want to dispense. All over the world our future is in our own hands to do with what we will. If we make a mistake, we will only have ourselves to blame.

Members of the Federal Executive, the Federal Council and Councils and Officers of the Divisions of the Wireless Institute of Australia over the Commonwealth of Australia join me in wishing every Amateur wherever he may be located, on land or sea or in the air, hearty Christmas wishes and a prosperous New Year for 1966.

—G. M. HULL, VK3ZS, Federal President.

## CONTENTS

# NEW SILICON TRANSISTORS FROM Mullard

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| Type Number | Description | $V_{CBO}$ (V) | $V_{EBO}$ (V) | $I_C$ (mA) | $P_{tot}$ (mW) | $f_T$ (Mc/s) | $h_{FE}$ |
|---|---|---|---|---|---|---|---|
| BF115 | n-p-n RF silicon planar epitaxial transistor | 50 | 5 | 30 | 140 | 230 | 45 to 165 |
| BC107 | n-p-n AF silicon planar epitaxial transistor | 45 | 5 | 50 | 300 | 85 | 125 to 500 |
| BC108 | n-p-n AF silicon planar epitaxial transistor | 20 | 5 | 50 | 300 | 85 | 125 to 500 |
| BC109 | n-p-n low-noise AF silicon planar epitaxial transistor | 20 | 5 | 50 | 300 | 95 | 240 to 900 |

Mullard silicon planar transistors are designed so that each gives optimum performance for a particular application, such as RF or AF amplifiers. The BF115, for example, is designed as an AGC controlled RF amplifier, its low value of feedback capacitance providing high gain; and low knee voltage (less than 1V at 10mA) enabling a large voltage swing to be achieved in IF stages.

*More detailed information on these transistors may be obtained from the Mullard Technical Service Departments at the addresses below.*

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M170

# Do's and Don'ts in Constructing Power Converters

*GILBERT YANOW,* VK4YG (K6TOS), Physics Dept., University of Qld.*

BUILDING the a.c. supply for my Drake TR3 posed no great problem as I had the necessary transformers in my "junk box". However, the mobile power supply was another story. Buying the commercial unit was out of the question—the purchase of the TR3 itself had strained the good relations with the XYL enough, as any married Ham can well appreciate! I tried to find the special transformer needed to build a unit on the local market, but this also proved unsuccessful. That left only one thing to do—I would have to build the converter from scratch.

There has been a good deal written on d.c.-d.c. converter circuits in trade and Amateur journals. There are two basic circuits that can be used; the difference being that with one, the collectors of the transistors are grounded, and with the other circuit, the collectors have a potential on them. I frankly prefer the former, since it permits one to directly bolt the transistors to the chassis, thereby eliminating the worry of shorting the transistor cases on some part of the car when installing the unit. The basic oscillator circuit is shown in Fig. 1.

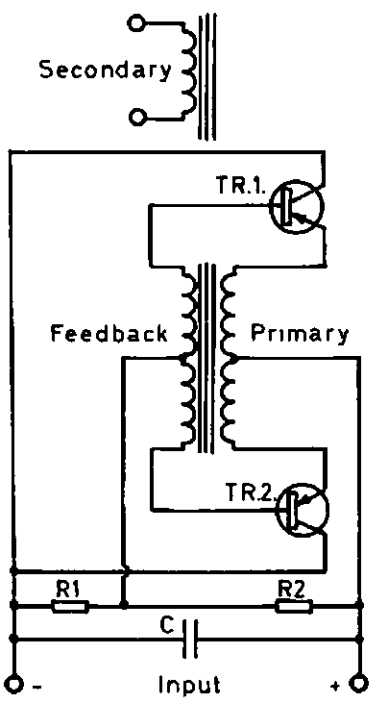



Fig.1.

The way it works is really quite simple. The resistor network composed of R1, R2 puts a small forward bias on the biases of the transistors to ensure that oscillation will start. The capacitor acts as a low Z source and filters any spikes on the d.c. input. When the battery is connected, current will flow through the transistors, and since the gain values of the two are not exactly the same, the current flow will be larger through one over the other. The changing current causes an e.m.f. to be produced in one-half of the primary, which in turn produces an e.m.f. in the corresponding half of the feedback winding. The effect is for still more forward bias to be put on the transistor, which causes still more current to flow, etc. This run-away continues until the core is finally saturated, and the current stops increasing, i.e. the production of the e.m.f. stops. At this point, the other transistor and half of the primary take over and start the process again. In such a manner an oscillation is produced. It is interesting to note that the circuit will actually work with just one transistor—it just operates at a different frequency.

The most critical item of design is the transformer. The core material should have what is known as a "square hysteresis loop". That is, when the proper amount of primary current is drawn, the core should saturate very quickly. This characteristic assures the production of a good square wave without a large voltage spike, but we will talk more about this in a moment. Now, let us direct our attention to the problems associated with designing the transformer.

**DESIGNING TRANSFORMER**

The "transformer formula" can be found in any radio handbook, and it determines for the builder the number of turns of wire to be put on the primary winding, i.e.

$$N_P = \frac{E \times 10^8}{26\ B\ A\ f}$$

where $N_P$ = number of turns on the primary.
$E$ = voltage across the primary.
$B$ = saturation magnetic field in gauss.
$A$ = cross-section area of the core in square inches.
and $f$ = frequency of oscillation in cycles per second.

This formula was actually around long before we had transistor d.c.-d.c. power converters, for it is also used to calculate the number of primary turns on a regular a.c. power transformer. When this equation is now applied to the specialised converter transformer, care must be taken.

Without going into a lot of detail, let us examine the physical significance of the formula, and also the difference in operation between an a.c. and a converter transformer.

Under no load conditions, i.e. the secondary circuit left open, the primary itself presents an impedance ($X_L = \omega L$) to the input voltage. This impedance will cause a certain "idle" current to be drawn, and this current in turn produces a magnetic field inside the core material. It turns out the magnetude of the magnetic or "B" field remains constant regardless of the load conditions. The transformer equation determines the number of turns on the primary winding so that the "magnetising force" or more simply the $N_PI$ product (where I is the current in the primary) under no load conditions will produce the maximum B field the core can sustain before saturation.

It should be pointed out that the $N_P$ value, as calculated from the equation, is the theoretical minimum turn number to use; however, in practise it may be necessary to increase this number depending on the particular requirements of the transformer.

What happens if the $N_P$ that is used is too small? If a value less than that given by the equation is taken, the primary current will be too large, causing excessive losses in the core. It is almost a sure bet that the transformer will overheat and probably buzz quite loudly. Even if the calculated $N_P$ is employed, there may still be trouble. The current drawn in the secondary produces its own B field which in turn causes more current to flow in the primary. (Note: Because of phase relationships, the total flux in the core remains constant.) If too large a load is put on the secondary, it will cause too much current to flow in the primary with the same effect as before. As the core losses increase, the efficiency also falls drastically. This problem can be solved simply by increasing the number of turns on the primary winding. That is, if the value of $N_P$ is increased, I must become smaller since $N_PI$ equals a constant value—i.e. the number of ampere-turns to produce the saturating magnetic field.

So far, the discussion has only been in reference to the normal a.c. power supply. When turning to converter transformers, it is found that the exact same arguments hold, the only difference being in the end effects observed. Whenever $N_P$ proves to be too small, the oscillatory circuit will not work properly—the effect is really quite dramatic. When the point of maximum load is reached, the operating frequency will start to "take off" and increases rapidly, while the voltage output falls "like a rock"! Again, if the wish is to be able to draw more power, the number of turns on the primary must be increased to lower the I.

The prime lesson that should have been driven home by now is to use as many turns on the primary as possible, or, in other words, the lowest frequency of operation. The limiting factor will be the "window" of the transformer; that is, the amount of area available for wire to be wound in.

One more point should be mentioned before actually going on to the design of the transformer. We can minimise the problem of core loss to some extent by properly choosing the thickness of the core lamination or tape the core

* 68 Victoria Park Rd., Kelvin Grove, Brisbane, Queensland.

is made up of. It would seem, from a logical point of view, that if the individual layers in the stack are thin it might be possible to saturate them more evenly and quickly. As a rule of thumb, I would use Table 1 as the maximum frequency of operation for various lamination or tape thickness.

| Thickness | Operating Frequency |
|---|---|
| 0.004 inch | 400 c.p.s. |
| 0.002 inch | 1000 c.p.s. |
| 0.001 inch | 2500 c.p.s. |

Table 1.

Now with this background, let us go ahead. As an example, take a d.c.-d.c. power converter capable of ratings in Table 2.

| | |
|---|---|
| HV | 500v. d.c. at 225 mA. |
| LV | 250v. d.c. at 175 mA. |
| Bias | —90v. d.c. at 10 mA. |
| Input | 12v. d.c. |

Table 2.

Voltage doubling circuits will be used for the output circuits. This means fewer turns on the secondary, fewer diodes, and smaller voltage ratings of the capacitors. Also because of the fact large value capacitors are used, there will be good dynamic regulation, a must for proper s.s.b. operation. Finally as design criteria, let the switching frequency be taken as 1000 c.p.s.

In addition to the windings shown, a feedback winding will be needed to operate the switching circuits. Operating the transistors in grounded collector requires quite a high driving voltage. A feedback factor of about 1.25 is adopted. This winding will not carry a large current, so a small size wire may be used.

The h.v. power is, under full continuous load, 112.5 watts, but this will only be drawn on transmit. Assume one talks about 50% of the time, so the average power would be about 55 watts. The l.v. will be assumed on for both transmit and receive, and therefore will require a continuous 45 watts. Assuming 90% efficiency, a typical value for this type of converter, 9 amps. average will be required from our 12v. d.c. source, with a peak current of 15 amps.

The next step is to determine the different sizes of wire needed to carry the various currents. The cross-sectioned area of a wire is rated in circular mils" (c.m.) or simply the diameter of the wire squared in units of thousands of an inch. The current capacity of the wire is given in circular mils per ampere of current, and this figure may vary anywhere from 500 to 1200 c.m./amp. A good safe figure is 1000 c.m./amp. Looking up the needed current requirements in a wire table, such as found in the "Amateur Radio Handbook," the information in Table 3 was found.

| Winding | Needed Current | Wire Size (B. & S. No.) |
|---|---|---|
| HV | 450 mA. | 23 |
| LV | 350 mA. | 25 |
| Bias | 10 mA. | 27 (over-rated —see text) |
| Feedback | — | 27 |
| Primary | 9 amp. | two 16 wires in parallel |

Table 3.

Only one-half of the primary and feedback winding operate at any one time—i.e. each half of the windings has a duty cycle of 50%. The parallel No. 16 wires can carry 5 amps. of current continuously, at a rating of 1000 c.m./amp., thereby giving more than ample capacity for our converter. Additionally, these two windings—the primary and feedback—must be wound bifilar. That is, both halves of the winding are put on simultaneously. (In this case, making the primary would necessitate winding four parallel wires.) This process assures that both parts of the primary and feedback are equally coupled. No. 27 wire was chosen for the bias and feedback winding, on the basis that a wire much thinner than this would be hard to work with, although from a current capacity the wire is much larger than needed.

Let us now turn our attention to the selection of the core. Cores can be obtained in various forms; the normal "E-I" type, as found in a.c. transformers, "C" type, toroidal, etc., but regardless of the shape, the laminations or tape forming the core cannot be thicker than 0.002 inch, as shown in Table 1. From the standpoint of size, I chose a toroidal core, although it is perhaps the most difficult shape of transformer to wind.

In Australia, toroidal cores can be obtained from Telcon Metals Ltd., Sydney. The metal used in these cores is an alloy with the trade name here of "HCR". It is composed of 50% nickel and 50% iron, and it possesses the characteristic of a "square hysterisis loop". This term means that the hysteresis curve of the core is as illustrated in Fig. 2. It can be seen that when the value of the "magnetising force", H (= $N_P I$), is such to produce a B field with saturating value, the core will saturate very quickly. This ensures that our output will be a good square wave and the voltage spike at the leading edge of the wave will be small. Actually, these last two points are quite important. If the wave form is not a proper square, there may be excessive heat dissipated in the transistors, and if the voltage spike is too large, the voltage rating of the transistors will be exceeded and eventually they will be ruined.

Cores can be bought from a large selection of sizes. However, in my case the choice was simplified in that the largest core available from stock was size "7C", which has the following characteristics:—

Outside diameter .. .... .... 2.25 inch
Inside diameter .... .... .... 1.5 inch
Saturation B field .... .... 15,000 gauss
Geometric cross-section .. 0.188 sq. in.

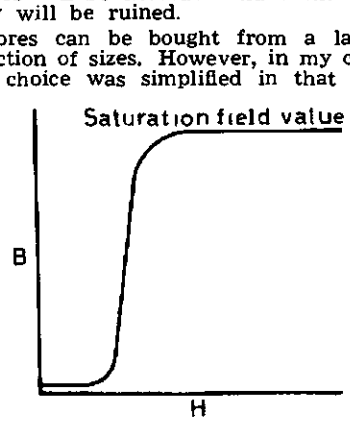


Fig.2.

Since the core is made of a spiral winding of tape, some of the geometric cross-section is just air space. Using the correction factor given by the manufacturer, an actually metal cross-section of 0.147 square inch was calculated.

The big question that had to be answered was whether the core was large enough for the transformer. This can be determined fairly easily, as illustrated by the following:—

From the transformer formula, assuming a one-volt drop in the transistors,

$$N_P = \frac{11 \times 10^8}{26 \times 15{,}000 \times 0.147 \times 1{,}000} = 19 \text{ turns.}$$

The primary will consist of two windings of parallel number 16 (B. & S.) wire, wound bifilarly. It was lucky that the $N_P$ was not greater—as it turned out this was the maximum value that could be put on the core in one layer. The turns of the other windings are quickly found. Assuming about a 20% voltage drop in the h.v. at a continuous full load we get:—

$$N_{HV} = \frac{300}{11} \times 19 = 520 \text{ turns}$$

$$N_{LV} = \frac{125}{11} \times 19 = 215 \text{ turns}$$

$$N_{bias} = \frac{45}{11} \times 19 = 78 \text{ turns}$$

$$N_{FB} = 1.25 \times 19 = 24.$$

The total window area of the windings, in circular mils, is given by,

| | | | |
|---|---|---|---|
| Primary | 2 x 19 x 2,583 | = 98,154 | c.m. |
| F'dback | 2 x 24 x 202 | = 9,696 | ,, |
| HV | 520 x 510 | = 265,200 | ,, |
| LV | 215 x 320 | = 68,800 | ,, |
| Bias | 78 x 202 | = 15,756 | ,, |
| | | Total 457,606 | c.m. |

It is safe to assume that at most only 40% of the winding space will actually be taken up by the wire, the rest being composed of insulating paper, air space, etc.

The window of the core, in circular mils, is 1,500 x 1,500 or 2,250,000 c.m. 40% of this is 900,000. It appears that the core will be big enough.

**PRACTICAL SIDE**

For the moment, let's shelf the theory and turn to the practical side of making the transformer. First, wind the primary evenly about the core, and insulate it with one layer of lunch wrap or similar type paper. Then wind on the feedback evenly over the core. Now stop! Breadboard up the basic circuit as shown in Fig. 1. Don't worry about the layout, as the placement of the wires is not critical. Put the power to the circuit and see if it works. If it will not oscillate exchange the end leads on the feedback winding —they have to be in phase with the primary. If it still does not work, check your bifilar windings. Realise

that if you incorrectly place the centre tap you will have two identical windings put on the core in opposite directions—i.e. you have done nothing more than make a non-inductive resistor!

The next operation is best carried out using an oscilloscope! In fact, I do not know a way to get around having to use one! Once the converter is working (it will make a soft buzz) look at the voltage pattern across the feedback winding. It should be a nice square wave, as illustrated in Fig. 3. Also look at the voltage spike and make sure the peak value does not exceed the voltage rating of your transistors. The general rule is if the wave form is not correct, drive the core harder into saturation—i.e. more turns on the primary.

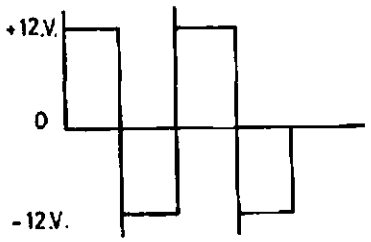



Fig. 3.

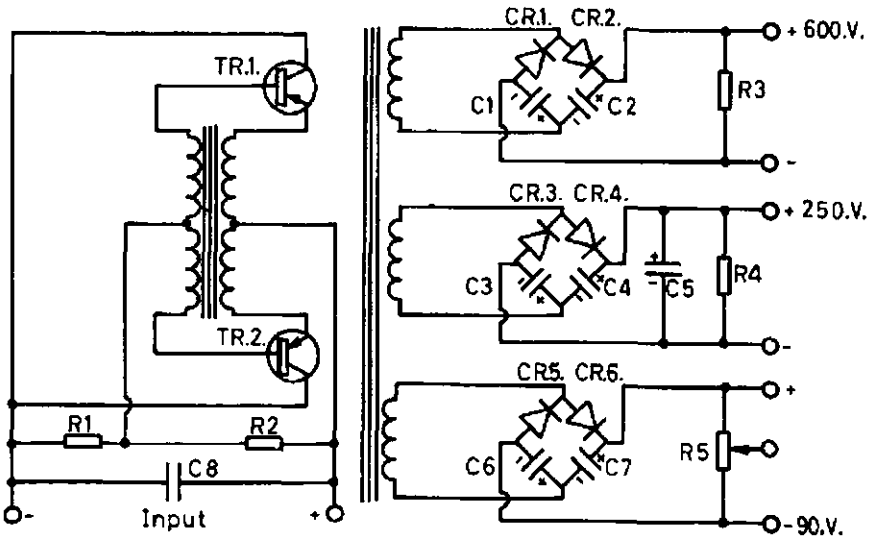
I might comment that when I attempted to operate at a frequency of 2,000 c.p.s. with this core I obtained a bad wave form. Actually, even at 1,000 c.p.s. the square wave is not perfect, but it is close enough to allow satisfactory operation.

Once the wave form looks satisfactory, you can now proceed to finish the unit. Wrap the feedback winding with two layers of paper. The sequence that the remaining windings are put on with is not important, except remember—the only winding which can be adjusted by adding or subtracting turns will be the last one put on! For the h.v. and l.v. secondaries, where a large number of turns is required, it will be best to use a winding shuttle. This can be an ice cream stick or a narrow piece of heavy cardboard with notches cut in each end. It may be necessary to make several splices in the h.v. winding. When a splice is made try to have it come out on the outside of the toroid, rather than on the inside where the wire is very close wound. Put one layer of insulating paper between layers of the same winding and two or three layers between windings. When the transformer is completed, put a layer of plastic tape around the outer perifery to protect the wire. The entire converter circuit to be used is shown in Fig. 4. Again, the placement of parts is not critical. It might pay to test the oscillator section before all the other parts are put into place. With the capacity values shown, the l.v. ripple at full load should be the order of 0.025% and the h.v. ripple at full load less than 1.0%. With my unit, the actual operating frequency turned out to be about 980 c.p.s.

In conclusion, let me make some general statements about this type of converter. The circuit should work with practically any pair of transistors, even if they are quite mismatched. If, however, they have a very low gain—i.e. say less than 40—some difficulty may be experienced in getting the unit to start oscillating. This problem can be overcome by adjusting the divider network, resistors R1 and R2, to put a slightly more forward bias on the bases.

I have tried to pick a converter with characteristics that might be of most interest to the majority of people. I run my TR3 at this lower input to conserve the battery of my car, and I have had most satisfactory results. However, if one wishes to make a higher power unit, let me give the following advice. It is a very difficult problem to look at a core, use the transformer equation, and predict the maximum power output obtainable. As I stated earlier, the reaction of the secondary on the primary has the effect of forcing the core out of saturation, and this particular load point is best found experimentally. To keep on the safe side when choosing your core try to get one with a fairly small cross-sectional area, but a large circumference. This will assure that there is enough winding space to properly saturate the core—i.e. room to put more turns on the primary if you have to. As a rough guide use the information given in this article about the core used. The maximum v.a. rating for the size appears to be about 150 watts.

Finally, I must make an acknowledgment to VK4ZAX, Dane Horgan. It was through Dane's help that I was able to overcome many of the problems that I ran into.




C1, C2—16 μF., 500v.w.
C3, C4—32 μF., 300v.w.
C5—8 μF., 500v.w.
C6, C7—8 μF., 150v.w.
C8—500 μF., 18v.w.
R1—150 ohms, 5w.
R2—2.5 ohms, 10w.
R3—560K ohms, 1w.
R4—560K ohms, 1w.
R5—25K ohms potentiometer.
CR1, CR2—1,000 p.i.v., 500 mA.
CR3, CR4—400 p.i.v., 400 mA.
CR5, CR6—Any diode of at least 100 p.i.v.
TR1, TR2—Any pair of transistors with Vce greater than 30 volts and Ic greater than 15 amp.

# SOME SIX-METRE ANTENNAE

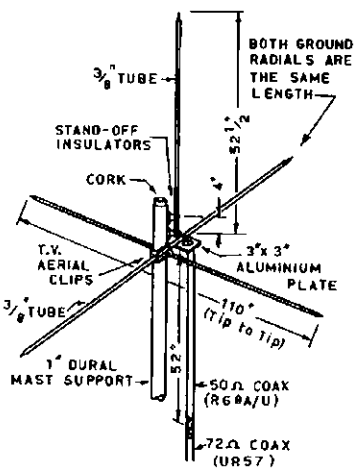
*ROGER HARRISON,* VK3ZRY*

IF you operate, or intend to operate, on six metres, either on the net frequencies or all over the band, then these antennae may help you radiate all that r.f. you may have.

I am not strictly a net frequency operator and my rig is capable of working from 52 to 54 Mc., but I spend most of my time on 53.032 Mc. The antenna polarisation for this frequency in VK3 is vertical and I built the two ground planes to be described, with this in mind.

## QUARTER WAVE GROUND PLANE

The first antenna is a normal type quarter wave ground plane and I claim no originality for it. The construction details are fairly clear (or should be) from the accompanying diagram (Fig. 1). The impedance at the base of this ground plane is approximately 36Ω and some sort of matching device was needed to match the 70Ω co-ax I had. This took the form of a "Q"-match and a second diagram (Fig. 2) gives details of which are the same for both the quarter wave and three-quarter wave ground planes.




1/4 WAVE GROUND PLANE

Fig. 1.

The ground plane radials are attached to the supporting mast with standard ⅜" element to 1" boom clamps, made by various t.v. aerial manufacturers. The radials are at right angles and situated about ½" (centre to centre), one above the other. This arrangement is used on both the quarter and three-quarter wave ground planes.

The stand-off insulators supporting the vertical radiator are either plastic or ceramic and about 1" high. They are mounted 4" centre to centre on the 1" mast support.

The lower one is about 1" above the ground plane radial nearest to the top or as close as you can situate it (depends on the insulator used). An aluminium bracket is mounted underneath the bolt that holds the topmast ground radial to the mast and a co-ax connector (Belling Lee or Amphenol) mounted in the centre.

The centre pin of the socket is connected via a short heavy wire to a solder lug mounted under the bolt on the lower insulator. To protect the co-ax socket from the effects of the weather, cover the exposed portion in araldite or putty or sealing compound.

So as not to strain relations with either family or neighbours, shove a large cork (champagne?) in the top end of the 1" support mast and flatten the ends of the ⅜" elements in a vice for about ½" of their length and file the corners round.

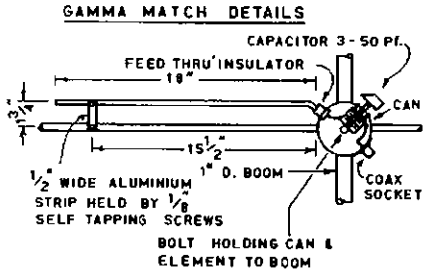



Fig. 2.

## THREE-QUARTER WAVE GROUND PLANE

Well, so much for the quarter wave ground plane. The three-quarter wave ground plane is almost exactly the same. I built this huge contraption because it was suggested to me as a joke—it's not funny any more, mainly because it works!

It has about 4 db. gain and two radiation lobes in the vertical plane. One lobe, a very low angle one (about 5° to 10°) contains very little radiated power. The other lobe has a radiation angle of about 50° to the horizontal and radiates the most power.

Funnily enough, I found this antenna radiates and receives a stronger signal than the quarter wave ground plane. This could be attributed to my location. I have the reputation with the locals of being the only underground operator on six metres. I am completely surrounded by hills, north, south, east and west, none of which is any lower than 80 feet. My theory is that the signal is diffracted at the crest of the hills—but that's only my theory.

The vertical radiator on the three-quarter wave ground plane is three times as long as the quarter wave (seems reasonable) and has to be supported at a half wave from the base. The guy wires (?) for this job are nylon fishing line and are all tied to the half wave point and taken down and tied to the tips of the ground plane radials. A slight tension must be applied to each one. When completed the vertical radiator should be roughly vertical, if it isn't, loosen or tighten the appropriate guy until it is.

All other constructional details are the same as for the quarter wave ground plane and indeed if you want to change from quarter wave to three-quarter wave ground plane, all you would need to do is change the vertical radiator. I would suggest, for added strength, that you insert about twelve feet of ¼" dural rod inside the ⅜" vertical radiator tubing. This would prevent it from bending or snapping in a gusty or strong wind.

3/4 WAVE GROUND PLANE

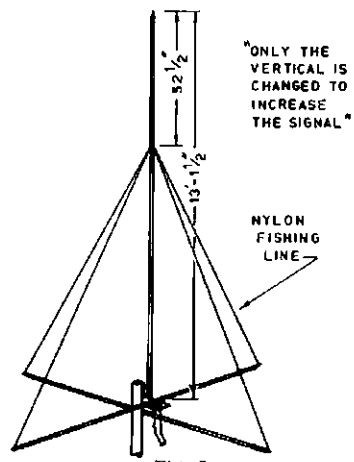



Fig. 3.

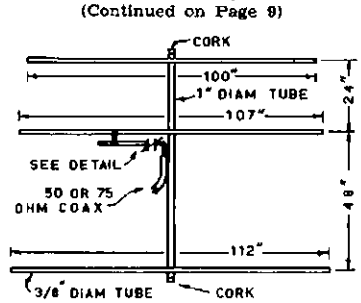
## THREE-ELEMENT BEAM

The third antenna is a three-element beam. It can be used either vertically or horizontally. It has roughly 8 db. of forward gain and well over 25 db. front to back ratio. The side lobes are well down too.

I have used this beam at a number of portable locations, both in VK3 and VK2 and once in VK4. Much DX has been worked as well as locals. It can be quite easily assembled or disassembled in about 10 minutes.

The boom is made of 5½ feet of 1" o.d. dural tubing, the elements are of ⅜" dural tube so that I can use the standard t.v. clips again. The ends of the elements were flattened in a vice for about ½" of their length so that they

(Continued on Page 9)

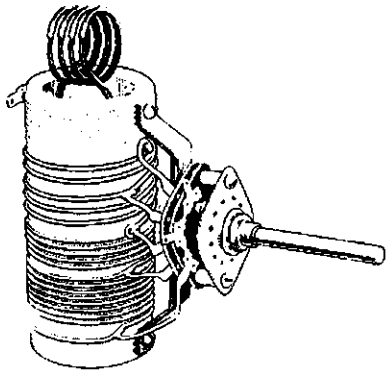



3 ELEMENT BEAM

Fig. 4.

* 1 Mary St., North Balwyn, Vic.

# PI-COUPLERS



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| 2-08 | ⅝" | 8 | 3" | No. 3006 | 6/3 |
| 2-16 | ⅝" | 16 | 3" | No. 3007 | 6/3 |
| 3-08 | ¾" | 8 | 3" | No. 3010 | 7/4 |
| 3-16 | ¾" | 16 | 3" | No. 3011 | 7/4 |
| 4-08 | 1" | 8 | 3" | No. 3014 | 8/5 |
| 4-16 | 1" | 16 | 3" | No. 3015 | 8/5 |
| 5-08 | 1¼" | 8 | 4" | No. 3018 | 10/6 |
| 5-16 | 1¼" | 16 | 4" | No. 3019 | 10/6 |
| 8-10 | 2" | 10 | 4" | No. 3907 | 13/9 |

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References: A.R.R.L. Handbook, 1961; "QST," March 1959; "Amateur Radio," Dec. 1959

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# COUPLING COMMAND UNITS

## BC454 AND BC453

ALL Amateurs are familiar with the excellent selectivity properties of the BC453 unit covering 190-550 Kc., and many who read this will have used the unit as a "Q5'er". However, when the i.f. of the preceeding communications receiver is higher than 550 Kc., conversion to the 85 Kc. channel demands another approach. Such was the problem at this location where the preceeding Command BC454 had an i.f. of 1,415 Kc.

The grid lead to the 12K8 of the BC453 was removed, thus isolating it from its own r.f. stage. Output from the last 1,415 Kc. i.f. can was passed through a ¼" co-axial link to the grid cap of the "Q5'er" 12K8 and the outer braid grounded to both units—thus the conversion operation was achieved without "butchering" a piece of precision equipment.

How? Simple arithmetic and heterodyning principles explain.

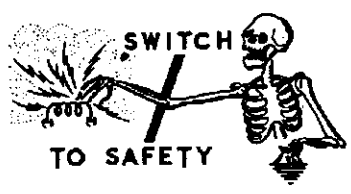
For conversion of 1,415 Kc. to 85 Kc. two frequencies can be used: 1,500 Kc. or 1,330 Kc. Consider the first of these frequencies. By tuning the dial of the "Q5'er" to 215 Kc. the local oscillator generates 300 Kc., the 5th sub-harmonic of 1,500 Kc. It is the peculiar property of every mixer or converter valve to produce at its anode useful i.f. outputs that are the sum and difference not only of the input signal and the local oscillator fundamentals, but also of the input signal and "harmonics" of the local oscillator: even though both signals may be pure sine waves!

Depending on whether you consider using 1,500 Kc. or 1,330 Kc. as the converting harmonic, it is obvious that a number of positions on the "Q5'er" dial will perform the conversion satisfactorily. Conversion efficiency varies inversely as the integral value of the sub-harmonic, being approximately 60 umhos when using an oscillator frequency of 300 Kc. in the case of the 12K8. However, the noise factor does not deteriorate.

There is more than abundant gain with both units working with a h.t. supply of 200 volts, and lessening of gain in the conversion was somewhat of a blessing.

These ideas may aid some Amateur in similar difficulties. The basic principle also has promise when considering the construction of high frequency converters. The stability of the combined units is adequate for the "not too fussy pauper Amateurs". S.s.b. QSO's can be resolved and held for considerable periods once the sets have warmed.

—Bro. P. L. Ellis.




# Book Review

**RADIO AMATEUR'S V.H.F. MANUAL**
**By Edward P. Tilton, W1HDQ**

This long awaited addition to the A.R.R.L. publications is a must for the book shelves of all Amateurs interested in v.h.f. Although most of the material has appeared from time to time in "QST," it has been well edited by Ed Tilton, and the book provides a very complete coverage of v.h.f. with a good balance of theory and constructional articles. Most of the components and valves are available in Australia and even the majority of transmitter circuits are suitable for our power limits.

The introductory chapter gives an interesting history of v.h.f. and is followed by chapters on propagation, receivers, converters, transmitters, antenna and feed systems, test equipment and handy hints for experimenters.

A soft covered book, 6½" by 9½", it contains 314 pages of text well illustrated with diagrams and photographs.

Publisher: The A.R.R.L. Inc., U.S.A. Price in Australia, 31/6 plus postage. Review copies from Technical Book and Magazine Co. Pty. Ltd., 295 Swanston St., Melbourne, and McGills Authorised Newsagency, 183 Elizabeth St., Melbourne.

**V.H.F. ANTENNA HANDBOOK**
**By Jim Kyle, K5JKX**

All v.h.f. Amateurs realise that the key to the success of a v.h.f. station is a good antenna system. Nearly all v.h.f. Amateurs experiment with their antennae more than any other part of their equipment. This book is for those people.

Written by an Amateur who has spent many years investigating antenna systems for v.h.f., the book covers practically every type of antenna ever used on these frequencies and provides sufficient information about each one to enable anybody to duplicate it, or adapt it for his own particular requirements.

Chapters include basic concepts, the dipole and its relatives, phased arrays, parasitic arrays (Yagis), circularly polarised antennae, non-resonant antenae, reflective antennae, practical antenna techniques, manufacturers' section, and Amateur and photo section.

A soft covered book, 8½" by 11", it contains 61 pages illustrated with many diagrams and a few photographs.

Publisher: 73 Inc., U.S.A. Price in Australia, 25/-, post and packing 1/3. Our copy from Technical Book and Magazine Co. Pty. Ltd., 295 Swanston St., Melbourne.

☆

# SOME SIX-METRE ANTENNAE

(Continued from Page 7)

would not whistle in a wind. The ends of the boom are plugged with large corks (I drink a lot of champagne!).

Make sure all the elements are in the one plane and parallel to one another, a "skew wiff" beam does not look the best.

The gamma match is pretty standard and should be tuned up for best s.w.r. with a bridge inserted in the line somewhere near the antenna. The gamma match capacitor was protected from the weather by a small 4 oz. baked beans tin. The lid (or one end to be exact) was removed, the contents removed and eaten, the can washed, dried and a hole drilled in the centre of the end. This was placed on the bolt holding the driven element onto the boom.

The mounting position for your gamma match capacitor and co-ax socket can then be determined. A feed-through insulator is mounted convenient to the gamma match arm (see diagram, Fig. 2). This rather hairy arrangement survived a number of violent storms in VK2 and VK4 without ill effects.

Well that's about it. If you are slightly confused or the diagrams are not too clear (apologies to the printer), then give me a shout on the air or drop me a line (please include s.a.e.) and I'll see if I can confuse you further. Don't forget, they are just ordinary little antennae, not supercalifragilisticexpidaliocious beams!

☆

# NEW CALL SIGNS

**AUGUST, 1965**

VK1JL—J. Lauten, 28 Atherton St., Downer.
VK1JW—J. B. S. Waugh, C/o. Dr. J. Lovering, 127 Buxton St., Deakin.
VK1ZFB—F. J. Beckett, 9 Clarke St., Yarralumla.
VK2FR—O. R. French, 78 Hercules St., Dulwich Hill.
VK2HI—R. L. Francis, 9a/3 Grainger Ave., Ashfield.
VK2UF—M. Meechan, Flat 709, 54 High St., North Sydney.
VK2AIK—J. A. Bowgen, C/o. Normandie Hotel, North Wollongong.
VK2AJT—J. R. Walker, 10 Leatham Ave., Nowra.
VK2AJU—M. G. Burleigh, Oaky River Power Station, Wollomombi.
VK2APS—P. C. Goldstone, 134 Byangum Rd., Murwillumbah.
VK2BMF—M. N. Featherstone, 5 De Villiers Ave., Chatswood.
VK2ZDO—W. J. Dockrill, 24 Valda St., Blacktown.
VK2ZHH/T—D. Horton, 122 Webster Rd., Liverpool.
VK3ZPY—R. J. Gowland, 19 Park Rd., Middle Park.
VK4AL—A. H. F. Nichols, 20 Headfort St., Greenslopes.
VK4EE—E. C. Bick, 55 Allowrie St., Stafford.
VK4GX—F. Barraclough, 16 Gall St., Kedron.
VK4HX—W. R. Boyldew, Hesp Park, Stratford, via Cairns.
VK4NN—Maryborough State High School (Boys) Radio Club, Kent St., Maryborough.
VK4NZ—J. Stone, Thompson Ave., Mt. Morgan.
VK4QX—J. A. Mackay, 84 Mill St., Gordonvale.
VK5AE—B. D. Abbott, 6 Invergowrie Ave., Highgate.
VK5OW—O. C. Winterton, Tatachilla Rd., McLaren Vale.
VK5SH—P. Eccleston, 2 Wecoma St., Holden Hill.
VK5VW—S. Atkinson, 3 Bosville Gr., Campbelltown.
VK5WZ—F. G. Anear, 4 Liston St., Parkside.
VK5ZM—K. M. Matthews, 9 Anglesey Ave., St. Georges.
VK5ZCJ—H. J. Schrickel, Lot 70, Tristania Tce., Dernancourt.
VK5ZIJ—A. R. Jenkins, Flat 2, 316 South Rd., Glandore.
VK6CU—R. D. Coleman, Off Shore Navigation Inc., C/o. W.A.P.E.T., Barrow Island.
VK6HW—J. H. Williams, 38 Williams Rd., Melville Heights.
VK7CR—C. Russell-Green, 99 Marlyn Rd., Sth. Hobart.
VK7KM—K. G. McCracken, 153 Bathurst St., Hobart.
VK7OZ—W. E. Dixon, 122 Main Rd., Claremont.
VK7ZRR—R. F. Rolls, 194 Waterworks Rd., South Hobart.
VK8MC—B. A. McRae, Station: Tennant Creek; Postal: P.O. Box 74, Tennant Creek.
VK8MD—B. A. McRae, Portable. Postal: P.O. Box 74, Tennant Creek.
VK9DI—D. I. Ralph, C/o. A.W.A., P.O. Box 13, Lae, N.G.
VK9GN—G. A. Nurkka, C/o. Summer Institute of Linguistics, Ukarumpa, N.G.

## RESULTS OF 1965 R.D. CONTEST

# SOUTH AUSTRALIA WINS AGAIN

Honours go to South Australia this year for a large marginal win.

This is attributed to this State watching closely the three significant factors which assist a State to win this Contest, i.e.—

(1) High top-six scoring.
(2) High State licence participation.
(3) High individual entrant scoring.

It was unfortunate to see VK4 with the Highest Average of the Top Six Logs, not supported by a high percentage participation.

The F.C.C. cannot stress too strongly the need for higher accuracy in submission of entries.

Two main errors were time discrepancies (G.M.T. and E.A.S.T. were both acceptable for this Contest), and transcription from station log to entry log.

The continuing success of this Contest is a constant reminder of our appreciation to those Amateurs who gave their lives in World War II., so that we may enjoy this hobby and continue to do so.

Again our congratulations to South Australia for a good effort.

—Federal Contest Committee, W.I.A.

## DETAILS OF STATE SCORES

| State | Log Entry | Licences | % | Total State Score | Aver. Top Six Logs | State Points |
|---|---|---|---|---|---|---|
| New South Wales | 109 | 1,275 | 8.6 | 19,751 | 796 | 2,495 |
| Victoria | 62 | 1,135 | 5.5 | 12,508 | 623 | 1,311 |
| Queensland | 68 | 505 | 13.5 | 13,174 | 814 | 2,592 |
| South Australia | 91 | 460 | 19.8 | 18,096 | 769 | 4,172 |
| Western Australia | 56 | 250 | 22.4 | 8,080 | 506 | 2,316 |
| Tasmania | 32 | 140 | 23.0 | 6,605 | 590 | 2,096 |

### FINAL STATE SCORERS

| | | |
|---|---|---|
| South Australia | 4,172 | points |
| Queensland | 2,592 | „ |
| New South Wales | 2,495 | „ |
| Western Australia | 2,316 | „ |
| Tasmania | 2,096 | „ |
| Victoria | 1,311 | „ |

## STATE TROPHY

**South Australia**

## AWARD WINNERS

**Open—**

| | | |
|---|---|---|
| VK1VK—S. Grimsley | 622 | pts. |
| 2AHM—R. Whyte | 1116 | „ |
| 3XY—R. Prowse | 663 | „ |
| 4RH—A. L. Hoey | 1091 | „ |
| 5NO—L. H. Vale | 1226 | „ |
| 6SM—W. H. Saw | 510 | „ |
| 7DK—D. H. Kelly | 938 | „ |
| 8KK—D. A. McArthur | 439 | „ |
| 9X1—Christmas Is. A.R.C. | 132 | „ |

**Phone—**

| | | |
|---|---|---|
| VK1AU—C. Harvey | 710 | pts. |
| 2RS—D. Haberecht | 856 | „ |
| 3MO—I. Williams | 1065 | „ |
| 4PQ—N. Martin | 783 | „ |
| 5BQ—B. Cleworth | 741 | „ |
| 6RY—R. Chamberlain | 759 | „ |
| 7MS—D. Slowan | 740 | „ |
| 8DI—B. Burns | 102 | „ |
| 9AG—A. Nunn | 354 | „ |
| 0KH—K. Hicks | 414 | „ |

**C.w.—**

| | | |
|---|---|---|
| VK2VN—M. Myers | 507 | pts. |
| 3XB—I. Stafford | 436 | „ |
| 4HH—H. Hilder | 258 | „ |
| 5MY—H. Roberts | 411 | „ |
| 6WT—D. Couch | 380 | „ |
| 7SM—S. G. Moore | 440 | „ |
| 8UX—L. W. Wallbridge | 17 | „ |
| 9CJ—C. Marley | 133 | „ |

**Receiving—**

| | | |
|---|---|---|
| L2188—C. Christiansen | 806 | pts. |
| L3100/P—S.w.l. Group | 715 | „ |
| L4152—D. Hunter | 571 | „ |
| L5065—A. F. Raftery | 817 | „ |
| L6021—P. Drew | 925 | „ |
| S.W.L.—G. Johnston | 1011 | „ |
| L9004—J. Corvan | 193 | „ |

**V.H.F./U.H.F. Section—**

| | | |
|---|---|---|
| VK2ZCF—R. Norman | 90 | pts. |
| 3ZNJ—K. Jewell | 73 | „ |
| 4ZLO—L. Davies | 16 | „ |
| 4ZPL—P. Lindsay | 16 | „ |
| 5ZTM—T. Marshall | 56 | „ |
| 6HK—D. Graham | 21 | „ |
| 7ZAS—G. C. D'Emdem | 10 | „ |
| 7ZJG—J. Grace | 10 | „ |

## AUST. CAPITAL TERRITORY

(Licences 48)

**Top Six Logs—**

| | | | |
|---|---|---|---|
| VK1AU | 710 pts. | VK1DA | 282 pts. |
| 1VK | 622 „ | 1RD | 185 „ |
| 1VP | 500 „ | 1AOP | 133 „ |

**Open—**

| | | | |
|---|---|---|---|
| VK1VK | 822 pts. | VK1RD | 185 pts. |
| 1DA | 282 „ | | |

**Phone—**

| | | | |
|---|---|---|---|
| VK1AU | 710 pts. | VK1JG | 73 pts. |
| 1VP | 500 „ | 1AS | 40 „ |
| 1AOP | 133 „ | 1LF | 14 „ |
| 1KM | 97 „ | 1ML | 7 „ |

Check Logs: VKs 1QL, 1DD.

Total Points .. .... .... 2663
Log Entry .... .... .... 11
Average Top Six .... 405

Calculation:
= 405 + (11 ÷ 48 × 2663)
= 405 + (0.23 × 2663)
= 405 + 612
= 1017

## NEW SOUTH WALES

(Licences 1275)

**Top Six Logs—**

| | | | |
|---|---|---|---|
| VK2AHM | 1116 pts. | VK2BO | 756 pts. |
| 2RS | 888 „ | 2APK | 684 „ |
| 2DO | 778 „ | 2ANO | 587 „ |

**Open—**

| | | | |
|---|---|---|---|
| VK2AHM | 1116 pts. | VK2CK | 238 pts. |
| 2DO | 778 „ | 2AGS | 188 „ |
| 2BO | 756 „ | 2ATT | 131 „ |
| 2APK | 684 „ | 2AJQ | 116 „ |
| 2SG | 491 „ | 2OT | 75 „ |
| 2PA | 425 „ | 2XU | 42 „ |
| 2SU | 261 „ | 2BSB | 31 „ |

**Phone—**

| | | | |
|---|---|---|---|
| VK2RS | 856 pts. | VK2EK | 76 pts. |
| 2ANO | 587 „ | 2BCP | 74 „ |
| 2VV | 860 „ | 2LV | 71 „ |
| 2AGF | 554 „ | 2WT | 70 „ |
| 2XT | 473 „ | 2OK | 67 „ |
| 2AEC | 473 „ | 2AAB | 63 „ |
| 2ASI | 472 „ | 2AHA | 63 „ |
| 2AFD | 400 „ | 2PF | 62 „ |
| 2VU | 382 „ | 2BG | 54 „ |
| 2AKF | 369 „ | 2CU | 52 „ |
| 2ATZ | 306 „ | 2ACD | 50 „ |
| 2BMK | 242 „ | 2NZ | 50 „ |
| 2KM | 232 „ | 2AKL | 49 „ |
| 2FM | 220 „ | 2LA | 42 „ |
| 2AUC | 188 „ | 2AIC | 42 „ |
| 2PN | 184 „ | 2AKV | 42 „ |
| 2MW | 170 „ | 2AWR | 40 „ |
| 2OH | 169 „ | 2BCF | 39 „ |
| 2ACZ | 153 „ | 2AW | 38 „ |
| 2BJO/P | 152 „ | 2AXJ | 37 „ |
| 2APQ | 144 „ | 2VH | 36 „ |
| 2ALV | 143 „ | 2AUQ | 35 „ |
| 2AAK | 131 „ | 2UJ | 35 „ |
| 2AVT | 129 „ | 2XP | 30 „ |
| 2OX | 129 „ | 2ASC | 29 „ |
| 2AIA | 109 „ | 2ABB | 20 „ |
| 2RU | 108 „ | 5ZP/2 | 28 „ |
| 2TS | 105 „ | 2AIM | 27 „ |
| 2ATS | 100 „ | 2OE | 25 „ |
| 2QZ | 99 „ | 2AMX | 24 „ |
| 2SJ | 96 „ | 2EY | 17 „ |
| 2AQJ | 89 „ | 2OM | 12 „ |
| 2WD | 87 „ | 2AKX/P | 10 „ |
| 2AQ | 88 „ | 2RJ | 9 „ |
| 2ACQ | 82 „ | 2EZ | 6 „ |
| 2AVJ | 78 „ | | |

**C.w.—**

| | | | |
|---|---|---|---|
| VK2VN | 507 pts. | VK2VA | 74 pts. |
| 2QL | 491 „ | 2IC | 67 „ |
| 2AGI | 365 „ | 2ZC | 67 „ |
| 2QK | 335 „ | 2JM | 55 „ |
| 2GT | 280 „ | 2AKE | 51 „ |
| 2YB | 277 „ | 2HZ | 50 „ |
| 2GT | 208 „ | 2JY | 44 „ |
| 2EO | 151 „ | 2MT | 41 „ |
| 2PU | 147 „ | 2GW | 36 „ |
| 2PQ | 140 „ | 2RA | 31 „ |
| 2ZO | 111 „ | 2AAH | 17 „ |
| 2GD | 103 „ | | |

Check Logs: VKs 2KD, 2XA.

Total Points .. .... .... 19751
Log Entry .... .... .... 109
Average Top Six .... 796

Calculation:
= 796 + (109 ÷ 1275 × 19751)
= 796 + 1698.6
= 2495

## VICTORIA

(Licences 1135)

**Top Six Logs—**

| | | | |
|---|---|---|---|
| VK3MO | 1065 pts. | VK3EG | 517 pts. |
| 3XY | 663 „ | 3QV | 486 „ |
| 3ZL | 530 „ | 3ACW | 474 „ |

**Open—**

| | | | |
|---|---|---|---|
| VK3XY | 663 pts. | VK3KC | 67 pts. |
| 3QV | 486 „ | 3GZ | 63 „ |
| 3ACW | 474 „ | 3OH | 35 „ |
| 3APN | 164 „ | 3UM | 30 „ |
| 3AZL | 93 „ | | |

**Phone—**

| | | | |
|---|---|---|---|
| VK3MO | 1065 pts. | VK3TG | 122 pts. |
| 3ZL | 530 „ | 3LW | 119 „ |
| 3EG | 517 „ | 3VK | 114 „ |
| 3RV | 465 „ | 3WW | 104 „ |
| 3ASN | 450 „ | 3VL | 101 „ |
| 3AKS | 408 „ | 3ZU/P | 98 „ |
| 3EF | 395 „ | 3ABP | 90 „ |
| 3AGM | 370 „ | 3DY | 86 „ |
| 3ARJ | 330 „ | 3AIE | 78 „ |
| 3SM | 319 „ | 3AGZ | 57 „ |
| 3ABP | 310 „ | 3IE | 53 „ |
| 3AWT | 300 „ | 3ANI | 49 „ |
| 3AWY | 259 „ | 3AKB | 46 „ |
| 3NN | 250 „ | 3ABA | 37 „ |
| 3GC | 243 „ | 3DS | 33 „ |
| 3AKO | 236 „ | 3WK | 29 „ |
| 3AZM/P | 187 „ | 3PG | 24 „ |
| 3PW | 139 „ | 3APJ | 24 „ |
| 3AAO | 128 „ | 3RN | 16 „ |
| 3VZ | 125 „ | 3ALD | 15 „ |

**C.w.—**

| | | | |
|---|---|---|---|
| VK3XB | 436 pts. | VK3BL | 139 pts. |
| 3AXK | 394 „ | 3ABR | 126 „ |
| 3RJ | 233 „ | 3ANA | 121 „ |
| 3ARV | 173 „ | 3AWM | 83 „ |
| 3TL | 155 „ | 3ARX | 60 „ |
| 3AMS | 146 „ | 3AR | 30 „ |
| | | 3KS | 16 „ |

Check Logs: VKs 3AFD, 3AKW, 3ALL.

Total Points .. .... .... 12508
Log Entry .... .... .... 62
Average Top Six .... 623

Calculation:
= 623 + (62 ÷ 1135 × 12508)
= 623 + 688
= 1311

## QUEENSLAND

(Licences 505)

**Top Six Logs—**

| | | | |
|---|---|---|---|
| VK4RH | 1091 pts. | VK4BQ | 768 pts. |
| 4LT | 921 „ | 4JI | 677 „ |
| 4PQ | 783 „ | 4VX | 643 „ |

**Open—**

| | | | |
|---|---|---|---|
| VK4RH | 1091 pts. | VK4UC | 345 pts. |
| 4LT | 921 „ | 4VB | 265 „ |
| 4JI | 677 „ | 4QW | 115 „ |
| 4AK | 393 „ | 4HR | 95 „ |

**Phone—**

| | | | |
|---|---|---|---|
| VK4PQ | 783 pts. | VK4RL | 61 pts. |
| 4BQ | 768 „ | 4HC | 60 „ |
| 4VX | 643 „ | 4GS | 53 „ |
| 4RZ | 507 „ | 4TF | 50 „ |
| 4UW | 601 „ | 4NS | 48 „ |
| 4CS | 445 „ | 4AN | 47 „ |
| 4FK | 397 „ | 4PS | 46 „ |
| 4CK | 365 „ | 4CZ | 42 „ |
| 4RO | 335 „ | 4ZZ | 32 „ |
| 4SD | 320 „ | 4KS | 31 „ |
| 4XY | 273 „ | 4JA | 28 „ |
| 4JM | 249 „ | 4FE | 28 „ |
| 4EZ | 253 „ | 4FY | 26 „ |
| 4NK | 249 „ | 4DV | 25 „ |
| 4WP | 237 „ | 4BG | 24 „ |
| 4DO | 219 „ | 4GG | 24 „ |
| 4AF | 137 „ | 4XJ | 19 „ |
| 4HB | 134 „ | 4CW | 18 „ |
| 4OF | 127 „ | 4MF | 16 „ |
| 4OL | 123 „ | 4RW | 16 „ |
| 4OR | 92 „ | 4GT | 14 „ |
| 4HA | 84 „ | 4HW | 12 „ |
| 4FX | 81 „ | 4VS | 9 „ |
| 4CP | 81 „ | 4PR | 7 „ |
| 4PU | 74 „ | 4LE | 7 „ |
| 4EH | 66 „ | 4SA | 6 „ |
| 4LB | 63 „ | 4HZ | 5 „ |

**C.w.—**

| | | | |
|---|---|---|---|
| VK4HH | 258 pts. | VK4JF | 161 pts. |
| 4SN | 209 „ | 4XP | 126 „ |
| 4VR | 195 „ | 4WO | 63 „ |

Check Logs: VKs 4PJ, 4XC, 4VO.

Total Points .. .... .... 13174
Log Entry .... .... .... 68
Average Top Six .... 814

Calculation:
= 814 + (68 ÷ 505 × 13174)
= 814 + (0.135 × 13174)
= 814 + 1778
= 2592

## SOUTH AUSTRALIA

(Licences 460)

**Top Six Logs—**

| | | | |
|---|---|---|---|
| VK5NO | 1226 pts. | VK5TC | 616 pts. |
| 5GZ | 815 „ | 5CV | 612 „ |
| 5BQ | 741 „ | 5EF | 607 „ |

**Open—**

| | | | |
|---|---|---|---|
| VK5NO | 1226 pts. | VK5FM | 244 pts. |
| 5GZ | 815 „ | 5RG | 239 „ |
| 5TC | 616 „ | 5DE | 142 „ |
| 5CV | 612 „ | 5HM | 86 „ |
| 5WC | 436 „ | 5JN | 73 „ |
| 5WW | 421 „ | 5VE | 8 „ |
| 5EJ | 330 „ | | |

**Phone—**

| | | | |
|---|---|---|---|
| VK5BQ | 741 pts. | VK5DR | 82 pts. |
| 5EF | 607 „ | 5KS | 77 „ |
| 5FT | 490 „ | 5SS | 74 „ |
| 5OH | 479 „ | 5QR | 73 „ |
| 5NN | 474 „ | 5WH | 73 „ |
| 5GV | 451 „ | 5BV | 72 „ |
| 5TJ | 390 „ | 5WI | 69 „ |
| 5NY | 353 „ | 5OK | 69 „ |
| 5EN | 354 „ | 5KE | 67 „ |
| 5GX | 331 „ | 5WL | 55 „ |
| 5ZZ/T | 327 „ | 5JC | 53 „ |
| 5EK | 311 „ | 5TU | 53 „ |
| 5AX | 275 „ | 5KY | 52 „ |
| 5FL | 264 „ | 5TL | 43 „ |
| 5LC | 263 „ | 5LB | 41 „ |
| 5IZ | 255 „ | 5MS | 39 „ |
| 5TY | 248 „ | 5KF | 37 „ |
| 5LQ | 230 „ | 5CL | 35 „ |
| 5TM | 218 „ | 5CJ | 34 „ |
| 5GQ | 184 „ | 5CI | 33 „ |
| 5WG | 176 „ | 5OF | 33 „ |
| 5UJ | 175 „ | 5XM | 32 „ |
| 5ZQ | 172 „ | 5BP | 31 „ |
| 5LN | 156 „ | 5GF | 28 „ |
| 5LZ | 150 „ | 5NH | 26 „ |
| 5ON | 138 „ | 5UF | 25 „ |
| 5WN | 137 „ | 5CO | 24 „ |
| 5BI | 134 „ | 5PM | 24 „ |
| 5DF | 134 „ | 5JB | 22 „ |
| 5BG | 119 „ | 5XL | 20 „ |
| 5MM | 97 „ | 5JA | 19 „ |
| 5EQ | 90 „ | 5NF | 12 „ |

**C.w.—**

| | | | |
|---|---|---|---|
| VK5MY | 411 pts. | VK5FE | 154 pts. |
| 5FO | 389 „ | 5AU | 91 „ |
| 5KO | 300 „ | 5KU | 64 „ |
| 5XK | 283 „ | 5OR | 61 „ |
| 5ZF | 272 „ | 5RK | 48 „ |
| 5ZC | 249 „ | 5BS | 33 „ |
| 5LD | 161 „ | 5JG | 22 „ |

Check Logs: VKs 5JO, 5ZE, 5PH, 5OB, 5JT, 5KC, 5WO, 5OC, 5PS, 5GP.

Total Points .. .... .... 18096
Log Entry .... .... .... 91
Average Top Six .... 769

Calculation:
= 769 + (91 ÷ 460 × 18096)
= 769 + (0.198 × 18096)
= 769 + 3403
= 4172

## WESTERN AUSTRALIA

(Licences 250)

**Top Six Logs—**

| | | | |
|---|---|---|---|
| VK6RY | 759 pts. | VK6XY | 467 pts. |
| 6SM | 510 „ | 6CW | 408 „ |
| 6RU | 502 „ | 6DA | 393 „ |

**Open—**

| | | | |
|---|---|---|---|
| VK6SM | 510 pts. | VK6VK | 177 pts. |
| 6RU | 502 „ | 6BE | 111 „ |
| 6CW | 408 „ | 6PH | 98 „ |
| 6EZ | 201 „ | | |

**Phone—**

| | | | |
|---|---|---|---|
| VK6RY | 759 pts. | VK6BA | 62 pts. |
| 6XY | 467 „ | 6MM | 60 „ |
| 6DA | 393 „ | 6XG | 53 „ |
| 6DT | 348 „ | 6XO | 49 „ |
| 6LR | 334 „ | 6CP | 40 „ |
| 6AV | 260 „ | 6WI | 40 „ |
| 6KH | 246 „ | 6WU | 40 „ |
| 6DR | 243 „ | 6VW | 37 „ |
| 6DI | 177 „ | 6VM | 36 „ |
| 6WY | 159 „ | 6MA | 32 „ |
| 6RX | 135 „ | 6RW | 31 „ |
| 6CY | 135 „ | 6YL | 28 „ |
| 6CD | 125 „ | 6JO | 27 „ |
| 6HK | 116 „ | 6GH | 26 „ |
| 6CF | 112 „ | 6AQ | 24 „ |
| 6TX | 99 „ | 6TK | 23 „ |
| 6WL | 88 „ | 6SN | 22 „ |
| 6KJ | 86 „ | 6LS | 21 „ |
| 6KW | 82 „ | 6GL | 18 „ |
| 6TY | 76 „ | 6BS | 18 „ |
| 6ZZ | 71 „ | 6DC | 16 „ |
| 6CR | 63 „ | | |

**C.w.—**

| | | | |
|---|---|---|---|
| VK6WT | 380 pts. | VK6JK | 93 pts. |
| 6RS | 161 „ | 6RP | 43 „ |
| 6AS | 115 „ | 6GA | 28 „ |

Check Logs: VKs 6LM, 6GP, 6NJ.

Total Points .. .... .... 8080
Log Entry .... .... .... 56
Average Top Six .... 506

Calculation:
= 506 + (56 ÷ 250 × 8080)
= 506 + (0.224 × 8080)
= 506 + 1810
= 2316

## TASMANIA

(Licences 140)

**Top Six Logs—**

| | | | |
|---|---|---|---|
| VK7DK | 938 pts. | VK7KZ | 442 pts. |
| 7MS | 740 „ | 7SM | 440 „ |
| 7XL | 577 „ | 7JF | 400 „ |

**Open—**

| | | | |
|---|---|---|---|
| VK7DK | 938 pts. | VK7TX/P | 360 pts. |
| 7KZ | 442 „ | 7LZ | 18 „ |
| 7ZZ | 374 „ | | |

**Phone—**

| | | | |
|---|---|---|---|
| VK7MS | 740 pts. | VK7CK | 61 pts. |
| 7XL | 577 „ | 7RX | 37 „ |
| 7JF | 400 „ | 7AL | 28 „ |
| 7SF | 292 „ | 7YL | 27 „ |
| 7TT | 228 „ | 7DS | 23 „ |
| 7RL | 210 „ | 7CT | 18 „ |
| 7SK | 154 „ | 7JD | 12 „ |
| 7MX | 144 „ | 7KS | 11 „ |
| 7KH | 143 „ | 7DW | 8 „ |
| 7EB | 128 „ | | |

**C.w.—**

| | | | |
|---|---|---|---|
| VK7SM | 440 pts. | VK7RY | 72 pts. |
| 7GK | 321 „ | 7JB | 60 „ |
| 7GV | 176 „ | 7KA | 52 „ |
| 7LJ | 78 „ | 7BJ | 33 „ |

Total Points .. .... .... 6605
Log Entry .... .... .... 32
Average Top Six .... 590

Calculation:
= 590 + (32 ÷ 140 × 6605)
= 590 + 1506
= 2096

## NORTHERN TERRITORY

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(Continued on Page 20)

# JOHN MOYLE MEMORIAL NATIONAL FIELD DAY CONTEST, 1966

## SATURDAY, 12th FEBRUARY, TO SUNDAY, 13th FEBRUARY

The Federal Contest Committee of the Wireless Institute of Australia invites all Australian Amateur and Short Wave Listeners to participate in this Annual Contest, which is held to perpetuate the memory of John Moyle, whose efforts advanced the Amateur Radio Service.

**There are two divisions of this Contest, one of 24-hour duration, and the other of six-hour duration.** The six-hour period has been included to encourage the operator who is unable to participate for the full 24-hour period.

Operators using 25 watts or less input to the final stage in each section will be considered for a certificate where activity warrants its issue.

It will be seen that the Federal Contest Committee has, in accordance with comments and suggestions received, made changes in the Rules. The F.C.C. hope that the alterations will increase activity and operators will again make an effort to participate in this Contest.

**DATE**

From 0800 G.M.T., 12th February, to 0800 G.M.T., 13th February, 1966.

**OBJECTS**

The operators of Portable and Mobile Stations within all VK Call Areas will endeavour to contact other Portable/Mobile and Fixed Stations in Australia and Overseas Call Areas.

**RULES**

1. There are two divisions, one of six (6) hours, and one of twenty-four (24) hours duration. In each division, there are six sections:—

(a) Portable/Mobile Transmitting, Phone.
(b) Portable/Mobile Transmitting, C.w.
(c) Portable/Mobile Transmitting, Open.
(d) Portable/Mobile Transmitting, Multiple Operation, open only.
(e) Fixed Transmitting Stations working Portable/Mobile Stations, open only.
(f) Reception of Portable/Mobile Stations.

2. All Australian Amateurs are encouraged to take part, Portable/Mobile operators only will be eligible for certificates. Operators will be limited to their licensed power. This power shall be derived from a self-contained and fully portable source.

(a) Portable/Mobile Stations shall not be situated in any occupied dwelling or building. Portable/Mobile Stations may be moved from place to place during the Contest.

No apparatus shall be set up on the site earlier than 24 hours prior to the Contest.

All Amateur bands may be used, but no cross band operating is permitted.

Entrants in Section (d) for Multiple Operator Stations can set up separate transmitters to work on different bands at the same time. All such units of a Multiple Operator Station must be located within an area that can be encompassed by a circle not greater than half a mile diameter.

For each transmitter of a Multiple Operator Station a separate log shall be kept with serial numbers starting from 001, and increasing by one for each successive contact. All logs of a Multiple Operator Station shall be submitted by the Operator under whose Call Sign the transmitters are working. No two transmitters of a Multiple Operator Station are permitted to operate on the same band at any time.

3. Amateurs may enter for any section in the Portable/Mobile Sections.

4. One contact per station for phone to phone, also one for c.w. to c.w. per band is permitted. Cross mode operations will not be accepted for scoring purposes.

5. Entrants must operate within the terms of their licences and in particular observe the regulations with regards to portable operation.

6. Serial numbers consisting of RS or RST report plus three figures commencing with 001 and increasing by one for each successive contact shall be exchanged.

7. **Scoring:**—

(a) **Portable/Mobile Stations:**

For contacts with Portable/Mobile Stations outside entrant's Call Area .. .... .... .... .... .... **15 points**

For contacts with Portable/Mobile Stations within entrant's Call Area .. .... .... .... .... .... **10 points**

For contacts with Fixed Stations outside the entrant's Call Area .... .... .... .... .... .... .... .... **5 points**

For contacts with Fixed Stations within the entrant's Call Area .... .... .... .... .... .... .... .... **2 points**

(b) **Fixed Stations:**

For contacts with Portable/Mobile Stations outside entrant's Call Area .... .... .... .... .... .... **15 points**

For contacts with Portable/Mobile Stations within entrant's Call Area .... .... .... .... .... .... **10 points**

8. The following shall constitute Call Areas: VK1, VK2, VK3, VK4, VK5, VK6, VK7, VK8, VK9, and VK0.

9. All logs shall be set out under the following headings: Date/Time (G.M.T.), Band, Emission, Call Sign, RST/No. Sent, RST/No. Received, Points Claimed. Contacts must be listed in numerical order.

In addition, there shall be a front sheet showing the following information:—

Name.....Address.....
Call Sign.....Section.....
Division.....(6-hour or 24-hour).
Call Sign of other operator/s (if any).....
Location of Portable/Mobile Station.....
From.....hours to.....hours.

A brief description of equipment used, bands used, and points claimed, followed by the declaration:

"I hereby certify that I have operated in accordance with the rules and spirit of the Contest."

Signed.....Date .....

10. The right is reserved to disqualify any entrant who, during the Contest, has not observed the Regulations and the Rules of this Contest, or who has consistently departed from the accepted code of operating ethics.

11. The decision of the Federal Contest Manager of the Wireless Institute of Australia is final and no disputes will be entered into.

12. Certificates will be awarded to the highest scorer of each section of each division. Additional certificates may be issued at the discretion of the F.C.C.

13. Comments concerning the Contest, with particular reference to: Duration of Contest, points scoring system, Rules of Contest, would be appreciated by the F.C.M.

14. **Return of Logs:**

All entries must be postmarked not later than 28th February, 1966, and be clearly marked "John Moyle Memorial National Field Day Contest, 1966," and addressed to:

**Federal Contest Manager, W.I.A., 55 Moulden Ave., Mt. Yokine, Western Australia.**

**RECEIVING SECTION**

15. This section is open to all Short Wave Listeners in VK Call Areas. The Rules shall be the same as for the Transmitting Stations. Logs shall take the same form as for Transmitting Stations, but may omit the serial numbers received.

Logs must show the Call Sign of the Station heard, the serial number sent by it, and the Call Sign of the Station being worked.

Scoring will be on the same basis as for Transmitting Stations. It will not be sufficient to log a station calling CQ. A station may be logged once only for phone and once for c.w. in each band.

**Awards**: Certificates will be awarded for the highest scorer in each Call Area.

# IMPROVING THE REMEMBRANCE DAY CONTEST

*W. T. MITCHELL, VK3UM, Federal Communications Manager*

Since this Contest was first held in 1948, it has undoubtedly held first place in the Australian Amateur's Contest Calendar. Its popularity is attributable to the fact that it is a Contest between Divisions more than individuals, all aiming to win the coveted award of the R.D. Trophy for their State. Its original objects, apart from remembering those Amateurs who gave their lives for their country, were to promote friendly rivalry between States, to be as equitable as possible for all States to win and to encourage as many Australian Amateurs as possible to enter. It has achieved these objects to some degree since its inception except that the scoring methods seem to have favoured the smaller States rather than being equitable to all.

Historically, in an attempt to meet the object of fairness to all States, four changes to the scoring system have been made over the years since 1948. I believe none of these have acted as intended. It is with this in mind, that a new method of scoring is here presented with the object of giving each State, no matter what their Amateur size, an equal chance of winning. Statistical records have been maintained since 1948, and these form a background pattern on which to base a new system of scoring.

The Contest developed in the following manner—the author and the late Ted Jenkins, VK3QK, being the originators of the scoring system, but not the subsequent modifications. The first Contest in 1948 was arranged with a sliding scale of points designed to compensate between States for distances, propagation conditions and differences in Amateur population. This scale of points has never changed, although additions by way of VK1, VK9 and VK0 scoring have been added. The 1948 winner was determined on the average of the six highest scoring logs from each State and in that year it was won by VK2. In the following year, Federal Council saw fit to add a multiplier applied to the sliding scale to produce a more equitable result. This multiplier appeared to favour the smaller States as evidenced by the wins of VK7 in 1949 and 1950.

In 1951, the multiplier was again changed in an attempt to even the scoring and this change applied until 1957. In this multiplier, the ratios of entrants to licensees occurred. The results over this seven-year period show that VK5 won twice, VK6 four times and VK7 once. In 1958, the multiplier again altered but not significantly from the previous seven years, and this time it was again won by VK5.

From 1959 to 1964, the multiplier again altered and in this period of six years, the Contest was won by VK6 and VK7 twice each, and VK4 and VK5 once each. So it can be seen that except for the first year, 1948, when there was no multiplier, the Contest has been won by the smaller States. Federal Council being aware of the need to try and even up the scoring between States, at the Convention in Perth in 1962 authorised the Executive to publish a new system originated by the author and presented at that Convention. Although not published at the time originally intended, the results of this study are now published for comment by any who wish to do so.

The writer, after a careful examination of all the facts, considered that the unevenness in the scoring system pertained because the multiplier was based on a factor of entrants to licensees per State. Whilst not detracting from the interest and activities organised by the smaller States in encouraging their members to enter even for a minimum number of contacts, it will be conceded that it is easier to obtain participation from a smaller number of members than it is from four or five times that number. This fact is borne out by a study of these figures by the author which may be plotted as a hyperbolic curve of the form:—

$$P = A \times L^{-b}$$

where P is percentage of entrants to licensees.
A is a constant (about 2,850).
L is number of licensees.
b is a power factor (about 0.8).

All this formula or its graph means is that the higher the number of licensees in a State, there is unlikely to be a significant increase possible above a certain figure in the percentage of entrants to licensees. This could result in a large State with say 1,000 licensees never being able to achieve an entrants to licensees percentage above 20% as against a smaller State being able to obtain a figure of 40 to 50% (which incidentally has been achieved). This factor then obviously gives a big boost to the smaller States.

The author has taken the results of the Contest between 1951 to 1964 as the basis for background on the new system. Results before 1951 did not introduce total State points and could not therefore been taken as representative of results achieved. Symbols used to explain the system are:—

E is entrants from the State considered.

P is the total score of State concerned.

N is total log entries received.

S is particular State's trophy tally points.

It is considered that the final form of any formula to determine the winner must include E and P arranged in such a way that Divisions obtain E as high as possible, which in turn ensures that P is as high as possible. Entrants should be encouraged to stay in the Contest as long as possible and obtain as many contacts as they can.

Here it is appropriate to introduce another argument. Ideally, every entrant from a State should be able to contact every other entrant in the Contest outside his State on each band operated. I think everyone would agree that if there was only one entrant from each State this should be possible, and in this case, all entrants would finish with the same number of points. (A look at the sliding scale of points will show this to be true.) However, in practice, and with the number of entrants involved, this will never happen, but as a hypothetical case it is valid.

Let us assume therefore that we are discussing one band only—the case is still valid—if every entrant from one State contacts every other entrant in the Contest (based on points given in the sliding scale), a certain total of points will be obtained. This will give, for that State, the total points it should have been possible to score for that band. Now if we take these total points as a percentage of the possible total National points and compare this percentage against the actual points scored by that State as a percentage of the actual National points scored, will show whether the State has bettered or fallen short of its possible percentage. This will give us a yardstick or "factor of merit" for that State. This will give us a ready check on whether the formula devised is truly representative of what could have been achieved. As an example of how this works, the figures for the 1961 Contest have been taken as a typical case.

| | Possible % | Actual % | Factor of Merit | Position |
|---|---|---|---|---|
| VK2 | 25.58 | 27.36 | +1.78 | 3 |
| VK3 | 16.72 | 19.40 | +2.68 | 2 |
| VK4 | 12.12 | 10.51 | —1.61 | 4 |
| VK5 | 16.96 | 20.05 | +3.09 | 1 |
| VK6 | 16.51 | 12.46 | —4.05 | 6 |
| VK7 | 11.51 | 9.15 | —2.36 | 5 |

The actual positions in this Contest were as follows:—

| | |
|---|---|
| VK2 4th | VK5 2nd |
| VK3 5th | VK6 1st |
| VK4 6th | VK7 3rd |

which can be seen do not really represent the true effort or attainable result for this Contest.

A further examination of all the figures under consideration shows that statistical interpretation relates P and E by the straight line:—

$$P = 175\ E - 408$$

where 175 is the gradient of the line and the constant —408 is an intercept on the axis of the graph (which can be disregarded as the line virtually passes through the origin). By applying this gradient figure to the formula, we later endeavour to produce evenness of the result of State scores.

Without going into the various reasons, a formula of the following form has been devised out of all the information available from previous Contest results:—

$$S = P + a\ (N - E)$$

where S, P, N and E have previous meaning and a is a constant or factor.

If we apply a correct value to the constant a, the various States' final scores should be reasonably even. The

value chosen for constant a is the gradient 175 previously determined. This is now applied to this formula with a simple divisor for the entire right hand side of the equation to make the results of a reasonable size. The equation is therefore:—

$$S = \frac{P + 175\ (N - E)}{1000}$$

To show that this formula provides a result comparable with the achievable performance of each State, let us take the case in 1961 again. Applying this formula gives the following scores for each State:—

| | | Position |
|---|---|---|
| VK2 | 84.401 pts. | 3 |
| VK3 | 85.218 „ | 2 |
| VK4 | 83.119 „ | 4 |
| VK5 | 86.132 „ | 1 |
| VK6 | 77.987 „ | 6 |
| VK7 | 81.766 „ | 5 |

It will be noted that these results exactly conform with the Ideal Result previously shown for 1961. To further indicate the agreement and correlation between the Ideal and New Formula results, these are shown for the years 1959 to 1964. Column headings indicate I for Ideal, N for new formula, and A for result determined by the old formula.

| | 1959 | | | 1960 | | | 1961 | | |
|---|---|---|---|---|---|---|---|---|---|
| State | I | N | A | I | N | A | I | N | A |
| VK2 | 3 | 3 | 5 | 4 | 4 | 5 | 3 | 3 | 4 |
| VK3 | 2 | 2 | 4 | 1 | 1 | 4 | 2 | 2 | 5 |
| VK4 | 6 | 5 | 6 | 6 | 5 | 6 | 4 | 4 | 6 |
| VK5 | 1 | 1 | 3 | 2 | 2 | 3 | 1 | 1 | 2 |
| VK6 | 5 | 6 | 2 | 5 | 6 | 2 | 6 | 6 | 1 |
| VK7 | 4 | 4 | 1 | 3 | 3 | 1 | 5 | 5 | 3 |

| | 1962 | | | 1963 | | | 1964 | | |
|---|---|---|---|---|---|---|---|---|---|
| State | I | N | A | I | N | A | I | N | A |
| VK2 | 3 | 3 | 5 | 3 | 3 | 4 | 3 | 4 | 6 |
| VK3 | 2 | 2 | 6 | 2 | 2 | 6 | 1 | 1 | 5 |
| VK4 | 4 | 4 | 2 | 4 | 4 | 1 | 5 | 5 | 3 |
| VK5 | 1 | 1 | 3 | 1 | 1 | 3 | 2 | 2 | 1 |
| VK6 | 6 | 6 | 1 | 6 | 6 | 2 | 6 | 6 | 2 |
| VK7 | 5 | 5 | 4 | 5 | 5 | 5 | 4 | 3 | 4 |

If one therefore accepts the proposition of the Ideal case, the new formula closely predicts the Ideal result.

The new formula also leads to the original concepts of the Contest—that is, that it will be equitable to all States, that it will encourage a maximum entry from each State, and does not lend itself to "juggling". If a State attempted to win by restricting its entrants to a few good operators, its State total points P would be low although the factor N — E × 175 might be high, so that one compensates for the other.

It is therefore proposed that the following basic rules apply with the use of the new formula:—

(a) The present sliding scale of points be retained.
(b) Each State contesting the trophy enters a minimum of 20 eligible logs.
(c) The new formula be used for at least three consecutive Contests.
(d) The minimum number of contacts per entrant, namely five, be deleted.
(e) Only recognised Divisions compete for the Trophy.
(f) Stations outside Divisions, e.g. VK1, VK8, VK9, VK0 be excluded from Divisional scores.
(g) Stations outside Divisions be issued with certificates as per winning stations within Divisions, a minimum of six entrants per call sign area being required.
(h) Certificates be awarded to the three highest logs in Open/Phone section and c.w. sections, a maximum of six certificates per area or Division.

If Divisions are prepared to adopt these basic rules and use the new formula for the Divisional Trophy winner, I am sure the Contest will promote greater interest which has tended to wane over the last few years. If this new formula does not operate in the way predicted, then it can be changed after a reasonable trial of three years. This may tend to inject a pessimistic note but one can only base the future on past trends and not on fact, otherwise clairvoyance would be a lucrative business. The Executive, in proposing this new means of finding the State winner, hopes the Contest will be rejuvenated and that the larger States may now achieve something tangible for their efforts over the years.

Any comments on the proposed new system should be forwarded to the Federal Communications Manager, Box 2611W, G.P.O., Melbourne, Vic.

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# 1965 R.D. CONTEST RESULTS

(Continued from Page 11)

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| 2ARF | 30 ,, | 2APQ | 9 ,, |
| 2ZID | 24 ,, | 2ZSR | 8 ,, |
| 2AXJ | 23 ,, | 2ZJC | 8 ,, |
| 2ZTM | 21 ,, | 2ZAZ | 7 ,, |
| 2YJ | 18 ,, | 2ZSG/T | 6 ,, |
| 2ZVC | 18 ,, | 2ZKT | 5 ,, |
| 2WI | 16 ,, | 2AZY | 3 ,, |
| 2ZJH | 14 ,, | | |

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| | | | |
|---|---|---|---|
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**South Australia—**

| | | | |
|---|---|---|---|
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| 5ZDX | 54 ,, | 5ZKG | 15 ,, |
| 5ZBR | 33 ,, | 5ZKS | 15 ,, |
| 5ZTN | 30 ,, | 5ZDM | 8 ,, |
| 5ZNH | 24 ,, | 5ZTS | 8 ,, |
| 5ZBC | 23 ,, | 5ZSJ | 6 ,, |

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**Wetern Australia—**

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**Tasmania—**

| | | | |
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| 7ZAV | 9 ,, | 7ZAQ | 7 ,, |
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| L2033 | 281 ,, | |
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| Ass.—W. Schroeder | 144 ,, | |
| WIA-L2211 | 90 ,, | |
| L2039 | 52 ,, | |

**Victoria—**

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| WIA-L3138 | 714 ,, | |
| L3211 | 680 ,, | |
| P. R. Smith | 520 ,, | |
| WIA-L3285 | 518 ,, | |
| L3185 | 518 ,, | |
| L3190 | 364 ,, | |
| L3042 | 355 ,, | |
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| L3055 | 123 ,, | |

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| L5049 | 617 ,, | |
| D. Clegg | 583 ,, | |
| WIA-L5067 | 579 ,, | |
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**Tasmania—**

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| WIA-L7031 | 671 ,, | |
| P. Tompson | 420 ,, | |
| WIA-L7038 | 233 ,, | |
| L7035 | 176 ,, | |
| L7043 | 125 ,, | |
| P. Verral | 53 ,, | |

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| | | |
|---|---|---|
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# V H F

## 52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Summer is with us once again and band activity is increasing all around Australia and all those interested are preparing for another DX season. With the sunspot minima behind us, conditions should be on the improve, and if the experts can agree the next three seasons should see a swift rise in the sunspot count and a possible increase in DX.

This year will see lwo of the cities under the cloud of t.v.i. problems. Melbourne has already undergone one season which resulted in a spectacular decrease in activity during t.v. hours. As the respective stations increase their programme hours, then further inroads are being made in our operating times. Brisbane no doubt will experience a crop of missing familiar voices this year.

The problems that exist for one Amateur are not necessarily that of another, which makes it extremely difficult to predict what will happen in any one case. Some have chosen the high end of the band with low power and vertical polarisation and have achieved some success. Others have remained at the low end with normal procedures and the use of traps have overcome their problems.

Many are experiencing difficulty with reception so close to the t.v. channel—overloading of receivers and no end of filtering will overcome the problem. All of those plagued with troubles are anxious to conquer them. Large numbers of us are hobbyists and their overall knowledge is limited, whilst their are many who are professional engineers whose knowledge could assist in the investigation of these problems. The design of a no-overload converter and some investigation of t.v. receiver problems could be of great assistance to many who wish to use 6 metres.

### NET NEWS

Believe that the 53.035 net is active now in VK7 with some 15-20 stations operative—a recent visitor from VK3 apparently stirred up some activity. VK2 from Wollongong should be represented soon. We also believe that the VK5 beacon on 53 Mc. is temporarily out of business and it will be possible to work into Adelaide, so hope the VK5 stations will keep an ear on this frequency.

Crystal frequencies useable are 5892.5, 6.629, 8.8336, 13.258 Mc. will bring you up—of course a v.f.o. is ideal. Remember the majority of users of this frequency are using ex-commercial fixed frequency gear which requires fairly accurate alignment of frequency for best results.

Large numbers of net frequency users are mobile and to avoid undue congestion lengthy QSOs should be avoided. Mobiles can travel long distances and pass out of range during lengthy QSOs. Keep the overs short and observe a courtesy break before replying to allow others to identify themselves. There is nothing more annoying to run out of road in the middle of a QSO.

The VK6 f.m. net on 6 is quite active according to the W.A. V.h.f. Bulletin. Some 50 odd stations have been active with another 18 on the way. Contacts ranging up to 40 miles have been made whilst stations have been heard up to 120 miles.

The VK3 6 mx f.m. net is slowly making progress and some half dozen stations are active. Recent disposal sales will give a boost to this figure. VK6 52.656 Mc. and VK3 52.525 Mc. are the frequencies.

Two mx f.m. in VK3 has expanded enormously during the past 12 months. Over 150 stations have been logged all over Victoria, spread over the three channels. Peaks of activity are mornings and evenings with both fixed and mobile stations providing plenty of contacts. In the near country and country areas plenty of stations provide DX from time to time. Quite a few are near the 100 stations worked on these channels.

VK2 activity is reaching high levels centred on 146 megs., some 50 odd stations reputed active.

### DX OPENINGS

Six mx DX is slowly getting under way. VK4 signals heard in Melbourne on Nov. 1 was 4ZAZ between 8-9 p.m. On Nov. 4, 4ZRG was heard at 5.45 p.m. with some odd openings during the month. Channel 0 from various centres are being heard all over Australia.

Two mx: A good opening between VK3-VK5/VK7 occurred on Sat., Oct. 30. Melbourne stations worked into Adelaide and Renmark during the evening. 5ZKR and 5ZHL at Mt. Gambier were like locals, whilst 5NY (108E. of Adelaide) and 5ZDR in Adelaide, who was in for two hours, worked quite a few Melbourne stations along with 5BC at Renmark, whilst 3AGV at Colac worked 5ZDX. 7ZAA, 7ZAH and 7ZWN were worked and 3ZKU between Rochester and Echuca, north of Melbourne, was available—in all a good evening's work.

Who will gain the first two metre W.A.S. in VK? It's not far off. VK8KK should be active this year to provide another State for the tally. Will VK5-VK8 be worked again? Only time and patience will tell.

### OSCAR IV.

By the time you read these notes or soon after, Oscar IV. should be in orbit. Information received to date gives the following details.

The orbit will be sub-synchronous equitorially at a height of approx. 18,200 miles. The orbit time will be 12 days, taking about four days horizon to horizon, with an eight-day gap between appearances.

The receiver frequency is 144.1 plus or minus 5 Kc., and transmitter frequency 431.935 plus or minus 5 Kc.

When launched the satellite might have one or more of the following packages:—

(1) Beacon 431.920 with 20-sec. c.w. carrier plus two HI's, total run 32 secs. each 10 mins.
(2) Multiband beacons on 144.05, 432.15, and 1296.45 with 1 watt c.w. each, the 144.05 channel could be telemetry.
(3) 144.05 c.w. beacon, 432 beacon, 1296 beacon —all separate transmitters.

It will consist either of a tetrahedran package with 27 inch legs weighing 25 lbs., or a 19 inch cube weighing 35 lbs. In either case with the satellite being stabilised and probably the outer skin will be covered in solar cells having a life of 12 months.

A possible future version will have an input on 144.1 plus or minus 10 Kc. translated to 29.45 plus or minus 125, also 10 mx and 432 beacon. Where will it end? A long wire on 1825 Kc. would go well!

Hope everyone is aware of the early closing date for Jan. Thanks to all those who have contributed during the past year. I would like to ask that I be included on your Divisional or branch newsletter mailing lists for additional information and would welcome reports from s.w.l's and individuals to try and build up the newsiness of this page. Notes from areas of v.h.f. activity out of the capital cities will help bridge the gap. Will you help?

All the very best for the coming festive season. Hope you all join in the Ross Hull Contest—and forward a log to the Committee to help swell the numbers. 73, 3ZGP.

### NEW SOUTH WALES

Interest is still increasing in the DX field week-end over the New Year. Word was received last month that the VK4 Moonbounce team and ZL2TCW would be in it. The object is to select your favourite high spot, and some time between 5 p.m. (E.S.T.) on Saturday until 9 a.m. (E.S.T.) Monday to try to work v.h.f. DX on the bands of 2 metres and above.

In the next issue I hope to have a complete list of known stations taking part, but at the moment there should be at least 30 field sites. Would all stations who are taking part—including those outside VK2—please advise VK2ZTM, Box 342, P.O. Crows Nest, so that the final list may be compiled. 73, 2ZTM.

### QUEENSLAND

The 6 mx band has been open at least four times during October. In the first week of Oct. VK5s were worked by mobile VK4 stations who were on the Queensland Gold Coast at that time. On Oct. 31 both Channel 0 Melbourne and Channel 0 Wagga were heard in Brisbane. However, no Amateur stations were received.

Six metres in Brisbane is particularly active on mornings during the week. Regulars include 4ZRM, 4ZCV, 4ZLO, 4ZFF, 4ZGN. Sunday morning is the only other time that 6 mx comes alive. On this day one is liable to hear 4ZAA, 4ZAL, 4ZRH, 4ZBT, 4ZEP, 4ZDF. Some stations are operating successfully during t.v. hours. Those that have been heard are 4ZDJ, 4WM and 4ZLO.

Two metres remains an active band in Brisbane. 4ZJB has established himself at a new QTH and has earned himself the title of "Voice from the Mountains". 2 mx DX hunters should keep an eye out for 4ZJB this summer. Ross 4ZAT has been active again. John 4ZWB has made a first class job of his new final. Everything has been silver plated, so the rumour goes. Graham 4ZZG has packed his gear and has gone to Longreach. Bill 4ZBO is still flying the flag on 2. Bill is a regular with a first class signal from his 6/40.

The Jamboree-on-the-Air held during October was particularly successful on the v.h.f. bands. Many stations took part and the photographs of 4ZDF which appeared in the local paper caused some favourable comments. His v.h.f. station was situated in the window of the Scout Shop in the centre of the city of Brisbane. 73, 4ZPL.

### SOUTH AUSTRALIA

Activity within VK5 during the past month has been very spasmodic, despite stimulating injections provided by Sporadic E DX openings. Openings to VK4 during October have been regular, however activity from VK4 appears to be reduced to a finite quantity as no more than two call signs have been heard at the same time. The advantageous "benefits" of beacon tx's has shown up during this month. On the 6th and 22nd Oct. the VK6 beacon on 52.006 was audible in VK5, but no VK6 signals were heard.

Unfortunately the VK5 beacons are not as yet operational, due to technical correspondence with the Department in Melbourne. It is anticipated, however, that the beacons may again be in action in time for the DX season. Channel 0 reception from Brisbane and Melbourne appears to be the accepted thing, but Amateur signals very rarely follow.

Interest is being shown in Oscar IV. by a few members of the v.h.f. fraternity here in VK5 and 432 megacycle converters, both valve and transistor, are under construction. If nothing else is achieved by Oscar IV., it would appear that a boost for 432 meg. operation within VK5 will certainly eventuate. Unfortunately contacts made through Oscar IV. will have no record bearing status or count for points in the Ross Hull Contest, but nevertheless, should provide an interesting exercise in v.h.f. communication. 73, 5ZHJ.

### WESTERN AUSTRALIA

Activity in W.A. is lacking on a.m. due to many old timers being posted to country centres. Many stations are now on f.m. 52.656 and some full calls are coming into the net. One call is on 2 mx f.m. too. The Bickley net shifted to 53.44, but went back to 52.6 due to QRM from the t.v. tx. They are interested in some 8785 Kc. FT243 unmounted crystals obtainable from the W.I.A. for 4/-.

The last fox hunt on Oct. 23 was run by 6ZAG, assisted by Peter Taylor. Ken 6ZDT and Doug 6ZDW found me in 20 minutes, followed closely by 6ZDB in his Cortina. Chas. 6LK was 200 yds. away when he turned around and headed round the other side of Perry Lakes. Somebody provided a lit hurricane lamp on the roof of the fox, but it didn't help much, even with "talking in" on the f.m. net.

The meeting on Oct. 25 was well attended. The beacon was criticised for lack of operation due to keyer breakdown, faulty oscillator, lack of drive to the final and t.v.i. on 9 with both beacons running. Alternate running was discussed but nothing will eventuate unless someone does some work. The Christmas Party was discussed and Doug Wauchope said his place would be available. Note the address, 19 Hardy Road, Hollywood, and the date—Dec. 18. Some lady volunteers required please. A co-ordinator for the John Moyle Memorial Field Day in February is required too. Fin-

(Continued on Page 23)

## ERRATUM—V.H.F. CONTEST RULES

In the Rules of the Ross Hull Memorial V.h.f. Contest, published in Oct. "A.R.," page 10, an error appears in the scoring table. Under the sub-headings of "Higher—Up to 10 Miles," a figure 2 should have been shown instead of blank. Operators are asked to amend their copy accordingly.

# D X

## VP4, OA4, BV, ZM7, 7GI, FP, AC5, MP4, ZC6, TY2

Sub-Editor: ALAN SHAWSMITH, VK4SS,
35 Whynot Street, West End, Brisbane, Qld.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

DX is available on all bands. 28 Mc. is mostly dead and chancy, but does open to the U.S.A. around 2230z at this QTH, when QSOs are easy. 21 Mc. is open daily to all over. Plenty of Js and Ws. Short weak break to S.A. around 0330z and Europeans an hour or two later. 14 Mc. is good for W.A.C. any day. 7 Mc. DX under several layers of commercial QRM, and 3.5 Mc. also loaded with the same interference to the odd DX sig.

### NOTES AND NEWS

**Agalaga Is.:** VQ9HB plans activity from this rare spot during December. QSL: G8KS. Mode s.s.b./c.w. Look for the pile-up.

**Venezuela Radio Club:** YV9AA and YV3AJ hope to put in an all-band effort. 160-10 mx. Late Nov. and early Dec.

**Kwajalein Is.:** Leo W1MV, of KP6 expedition past, will open up from KX6 during Nov. into December. All bands and modes.

**Jan Mayen:** LA5CI/P on 1425 kc. QSL via LA1NG.

**Asiatic Russia:** UA0KYA operating in Zone 23. Daily on 20 c.w. from 0000z.

**Azores:** CT2AH will be back on the air again early December. S.s.b. mode.

**Marion Is.:** ZS2MI still QRV 14250 at 2000z. QSL via ZS1CZ.

**Malta:** 9N1AB is in the thick of it on 14035 kc. at 2115z. QSL R.S.G.B.

**Tchad Republic:** TT8AB is reported QRV 21210 kc. at 2000z.

**Georgia:** UF6UB 14237 kc. Try listening 1930z.

**Afghanistan:** Charlie YA3TNC is now on 15 as well as 20 mx. Try 21410 at 1430z.

**Crozet:** FB8WW also taken to using 21 Mc. as well as 7 and 14. 21051 at 1400z.

**Spanish Samara:** EA9AZ worked on 21280 at 1800z.

**Senegal:** 6W8DQ, Diop., 14230 at 0200z.

**Surinam:** PZ1BK, 2130 at 1600z or later. Also PZ1BW—14258 at 2300z.

**Republic of Congo:** Stan TN8AF, 21068 at 1830 or later.

**Liechenstein:** MB0ABS and MO0ABE, both on 14114 at 1100z.

**French Somaliland:** FL8RA, 21065 at 1730z, and FL8MC anywhere in the c.w. 14 Mc. band after 1200z.

**Alando Is.:** OH0NF, 14235 and about 14025 kc. after 1200z. QSL Box 1, Mariehamm, Finland.

**Sakhalin:** UW0ER is active s.s.b. on 14 Mc., and 7 Mc.

**Grand Turk Is.:** VP5AR will be active from here for about 18 months. Also VP5CS. QSLs to W2PVZ.

**4W1G and 4W1I:** QSLs from both are being handled by Harry Charvat, K9BPO, 207 Mandel Lane, Prospect Heights, Illinois, who has the logs and is having cards printed. He requests s.a.s. and g.m.t. He will probably be handling QSLs for other 4W1 stations as they are activated.

**Cocos Is.:** VK9JO active on 14 Mc. c.w. 1000z.

**Virgin Is.:** The perpetual KV4CI can be worked around 2200z on 14 Mc. c.w., also s.s.b. 14110 kc.

**Gloriosa:** Said to be commencing in Nov. some time. Duration not known. Call to be FR7ZI/G. Mode s.s.b. and maybe c.w. W6RKP can supply further info.

**Bonaire:** PJ5BC and PJ5BD will be the call used by K0GZN during December. Mode s.s.b. No other info.

**Kuching:** Several 9M8s are active as of now, but it seems 9M8TG is a pirate. However, 9M8FS, 9M8GT, 9M8RI are authentic. Mainly 14 Mc. c.w.

**South Georgia:** VP8HO is due to be active commencing Nov. Duration unknown. Mode 14 Mc. s.s.b.

**Port. Guinea:** Octavio CR3AD on 14067 c.w. at 2245z says QSL to Box 205, Bissau, Port. Guinea.

**Sanmarino:** M1B, Marion, worked at 1400z on 14247. QTH in Call Book.

**Montserrat:** VP2ML, Bruce (VP2AL) active on 20 s.s.b. Box 340, Antingua, W.I.

**Nepal:** 9N1MM, Father Moran, back on again. 14123 kc. at 1330z, listening 14275. QSL to W3KVQ/2, Edward Blaszcyk, 2308 Branch Pike, Cinnaminson, N.J., 08077.

**Laos:** XW8AZ on 14118 at 1300z.

**Mali:** Jose CR7GF (CR3GF) would like to go to TZ land, and is going to Lisbon to try to arrange permission.

**Malagasy Rep.:** 5R8CB, Jaques, on 21254 at 1800z.

**Eastern Carolines:** KC6FM is active from here s.s.b. 14230 kc. around 0630z. QSL to W2CTN.

**Bacanof Island:** Alexander Arch, KL7BJC, is active on s.s.b. 14245 kc. around 1645z. QSL to P.O. Box 44, Bacanof Is., Sitka, Alaska.

**ZD8AR** is a club station and they are active Friday and Saturdays s.s.b. 14250 kc., 1800-2400z, then QSY to 7090 kc. or 3785 kc. s.s.b. With a vee beam for 7 Mc. ZD8HL is also active all bands.

**Togo:** 5VZ8CM is active from Togo. QSL: F. Payet, P.O. Box 123, Lome, Togo. Will be there approximately one year.

**Marie Byrd Base, Ant.:** KC4USE is active from here. QSL to K1TWK.

**Kerguelen Arch.:** FB8XX active on 21 Mc. a.m. and c.w.

**Cuba:** CO2BO/OK3MM, Jan, is active on c.w., freq. 7010, 7013, 7038 kc. Hopes to be on s.s.b. later.

**Fr. Somaliland:** FL8RA and FL8MC active, but will avoid pile-ups.

### ACTIVITIES

Dud VK4MY has been picking off some nice ones on 14 c.w. They are KG6SZ 0600, XE1EK 0225, KB6CY 0640, OA8D/3 0500, UL7KGF 1240, UC2KMZ 1350, UC2AR 1350, UT5FI 0700, HK-3AVK 0600, HM0HQ 0700z, UA0FM 2100, UW1AR 1327, YO4CS 1400, UO5DN 0600, 9M6DH 1430, KC6SZ 0730, YV1AD 0600, UT5GT 1300, ON5ZO 0700, FO8BI 0600, 9M4MX 0000, KC4USX 0500, HK4AOY 0220, 5W1AZ 0200, UT5BX 0630—all G.M.T.

Chas. VK4UC, who is a QRP operator, has really been among them this month on 20 mx c.w.: KG4AA 0530, PE2EVO 1400, VE8NO (Zone 2) 2200, OM0VF 1135, HM0HQ 0930, VQ9J 1200, PL1TH/M 1300, GI3OLJ 0930, F7CY 1400, 1S9-WNV 1040, VS9MP 1100, VS9OSC (Oman) 1200, PA0ROL 1330, FB8WW 0700, VP7NQ 1200, 9M8RI 1200, VK9JO (Cocos) 1000—all G.M.T.

### QSL MANAGERS

AC4AX—VU2AX
EL3A—W3CGF
FL8MY—W0MLY
FQ8HQ—K6EC
FR7ZC/T—W4ECI
1U1TAI—W4VPD
KP6AA—K0YKJ
VR2EA—G3JFF
VR1B—VK3IB
VQ1RO—G2RO
VQ2WM—W2CTN
TU8AU—W8HMI
VQ1IT—VQ1GDW
GB3MAA—G3SXK
KC4USV—W2VIM
LI2CL—G3HCL
DJ9LJ/M1—DL1CF
M1QJ—ON4QJ
OH0AB—W2GHK
OH0VF—OH5VD
VP1JH—W0NWX

### SUMMARY

Piracy could be likened to an endemic affliction of A.R. There's always some going on, and it would be interesting to know just how much.

Reports of illegal intrusion into the VK1 ranks comes from Steve VK1VK in A.C.T. I quote: ". . . with only four stations on 14 Mc. s.s.b., we received at a recent meeting of the Canberra Amateur Radio Society, cards for another 23 unknown stations. The only VK1 stations active on 14 Mc. s.s.b. are VK1AU, VK1JG, VK1VK, VK1VP and now our newest arrival VK4YG/1. It is suspected that the offenders are from VK2 country areas."

Have you ever listened to a high-powered DX man bull-doze one of his lesser compatriots out of a rare QSO? This is another practice far too common, and for the sake of Amateur Radio's ethics, it needs periodic airing. It is saddening to hear this miserable feat being accomplished, because each time a little of the best of A.R's spirit is killed. These reprehensible performances seldom pass unnoticed—someone is always listening. The words of Robbie Burns are brought to mind: "Oh that God the gift wud gie us, to hear ourselves as ithers hears us." Those who should know better, don't seem to understand the difference between competition in the spirit—and dog eat dog.

My thanks again to the column's several contributors: L.I.D.X.A., Fla., DX'er, G3DHA, R.S.G.B., Jim G3UGT, Dot K2MGE, Steve VK1VK, Ken VK3TL, Dud VK4MY, Chas VK-4UC and S.w.l. C. Thorpe.

Please chaps, more info on Oceania DX activity. 73, Al VK4SS.

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## V.H.F. NOTES

(Continued from Page 21)

ally, I'd like to wish you all good luck with Oscar IV. and a Merry Xmas to everybody. 73, 6ZAG.

### TASMANIA

Most local activity is still concentrated on the net frequency with about 25 stations in Hobart and eight mobiles in Launceston. Although the crystals supplied to us produce a frequency of 53.035 Mc., it appears to be close enough to the generally accepted frequency to be useful.

A lone, unidentified DX signal around 52.8 Mc. broke the monotony on Oct. 15.

Oct. 23 heralded the start of the 2 mx DX season for the northerners when 7DK contacted 3ZDM. An early return to summer weather has brought with it, during the latter part of October, particularly good signals from Channel 0 and 2 to the northern coastline. On Oct. 24, 3AKN and 5ZHL(?), operating on a flight between Warrnambool and Melbourne, were heard 5/6 in Burnie. A power failure prevented Winston 7ZWN from participating; when power returned the opposition from Melbourne stations was too overpowering. The usual beacon failed on 26th Oct. when an opening between 7ZWN and Melbourne, 3ZOW and others, was not accompanied by VK3 t.v.

Now active on 2 mx is 7BR, Evandale, 12 miles south of Launceston, a useful liaison as he could contact both Hobart and Launceston. Kevin 7ZAH is now employed at Kelso, 40 miles north of Launceston and can contact Burnie easily.

It is hoped there will be some VK7 portable activity during VK2's January effort. To my knowledge VK2 has never been contacted from VK7 on 2 mx although VK3, 4 and 5 have. The early morning hours should be the most fruitful.

Regular signals now include 6 and 2 mx re-broadcasts of 7WI at 1000 hours in both Hobart and Launceston. A slow Morse transmission on 52.2 on Sunday, Tuesday and Thursday is hoped to draw many listeners.

A final word to the hordes of motorists visiting the "Holiday Isle" in December or January—come equipped for 53.032 Mc. a.m. 73, 7ZAO.

### V.H.F. CONTEST OF THE YEAR

Remember the V.h.f. Contest of the year—the Ross A. Hull Memorial Contest. It commences on the 11th December at 1401 G.M.T. (i.e. 12th Dec. at 0001 E.A.S.T.), and finishes on the 16th January, 1966, at 1359 G.M.T. (i.e. 2359 E.A.S.T.).

There are some new rules this time, so be in it! Full details from October "A.R.", p.10.

## CONTEST CALENDAR

**12th December:—**
N.Z.A.R.T. V.h.f. Field Day. (Refer "A.R." for Oct., p.19.)

**12th December to 16th January:—**
Ross A. Hull Memorial Trophy V.h.f. Contest. (Refer Oct. "A.R." p.10.)

**12th/13th February:—**
John Moyle Memorial National Field Day Contest. (Rules this issue.)

**19th/20th February:—**
First R.S.G.B. 1.8 Mc. Contest.

**19th/20th March:—**
B.E.R.U. (Rules p.609, Sept. "R.S.G.B. Bulletin".)

## DON'T FORGET

**your VK/ZL Contest Log!**

Deadline for local contestants is **15th December, 1965.**

Deadline for overseas entrants is 15th January, 1966.

# S W L

Sub-editor: D. Grantley, L2022.
Alexander Ave., Hazelbrook, N.S.W.

Whilst preparing my entry in the recently held VK/ZL Contest, it occurred to me that the average listener has little incentive to win the receiving section of this event. Under the present rules the receiving section is "open," meaning that the totals from both week-ends when combined, give the listener his final score. Many of our s.w.l's are students and young ones at that, and these lads have little or no chance of winning their State certificate, let alone be top scorer when they are forced to compete against men who are experienced c.w. operators and to whom the phone section is only a pipe opener.

The obvious answer would be to divide the receiving section into two parts—phone and open, and by doing this I feel the Contest committee would be rewarded by having increased entries from the junior listeners and phone men.

**BAND CONDITIONS**

Reports from around the continent show an improvement on all bands. In VK2, L2287, L2001 and L2022 supply the reports. Nothing on 160 or 80, but 40 mx is open to Europe from mid-afternoon and continuing to the daylight hours. 20 mx seems to be open everywhere. Ray L2287 has had openings to TY2, YU3, UL7, F9, UQ2 and CR8. Chas L2001 has been listening in the evenings when excellent loggings have been made from the Pacific. L2022 has loggings to all continents on 20 mx at any time other than mid-morning, at which time 15 mx has been opening to JA and Pacific. This band is usually open to Europe in the evenings, with F3, UA1 and G3 being heard by L2287 and other Europeans by L2022. On several occasions Ws have been heard working ZL on 10 mx.

In VK3 we follow the same pattern with reports from L3042, L3229 and L3211. On 160 Eric has logged VK3 only, but JA, KL7, VE1 and VR1 have been heard on 80 mx. Up to 40 mx, Bob L3229 heard JA, OX, CE, KH6, DU, UA1, KX6, YV, GW, DJ, G and KW6, whilst Eric hooked CM2, VK0, VP4 and ZC4 amongst others. Only other band report from VK3 is for 20, with Bob hearing 96 countries including 1S9, CX, CN8, EA8, MP4T, FR7, CT1, PJ2M, TF, OH0, XZ2, 3A2, LU, PY and ZB2, to which Eric adds K9LMU/HS, HK4, LA5, KC6, OA8D/3, KX6, VK9, 1S9 and 5W1. Warwick L3211 listened to 20 mx between 1100z and 1330z to hear SP, F, EA, 1S9, 5Z4, TI, UA, YO, DL, SM, 4X4, 9M6, DU7 and LA4.

No news from VK4, so over to VK5 represented by Alan L5065 and Tony L5073, both in the throes of exams., the latter just out of hospital. Alan reports good s.s.b. sigs on 7 Mc. from KX6, KS6, W, JA, etc., also on 14 Mc. s.s.b.: CT1, VS6, OD5, HK, HP, ZB2, UO5, KG6, 5X5, 5V8, 9G1, ZS6 and HL9 were just a few. 21 Mc. has been open to JA, KX6, W, and KW6, whilst a W was heard on 28 Mc.

News of openings to JA on 10 mx in VK6 come from Allan L6029 and Bryan L6028, and together with Geoff L6030 they logged 9M4, CR7, KR6, OK1, CR8, EL2, OH0, OA4, KZ4, KX6, UB5, KG6, SM, OD5, UO1, PY4, SV0, CE7 and many others on 20 mx.

Finally, the best 15 mx conditions to date come from Greg Johnston in VK7, where he logged all JA call areas in 90 mins. on 15 mx between 5 and 8 p.m. local time on 6/10. At this time a few Europeans, such as YU6CB were heard. Between 10.30 a.m. and 1 p.m. E.S.T. 15 mx has been wide open to the Pacific and JA. It would seem that conditions on 20 mx in VK7 are excellent up to 2000 local time.

That winds up band reports for the month, but to sum up there seems to be a general lift on all bands, and we can look for some good DX over the holiday period.

**PERSONAL NOTES**

Eric Trebilcock back at work after a month's lay off with a damaged ankle. Tony Wege back to the studies after a period in hospital. Mrs. Aberneathy has returned from hospital and is 100 per cent. again. A whisper that Greg Johnston is off to VK0. L2022 back from holidays.

**DX NEWS**

LA8FG/P is on Jan Mayer. ZA1RR and ZA3BA are proven pirates. VP7DL is ex-MP4TAO and will be at present QTH for two years at least. KC6AA is in West Carolines. KC6FM in the East Carolines. The following logs are not available for s.w.l. reports: VQ-8BFC, DU1GFM, TC2ZA, GC8KS, DU3DM, DU5DM, DU0DM and VQ8BFA. PY1NEW welcomes s.w.l. reports, try him via I.S.W.L. VQ9J heard here on 20 c.w., says QSL via K4IXC. JA1SSS is a club station. VP5GC heard in VK2 recently is Frank Stallend, Bodden Town, Grand Caymen Is., B.W.I.

Further from HCJB "The Voice of the Andes," to the effect that HCIs OW, JJ, MX, HG, CM, GE and WR are on the staff there, and usually work on 15 and 20. Not an easy country for Amateur confirmation, but these chaps will be OK via HCJB, Box 691, Quito. This station's DX news session "DX Party Line" heard here recently on Wednesday, 7.30 p.m. E.A.S.T. is valuable for DX news. Station is now changing its QSL card monthly.

**INTERNATIONAL DX LADDER**

Further to our recent discussions on s.w.l's who have reached the 300 confirmed, G. Watts is the I.S.W.L. member who scored 312 by 1982. Eric L3042 tells me that the A.R.R.L. and W.I.A. lists differ slightly. I do not have exact figures here, but in mid 1960 the A.R.R.L. listed 304 countries whilst in Jan. 1965 the W.I.A. shows over 340 and the I.S.W.L. 317 if my count is correct.

When you next write in chaps, would you please tell me which list you are working from. Being a W.I.A. group, our ladder should follow the local list. However we do note that Eric, who at present is on 294/290, uses the A.R.R.L. list. Just as well, or we wouldn't catch him.

**AWARDS**

It is fitting that our No. 1 S.w.l., Eric L3042, has been issued with Certificate No. 1 for D.X.C.C. When submitting your claims for D.X.C.C. make certain all rules are complied with, particularly 3 (5) which states that all loggings must be made in the same call area. 4 (2) which refers to altered cards, and 4 (3) make sure the card contains call, time, band, mode, date and location.

A new award is available to S.w.l's. It is called the "San Francisco Award—S.w.l. Class." Confirmation is required from 25 San Francisco stations, one of whom must be a member of the San Francisco Radio Club. QSLs from club members, regardless of QTH will count. All cards must be dated Jan. 1, 1961, or later. Check list only, showing call, date, band, mode, QTH and signed by two W.I.A. officers or radio club offices plus 50c. or 5 I.R.C. to Ray Eichman, 2223, 43rd Ave., San Francisco, Calif., U.S.A. (From "Monitor.")

**DX LADDER**

The editor has suggested I delete this feature to every second month. so the next will appear in January. Meanwhile, there are several changes, with Roy Kearney, of VK2, reaching the 100 confirmed mark.

**QSLs RECEIVED**

Those received by members over the past month include: L3042 DU7SV (3.5), UD6BZ, UG6DL, UM8AP, UP2KNP, VK3NZ (1.8), W5EJT (3.5), W9WJB (3.5), 9M4MT and WB6BFE/MM. Alan L5065: KH6EZT, 7Q7PBD, VK9DR, I1RB, YV9AA. Chas. L2001: LA5HE. Ray L2287: UB5, UH8, UT5, 4X4, EI6 and VR1.

That winds it up for this month chaps, remember there will be no notes in the February issue. 73, Don L2022.

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# *Publications Committee Reports That . . .*

From the 12th October to the last mail on 8th November correspondence was received from VKs 3IE, 4SS, 6XY, 2KD, 3IB, and Mrs. E. Stevenson, Rev. Bro. Ellis, Greg Johnston and G. Bonadio. Three technical articles were also received.

All correspondents are reminded that their notes must be in the hands of the printer by 8th of each month, hence should be received at "A.R." by the 5th. This date will be adhered to.

January "A.R." will be issued late in December 1965, and the February issue will be distributed about mid February, hence for this issue only there will not be any Divisional notes.

The "Call Book" will not be available this year, due to delays outside of our control. It will be distributed early in February 1966. Many Amateurs have not notified the P.M.G., as required by law, of their change of address, and these incorrect addresses have caused much delay in the forthcoming edition. New arrangements have been concluded with the P.M.G. regarding future editions of the "Call Book" which will enable this Committee to publish it with the minimum of delay.

The new cover design for the 1966 edition of "A.R." has been agreed upon and will be a green colour.

Your Committee wishes all readers Compliments of the Season and thanks all contributors for their efforts during the year.

This year has enabled your Committee to adopt the better quality paper for "A.R." and increase the number and size of drawings in the magazine, all of which we trust has improved it.

Merry Christmas everyone, and a safe holiday.

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# YOUTH RADIO CLUBS

Christmas greetings to every one of my four readers! By the time you read this, most Y.R.C. will have tapered off their activities during the important end-of-the-year examinations, and schools will soon be into the summer break. There are important Y.R.S. matters at this time of the year—especially Vocational Guidance matters. Many members will obviously be looking for a job which pays them for doing the work they enjoy as a hobby. More and more employees are showing their preference for our members because the boy with Y.R.S. experience has already acquired considerable skill and has a settled idea of vocation. It is still desirable for Club Leaders to give some advice on how to apply for jobs and particularly on how to create a good impression at interviews by being well dressed, well groomed, alert, well spoken, and courteous.

Y.R.S. Certificates are becoming known, and in addition it would be a very good thing to take some well constructed project. Another end-of-the-year matter which is sometimes a worry is the transfer of teachers, sometimes resulting in the disturbance of a well-settled Y.R.C. This year, with the establishment of a radio club at Sydney Teachers' College, VK2 may not have any worries in 1966. Can other States ensure their future in similar fashion? Here's hoping!

Last items from VK3 show continuing healthy signs. One of the healthiest and most interesting is the amount of technical knowledge absorbed by the boys at Gowrie Park State School. If many 11 and 12-year-olds can demonstrate thorough understanding of work placed in 4th and 5th years of High Schools, can learning be difficult under the right conditions with incentives? Club instructors Bill Allen and Harry Saitch are to be congratulated on their work—as they were at a recent Presentation Night at the School attended by our Federal President and Education Department officials.

Faye Stuckey, of St. Anne's Radio Club at Sale, reports that the club have built their own tx and have the call sign VK3ACO.

Latest certificate passes are Greythorn High (8 Elem.), Gowrie Park (5 Elem., 5 Junior), Caulfield Grammar (2 Elem., 2 Junior), Edmund Rice (6 Elem.).

Finally, congratulations to Ken Matchett on his newsletter and other work. Thanks also to Dave Buck for publicity.

Final VK2 items come from that excellent newsletter, seldom less than six pages, produced by Jim Webster at Birrong Boys' High. First Postal Group member to gain the Elementary is Mark Swinton (famous name) of Beecroft Grammar, and another Elementary (Honours) to David Tester, of Kingsgrove Nth. High. At Birrong, N. MacDonald, E. Licpens and R. Girdo gained Elementary. The club also reports plans to join in W.I.C.E.N.

Susan 2BSB reports on doings at that very active Westlakes Radio Club, which has a range of members but includes a lot of work for Y.R.C., especially on Saturday afternoons, when Keith 2AKX has a construction class and Fred Overvliet does slow Morse. Paul Linsley and Allen Legge recently passed Elementary. Allen had a lot of fun in the R.D. Contest, logging 142 stations. Ten boys from Westlakes made a visit to Sydney recently for two special excursions—one to the A.B.C., and the other to the A.W.V. works. At both places, they were made welcome and had most interesting visits. Incidentally, Susan 2BSB, now at Newcastle University, supervises a Postal Group but Uni. studies cramp her radio-activity—very sensibly she makes studies first priority.

Lastly, best Christmas wishes to all you wonderful types, the club leaders. You may not get all the obvious signs of gratitude because many young people are careless in that regard, but a lot of people will remember you. 73, 1KM.

# SIDEBAND

By Phil Williams VK5NN.

During the past months I have described the s.s.b. generator using phasing circuits, for the benefit of those who wish to get on sideband with the best possible signal which can be generated with truly home-made gear, using the sort of components which can be bought over the counter in any city retail radio store.

From the correspondence I have received, it is apparent that many people are interested in doing just this, and the response from the v.h.f. fraternity seems to indicate an upsurge in interest in s.s.b. for the summer DX period which is about to start.

There is one component for which I have had requests and that is the ferrite cup-cores type K3.001.07. Those who have access to supplies of ferrites through Philips or Mullard sources, have no problem, but if you are really stuck I shall be pleased to send on two pairs of cup-cores if a 10/- postal note is enclosed. This will cover cost plus postal charges, and the change will be returned as stamps. This

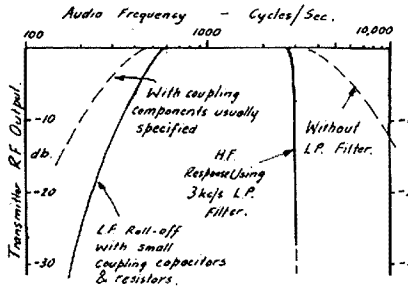


Fig. 1.—Transmitter r.f. output v. audio frequency input—using modified audio circuits in phasing exciter.

can only continue while stocks last—but, please, only if you are "stuck" as I do not wish to get into business, but only to help out.

One question frequently asked has been, "Why is the filter described, better than the simple job using 26 mH. t.v. coils and 0.1 microfarad condensers?" To answer this, I have taken an over-all frequency response curve for the whole transmitter, and this is shown in Fig. 1. The output was taken from the forward direction current on the s.w.r. bridge with the transmitter supplying about 30 watts peak output with 1,000 c.p.s. input. You will notice that the output is more than 20 db. down at 300 cycles/second, rising to full output at 600 cycles. This characteristic is due to the low coupling capacitors and grid resistors in the audio amplifier.

At the high audio frequencsy end the cup-core low-pass filter and grid to ground capacitors it has been possible to get a very sharp cut-off. The frequency response begins to drop at 2.8 kc. and is better than 30 db. down, and still dropping at 3050 c.p.s. The low Q of the t.v. coils of about 26 mH. will not give such a sharp cut-off at the high end of the audio band, so the result is no better than using grid bypass condensers.

The procedures for adjusting phasing exciters have been described in "QST" for Nov. 1956 by Robert Ehrlich, W0JSM, and the article has been reprinted in the A.R.R.L. Handbook entitled "Single Sideband for the Radio Amateur." This article is a classic, which has stood the test of time and I have recommended it to many satisfied customers.

### S.S.B. ON V.H.F.

During the coming summer v.h.f. openings don't be surprised to hear the VK5 boys coming up with potent s.s.b. signals on 6 mx and 2 mx.

The purpose of mentioning this is to get the DXers to put a good slow-motion dial and a b.f.o. into their v.h.f. receivers. Perhaps a little better stabilisation of the oscillator would be in order, as well as removal of the a.v.c. from the tunable mixer. A product detector helps on some occasions, but it is amazing how good a diode demodulator can be, provided it has sufficient b.f.o. injection. A trick worth remembering is to couple the b.f.o. into the grid of the last i.f. amplifier via a "gimmick" twisted wire condenser—about ¾ inch of twisted wire is adequate.

Out of a series of eight lectures at v.h.f. group meetings in Adelaide, have come several copies of the phasing exciter ending with a 5B/254M, and all using junk-box parts. Bob 5ZDX and Robb 5RG did much of the spade work on this 6 mx transmitter and other contributors were Les 5AX with a McCoy filter 6 mx tx, George 5GG with an 815 transverter for using the 14 Mc. signal from his Galaxy on six. Last but not least was a very well constructed 2 mx s.s.b. rig built by Comps 5EF. The latter has a QQE06/40 in the final and puts out a potent signal from Gawler S.A.

The V.h.f. Group is to be congratulated on this effort. At the conclusion one of the sponsors was heard to relate that it is no longer necessary to convince people that s.s.b. has something to offer for v.h.f. working. These days people convince themselves when they see that a little box will do more than a hot rack-full of transmitter.

During the Christmas holidays these notes will contain brief descriptions of popular transceivers available to Australian Amateurs. This is in response to many requests, and will as well involve less work than an original dissentation.

In the new year we will get on with technical discussions on the subject of linear amplification of the final signal—from the output of the last mixer to the antenna.

### HAMILTON (VIC.) S.S.B. CONVENTION

The second Sidebanders' Convention will be held at Hamilton (Victoria) on 29th January, 1966. The object of this gathering is to enable those who use the s.s.b. mode of transmission to get together in person. The previous Convention was held in May 1964, and was a very pleasant turn-out. Those who came to the previous one have received circulars, and are reminded that accommodation is limited in Hamilton, so early booking with Ern 3AEM will be essential.

73, and good sidebanding for Christmas and New Year. Phil, VK5NN.

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# Gowrie Park State School Radio Club Presentation Night

The Gowrie Park State School Radio Club is the only club in a primary school in Australia. The members have an average age of 12 years and some of them recently qualified for certificates issued by the W.I.A. Youth Radio Scheme.

Those present for the occasion included: Mr. E. Nelson, Asst. Supervisor, Vic. Radio Branch; Mr. G. Romanes, District School Inspector; Mr. M. Hull, Federal President, W.I.A.; Mr. K. Matchett, Vic. Supervisor, W.I.A. Y.R.S.; Mr. Fishe, School Headmaster; Dr. Plummer, Essendon Grammar School Radio Club; Mr. D. Reed (VK3EI) and Mr. N. Blake (VK3JN) as well as parents and friends of the boys.

Mr. Nelson presented the Junior Certificates, congratulated the boys on their efforts and reminded them that school work must come first and hobbies second. He then recalled some recent changes in Radio Communications, pointing out that future developments will be more startling.

Mr. Romanes, in his address before presenting the Elementary Certificates, said that the Radio Club activity had resulted in an improvement in the spelling, maths. and interest in science of the members' school work.

Mr. Hull spoke briefly on the history of the Y.R.S. before presenting Frank Wrobel (aged 12) with a R.S.G.B. Handbook. Frank is quite a scholar because in addition to being "Dux" of the club in that he gained the highest marks in the Junior Certificate exam., is also top of his class in school.

After the formalities were over, the guests were served with supper and met each other on an informal level.

The club instructors, Bill Allen and Harry Smitch, are to be congratulated for the work and keeness displayed in training these lads to a very high standard. Also congratulations to the successful boys: A. Joyson, H. Kulakowski, R. Kulakowski, W. Stubbs, A. Todorov, who gained Elementary Certificate, and G. Smith, D. Hughes, D. Hardiment, F. Wrobel, T. Todorov, for gaining Junior Certificates.

The W.I.A. Y.R.S. is proud of this club because not only are very young boys making Y.R.S. history, but educational history as well. These keen boys passed an exam. containing some of the work taught in 4th and 5th year at High Schools, proving again that learning need not be difficult if sufficient interest is taken by the student in the subject.

# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL

### FEDERAL EXECUTIVE MEETING, 23/9/65

Prior to the meeting an informal discussion took place with representatives of the Victorian Division re A.R.R.L. publications and their possible effect on advertising in the magazine if handled by the Executive. As no final decision was reached, the matter is to be further examined. The general business of the meeting were matters dealing with a new transit case for the R.D. Trophy, a report on the progress of negotiations with the P.M.G's Department on the revision of the Handbook, and a few outstanding matters remaining to be dealt with from the last Convention.

### FEDERAL CONSTITUTION ALTERATION

Federal Executive, on behalf of the Federal Council of the Wireless Institute of Australia, gives notice that having published the following amendment to the Constitution in a regular manner and having received no dissent thereto, now notifies that the said alteration is approved and takes effect as from 1st January, 1966.

The Federal Constitution of the Wireless Institute of Australia 1947 is amended as follows:

(a) By adding the following words at the end of Clause 3 thereof: "and to form a Company to take over the real and personal property belonging to and to give an indemnity against all or any of the liabilities of the Institute and to pay the costs charges and expenses of such formation and to transfer all the assets of the Institute to such Company."

(b) By adding a new Clause 67a after Clause 67 thereof as follows: "67a. Upon the incorporation of the Company referred to in Clause 3 of this Constitution, the Institute shall be dissolved and the assets of the Institute shall be paid and transferred to the said Company in consideration of the said Company indemnifying the Institute, the Council, the Executive and members against all costs expenses and liabilities."

### HANDBOOK FOR THE GUIDANCE OF OPERATORS IN AMATEUR SERVICE

During the last few months members of your Federal Executive have been busy on the revision of the Handbook for the Guidance of Operators in the Amateur Service. This is proving to be a formidable task, not only because new ideas are being presented, but because the whole significance of the Wireless Telegraphy Regulations has to be considered in relation to present Departmental policy and the Institute's requirements.

We should like to make it clear that any Regulatory changes will not impose restrictions on the Amateur Service, but will serve to strengthen the foundations of the machinery by which we are regulated. In point of fact it is hoped that certain concessions will be made to present policies and operating procedures; among them being the certain clarification of power measurement for s.s.b., mobile operation, and interference.

It is our and the Department's intention to present the Handbook in a logical progression of events so that it becomes a factual text for the prospective Amateur, and an equally factual reference in time of doubt for the practising Amateur.

### 1966 FEDERAL CONVENTION

Next year the Convention will be held in Brisbane at Easter, and as usual your Federal Councillor will be presenting to Executive agenda items to be discussed at this Convention. However, he can only do this if members submit to their Division considered ideas on matters affecting the Amateur Service, whether they be administrative or affecting the regulations.

### RECIPROCAL LICENSING

We have received details from the Department indicating the procedure to be adopted by aliens wishing to operate an Amateur station in Australia or its Territories. This applies of course to American Amateurs, and those in contact with W stations may wish to pass on this information.

An application shall be made in a form RB80 to the Superintendent, Radio Branch, in the capital city of the State in which the station will be established, or if the operation is intended in a Territory of the Commonwealth, to the Controller, Radio Branch, Melbourne. In each case the formal application should be accompanied by:—

(a) A Photocopy of the applicant's current F.C.C. Amateur licence;

(b) The licensing fee of £1 (American equivalent $2.25);

(c) Information covering the following points:

(i) Date, place of entry and means of arrival in Australia or Territory, name of ship or registration markings of aircraft;

(ii) Whether any war service and if so in what capacity served;

(iii) Occupation, name and address of employer (if any).

One point worthy of mention, however, is that it is not possible for processing of an alien's application to be completed until after his arrival in Australia or in a Territory of the Commonwealth and accordingly there is nothing to be gained by the submission of a formal application prior to his arrival.

### RECENT FEDERAL ACTIVITIES

New arrivals to this country are sometimes unaware of the procedure to obtain an Amateur licence, especially if they have held a call or are otherwise suitably qualified in their own country. Several cases have been brought to our attention over the past few months where, because of misunderstandings, a licence has not been granted to qualified Amateurs.

Happily these cases have now been resolved, but if they had been brought to the attention of Executive much earlier, these Amateurs would have had their call signs years ago.

If you know of any instance where Executive may be of assistance, feel free to put the facts before us.

### MOONBOUNCE

The Institute has no recent knowledge of the preparations by VK5ZP, VK5ZHJ, VK5NO for their proposed Moonbounce experiments which will take place in the low end of the two-metre band. However, those interested in this phase of Amateur activity will be interested to read that the proposed power to be used will be 1,000 watts. Federal Executive supported the application for the use of this power and formal permission was granted by the Radio Branch last July.

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## FEDERAL QSL BUREAU

As usual the details of the Rumanian Contest were received two months after the event was over! The Contest was held during the first week-end of August.

Any station who contacted two Israel stations with the suffix /H during the month of September is eligible for an award. Full details from this Bureau.

Advice has been received from George 5W1AZ, Apia, Western Samoa, that the call sign ZM6AC is not known there. George points out that the prefix for W. Samoa has been 5W1 since 1962, so even the pirate is not moving with the times.

Details of two new awards issued by the Malmoe Shortwave Club (Sweden) are to hand. One is for working 30/20/15 Asian capitals and the other for contacting 30/20/15 African capital cities. 30 is class A, 20 class B, and 15 class C. Awards manager is SM7DQK. Further details from this Bureau.

Rex Glew, ZL2ASM, now resident in VK3 for 2-3 years, is nicely settled in the Moorabbin area and has taken out the call VK3ASQ. He will be active when repairs are effected to equipment damaged in transit from ZL.

—Ray Jones, VK3RJ, Manager.

## SILENT KEY

It is with deep regret that we record the passing of:

Ex-VK2CY—James Allsop.

VK3XS—E. R. Curtin

## NEW SOUTH WALES

Seasons Greetings from the VK2 Division! An invitation is extended to everybody (including the XYL) to attend the December meeting of the Division which will be held on the third Friday (18th). It is a social evening and a film programme has been arranged.

Interest is being shown in Wagga re the formation of a club there. For further details contact Sid 2SW. 2ZKN from Orange has been appointed Zone Officer for Area 3. Don't forget the Easter Convention in 1966 which will be held at Urunga and Canberra.

The A.O.C.P. class conducted by the VK2 Division at Wireless Institute Centre will be commenced about mid February. Inquiries should be directed to the Class Supervisor via W.I.C. A relay on the 160 mx band, of the 2WI broadcast, is now being done by 2AWX (the Hunter Branch station). Kevin 2ANY was co-opted to fill a gap on Council.

We were sorry to hear early in October of the passing of James Allsop, ex-VK2CY, ex-VK2ACY. James had been an active member of the pre-war Lakemba Radio Club.

### W.I.C.E.N.

Activity and interest in W.I.C.E.N. in VK2 is still growing. When these notes were compiled at the start of November there were well in excess of 50 operators using 146 Mc. f.m. At the last meeting of the W.I.C.E.N. Committee, it was resolved that 146 Mc. f.m. would be the prime mobile frequency in VK2. Six mx frequencies have not yet been decided, but they have to be chosen in relationship to the local t.v. channels and as such they will have to differ from those used in other States.

Around the country many new stations are coming on the air. At Orange in Area 3, there are some seven mobiles and a base and whip-to-whip coverage has extended to past Dubbo in the west and to Mt. Boyce in the Blue Mts. in the east of Orange. Newcastle is to set up 146 Mc. and the base will be run by the Hunter Branch station 2AWX. In Canberra, 1VP has been obtaining good coverage. A test from Mt. Ginini to Bowral provided good signals. 2ZJC and 2ZNS provide coverage in the Penrith/Richmond area, which is one subject to severe flooding. 2AAK at Kulnura, which is the other side of Gosford to Sydney, is providing contacts with Sydney.—2ZTM.

### HUNTER BRANCH

What must be judged as the most outstanding lecture on a single component given during the year was presented by Mr. John Lake, of the staff of Mullard (Australia) at the November meeting. John spoke in great detail of the small power diodes commonly in use by Amateurs and gave a most comprehensive report on the operating conditions and capabilities of these devices. His remarks were supported with an abundance of literature and an impressive display of diodes and heat sinks, from the very small to the very large. So great was the interest by the audience of 32 that questions directed to the lecturer continued for 40 minutes. John showed that he was fully equipped to answer all the enquiries and many new and interesting facts were assembled in this way. By courtesy of his Company, Mr. Lake presented two excellent films, one of which, "Thin Film Microcircuits" in colour, was a real assembler's view of the processes involved in this exacting technique. At the conclusion of the meeting, a vote of thanks to the lecturer was moved by Bill 2XT.

At the commencement of the meeting, one member had great difficulty in making himself heard, but following representations made to the President, he was allowed to say his piece, which included among other interesting information that there were now two new calls in the area. Both ex students of the Westlakes Radio Club, the new QRM generators are Fred Overvllet 2ZFO and Henry Schroeder 2ZGK. How these two ever missed out on the Morse is difficult to understand.

Members are also asked by the Bureau of Meteorology to take an interest in the GHOST programme, an observational programme involving radio detection of balloon transmitters on 15.025 Mc. before 7 and after 5 o'clock. Those interested should contact Mr. Henderson at the Bureau, Box 1289K, Melbourne. The attention of s.w.l's in particular is directed to this interesting observational project.

Some members may have gained the impression that 2AWX is conducting a talent quest for announcers for the Monday night broadcasts. This is quite untrue of course, but letters of justified protest should be addressed to the management, if the address can be found. Thanks to Geoff Moore, of the A.B.C., and Tony Chevis, of the N.Z.B.C., "a bit of culture" as one misinformed gent said, is being injected into the weekly sessions. All that is needed now is a bit of electronics, a bit of audio, a bit of suppression of spurious responses and about an extra two hours each day, and we'll have a first class broadcast—you know, like 2WI.

Little is heard on the air these days of the most regular visitor to the concrete jungle, Frank 2APO, but he does get QSL cards, and they are not all from pirates. Mine are—no, sorry 2ZSG isn't a pirate, he's a buccaneer—he used to be an Admiral you know, but they scuppered his barge. Now he just sits and makes mods to mods to Command receivers.

Up where the v.h.f. men do their talking there is great concern since Mac 2ZMO put his 2 mx beam on the Fitzgerald bridge across the Williams River. Some of these chaps will go to any trouble to work the DX! Since a skull was found recently out Toronto way, 2YJ had to be "one up" so he hung a skeleton in a slot above his shack. It has really got results too—much more attention than the skull ever did. Tony 2ZCT, the transistor king, has induced Ian 2ZIF to join him and another 2 mx transistor transceiver has been added to the ranks. But Kevin 2ZKW has built just about everything there is to build so he contents himself by making his shack the most comfortable in VK.

If you receive this before the December meeting, don't forget to look out for 2ZFD and 2ZMO who are coming in fancy dress. But whatever happens, have a happy Christmas and make two resolutions. Don't go to the January meeting and, listen to 2AWX. 73, 2AKX.

### CENTRAL COAST AMATEUR RADIO CLUB

The last meeting of the Central Coast Radio Club was held on Oct. 15 with quite a large attendance in spite of several members being away. The evening was devoted to a short business meeting after which a very interesting film on automatic coal mining in N.S.W. was shown. Phil 2TX also gave a lively account of his recent expedition along part of the route of Burke and Wills. His group ventured over the sand hills of the Simpson Desert and on their return trip found their tracks had been obliterated in places. This is when experience and bush-craft are very necessary and as Phil is still hale and hearty, we presume the compass was in good working order. It seems there are still frontiers left in Australia from the sound of a trip like this.

Gary 2UX and Gordon Proctor organised the Boy Scout Jamboree of the Air on Oct. 16 and 17. This year the Girl Guides joined in and from all reports the boys and girls had a wonderful time. Lindsay 2ON gave permission for the use of his shack and gear with Gary in control and Mrs. Douglas supplied large quantities of cool drinks and biscuits. The group used our club call sign of 2AFY and put Gosford on the world map with contacts in Antarctica, Honolulu, New Zealand and Israel. Many intelligent questions and answers were given and received. Les 2AKL, from Ourimbah, entertained several children in his shack with the inevitable drinks and cookies. It is quite an experience to participate in an International event of this kind.

Lindsay 2ON has just returned from his overseas trip—in fact jets in today—and at this stage there is no news. However, he is to give a talk on his trip at the next meeting, so the next issue will have more details.

### VK2 DIVISION

**Two Metre DX Week-End**
On 1st, 2nd and 3rd January, 1966.

**Annual Convention**
On Australia Day Week-End at VK2WI, Dural.

**Zone Two Convention**
Dinner and Field Day on Australia Day week-end at Armidale. Inquiries, 2BMK.

**Central Coast Field Day**
Mid February at Gosford.

We recently talked to Harry 2LX and find that things are proceeding well with the new motel at Urunga and that he expects to be open by Xmas. Good luck Harry!

The Central Coast Radio Club will be having its annual Field Day around the middle of February. Visitors are always welcome and are reminded that the entry fee covers morning and afternoon teas, salad lunch, sightseeing trips, etc., and all the family comes on this day. There will be a launch trip on Brisband Water and a bus trip to cover the beautiful scenic spots of our district.

Frank 2ACQ and his XYL have been away on a lengthy tour which included a visit to the field day at Tumbarumba. I'm sure he met a lot of old friends as well as making many new ones in his capacity as Liaison Officer for country areas.

My OM, Alex 2AAK, and myself have just returned from a three-weeks tour through Victoria. We met a lot of Hams along the way. 73, Mona, 2AXS.

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## VICTORIA

### WESTERN ZONE

Here is some items of news re our Western Zone Convention which was held at Warracknabeal on 10th Oct. with a very good attendance. Following lunch at the Royal Mail Hotel, our meeting was held. Those elected for office were David 3ADS, President, and once again Bill 3AKW as Secretary; good work Bill. John 3AFU was elected as W.I.C.E.N. co-ordinator for our zone. Those on the Committee are Bill 3AKW, David 3ADS, Neil 3AQD and myself 3AOS.

Michael 3ZEO gave a very interesting talk on W.I.C.E.N. and we thank him very much. Accompanying Michael to Warracknabeal was the Divisional Secretary, Ken 3ACS. 73, Roy 3AOS.

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## QUEENSLAND

### TOWNSVILLE AND DISTRICT

As the year draws to a close it is time that I wished every one "A Merry Xmas and a Happy New Year" with the earnest prayer that 1966 is much more kinder in the way of DX to every one. That each and every one get all the DX-peditions that seem to be getting around now.

Last night was pleased to hear from the boys on Christmas Is. How happy they are going to be when the AT13 arrives in the near future from the boys of VK4 W.I.A. for their club station. Speaking to many of the boys of the club at the time, it seems that almost everyone will be studying for their ticket. Don 9DR passed on his 73 to all the local boys and hopes they call him some time.

Congratulations go to Evie 4ZEF on passing the Morse and now awaiting the coveted two letter call sign. Charlie 4OM will go mobile to make the first QSO. Better stick to the mobile now Charlie, only chance you will get to be on the air.

A few of the boys are giving the higher bands, 21 and 28 Mc., a hiding when there is the least semblance of it being open.

Congratulations to Ray 4ZRR on getting into double harness. Maybe now will have time to get the Morse under the belt, Ray. Noticed Joe 4JH the other night doing his good deed at the Blind Social entertaining with his musical box. Hard to see him behind the double base—a good job well done. 73, 4RW.

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## SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division was held in the clubrooms to a very representative audience of members and visitors, and took the form of a jumble sale (buy and sell to you), and whilst it irks me to say it, so very little can be said about this type of night that has not been said before, that I am going to risk being accused of sparing my words in describing it, except to say that the night was helped along by the joint auctioneers, Brian 5CA and Phil 5NN, and a good time was had by all.

Very little business was transacted, although some time was spent in outlining the details of the proposed bill now before Parliament in connection with the licensing of electricians, much to the consternation and surprise of most of those present, also the resignation from the position of Secretary by John 5JC after long and faithful service, and a couple of other minor items connected with Federal business. Quite a number of old members were present, some of whom have been conspicuous by their absence of late, to say nothing of one or two visitors who were more than welcome. The meeting closed at the witching hour of 11.04 p.m. and it gives me great pleasure to report

## JOHN MOYLE MEMORIAL NATIONAL FIELD DAY CONTEST, 1966

**12th February to 13th February**

that nothing was seen of the caretaker, nor of his Alsatian elephant—sorry, I mean dog. He looks as big as an elephant some times, especially when he is only one step away from my muscular and athletic figure.

Noticed John 5MX at the meeting, and it certainly is a long time since I reported that fact. He is not very active at the moment, studies must come first, but he manages to sneak in a contact now and again. Why he even contacted me once, when I was sojourning at Oakbank last Easter.

Jim 5FO was another member who has not been seen at a meeting for some time, and he could not get to me quick enough to pass on a message to me from his XYL Rae, which after giving consideration, I am not sure whether it was intended as a compliment or an insult. Jim has been giving the c.w. a bash on 7 Mc. and has at last succeeded in getting his W.A.S. on that band. When I told him that I had heard him at times, he seemed somewhat surprised that I could still copy the code. How insulting can they get?

Al 5EK is our new Secretary, and his appointment has met with general approval. Probably better known for his v.h.f. activities to most, Al has always shown his interest in Divisional matters and will without doubt prove an acquisition to Council, to say nothing of making a good replacement for John 5JC, who incidentally has put in an incalculable amount of work for the VK5 Division and will definitely be missed from the secretarial duties.

Joe 5ZJW made himself known to me at the meeting by telling me that he had installed a new t.v. receiver at the QTH of my daughter and son-in-law, and whilst I can trust my daughter to keep her mouth shut, I am not so sure of Bob, my son-in-law, and judging by the expression on Joe's face as he introduced himself, methinks that a portion of my guilty past may have been aired. Oh well, guilty is as guilty does!

Talking of guilty pasts, I thumbed through the October issue of the magazine to find out if anybody had woken up to my horrible blunder in mixing up, with reckless abandon, a couple of VK2 OM's and XYL's in the Sept. issue. I was almost through the magazine and starting to breathe more easy, when I bumped into the remarks of one Bob 4RW. There are narks in Heaven, so I am told, and this bloke turned out to be a beauty. He exposed my guilty secret in no uncertain manner, so much so that my "friends" decided to "needle" me once again, much to their enjoyment. There is no doubt about these VK4s, they have never let up on me since I insinuated that they could not grow a straight banana.

Ray 5RK and Joe 5JO were having quite a conflab in front of me at the meeting, and in the hope that I might learn some information hot off the press, I leaned forward and tuned in. They were talking about all of the previous "buy-and-sell auctioneers that had passed on—Dougal, Ross and Norm—and Ray, noticing me, said in a tone of voice that implied that I had somewhat let them down, "all except Pansy, and he got out in time." I did not like their tone or looks as they glared at me, so mucha so, that I did not walk in front of them as we left the meeting—after all, it is marvellous just what a slight push in the back can do to one at the top of the stairs. Sorry to disappoint you OMs.

Jack 5LR has finally broken the ties that bind, and has "the thing" working on all bands, much to his satisfaction and to my disgust. Comps 5EF, of course, is tickled pink, another one to put in the little black book. Thank heavens I am too pure to get in that book!

Latest news from Frank 5MZ since his return from his sojourn in the Adelaide Hospital is that he is making good progress toward good health. Carl 5SS, now that Frank is home and about again, can relax a little.

Understand that Geoff 5TY was heard to remark on the air that he was having a go at his "Beetle" to find out just why one of the cylinders had conked out, and the others had decided to act as pallbearers. I gathered from his lack of confidence expressed, that he did not expect to break any records established by Volkswagen mechanics for maintenance, but was at least hopeful that it would at least go again, but he failed to say where it would go!

Uncle Tom 5TL has returned from his sojourn among the "'wise men from the east," although he was somewhat lucky to make it. It appears that he was only a few miles from his QTH, on the way to VK2, when another car tried to bite his car, and after his car had bitten back, both cars went into dock for minor repairs. The only serious damage being to Tom's ego, which was somewhat deflated after going 40 years without such an incident. Whilst on his trip, Tom renewed acquaintance with Frank 2GD, of Deniliquin, formerly of Ouyen (3FC) and places further south.

Mac 5MM is doing his best to make his presence felt on the "square bands" and the extent of his dedication in this respect may be estimated by the fact that he had a large palm tree removed from his QTH to facilitate the antenna position. Such dedication deserves its reward, has it Mac?

The new VK5 proposed legislation by the Government in power concerning electrical contractors, is causing much controversy among those most likely to be affected, and the V.I.P's in the VK5 Divisional set-up have not been letting the matter lay idle. Very little information to hand at the moment of writing, but if the bill be taken on its theoretical merits, no one, outside the favoured few, will even be allowed to replace a three-pin plug on voltages above 40 volts. Letters to the paper, under the signature, and without the signature, of well known Amateurs have appeared as if by magic, to say nothing about personal contacting local M.P's by the "right people" and all in all, it will not be the fault of the VK5 Division if the proposed legislation does not receive plenty of publicity as to its merits and de-merits, before it becomes law or is thrown out by the Parliament.

The Adelaide Airport was the scene of much activity, t.v. cameras, etc., etc., the other day as V.I.P's disembarked from the Interstate jet service, and among the arrivals were none other than Rex 5DO and his smiling and attractive XYL, Doris, who were returning from their extended tour to England, Europe and America, and all ports between. Welcome home Rex—and you, too, Doris!

Listened in the other early evening on 7 Mc. and heard a contact which I usually describe as a typical Radio Amateur contact. Not very often heard on the bands these days of high falutin' technical disussions, and other long-winded descriptions of station gear, but nevertheless doing more to create an image for Amateur Radio in the listener's ear and mind, this type of contact does more for our hobby than all of the publicity in the world. The contact was between a VK2 and a VK3, and unfortunately the VK2 was not audible to me, but if Ike 3OW—and I call him Ike because I missed his name, and Ike seems to fit him like a glove, should be reading this paragraph, then I congratulate him most heartily for reminding me, if only fleetingly, of just what Amateur Radio used to sound like. After listening to such a contact, I am beginning to wonder if in striving to create a 1965 "image" for Amateur Radio, we are only succeeding in destroying all that is so symbolical of our hobby of Amateur Radio, and never forget, despite all that is written these days concerning the modern Radio Amateur, it all started as, and still is, a hobby in the true sense.

Was beginning to wonder what had happened to Les 5PN. I have not heard him for such a long time. Anyway, just when I had decided to institute a search, up he bobs on 7 Mc. in contact with a VK3, and whilst I did not hear him sign, I could never miss that aristocratic intonation. How's that Les?

Another one that has been conspicuous by his absence is Lloyd 5OK, but I found him too. He was testing his mobile outfit on 7 Mc. the other late afternoon and from this I have deduced that he was on his holidays, or possibly having a "sickie". Oh, I just remembered, Past Presidents do not sink that low! at least going on my secluded and cloistered experience.

Noticed Ses 5GP leaving the meeting laden up with bulky parcels. This bloke must have a huge collection of buy-and-sell purchases at his QTH. He has been staggering out of such meeting nights for years, what it is to be a millionaire!

Gilbert 5GX, our busy disposals officer, at the moment of writing, has adjourned to the local hospital for a minor chassis repair. He told me at the meeting that he only expected to be hospitalised for about nine days or so, so as you read this he should be kicking up his heels again. What's that? Gilbert does not kick up his heels. That's what you think, you never know these quiet ones!

Ted 5ZE is the new President of the Elizabeth Amateur Radio Club, with Bill 5VE as the new Secretary, and whilst I am on it, Ken 5ZCH is the new Treasurer with Daryll 5ZLO and Don 5TM completing the committee.

Brian 5ZNK at the moment of writing is holidaying up with the "straight banana mob." Hope they don't find out that he is a VK5, they will probably take to him with a pineapple or something.

By the way, the Elizabeth Club station 5LZ is on the air on 80 mx each Monday evening, so here is a chance for all to contact them.

Just as I was preparing to put these notes to bed, as they say in newspaper circles, I received a long white envelope, bearing the imprint of the Silverton Tramway Co. Ltd., Broken Hill, and very formally addressed to Warwick Parsons, Esquire. Now a long white envelope is always suspicious looking, an official imprint a little awesome, and a formal address usually clinches the whole matter. Sure enough, it worked out that way, it was from Dud 2DQ, the Secretary of the Hamilton Sidebanders' Get-Together for 1966 at Hamilton, VK3, and could only be taken as an invitation to me (may I be excused for my profanity) to attend the gathering. Can you imagine the hide of that joker? Me at a sidebanders' get-together, how insulting can he get? Why, you might just as well ask me to give allegiance to the present VK3 President! Anyway, Dud, insults aside, I thank you for the invitation and the particulars enclosed, but due to my having a little trouble with a couple of hungry looking wolves at my front door, I must continue to slave away at my vocation and thus cannot attend. However, I will do my best to plant a member of my espionage service at the gathering, and I feel positive that he will be only too pleased to write a full account of the doings in the magazine the next time he acts as Pro 5PS, in fact we will have to shoot him to stop him.

Well, here it is, the Festive Season again, and all in the VK5 Division extend the Seasons Greetings to all in the other Divisions. We sincerely hope that the coming year will bring you all that you desire and that 1966 will see still a further step forward for our wonderful hobby, and also for our status in the world of radio and t.v. Just to show how ga-ga I get this time of the year, all the best to those users of "The Thing," and may they all escape being grabbed for the Xmas dinner table. Get it? Quack, quack—Xmas dinner table—quack, quack—never mind, I thought it was funny! 73, 5PS, PanSy to you.

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# TASMANIA

Here it is December, and another year almost gone. I wonder how many of us have finished or almost finished those jobs we resolved to get done at the beginning of the year. Personally I think I must have taken on too much, I've only got about half of what I intended finished. Still, I'll get the remainder done soon (before I take on any more).

Looking back, it has not been a bad year, radio wise. The bands are improving(?), propagation wise I mean; QRM wise they are possibly deteriorating with more commercials about on our frequencies. Most of our contests were reasonably well patronised, however, if you didn't get on when you should for these, then make up your mind to help your Division this coming year.

Talking of helping your Division, we will be losing three Councillors next year, so what about giving this matter a bit of thought. The Division cannot carry on without a Council of seven members and three from seven only leaves four. What about you, couldn't you give your services, and help with the responsibility. When I look around at a meeting, almost everybody has a good solid set of shoulders which are quite capable of carrying a little bit of the load.

By the time you read this, our Hamfest will be over for another year, and as I said last month its success or failure was due to two things, the weather (over which we have no control) and you!

The v.h.f. DX season is upon us once again, and with the greatly increased 6 mx activity in this State, we should have a good run this year. The V.h.f. Group discussed the final Ross Hull rules as they appeared in "A.R." a couple of months ago, and all seemed reasonably happy with the arrangement. Time will tell of course and I trust all who work and exchange numbers in the Contest will submit their log and include any pertinent comments you may have on the rules, to help the Committee.

Our general meeting for November was to have been graced with a short lecture by Len 7LE, but due to unforseen circumstances, he couldn't get along, but our ex-W friend, Lee (soon to be a VK7) bridged the gap and filled in with a short and most interesting "off the cuff" lecture on car ignition systems (transistorised, etc.).

I cannot sign off this month without the very pleasant job of wishing each and every member of the Institute, on behalf of the President and Council of the VK7 Division, a very Merry Christmas, a Happy and Prosperous New Year, in fact everything you would wish yourself. 73, Geoff 7ZAS.

### NORTH WESTERN ZONE

The October general meeting of this zone took place at our usual headquarters at Ulverstone on Tuesday 5th with another good roll up of 20 members. I was about to say 19, but remembered that 7TT (the Terrible Tiger) stealthily crept in half way through the reading of the minutes. Nice to see you again Terry, and also to Snow 7CH and Sam 7SM.

With regard to W.I.C.E.N. and the proposed 2 mx mobile units, you should have seen members' faces light up with enthusiasm when our

worthy Secretary said he had received a letter from the Southern Zone regarding the delivery of the mobiles. However, the enthusiasm was short lived when members were advised that it might be weeks or months and quite possibly years before the N.W. Zone received their quota of mobile units.

Another item that cropped up was the appointment of a Broadcast Liaison Officer—whose duty it is to call up VK7WI before each Sunday morning broadcast and pass on information from the N.W. Zone regarding forthcoming meeting arrangements, etc. Now as conditions have been poor at times, a strong reliable s.s.b. signal would be the ideal mode of transmission, but unfortunately looking around for the right person poses a problem. George 7XL is a late riser and doesn't crawl out of bed until half way through the broadcast; Sam 7SM is too busy chasing DX; while Ken 7AI is busy milking cows and I am usually tearing up turf at the golf links most Sunday mornings, so the logical choice fell on Max 7MX with his 80w. of ancient modulation helped by two healthy tonsils. Anyway, after a certain undercurrent of laughter had died down regarding the pros and cons of s.s.b./a.m., Max was duly appointed.

To round off the evening Gerald Wade and Winston Nichols gave a combined lecture on the subject of transistors, which was dramatically illustrated by a series of meters showing current and voltage flow through both the emitter and collector circuits, and the actual rise in temperature represented by current flow when heat was applied to the transistor itself. It was certainly very well done, chaps, and we look forward to your next lecture whatever it might be.

To finish off this month's gossip I must tell you about a letter I received in the post the other day. It was post marked "Alberta" and apart from the colourful stamps which took my eye there was also scrawled across the envelope such expressions as "Sunny Alberta," "Peace River District," "Land of the Braic," etc. Do you remember that educated nut from Wynyard who used to sign himself VK7 Beautiful Ladies? Well, you guessed right, yes the letter was from Basil and it appears he receives "A.R." each month and when my zone notes appeared he wrote to me threatening libel if I made any derogatory remarks about him. Anyway, Basil, nice to hear from you and from all accounts it looks like you have almost amassed your fortune and will one day be returning to VK7 land.

Well chaps, all that remains is for me to say a very Merry Xmas to all VK7s and S.w.l's and to all our friends everywhere. 73, 7MS.



# HAMADS

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SELL: AR88 L.F. Receiver, 74 Kc. to 30.4 Mc., good condition, c/w "S" meter, alignment tools and instruction book; 40w. a.m. and c.w. Transmitter, Geloso V.f.o., 807 final, p/s. and mod. on separate chassis; £110 the lot. VK-4LI, 77 Darling St., Ipswich, Qld. Phone 81-1820.

SELL: Eddystone 740 Rx, £35. Type 3 Mk. II. Transceiver, with modulator, v.f.o., all coils, handbook, £30. 20 Blencowe St., Elizabeth Grove, S.A. Phone 55,2288.

SELL: AT14A Transmitter, modified plate and screen modulation using Woden UM3 transformer, £55 or near offer. Also Transmitter using Geloso V.f.o. and QB3/300 final, £25 or near offer. VK3WK, W. J. Bell, Wangoom, Vic.

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SELL: Swan Trnsver. 120 (Mono-band), complete with Topaz d.c. power supply, £100. Central Electronics Sideband Slicer, suit any receiver with 455 Kc. i.f's, £24. 2 metre Antenna Coupler, made by "Comaire," U.S.A., co-ax to tuned feeders, new, £14. Gill Cowl Motor, £6. 115 volt Antenna Rotator, complete with indicator, suitable light beam or quad, £15. Leak TL12 Amplifier, with pre-amp., £25. Kingsley S9'er, £5. Power Trans. 800v. aside, 500 mills., £5. One pair Selsyn 3" Motors, £5. VK3ABV, 23 Tristania St., East Doncaster, Vic.

SELL: Type 3 Mk. II., P/S., Tx-Rx, modified for speaker, 5 xtals, 4 coils, outboard r.f. stage, some spares, £20. J. Wiseman, VK3YC, Ring 98-7618, 9 till 4.

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SWOP: Surplus Conversion Manual No. 1 (BC645, BC946, BC312, T.B.Y., SCR522, etc.) for Instruction Manual A.W.A. No. 19. Also wanted 12v. power supply and cable for No. 19. Home brew 230v. power supply also considered. Write P. Ward, Litchfield, Vic.

WANTED: Dish from 6 ft. to 30 ft. diameter. Alex Swinton, VK2AAK, Box 1, Kulnura, N.S.W.

WANTED: One coil box each bands D and E for AR7, bandspread preferred, also Instruction Book or info on kit assembly Eico 735 Triband Transceiver on loan. L. B. Fisher, VK1LF, Flat 59, Block A, Currong Flats, Braddon, Canberra, A.C.T.

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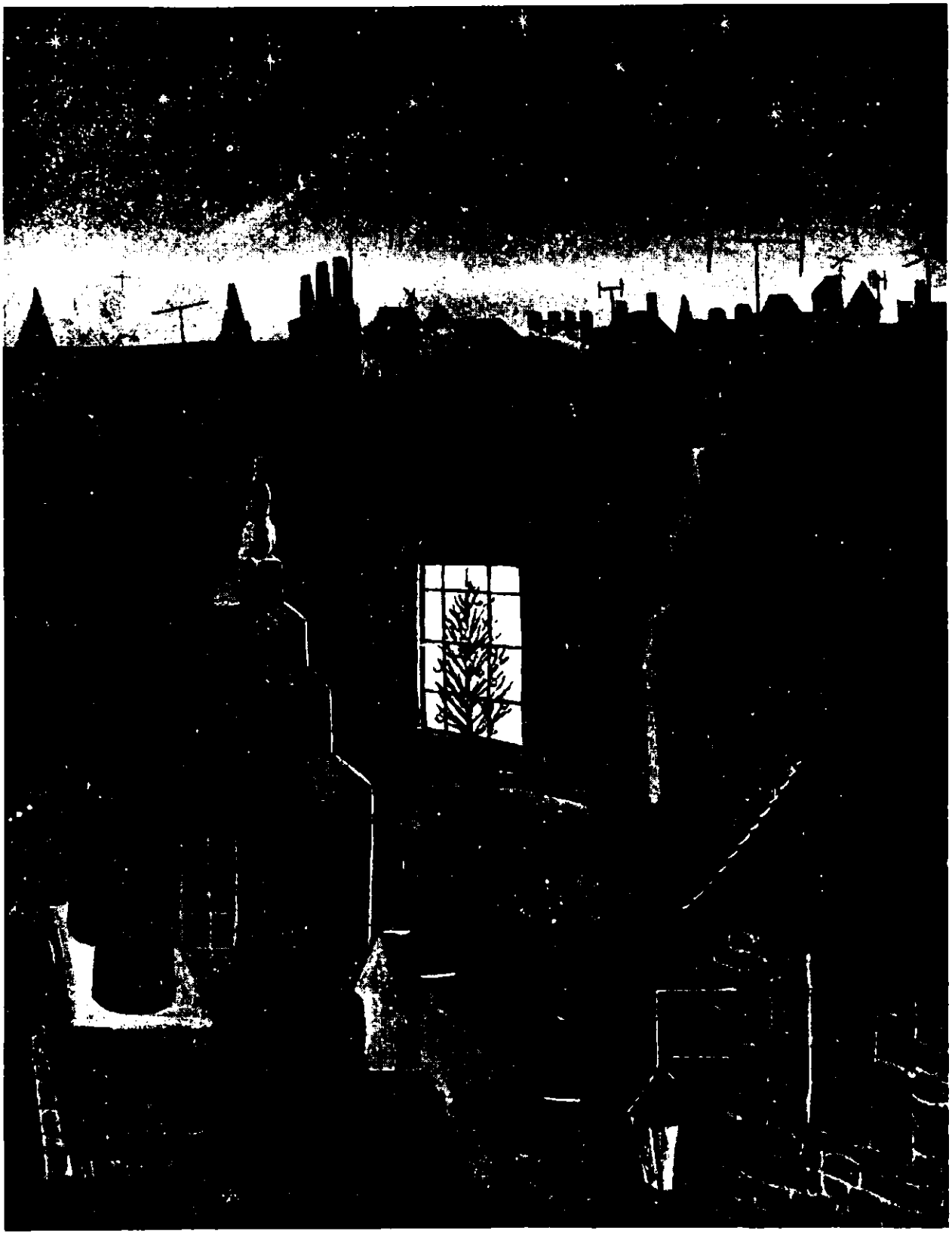

# *Christmas Greetings from* AWV