THE AUSTRALASIAN

Radio World

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

VOL. 7 . . . . . NO. 12 MAY 15 1943

★ **Receiver for local stations uses mostly junk parts.**

★ **Army instructions worded in familiar, not official, terms.**

★ **Midget amplifier designed to be built into cigar-box.**

★ **Short-wave loggings are key to good overseas reception.**

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Crown B.C. Coil, Air-core. Price, 6/6.

KEEP 'EM LISTENING

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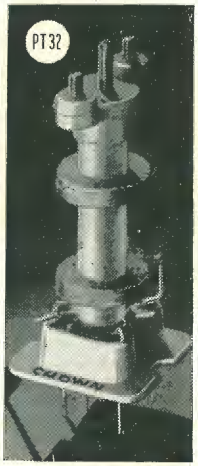
"KEEP 'EM LISTENING."



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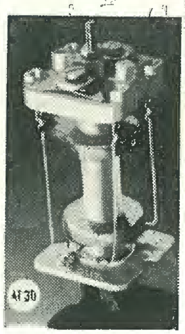

Crown Compression trimmed I.F., Frequency 455 K.C. Price, 7/9

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THE AUSTRALASIAN RADIO WORLD

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CONTENTS

EDITORIAL

Recent correspondence has been sharply divided between those complaining of lack of service, and others asking why our staff is not working in the interests of the war effort.

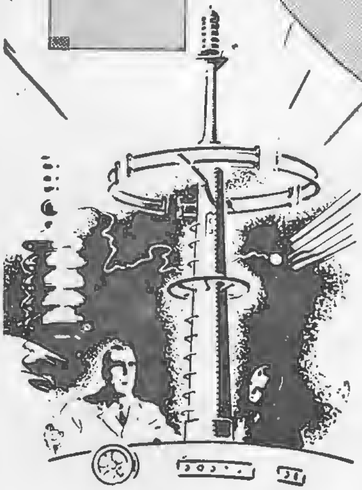
There have been good reasons for the complaints about the answering of letters, acknowledgments of subscriptions and so on. Of our office staff of seven persons a couple of years ago, not one remains. Bill DeCosier, our first office boy, was shot down in his Spitfire over the North Sea a couple of months ago. Of the rest, two are now prisoners of war, one in the A.I.F., two engaged on munitions production and even little Patsy is now a WAAF!

Recently we made arrangements with an established office to handle our business affairs. This should mean vastly improved service without any drain on manpower.

With regard to our war effort: Mr. Straede is a physicist in a munitions factory; Mr. Keast handles his short-wave pages in his spare time, and personally, having been rejected on account of physical unfitness, I put in over 56 hours per week as manager of D. M. HULL & Co., an engineering factory engaged solely on war work.

Under the circumstances we feel that we are doing our best to justify the confidence of the thousands of subscribers and supporters who are greater in number today than ever before in the seven years history of the publication. —A. G. HULL.

Watch RCS



Right now R.C.S. are unable to supply the general public with the radio kit parts and components that have made the Company—and its products—so well and favourably known throughout Australia.

There's a war to be won, and every ounce of technical skill—every precision tool—must be placed at the disposal of those who are defending these shores against the invader.

But the future of radio was never better.

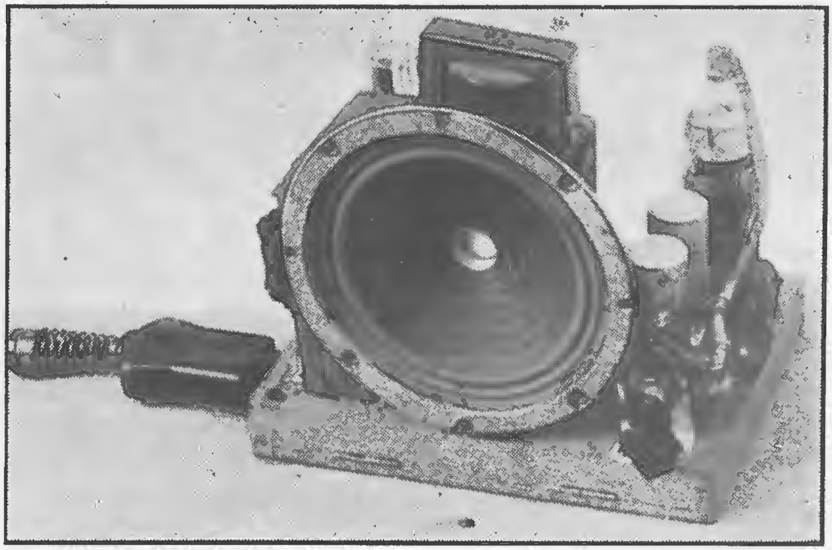
Under the stimulus of war, great advances have been made in set construction and design, and the post-war period will see the introduction of receivers possessing a range and performance rating far beyond anything known today.

R.C.S. is taking an active part in these developments, and when happier days return, both the amateur and the commercial set builder will find the Company ready with the exact type of equipment required.

R.C.S. RADIO PTY. LTD., SYDNEY, N.S.W.

NOVEL DESIGN FOR AMPLIFIER

Some details of how an enthusiast built a miniature 4-watt amplifier on a cigar-box chassis.



Photopgraph of the Amplifier built on to a cigar-box.

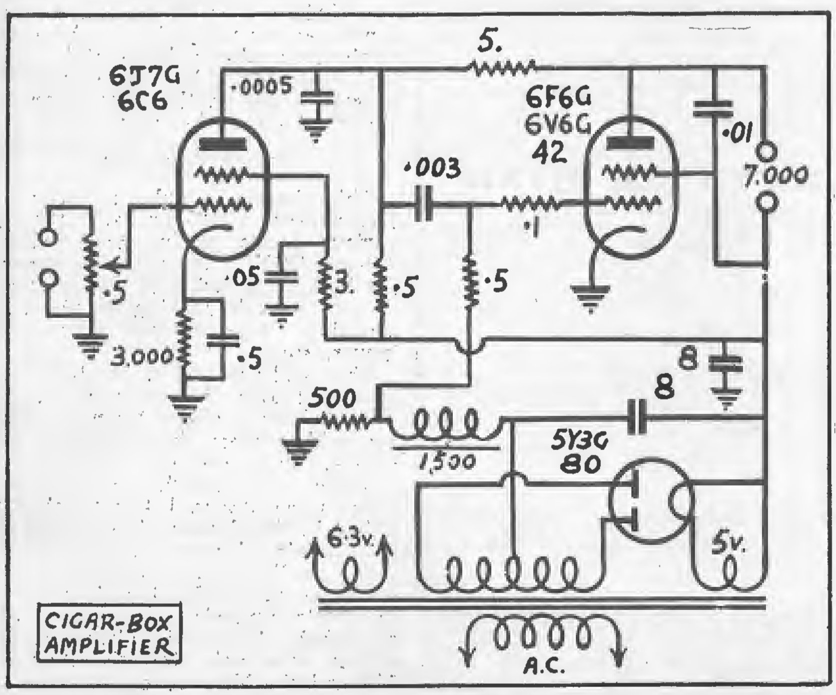
IN the January issue of "Radio World", it was suggested that wood and masonite be used as chassis materials. Well, here's an amplifier using a wooden chassis. Not only that but the overall dimensions are extremely small, the chassis being only 6-7/8-ins., long. Small objects have a charm all their own, especially when the performance is out of proportion to their size.

Standard Circuit.

The circuit is standard in every respect and consists of a 6J7G or 6U7G as resistance-coupled voltage amplifier and a 6G6G as power tube. The rectifier is the good old 80 or its octal equivalent, the 5Y3G. Back-bias is used to save the bulk of one low-voltage electrolytic and to provide increased power output. There is no tone-control, but possibly one could be mounted above the volume control. A midget (40 ma.) vertical power transformer is used, but a 60 ma. horizontal of one make will just fit in if mounted on the side so that its lugs face the field of the speaker.

Although midget vertical semi-dry electrolytic condensers are shown, pigtail types may be used, there being room under the speaker field for an extra one if necessary.

The speaker is the weakest link and in the particular amplifier shown, restricted the output to about 2½ watts. A later type (a Rola K5) was tried giving a slight increase in the electrical power besides slightly higher efficiency and, consequently, greater acoustic power.



Connection to the A.C. mains is via plug-all and flex borrowed for the time being from the household electric iron.

The input socket is an octal valve base (any type of valve base would do) and the pick-up leads end in an old valve base.

PARTS LIST

1—Chassis 5½ × 6-7/8 × 5/8 (Monopole).
1—Set valves (Mullard, Radiotron).
1—Set sockets to suit valves (Tasma, Amphenol).
1—.0005 mfd. condensor (T.C.C.).
1—.003 mfd. condenser
1—.01 mfd. condenser.
1—.05 mfd. condenser.
1—.5mfd. condenser.
1—500 ohm W.W. resistor (I.R.C., R.C.S.).
1—3000 ohm resistor (I.R.C.)
1—.1 meg. resistor
2—.5 meg. resistor.
1—3 meg. resistor.
1—5 meg. resistor.
2—8 mfd. midget electros.
1—40 ma. Power transformer (R.C.S..
1—5-inch Speaker, 1500 field, 7000 transformer (Rola, Amplion).
1—½-meg. volume control.
Wire, screws, nuts, etc., etc.

Making the Cover

A cover for the midget amp. was

(Continued on next page)

AMPLIFIER

(Continued from previous page)

made from three oddments of sheet-iron, two rectangles for front and back and a third piece for ends and top. For the speaker outlet a hole 5-ins., diameter was cut and then covered by thin black silk and touched off with a circular dial escutcheon. A slot is left so that the volume control shaft is cleared. To prevent cavity resonance, six quarter-inch holes were punched in the back, and to eliminate rattles the entire inside of the case was given a liberal coating of transformer compound.

Preventing Overload

The midget speaker overloaded first on the deeper bass notes, so various circuit constants were changed to give a fairly sharp cut off, the main points being a .5 mfd., cathode bypass condenser, a .05 mfd. screen bypass condenser for the first tube and a .003 mfd. coupling condenser. To prevent any shrillness or tinny-ness, a small condenser is connected from the anode of the first tube to the "earth" — actually a length of bare wire under the chassis —and another small condenser wired across the output.

Only a Beginnning

This chassis is only a beginning. Experimenters will probably try out various forms of inverse feedback, (please DON'T use negative current feedback with such a small speaker—it gets enough shaking on the bass already!), tone-controls, microphone inputs, etc.

The addition of a midget coil (mounted over the electrons) and a solid dielectric midget tuning condenser, will convert the amplifier to a simple 3-tube receiver.

Values are somewhat more critical than in the standard 4-watt job described in the January issue, but still have a fair tolerance.

If a small permag. speaker and a filter choke can be fitted in, in place of the electrodynamic speaker, tone will be probably improved. Suitable speakers are the Rola 5/8, the Amplion 5P8 and the Magnavox 5-11.

SWEET MILK

The use of radio music in barns during milking hours has increased production of milk 30 gallons daily from 180 cows, according to one Southern California farmer. This is one way of meeting the goal of 125 billion pounds of milk for 1942.

—Radio Jobber News.

RADIO FREQUENCY COUPLING METHODS

Last month we discussed the various types of A.F. coupling and the merits and demerits of each type. This time we are dealing with amplification at high frequency, the amplifcation that precedes the detector valve.

Historically

IN the early days of broadcasting systems similar to A.F. couplings were often used. Resistance-capacity coupling was simple and compact and provided a modicum of gain on the long wave-lengths in use at that time, King George V had a six tube receiver with metal plates as aerial and counterpoise and the first three tubes were resistance coupled R.F. stages.

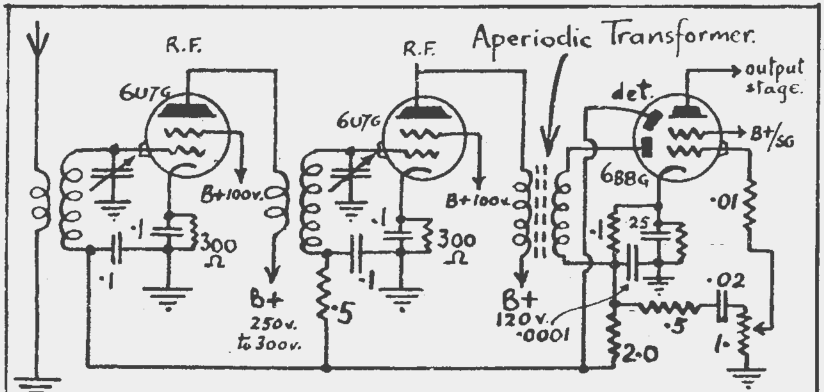


Fig. 2.
Use of Untuned R.F. Transformer in "Hi-fi" set.

Untuned Transformers

Aperiodic (i.e., untuned) R.F. transformers both with and without iron cores were used, but either the gain was extremely small on account of hysteresis loss, or marked resonance effects prevented a uniform response over the whole frequency band. An early design for an aperiodic R.F. transformer for 250-500 metres was a laminated iron core ½-inch square, and wound with 40 gauge enamelled wire, 125 turns for primary (on the outside) and 250 turns for the secondary. Thin wire was used so that the resistance prevented too marked a resonance. Both the two systems mentioned so far were completely ousted by either the "tuned anode" or "tuned transformer" systems, but are well worth keeping in mind, as they show signs of partial revival.

Tuned anode coupling was similar to resistance-capacity coupling except that the plate anode resistor (which caused a big drop in the effective B+ voltage) was replaced by a "rejector" circuit consisting usually of a tuning coil shunted by a variable condenser, although a variometer (variable inductance) was sometimes employed. Tuned anode coupling was not very selective and was suited to high-impedance valves. Consequently, it underwent a revival with the introduction of the screen-grid valve. See Figure 4.

Tuned Transformers

Most successful of all methods, the tuned transformer is the most popular and has risen steadily in efficiency during the last twelve years. Usually the secondary winding forms part of an oscillatory circuit and at resonance, the reflected load in the primary circuit is very high, so that the R.F. valve gives plenty of gain. Nowadays the primary winding is often of high impedance so that it is near resonance at the low frequency end of the dial, whilst the addition of a small coupling condenser gives a boost at the other end.

Another type of coupling is somewhat similar to this, but the "primary" is at right angles and acts only as an R.F. choke, all the energy transfer being via the condenser. This last method, the choke-condenser-tuned circuit is frequently employed for short-wave receivers of the T.R.F. type. See Fig. 1.

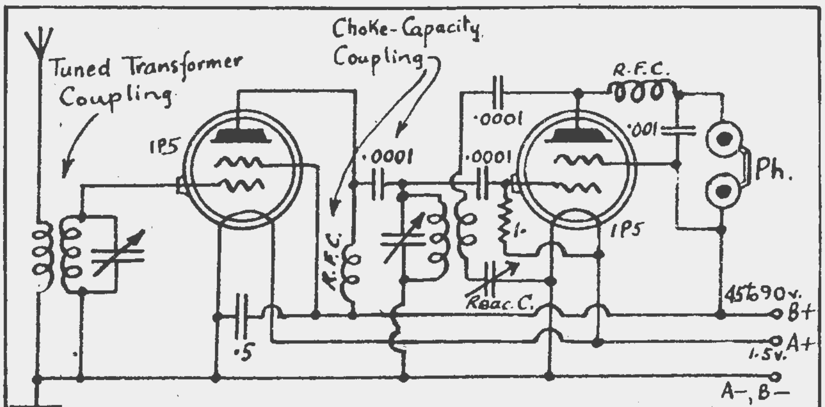


Fig. 1 SIMPLE 2-VALVE "R.F. and DET." SET.

Modern Applications

Resistance-capacity coupling gives high gain at audio-frequencies, medium in the "I.F.' region, a small gain at the B.C.B. frequencies and none at all (or maybe a loss) on short-waves.

Its main application today, apart from A.F., is in I.F. amplification. Where extreme gain is necessary, as in communication receivers, car radios for the outbacks, etc., more than one I.F. stage is apt to be required. When there are two or more tuned stages of the same type together, instability is liable to result unless the gain is kept down or extreme precautions taken. Possibly the instability will only make itself felt on local, or possibly only on DX stations. To overcome this, a resistance-capacity coupled I.F. stage may be inserted between two tuned stages in much the same fashion as the old T.A.T. (tuned, aperiodic, tuned) system of R.F. amplification. See Fig. 3. Typical values for a 6J7G used as such a stage are: Anode resistance: .03 meg.; screen-grid dropping resistance: .5 megohm; bias resistance: 1,000 ohms; coupling condenser: .001 mfd.

Tuned Anode Coupling is sometimes

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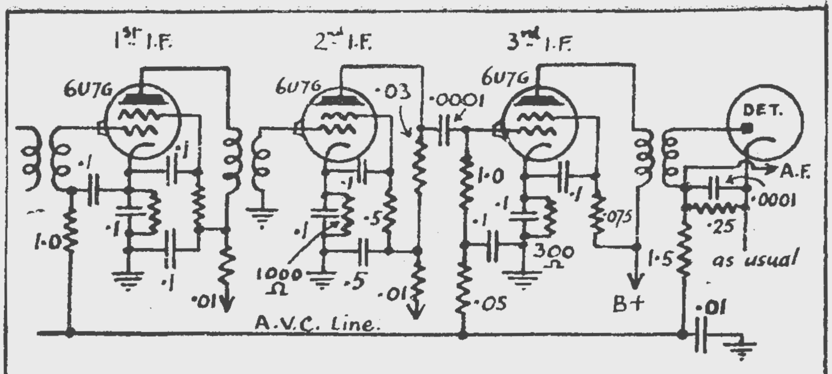

Fig. 3. I.F. Section of a Superhet. with Resistance-Capacity coupled stage.

R.F. COUPLING

(Continued from previous page)

encountered between an R.F. stage and the detector in a short-wave receiver. It gives high gain, but poor selectivity. While we're on the job let us point out that special triode valves were made for tuned-anode, just before the introduction of the screen-grid. Using hi-mu triodes such as the 6F5, 904V, E435, quite respectable gains can be obtained on the broadcast band.

Untuned transformers are employed again today, mainly in T.R.F. receivers between the last R.F. stage and a diode detector. It is rather awkward arranging for a tuned transformer and a diode without running into hum or excessive damping.

The modern aperiodic transformer is quite different from its ancestor of the 1925 era. Today, it consists of two miniature honey-comb coils wound with Litz (stranded) wire and having not only an iron-dust core, but also immersed in an iron-dust shield. The valve preceding such a device should have a fairly low impedance so that the gain is even over the entire tuning range. A valve such at the 6U7G, 6D6, 58 or 35 is suitable. Its screen-grid voltage should be as high as allowed and its anode voltage about 20 per cent more than the screen voltage.

Another application of the aperiodic transformer is between the R.F. stage and converter of a superhet, thus enabling a comparatively simple job of aligning a powerful receiver. Each winding should be shunted by a resistor to prevent its being naturally tuned to some frequency. For the primary, 50,000 ohms and for the secondary, 100,000 could be used.

Band-pass Transformers are usually tuned transformer in which both the primary and secondary windings are tuned, usually to the same frequency. This gives an increased width to the band of frequencies received at one time and makes for improved tone if the transmitter is of the high-fidelity type (otherwise it makes for noise). Some American designers arrange their I.F.'s so that they can be peaked for DX or staggered for "high-fidelity" and state the required amount of staggering and its purpose in their service manuals.

Aerial Coupling

Coupling between the aerial and first valve may be direct, capacitive or inductive, most often the last.

If the aerial is directly connected, the impedance between the grid (and aerial) and chassis, may be an oscillatory circuit, or an aperiodic device, such as an R.F. choke or resistor. In the S.W. converter described recently, we showed such a device and pointed out that the lack of tuning in the aerial circuit simplified alignment considerably. Sometimes the aerial picks up A.C. hum from mains wires and the use of direct coupling applies this 50 cycle A.C. to the first tube. If the A.C voltage is large and the tube is already well supplied (and it will be if the coupling is aperiodic) then modulation hum is produced. That is, the set is quiet until a station is tuned in; then there is an annoying background of hum and distortion.

To eliminate this, a small condenser is inserted between the aerial and receiver, the usual capacity being .0001 or .00025 mfd. Now another bugbear arises. The aerial is isolated as regards D.C. and may, therefore, collect an electrostatic charge. This is overcome by connecting a resistor (.1 to 5 megohm) between the aerial and earth, producing a circuit similar to the conventional resistance-capacity coupling.

Inductive coupling is by far the most commonly used, as in the transformer. It may be supplemented by a small capacity for the high frequency stations as in the case of the inter-stage transformers.

The Circuits

The first is a simple S.W. receiver for batteries. It shows conventional tuned transformer coupling between the aerial and R.F. valve, whilst between the R.F. stage and detector the choke-capacity-tuned system is used. (For "A.C." operation, 6U7G and 6J7G tubes could be used with the filaments heated from a 6.3 volt transformer, retaining the B battery for the H.T. supply.

Next we give part of the I.F. section of a high-gain DX receiver, showing the insertion of a resistance-capacity coupled I.F. stage, which not only gives extra gain (due to the extra valve) but further isolates the tuned stages, reducing the chances of unwanted oscillation.

The third circuit is that of another S.W. receiver, this time a 4-tube job for loudspeaker work. A "static leak"

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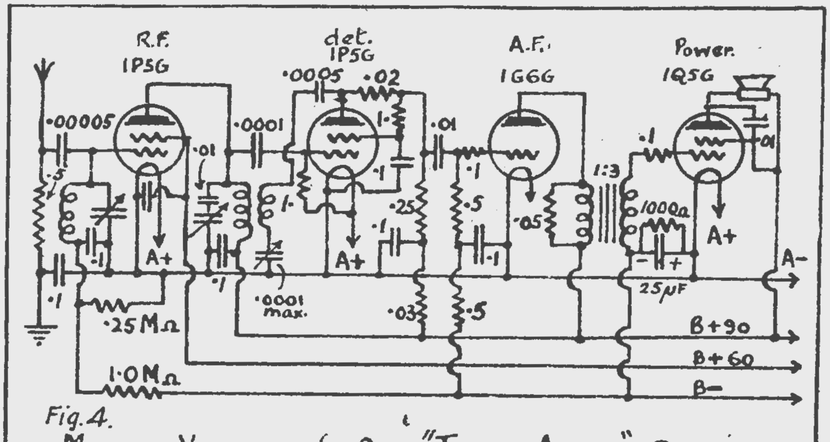
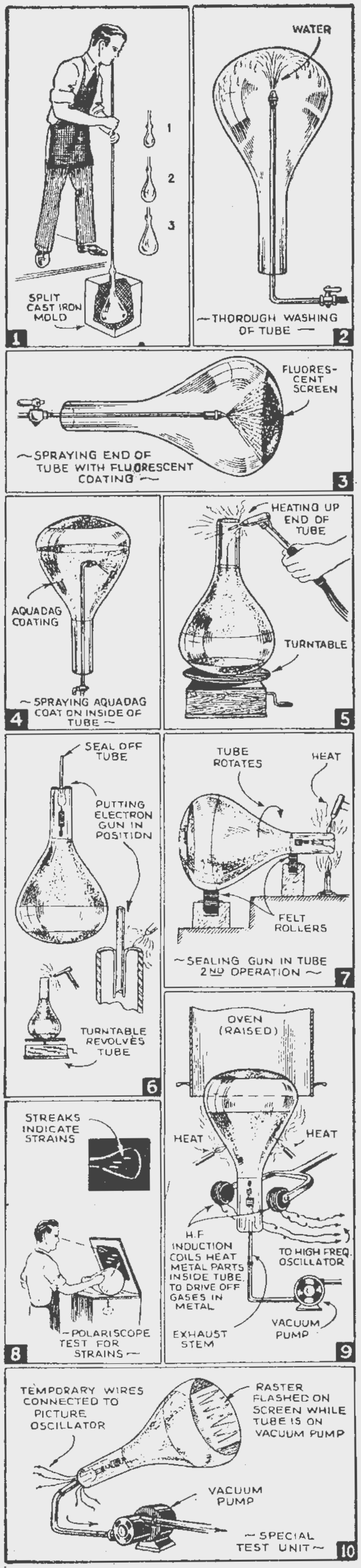


Fig. 4. Modern Version of Old "Tuned-Anode" Receiver.

HOW THEY MAKE
TELEVISION TUBES



The manufacture of the large cathode-ray tubes is very interesting. A surprising fact is that all the metal parts, such as the deflecting plates, electron gun, electrodes, etc., are made of pure nickel (due to its high ductility, etc.), the only other metal being the Dumet alloy wires passing through the glass wall. On such large cathode-ray tubes, the atmospheric force reaches the astonishing figure of 5 tons.

Protection Needed

A heavy plate glass window is placed in front of the C-R tubes in the receiver to protect the televiewers in the event that a tube should happen to collapse. The walls of these 14-in. tubes is about ¼-in. thick and is made of pyrex glass.

One of the first manufacturing steps is to thoroughly clean the hand-blown glass bulb, both inside and out. Next, the fluorescent chemical coating is placed inside the tube by a spraying process; and the tube is then baked. A coat of aquadag (graphite) is placed on the inner wall of the cone-shaped section; this is later used as a grounded electrode. In another section of the tube assembly department, experts mount all of the nickel deflecting plates, electron gun, etc., in the glass stem, which is later to be welded to the small end of the pear-shaped glass bulb. All of the electrodes in the stem have to be mounted accurately in line by means of jigs. An expert glass worker next takes one of the completed stems with its nickel electrode assembly (which also include the cathode heater) and proceeds to fuse this glass stem or base onto the smaller end of the large 14-in. C.R tube, with the aid of several extremely hot gas flames. It takes about three hours to put one of these giant image tubes through its manufacturing stages, including the exhausting process.

Pumping Out the Air

The assembly of metal and glass parts is mounted on a glass envelope which is generally funnel shaped, and sealed in place. A glass tube, giving access to the inside of the glass bulb, service for pumping the air out of the glass envelope. While the pumping operation is being conducted, the glass envelope is subjected part of the time to baking in an oven which is part of th exhaust equipment, at a temperature of approximately 750° F. This baking drives off moisture which might otherwise remain inside the tube. An interesting point in passing is that while the tube is being exhausted, an image from a laboratory transmitter is flashed on the chemical (fluorescent) screen of the tube, so that if there is any defect in the tube, it can be detected at this stage, instead of having to waste further manufacturing time on a defective tube.

While the tube is passing through the exhausting stage, any occluded gases (gas trapped in between molecules) in the metal electrodes ,or in the surface of the glass, are driven off by heating and carried out through the exhaust pump. The metal parts within the tube are heated by high frequency induction coils, placed on either side of the neck of the tube.

Terrific Internal Heat

The metal parts attain temperatures up to 1850° F. during bombardment. The bombardment serves to free metal parts of gases. The construction and assembly of the cathode-ray tube calls for exceptional accuracy. The parts must be very accurately positioned and spaced, since such details affect the quality of finished tubes. Also, the metal parts must be imbedded in the glass, which again calls for great skill on the part of workers familiar with glass working. The cathode-ray tube plant must have skilled glass applicators to take care of the more intricate details of glass working. Were it not for the availability of pure nickel and certain nickel alloys, the cathode-ray tube would not be a practical reality today. The metals used in such devices must possess a number of mechanical, electrical and chemical characteristics. The metal must be amenable to proproduction process which involve a wide variety of fabricating operations. Even in the softest temper, it must be sufficiently strong to avoid deformation during normal handling and use. It must also remain strong at high temperatures in order to preserve tube characteristics through evacuation and bombardment, and must permit strong spot welds while being rustproof and resistant to corrosion. It must resist warpage and distortion regardless of high temperature during manufacture and use. (The position and clearance of the various parts are vital factors in maintaining the proper tube operation.) The metal must have the required electrical properties, especially proper electron emission characteristics, must be low in contained gas, and be readi-

(Continued on next page)

TELEVISION TUBES

(Continued from previous page)

ly de-gassified at moderate temperatures. Approximately 8 times as much nickel is used for the cathode-ray tube as for the conventional radio tube.

The exhaustion in one of these tubes is carried out to a very high degree—in fact to 10^{-6} millimetres (almost a perfect vacuum) of mercury. Special annealing appliances have been constructed to maintain any desired degree of heat on the tubes over a considerable period of time, so that they can be cooled slowly and thus avoid any undue strain in the glass. Interesting, too, is the fact that each tube is checked with a **polariscope**, which shows up any strain in the glass by variation in the light pattern on the screen.

The large 14-in. tube television receivers, designed and built at the Du Mont plant, use 5,500 volts on the anode, and as a safety feature, interlocking switches are mounted within the cabinet, so that if any one opens the rear panel, the high voltage transformer is cut out of the circuit. Electrostatic scanning is employed on this large image receiver, thus marking a departure from the usual practice of using electro-magnetic scanning on tubes larger than 5-in. diameter. Twenty-two tubes are used in the television receiver for the 8-in. × 10-in. image. This includes the sound channel receiver.

For a large console receiver with 14-in. C.R. tube, and fitted with an all-wave broadcast receiver, 32 tubes are used.

—"Radio and Television" (U.S.A.

AMATEUR ACTIVITIES

In a message to amateurs regarding post-war activities, A. D. Gay, president of the Radio Society of Great Britain, states that "as far as can be judged at present the G.P.O. is agreeable to the restoration of full licences to all pre-war licence holders, but for Service reasons questions relating to frequency, power and other matters of detail cannot be considered officially at the present time. With many Axis amateurs still on the air, without apparently causing any embarrassment to Service requirements, there seems to be no reason why British licences, terminated in September, 1939, should not be restored within, say, two months of the time hostilities cease, followed by the return of our impounded equipment as promptly as it was collected."

RECEIVER USING JUNK PARTS

Details of how a simple loudspeaker set was built up from the remains of two 1930 chassis.

MANY advanced experimenters have, at times, invested a few shillings in an old chassis just for the sake of one or two parts and a bit of fun tracing out the original circuit. After the wanted parts have been removed, the chassis is often tossed into the corner, junk-box or on to the rubbish pile. If everything worthwhile has been removed, then give what metal remains to the war effort. But parts are scarce now and a choke rewound and made O.K. is better than just a bit of old iron and dirty copper. So, if there are any usable parts, use them or get them in order, or give them to someone who can. (Possibly the mag will run a "swap" column?)

Chassis Remnants

An investigation recently brought to light a couple of old chassis "remnants" which, when put together with a couple of new condensers and resistors, made a set that worked. Here's how it was done:—

First, a power transformer was dug up and each winding checked for continuity. The leads were not labelled and at first there seemed no way of knowing what was what. The leads were sorted out according to the continuities found and a couple of pairs of thick leads picked out. To one of these pairs an A.C. supply of 4 volts (from an old filament transformer) was applied and an A.C. voltmeter connected to various other leads. One group of leads was found to be the H.T. and C.T., another was a collection of mains input wires. The other filament pair gave a reading about 3-1/5 volts, so I concluded it was a a 4 volt filament and that the 4-volt input was at present connected to a 5-volt rectifier winding.

Not knowing the allowable H.T. drain, I decided to make it on the small side, around 20 miliamps.

Check for Shorts

To check for shorts a suitable pair of mains leads was connected to the 230 volt supply and left for one hour. If there were an internal short the fuse would have blown, or the transformer become quite hot. Every thing seemed O.K., however.

The Valves

For valves, a Mullard 354V (a 4-volt triode), an E443N and an 80 were found. The E443N output could take 400 volts on anode and 200 on screen, but the old transformer supplied only 320, so after allowing for the speaker field drop it was decided to put the H.T. on both anode and screen and hope for the best.

One of the old chassis plates was completely stripped, scrubbed, dried, sand-papered and given a coat of grey paint to hide where the rust had been.

The other chassis provided a tuning condenser which had not corroded away and a reaction condenser also. Floating around in the junk-box, an old coil was found. This coil gave trouble later until we discovered an unsoldered point in the secondary—someone had evidently reduced the number of turns at one time by clipping a few turns off and just twisting the loose wire ends together!

Filter Condensers

It was decided to use a couple of pigtail electros for the filtering, more for convenience and because I had them, than for any other reason. Block type paper condensers of suitable voltage rating (1500 test, 400 volt D.C. working, or 250 volt A.C. working) would have been quite satisfactory.

Making a Resistor

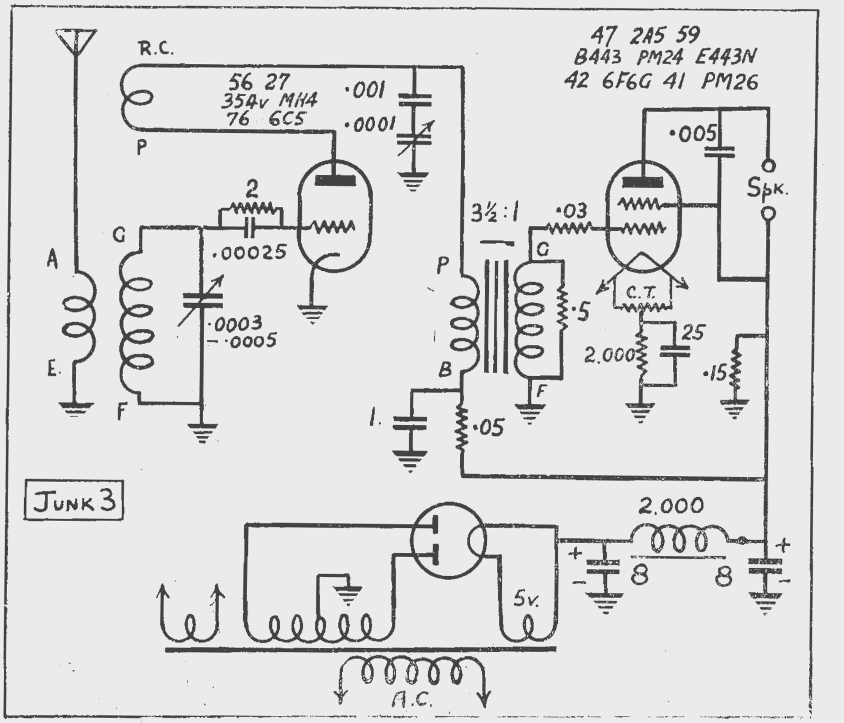
The circuit is conventional in every way. As the output valve was directly heated a centre-tapped filament resistor seemed necessary and this component was made by rewinding an old wire-on-fibre resistor. The old resistor was 250 ohms, so one fifth of its wire was used. The new resistor had a glass tube (from a dental cartridge) as a former and the wire was spaced by winding cotton between it. Ends of the wire were temporarily held in place by rubber bands while metal clips were made. For those constructors unable to obtain or make a C.T. resistor, let me suggest the use of two pilot lights in series. Of course, an indirectly heated output tube does not require a C.T. resistor — just earth one side of the heater.

Trouble With Hum

At first th grid-leak detector produced hum when a station was tuned in and reaction pushed to the limit. The cause was found to be insufficient filtering of the H.T. supply and decoupling was decided on.

Some of the values shown in the circuit diagram are rather unusual, but they are the ones that happened to be on hand. Generally any condenser can be from half to twice the capacity indicated, and any resistor from three-quarters to one and a half times. Dif-

(Continued on page 16)



Circuit of a simple receiver suitable for using up junk parts

ARMY INSTRUCTION "A LA YANK!"

THE criterion of dullness is the knife that "won't cut hot butter." Veterans of World War I might wish to add another example: "Nothing was so dull as the language used in army regulations and instruction books." However, fathers of the American doughboy, Model 1942, would hardly recognise some of the official language now used in military terminology. It sounds human. Leaders of our modern Army have learned that if the maximum amount of training is to be given to our soldiers in the minimum of time, it becomes necessary to talk the language of the average soldier.

The signal Corps has set the example in presenting instruction in plain, everyday Americanese. Instructional pamphlets using cartoons, slang, and typical Yankee terms have been issued to Signal Corps radio operators and maintenance men which supplement the formal, standard Army texts. These pamphlets are in use at Ft. Monmouth, N. J., home of the Signal Corps, and are being issued also to operators and technicians of other arms and services in the field.

Tank radio operators are instructed not to try to get more range out of their transmitters than they are designed for: "Some radio operators after experience with the tank radio discover that by smart spot-picking (i.e., from a high hill) they can set up a long distance record of say umpty-five miles . . . then there's hell to pay. The umpteen mile sets are suspected of the worst and promptly sent back to Maintenance for an injection of something or other . . . Don't let the rumour that so-and-so's set will do a regular umpty-five miles fool you. Someone is shooting what is known in polite circles as "the bull."

Radio in Tanks

Tank radio operators are cautioned to familiarise themselves with their equipment and learn how to use it properly: "There's one thing about this radio business that sort of gripes the old timers. Nobody expects to start shooting a 75, a 37, a machine gun, or even a pistol until he's been taught a lot. But when it comes to a radio set —**that's different**, and any healthy American over 18 (and not dead drunk) is, for some reason or other, supposed to be able to walk up to the near side of a radio set, look it squarely in the eye, rapidly twist all the knobs in a different direction, stick a couple of plugs inside, and presto—have it talking both ways. But the above is pretty near 100 per cent baloney, and don't let it fool you."

Operators of mobile radio stations are cautioned against exposure to death-dealing high voltages, and are taught the use of safety devices. The Signal Corps pamphlet whimsically observes that "broadcasters need these devices to keep half-canned announcers and over-fed sopranos from sitting on their tank-coils."

Not Broadcasting!

In order to keep extraneous noise out of the microphone, operators are told to speak directly into the instrument, and not to "sit comfortably back like a sports announcer and proceed to talk a foot from your mike. Your signals at the other end will sound like four skeletons on a tin roof around the first of June."

Sometimes, when a mobile radio unit is on the move, areas of radio interference, noise, static, and atmospherics are encountered that make it extremely difficult for an operator to hear radio signals over the bedlam in his receiver. Realising radio's limitation, the Signal Corps admits that all an operator can do then is to "do your damndest to pick signals out of the hash."

That's language Americans understand. —From "Radio" (U.S.A.)

IDEAS FROM MODERN CIRCUITS

Stabilised Bias System

In any AB1 or AB2 output system the total cathode current, i.e., the sum of the anode and screen currents, rises considerably from the no-signal to the maximum output level. If cathode bias is employed, and this is usually the case, then the increased current produces an increase in the grid bias, thereby reducing both power output (some tubes suffer more than others) and the sensitivity. The latter is reduced because more grid swing is required to give a smaller output.

Attempts at stabilisation of bias include the feeding of a bleed current through the bias resistor, the use of back-bias (using the other tube currents as stabilising current), filtered back-bias (not applicable to class AB2 or class B2) and use of large capacity shunt condensers.

Each system has its own advantages and disadvantages. The system given

by

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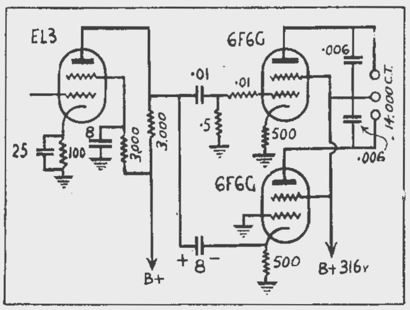
PRESTON, VIC.

in this article is one which is applicable to class AB1, AB2 and B outputs and consists in using the same resistor for biassing three tubes: the outputs and their driver. For AB2 and B2 outputs where the driver is a power tube, its cathode current is large and assists greatly in stabilising the bias. Class AB1 and B1 (or Q.P.P.) systems usually have a driver of comparatively little power and consequently small cathode current, but on the other hand these no-grid-current systems usually require less bias and less regulation. The circuit shown is one for three 45's in class AB2 and with the voltage shown has an output of approximately 15 watts.



Novel push-pull circuit.

This Month's Series:

1.—**Stabilisation of Bias.**

2.—**Voltages for Carbon Microphone.**

3.—**Degenerative Push-Pull system.**

4.—**Dual Application of Pilot Light.**

Without the stabilising effect of the driver's current, this output would be reduced to about 11 watts (for same voltage and load resistance).

Microphone Voltage Supply

Carbon microphones require a small supply of current, usualy about 2 to 5 milliamps., at a pressure of approximately 3 to 8 volts. In some cases this is supplied from a small dry battery, but in the case of an A.C. amplifier, some of the cathode current if one or more valves can be used. A small portion of the output valve current can be taken from its cathode and fed through a resistance-capacity filter to the microphone.

The filter has another purpose besides preventing feedback. The resistor prevents the marked erratic resistance fluctuation of the microphone, affecting the output bias and stabilises the microphone current, reducing the "blasting" tendency of some mikes.

Although a step-up transformer of about 1 to 20 ratio is used for coupling the microphone to the first valve, resistance-capacity coupling can be employed instead to give greater fidelity (a large part of the poor quality of a cheap carbon mike is due to the poor transformer). The circuit shown is particularly suited to the Reitz or transverse-current microphone.

Degenerative Push-Pull System

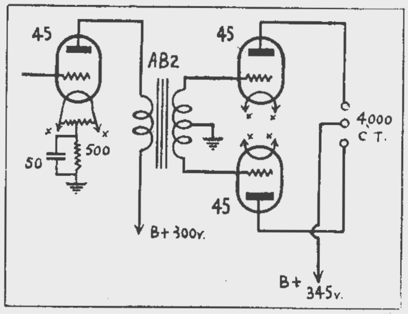
Here is a rather unorthodox system in which the driver preceding the output tubes does NOT provide a pair of anti-phase signal voltage! Instead the same voltage is fed to both output tubes, but is supplied to the grid of one and the cathode of the other. The system is suitable for Class A1 and AB1 output operation in which the tubes are not driven near the point of grid current. Unfortunately, the small value of cathode resistor prevents any appreciable gain being obtained from the driver tube unless it is a really high-conductance valve. The lack of a bypass condenser across the cathode resistors of the output valves provides a form of "degeneration", or negative feedback, reducing distortion and in this case giving a hump in the bass and a general increase in the "highs."

A simplification of the circuit shown can be made by using a lower-powered driver, e.g., a 6J7G connected as triode, and feeding its plate direct from the cathode of the second 6F6G. the plate being still capacity coupled to the first 6F6G. This results in an improved frequency response and less distortion at very low frequencies, but the output is reduced.

Multiple Use of Pilot Light

As its name implies, the first function of a pilot light is to indicate when a set or amplifier is working.

Another use for a pea-lamp is to



Using same bias for driver and output valves gives greater power with some circuits.

use it as a fuse, connecting it in series with some component, often the first electrolytic, so that an excessive flow of current does not damage the component or the power transformer.

These uses can be combined, and in addition, the lamp will serve as a "warmed-up" or "ready for use" indicator if the circuit shown is employed.

A 6-volt globe is connected in the centre-tap lead from the H.T. winding on the power transformer. If back-bias is used, the lamp-holder must be insulated from the chassis, but if self-bias is used on all tubes then the metal lamp-holder can be screwed directly to the chassis.

Should the first electrolytic short, then a large current flows through the H.T. winding and the rectifier. If this state of affairs continued, either the rectifier would go (after getting its plates beautifully red) or the power

(Continued on next page)

MODIFIED VIEWS ON SHORT-WAVE PROPAGATION

TWO abstracts from technical papers of German origin which have recently appeared in "Wireless Engineer" deal with matters of particular interest to those engaged in short-wave work.

The first of these is from a paper by B. Beckmann, W. Menzel and F. Vilbig, and gives details of a particular form of "scattering" in the ionosphere, which results in strong signals being obtained within the skip distance of a transmitter.

As is generally well known, there is, for any particular point on the earth's surface not too far distant from a short-wave transmitter, a certain frequency which, with a given state of ionisation in the ionosphere refracting layer, is the highest point that is returned to earth at that point. Waves of higher frequency than this, going up at the same angle, will penetrate the refracting layer, while waves of lower frequency will be receivable at the point in question and also at points nearer the transmitter. Similarly, when the ionisation in the layer is steadily increasing or decreasing, there comes a time for any particular frequency to be the highest which is returned to earth at the given point. At this time all points nearer to the transmitter lie within the "skip distance" **for that frequency,** and refracted waves are not receivable at them

Weak and Unsteady Signals

Within the skip distance, and beyond the limits of the ground wave, signals of a kind are, however, normally obtainable, but they are of a generally weak and unsteady nature. These are due to the fact that, during the upward passage of the wave towards the F layer, it passes through the E layer, and here a portion of the energy in the wave is "scattered" by ionic clouds which nearly always exist in the lower layer. Some of this "scattered" energy is sent downwards so as to reach the earth within the skip distance for the refracted wave. It must be stressed, however, that this normal type of scattering provides only weak signals, which are not to be compared with those due to a refracted wave.

According to the abstract the German workers carried out their observations at Munich and found that, after that place came within the skip distance for the London 25-m. wave, the London 19-m. wave "could almost always be heard **at great strength.**" Of course, Munich would fall within the skip distance for a London 19-m. wave before doing so for a London 25-m. wave. Secondly, the 19-m. transmission of Zeesen, for which Munich was within the skip distance for the whole of the observing period, was frequently audible at **very great strength,** and on these occasions its signals did not, in fact, show any effect of "skipping". These strong signals could not have been due to the normal scattered radiation, and they are explained by the authors as follows: When, after the ionisation in the F layer has fallen below the limit necessary to return the wave to earth at the point in question, the transmission still is not interrupted, because the refracted rays are replaced by other rays which are deflected by the ionic clouds in the E layer on their upward journey, so that they fall more obliquely on the F layer than those going by a direct path. Under these conditions they are refracted by **the F** layer, and, reaching the E **layer, are** again deflected, this time downwards to earth.

The E region clouds do not act with the F layer to bring about this result on all occasions, for sometimes there is only the normal weak reception, which is due to the scattering from the E layer clouds acting by themselves. But, the German workers state, the strong reception was obtained during 50 per cent. of the observations, and if this is so it would appear that it should be taken account of in the planning of short-wave communication services to point not greatly distant.

Workers other than the Germans have also observed the fact that, at these distances, strong reception on frequencies which should normally skip is often obtainable, but whether it is due to some other effect in the E layer is not yet definitely known.

The other matter of interest to short-wave workers is from a paper by G. Leithauser dealing with, among other things, the behaviour of the F2 layer. According to the abstract, the author of the paper is not satisfied with the generally accepted theories seeking to account for the daily and seasonal variations in the F2 layer critical frequency, and on this point he will, no doubt, find many to agree with him. Certainly, when it comes to practice, there do seem to be some points which still require explanation, more particularly the matter of the low working frequencies which—if the measured critical frequencies

(Continued on page 16)

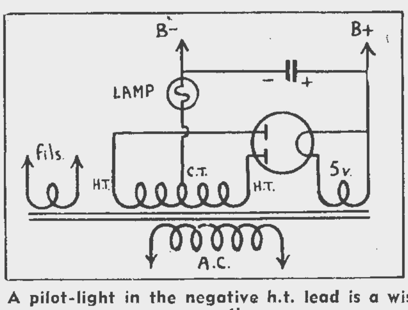
IDEAS

(Continued from page 13)

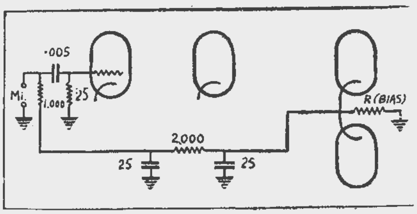
transformer would burn out—a disastrous accident these days.

The current rating of the lamp should be related to the total high-tension current taken by the set, otherwise it may fail to blow if the second electrolytic should go. A .3 amp lamp is suitable for sets using over 110 milliamps. or for an amplifier using a permag. speaker and taking over 80 ma. For lower currents a .15 amp or .06 amp globe should be employed. Normal operating current should cause a faint glow.

When the set is first switched on the lamp does not light. As the valves "warm up" to operating temperature,



A pilot-light in the negative h.t. lead is a wise precaution.



Current for the microphone can be taken from the bias circuit.

the glow gradualy appears, giving an indication that sound should be obtainable. After a while, the appearance of the lamp can be used to diagnose high or low mains voltages.

A Word of Warning

Do not, on any account, unscrew or screw up the lamp whilst the set is switched on. The former may give you a nasty shock; the latter may strain your rectifier valve and/or burn out the globe. If the light burns out, do not just substitute another—find the cause and remedy it.

If the lamp in an amplifier becomes broken by accident, operation of the amplifier can still be obtained by switching off, twisting the wires in the lamp together and switching on. It is just as well to remove and replace the broken lamp with a handkerchief or protective cloth.

S.W. PROPAGATION

(Continued from page 14)

are correct—should obtain during the summer day. Practical results show that these can often be considerably exceeded.

The critical frequency of the layer, i.e., the highest frequency return for a wave sent vertically up, is generally assumed to be that for the wave which is returned from the point of maximum electron concentration in the layer. According to this idea, all waves of higher frequency penetrate to a point higher than this, where the electron concentration is falling, and so they are not returned.

Attenuation and Frequency

The German writer bases his ideas on the fact that when a wave penetrates into the layer it becomes subject to a type of attenuation which increases with increasing frequency. Under certain conditions, he states, when the critical frequency measurements are made, what is obtained is not the point of maximum electron concentration but a point from where, as the electron concentration increases, the attenuation rises with increasing frequency. This means that the point of maximum electron concentration lies higher than the point to which the wave of critical frequency reaches, and that higher frequencies fail to return, not because they penetrate the layer, but because they are completely attenuated. Thus the critical frequencies recorded for the summer day are too low, and this fact may give rise to all sorts of errors when the vertical incidence measurements are applied to the oblique case, as they are in the practical forecasting of working frequencies. Furthermore, according to the author, the error in the measured critical frequency is not confined exclusively to the summer day.

One would have thought, however, that it would have been relatively easy to determine whether the measured critical frequency was, in fact, due to the point of maximum electron concentration having been reached, or whether on the other hand, it was due to attenuation of the wave with rising frequency. For example, does the virtual height increase very rapidly at frequencies near the critical frequency? If it does not, the implication would appear to be that point of maximum electron concentration does lie higher in the layer, and that waves of frequency greater than the critical would, if they did not fail to return because of being attenuated, show increased virtual heights. If, however, the curve of virtual height against frequency is rising almost vertically near the critical frequency, one would infer that the point of maximum electron concentration is being reached, and that the failure of higher frequencies to return is due to penetration of the layer.

Power Effect?

Again, does the critical frequency vary with the power radiated? If it does it would appear that attenuation is the deciding factor, because attenuation can be overcome by an increase in radiated power, whereas electron limitation determines the critical frequency quite independently of the power radiated. It ought, therefore, to be possible to determine whether it is, in fact, the true critical frequency which is being measured or not.

On the whole—so far as the abstract goes—one would conclude that, in that part of the paper which deals with F2 layer behaviour, Leithauser has not quite proved his point, and that, to account for the anomalies previously mentioned, further work is necessary.

—"Wireless World," (Eng.)

JUNK SET

(Continued from page 11)

ferent output tubes require different values of bias resistors. These are found from valve data charts.

Alternative Valves

If a 2½-volt transformer and 2½-volt tubes are used, then a -27 or -56 could be used as the detector, and a 47, 2A5 or 59 as output. Even a -58 connected as a triode gives a small, but quite useful output (about a third of a watt). For a 6-volt transformer, there is quite a range of tubes, such as 6J7G (as triode) for detector, 6F6G, 6A4, 6G6G, etc., for output. A 6U7G can be used as an output pentode giving about half a watt at 300 volts. The snag is the high speaker impedance required — about 50,000 ohms. (Impedances of about this value were used at one time straight after power detectors in small superhets).

For a tuning coil, a modern Reinartz shielded coil in any of the better makes could be used.

Performance

A simple set such as this "two-valve and rectifier" is best suited to distances of about ten or twenty miles from the city stations. A fairly long aerial can then be employed without trouble from stations running into one another. In the city areas, a short indoor aerial of about fifteen feet should be enough. More gain and better separation of stations could be obtained with a screen-grid or pentode detector. In that case, resistance coupling would be advisable.

We built up two of these sets, each of which happened to use 4-volt valves. One worked so well that we tried it out with short-wave coils, later adding an aperiodic (i.e., untuned) R.F. stage to improve selectivity and sensitivity. This will be described in a later issue.

EVOLUTION OF THE TUNING COIL

Part 5 of an interesting series of articles dealing with the development of modern design.

IN the very early days when a receiver was lucky to pick up one single transmitter, it was common practice to have no tuning device at all; just receive everything that came along and be grateful. Most of the stations were spark transmitters and even when two were received simultaneously the different notes made it possible to distinguish between them.

Early Tapped Coils

A tuned aerial circuit, however, gave increased efficiency and enabled the elimination of a station which worked on a markedly different wavelength. Early tuning devices were rather crude, consisting of a tapped inductance coil, or one with a slider. Sometimes there were both fine and coarse tappings and simple type of variable condenser might be shunted across it for a fine adjustment.

For the Long Waves

In England and Australia, the wide range of wave-lengths (when broadcasting first became popular) necessitated plug in coils and these were usually slab- (or pie-) wound, honeycomb, spider-web or basket-weave. Of the so-called "low-loss" types, the spiderweb was probably the least efficient and the basket-weave the most. The honeycomb type was the most common, on account of the ease with which it could be wound by machine.

With the restriction of the broadcast band (in Australia) to 250 to 500 metres, the need for plug-in-coils ceased and the higher efficiency of the cylindrical coil became more widely known. This was pointed out by Hugo Gernsback and others in "Radio News" in 1925.

Coverage Efficiency

The Lorenz, or basket-weave coil approached the cylindrical coil in general efficiency and had a lower distributed capacity, giving a surprising wave-band (or frequency) coverage for the one coil. A pair of coils with .0005 mfd. condenser that was standard in those days, would cover from 40 to 600 metres.

Three-Coil Tuners

The 3-coil tuner consisting of a fixed primary (aerial) coil, a fixed secondary (grid) coil and a movable reaction or feed-back coil was very popular with the simple one, two and three valve sets, and is quite suitable for use today, except that a fixed reaction coil is generally better. The primary winding varied from 3 or 4 turns for the high selectivity and low gains to 20 or 30 turns for poor selectivity and high gain. For the reaction coil, about 30 to 40 turns of thin wire (36 to 40 gauge) was used.

Larger receivers embodying one or more R.F. stages, used similar tuners without any reaction coils, sufficient (or more than sufficient) reaction being obtained from coupling between coils, inter-electrode capacities in valves, etc.

Problems of Shielding

When coils began to be shielded, various problems arose. If the shield can were too small it absorbed power in eddy-current effects unless the coil were small, whilst small coils in those days had very low efficiencies. The early screened coils were about 1 to 1½ inches diameter with cans 2½ to 5 inches diameter. Rather bulky. The length of the cylindrical winding reduced the efficiency and the thin wire usually suffered after a while from corrosion.

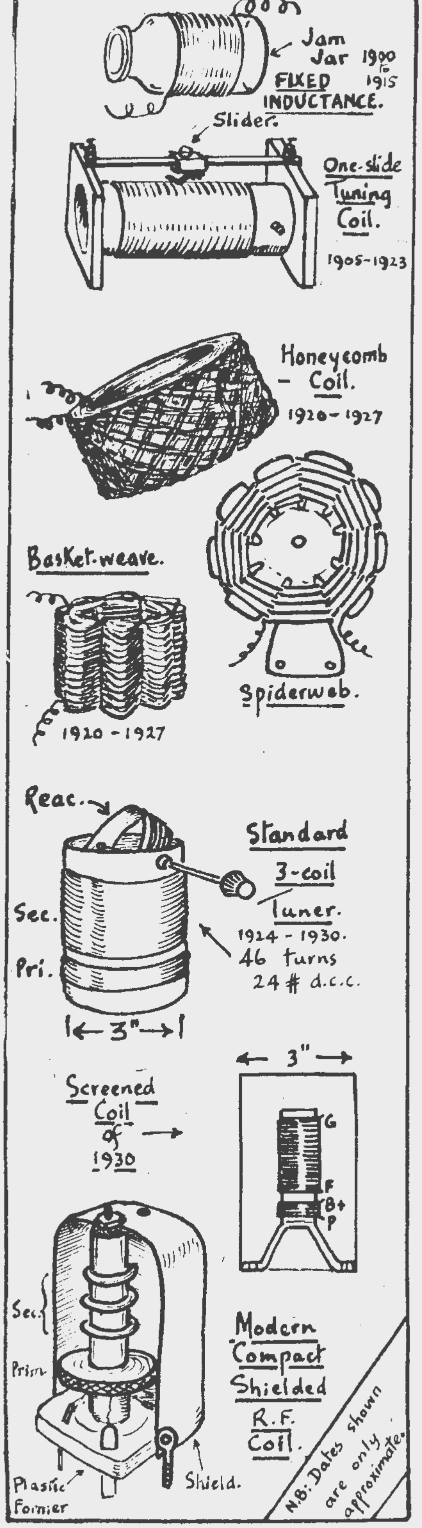
Modern Coils

To overcome these difficulties the honey-comb coil was re-introduced in a miniature form. A dipping of wax prevented corrosion, only special waxes of high insulating properties being used. To reduce capacity losses and enable a wide tuning range, the secondary coil may be wound in sections, whilst a large high-impedance primary is coupled to it by a small condenser (see article on R.F. coupling).

Coil efficiency has been further increased by the use of "iron dust" cores. These cores consist of a plug containing a very large number of particles each insulated from the others and composed of a high permeability material. The insulation and small size of the particles prevents eddy current loss and the nature of the magnetic material reduces hysteresis loss to a minimum.

Coils of the Future

Nowadays the home constructor can no longer wind his own coils and obtain the utmost in efficiency, and we hope that he doesn't have to try it in the future. Possibly, after the war, we will see even smaller coils of higher efficiency than ever before — a complete coil in a ½- or ¾-inch cube seems possible, although unshielded coils may be the rule in the ultra-small sizes.



The Regenerative Detector

The principle on which regeneration works, and how it is applied, is discussed in this month's instalment.

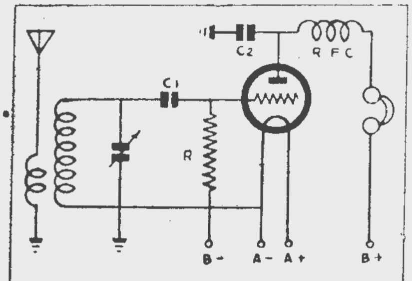


FIG 1

IN the circuit shown in fig. 1, the condenser "C2" connected from the plate of the detector to earth is inserted to by-pass the unwanted radio frequency currents appearing in the plate circuit. However, this r.f. energy can, by using the modified circuit arrangement shown in fig. 3, be put to a particularly useful purpose, by feeding it back into the grid circuit for re-amplification.

Enormous Increase In Sensitivity

This regeneration (or reaction), as this effect is called, results in a tremendous increase in sensitivity, as well as an appreciable improvement in selectivity. The great increase in sensitivity means that enormous distances can be successfully covered with small receivers. In fact while a station 50 miles away might perhaps not be heard on a one-valve set without regeneration, with it stations thousands of miles away can be

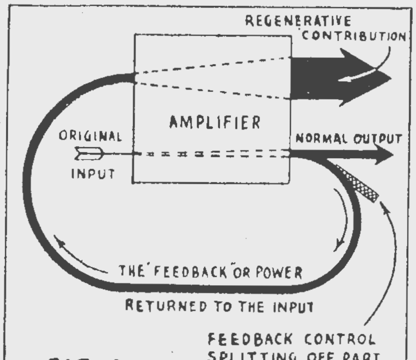


FIG. 2

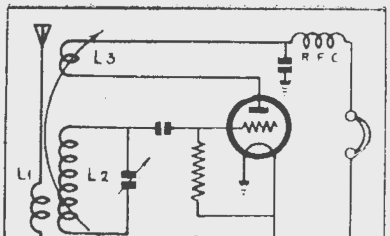


FIG. 3

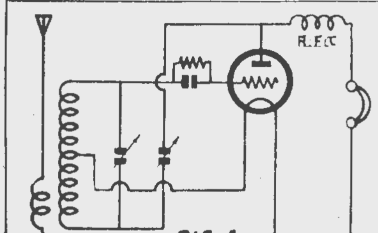


FIG. 4

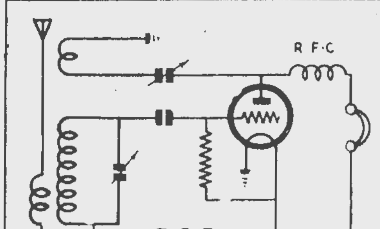


FIG. 5

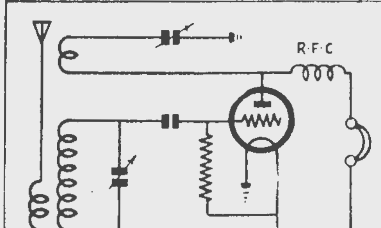


FIG. 6

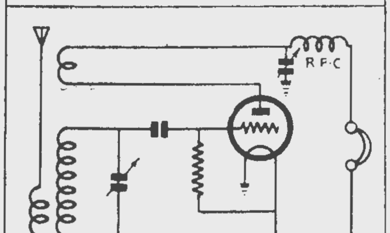


FIG. 7

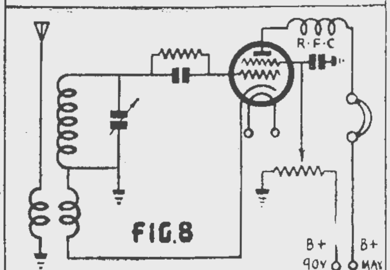


FIG. 8

brought in at good headphone strength.

Feedback Must Be Controllable

To enable this to be done successfully, however, it is necessary to provide an efficient means for controlling the amount of r.f. fed back from the plate to the grid circuit, for if the feedback passes a certain limit, the valve will commence oscillating, which largely nullifies the enormous benefit of regeneration. What is required, then, is a control that enable the highest possible amplification to be obtained without the detector breaking into oscillation.

Many Forms of Basic Circuit

There are many different modifications of regenerative detector circuits, but fundamentally they all work on the same principle—the feeding back of energy for re-amplification from one part of the circuit (generally the plate circuit) to the grid circuit.

The method of regeneration illustrated in fig. 3 is known as the "swinging coil" type. Universally popular in the early days of radio, it fell into disfavour some years ago, mainly because of several serious drawbacks.

The third winding "L3" shown connected in the plate circuit is the reaction or feedback winding. Supported near "L2", the grid winding, it is inductively coupled to the latter by virtue of its proximity.

The amount of coupling existing between the two windings, and thus the amount of feedback, is controlled by rotating the reaction winding about its axis. When the plane of the latter winding is at right angles to that of the grid winding, coupling is at a minimum; when the two are parallel it is at a maximum, while intermediate positions give intermediate values of feedback.

How Regeneration is Obtained

The signal applied across the tuned circuit from the aerial via the primary winding "L1" is in the form of a high frequency alternating voltage. When applied to the detector grid, this results in corresponding variations in the plate current. The latter flows through "L3" (which is known as the tickler, reaction or regeneration winding), and in so doing induces into "L2" by virtue of the inductive coupling existing between the windings, an identical but greatly enlarged replica of the original signal applied to the grid.

This regenerative effect, if kept under control to prevent the detector from breaking into oscillation, results in tremendous amplification.

The process is indicated in diagrammatic form in fig. 2. The sketch seems to indicate that regeneration is not solely a radio frequency effect, and this is quite true, as intermediate frequency as well as audio regeneration are obtainable.

Why Do They Like Woomphy Tone?

Can anyone explain why it is that those who use receiving sets for bringing in the dance music of the day so often find it desirable to turn the tone control as far counter-clockwise as it will go, or very nearly so? Is it because this takes the edge off the excruciating noises produced by muted trumpets and other strange instruments, thereby rendering them less unbearable

I don't know.

I seek more light on the subject. What I do know is that if the news bulletin follows a dance band programme, hardly a word is intelligible until someone has moved the TC knob a long way clockwise.

This preference for muffled (mellow is, I believe, the accepted term) reproduction is all the more puzzling since the majority of the sets that one comes across in messes and canteens have little enough "top" anyhow.

But sometimes I am assailed by doubt; do receivers sound woomphy to me because my aged ears have lost some of their high-note response.

Do I like the tone-control turned farther clockwise than the young dance-music enthusiast would have it owing to the sad effects of senile decay? It is, of course, a fact that once you are over thirty or so your ears respond less and less well to high frequencies. Hence grave and (we hope) reverend seniors might need the tone control turned clockwise in order to be able to hear the upper notes that are clearly audible to gilded youth.

Is it then really the ears of the older folk that woomph rather than the loudspeakers of our wireless sets? I hardly think this can be so, for I notice that the young, too, are unable to comprehend the news when it is reproduced with the dance-music settings of their choice.

—By "Diallist in Wireless World, (Eng.).

Methods for Obtaining Regeneration

Some of the methods that have been developed for introducing and controlling regeneration will now be discussed. From the above it is obvious that the essential requirements of a satisfactory regeneration system are smoothness and simplicity of operation. Freedom from hand capacity is also necessary. Some of the circuits to be discussed do not possess these qualifications, and so have fallen into disuse.

For example, the "swinging coil" method of obtaining and controlling regeneration is rather difficult to handle, and it is not easy to get the really fine degree of coupling necessary for best results. Also, varying the coupling between the two windings results in an alteration to the effective inductance of the grid winding, which means that with every adjustment of the reaction control the tuning is upset—only to a very slight degree, it is true, but sufficient to prove annoying.

The Hartley circuit shown in fig. 4 was at one time fairly extensively used. The grid and reaction coils comprise one continuous winding which is centre tapped. However, in the arrangement shown, both rotor and stator of the reaction condensor are above earth potential as regards r.f., and so hand capacity effects are particularly troublesome.

Fig. 5 shows the widely popular Reinartz circuit. The adaptation shown in fig. 6, known as the Schnell circuit, has an important advantage over the Reinartz, in that the rotor plates of the reaction condenser are at earth potential. Fig. 7 shows a still further modification, which is also very widely used.

Other popular methods of controlling regeneration include potentiometer control of plate voltage, and in the case of screen-grid detectors, potentiometer control of screen grid voltage.

Fig. 8 illustrates the now widely used electron-coupled method of regeneration, in which the feedback winding is included in the cathode instead of the plate circuit, regeneration being controlled by a variation of screen voltage. The valve shown is an indirectly-heated type, though electron-coupled regeneration is easily obtainable with battery type valves as well.

The main advantage of the electron-coupled oscillator is high stability and minimum de-tuning of the received signal.

R.F. COUPLING

(Continued from page 8)

of .25 megohm and a .00005 mfd. condenser couple the aerial to the grid and the first tuned circuit. The second tuned circuit is of the tuned anode type with the condenser plates at earth potential as regards D.C.

The fourth circuit shows the aperiodic R.F. transformer in a "hi-fi" set of the T.R.F. type. This idea is well worth experimenting with. Possibly a suitable transformer could be made up by jumble-winding two lots of 200 turns of 40 gauge wire over a core from an "iron core" coil. The secondary would be one winding and the primary the other. If there are two R.F. stages with a soupcon of regeneration from capacity between grid leads, then the gain should still be ample.

Shortwave Review

CONDUCTED BY
L. J. KEAST

NOTES FROM MY DIARY—

The Silly Season

I always think this time of the year can be truthfully called the Silly Season as far as radio is concerned. The Short-waves do not seem to be able to make up their minds what they going to do. One day we figure winter is just around the corner by the way the signals are coming in, and during daylight, and this is confirmed by the poor signals at night, when the next day there is no sign of them. But in a few weeks all will be well and pretty near the whole of the day we will have a grand choice.

During the Easter holidays (transport facilities preventing the brief vacation being spent away from home) I had a fine opportunity of checking up what was to be tuned in. One night I was inclined to test the valves when the BBC was "sotto voce" but at 9 p.m. I found the ABC were compelled to apologise through 2BL for the cessation of the news from London due to "bad reception conditions." Well, if they, with all their channels cannot pull London in conditions are poor.

Anyway, generally speaking, one of London's transmitters can be heard for the most of the day, but from 6.30 p.m. till 9.30 p.m. it is sometimes very difficult to hear them. Of course, there are days when conditions, for no apparent reason, are surprisingly bad, to wit, Easter Monday. From 9 a.m. I could not bring in one BBC signal till just on 3.30 p.m., but with the rapid approach of winter this will change.

Jacutta

Remember in February issue I made a guess at the spelling of the Japanese name for Batavia? From a talk by Paul A. Morawetz, I learn it is Djakarta. Singapore is, as we already know, Shonan, which means "Light of the East." Borneo is Brunei, Mayala, Marai and Java is Djawa.

South America

The suggestion in April issue that South America would probably improve their short-wave stations was timely, as hardly had the paper gone to press than we find PRL-8 in Brazil with a power of 50,000-watts reaching us several times during the day. Full particulars can be found under "New Stations."

Change of Set-up

Commencing with the June issue it is my intention to alter the set-up of station particulars, previously shown as The Month's Loggings, and now as Allied and Neutral Countries Shortwave Schedules.

Instead of appearing under Countries, the list of audible stations will be in **Frequency** order Symbols denoting New Stations Changes in Schedules or Frequency, etc., will be used, thus giving readers a quick check up on any alterations.

Austin Condon

A letter from Austin would suggest that schedules have given place to curriculum, so short-wave logging has been out the question, notwithstanding he has his "old faithful" with him. But I notice his leave is spent at a Dxers and his mail brings verifications of reports sent from Laura. One of the first to tune-in the now discontinued VLQ, he has received an acknowledgement from the P.M.G.'s Department. Letters addressed to 437779 AC2 A. S. Condon, F. Flight, 2 Squadron, No. 1 I.T.S., R.A.A.F., Somers, Victoria, will be welcomed

Arthur Cushen

Coming fourth in a world DX contest is something of which to be justifiably proud, and our congratulations go to Arthur Cushen for this fine achievement, all the more meritorious when it was conducted by such an organisation as the Radex DX Club of U.S.A., and he was the only listener outside of the U.S.A. to reach the final stage.

In a letter conveying the above information Mr. Cushen tells me he heard a station announcing as American Telephone and Telegraph Co on 9.89 m.c., 30.34 metres at 5 a.m., 7 a.m. and 5 p.m.

Another interesting item refers to HP5G. This Panama station at noon takes news in Spanish from the BBC, after which race news and results in English are given. (For those who would like a little after midnight listening, according to "Globe Circler," HP5G on Mondays at 3 a.m. broadcast "You Can't Do Business With Hitler." (L.J.K.).

Mr. Cushen tops his letter off with "verifications received from WCDA (31 metres), PZX, VUD (41 metres), VLQ and VLQ-3.

Quips From Quilpie

"About those 11 metre Daventry stations, are they in use, audible etc., if so, when?" says Dr. Gaden. (I have not received any reports nor ever heard of anyone tuning-in a 11 metre station from anywhere but the U.S.A. That was a year or so ago, and they were only audible for about a quarter of an hour around 10 a.m.—Keast.)

ALL-WAVE ALL-WORLD DX CLUB

Application for Membership

ALL-WAVE DX CLUB ALL-WORLD

The Secretary,
All-Wave All-World DX Club,
243 Elizabeth Street, Sydney.
Dear Sir,

I am very interested in dxing, and am keen to join your Club

Name ....

Address ....
(Please print both plainly) ....

....

My set is a ....

I enclose herewith the Life Membership fee of 2/– (Postal Notes or Money Order), for which I will receive, post free, a Membership Certificate showing my Official Club Number. NOTE—Club Badges are not available.

(Signed) ....

(Readers who do not want to mutilate their copies can write out the details required.)

Have you heard the South American on 25.61 metres– I think it is PRL-8, that's what the call sounds like. Heard it close at 4 p.m., not too sure, but think he is on in a.m. Heard KGEI on 25.57 metres again—and at long last letter of verification from them for reports on 5 frequencies—some reports were a year old.

Night reception has gone off a lot says Dr. Gaden, the 13 metres band is, after some nice nights, now completely gone. Daytime when I do listen, is pretty good especially Daventry, which booms in at 10 a.m., and from noon till 2 p.m. I often get good results. (While daylight reception is definitely on the improve down here, after about 8.30 a.m. it is nearly noon before a really decent signal is available from the BBC, but then right through till about 7 p.m. O.K.—Keast.)

KWID, KWV and KWY

Here are some regular Monday features from these popular "Voice of America" transmitters:—

KWID, 9570kc., 31.35m; KWY, 7565kc., 39.66m; KWV, 10,840kc., 27.68m.

KWID and KWV—5.45 pm: Headlines from home; 6.00 pm: News; 6.05 pm: News; 6.05 pm Sports Today; 6.15 pm: Melody Round-up; 6.30 p.m.: KWV Closes down.

KWID—6.30 p.m: Harry James.

KWID and KWY—6.45 pm: Overseas News; 7.00 pm: News; 7.15 pm: Benny Goodman; 7.30 pm: Cavalcade of Victory; 8.00 pm: News; 8.05 pm: Palmer House; 8.15 pm: KWID closes.

KWY—8.15 pm: Yarns for Yanks; 8.30 pm: Fred Allen.

And some others I have heard are: Wednesdays at 8.30 pm: Bob Hope. Fridays at 7.30 pm: Fibber McGee and Molly.

Saturdays at 8.30 pm: Charlie McCarthy.

And nightly, except Sunday and Monday at 8.15 pm through KWY, Prairie Serenade.

SHORT WAVE NOTES AND OBSERVATIONS

Under this heading will be printed each month excerpts from listeners' reports, notes culled from overseas publications, together with my own observations. These notes will be shown in country form so that readers can tell at a glance any particular changes that have taken place during the month.

AUSTRALIA

As from Monday, April 26, VLQ, 7240kc. 41.44m., has been withdrawn owing to interference, the service being taken up by VLQ-3, 9660kc., 31.05m. (Keast).

An air-mail letter from the chief engineer of Station VLQ-3 giving details of broadcasts also states the transmitter is a Standard Telephones & Cables (Sydney) 10,000 watt job, and signal is directed to Queensland. So he presumes we are getting the back beam. (Cushen.)

NEW CALEDONIA

FK8AA, Noumea, 6162kc, 48.68m: Heard with the news in English at 6.15 p.m. There's no doubt about this one, these days. (Perkins).

AMERICA

Central

Just heard an old favourite of mine, and not too bad at 1 p.m.—HP5G, Panama, 11,780kc., 25.47m (Gaden). HP5G very good at Invercargill as early at 11.45 a.m. on Sunday. At 11.55 a.m news in English is broadcast followed by Big Ben and a relay of the news in Spanish at noon. From London at 12.15 p.m. Horse racing results are broadcast. They announce as "HP5G and HOA, Voices of Democracy." (Cushen).

North

Heard WRUW, Boston, on an announced wave-length of 30.92m., at 3.45 p.m. on Easter Monday. Programme was directed to Central America, but station identification was given in English. Quite a good signal. (Keast).

WNBI, New York, on 9670kc., 31.02m. although scheduled to open at 4 p.m. closes at this hour announcing next broadcast wil be on 15,270kc., 19.60 metres through WCBX. (Keast).

KWV, 'Frisco, 7565kc., 39.66m., puts in a terrific signal opening at 4 p.m. with news. Mostly in parallel with KWID 931.35m., till closing at 6.30 p.m. offers some fine items. (Keast).

KGEI, 'Frisco, 11,730kc., 25,58m. Heard him again—closes at 12.45 p.m. and states will re-open on 41.28 metres at 1 p.m. (Gaden).

WOO-4, New York. According to advice from U.S.A. Office of War Information correct frequency is 8660 kc., or a wave-length of 34.6m. From the same source I learn WLWO is on 6080kc., or a wave-length of 49.3m from 2.15 p.m. till closing at 8 p.m. as suggested by Dr. Gaden and myself, although announcer said: "49.5 metres beamed to Europe." (Keast.)

WRUL, University Club, Boston, opens on 7805kc., at 6 p.m., a somewhat strange frequency for a commercial transmitter. Strength of this 50,000 watter is naturally very good. They carry "The Voice of America" programmes and Keith Gaden says he has heard them relaying WOO4 at 7 p.m. and WRCA at 7.15 p.m. (Cushen).

KWY, 'Frisco, 7565kc., 39.66m.: Is the champion in the 33-40 section (Gaden). In this I concur and "The Jack Benny Show" on Tuesdays at 8.30 p.m. is great. (Keast).

WRUW, Cincinatti, 30.93m.: Heard at 8.45 till 8.30 a.m. giving news session in English. Incidentally this is the best and clearest I have heard WRUW for a long time. (Perkins).

WCDA on 25.36m. was fine on Monday April 26, from 1 p.m. VLW-2 spoilt a really fine signal at 1.30 p.m. (Hallett).

Argentina

LRX, Buenos Aires, 9660kc., 31.06m. are in very fine strength when they sign at 9 p.m. "Radio el Mundo" reopens on LRU on 15,290kc., 19.62m at 9.15 p.m. (Cushen).

SOUTH AMERICA

Brazil

Dr. Gaden writes: "I have been hearing what sounds like a South American closing at 4 p.m. on 25.60m." This will be the new Brazilian, PRL-8, 11,720kc., See 'New Stations."

NEW STATIONS

PRL-8, Rio de Janier 11,720kc, 25.60m
This is a new station of the Brazilian Department of Press and Propaganda. First reporter is Hugh Perkins. Announcing as "Radio Nacional" with a power of 50,000 watts at transmits to Great Britain from 5.30 to 7.45 am, with a talk in English at 7.3 0am. News is heard at 6 am. A broadcast to Latin America in Spanish and Portuguese commences at 7.45 am., continuing till noon. From noon to 1.10 pm broadcast is intended for North America. (English announcer is John Adams. Theme signal is 14 note chime melody from "Country Moon" "Globe Circler.")

WRX, New York 9905kc, 30.29m
This new U.S.A. station is heard in parallel with WGEA, 6190kc, 48.47m from 2.15 pm to 8 pm. It is directed to Europe. But from 8 am to 2 pm is beamed to the West Coast of South America.

WCW, New York 15,850kc, 18.9m
Directed to Central Africa from 3 am to 7 am. This is another outlet for U.S.A.

——, London, ... 11,765kc, 25.50m
This station, which I believe to be a BBC transmitter, was heard on Good Friday in Pacific Service—not as loud as GSD.

- ——, London 9640kc, 31.12m
This also appears to be a new BBC transmitter—heard in foreign languages at 4 pm on April 24.

PRL-8, "Radio Nacional", Rio de Janiero is the most outstanding signal this month. First heard opening at noon with bells, and then with news and typical Spanish music till signing at 1 p.m. (Cushen).

PRL-8, Rio de Janiero. This is the station I told you about. Heard it from noon till 1 p.m. and at much better strength at 6—7 a.m. Beamed to British Isles. Midday session is for U.S.A. (Hallett).

Chile

CE-1180, Santiago 11,975kc., 25.04m. was heard at good strength at 1 p.m. (Gaden).

Allied and Neutral Countries Short-Wave Schedules

Schedules are believed to be correct at time of going to press, but are subject to change without notice. Readers will show a grateful consideration for others if they will notify me of any alterations. Please send reports to:— L. J. Keast, 23 Honiton Ave. W., Carlingford, Urgent reports 'phone Epping 2511.

Loggings are shown under "Short Wave Notes and Observations."

Australia:

VLI-3, Sydney 15,320kc, 19.58m
8.15 pm to 9.45 pm for Asia in Mandarin, English, Malay and Dutch. (See VLG-4 for times).

VLG-6, Melbourne, ... 15230 kc.. 19.69m
Monday to Saturday 11.45 am to 1.50 pm. National programme from 10.45 a.m. to 12.30 p.m. Mondays to Saturdays.

VLG-7. Melbourne 15160kc., 19.79m
Sundays 6.45 am to 1.50 pm; Monday to Saturday 6.30 am to 8.10 am.

VLG-9, Melbourne 11,900kc, 25.21m
From 12.15 am to 12.45 am for Asia in English.

VLR-3, Melbourne 11,880kc, 25.25m
Sundays 12.50 pm to 6.35 pm; Monday to Saturday 11.45 am to 6.35 pm.

VLI-2. Sydney 11,870kc, 25.27m
4.55 to 5.25 pm for British Isles.

VLG-4, Melbourne 11,840kc, 25.35m
8.15 pm to 9.45 pm for Asia; 8.16 to Chungking (in Chinese); 8.30 to Shanghai (in English); 8.50 to Batavia (in Malay); 9.15 to Batavia (in Dutch).

VLW-3, Perth ... 11,830kc, 25.36m
7.30 a.m. to 10.45 a.m.; 12.30 p.m. to 7.45 p.m. Relays W.A. National programme. Tune at 11 am for BBC news.

VLR-8. Melbourne 11,760kc. 25.51m
Sundays: 6.45 am to 12.45 pm; Monday to Saturday 6.30 am to 10 am.

VLG-3, Melbourne 11.71kc, 25.62m
3.10 p.m. to 3.45 p.m. to North America West; 3.55 p.m. to 4.40 p.m. to Tahiti in French; 4.55 p.m. to 5.25 p.m. to British Isles; 5.30 p.m. to 5.50 p.m. to New Guinea in Japanese; 6.25 p.m. to 7.25 p.m. to New Caledonia in French; 7.30 p.m. to 8 p.m. to Australian Forces in S.W. Pacific.

VLN-8, Sydney 10,525kc., 28.51m
Session to Nth America from 3.10 pm to 3.45 pm.

VLQ-3, Brisbane 9660kc, 31.05m
Sundays: 6.45 am to 12.45 pm; Monday to Saturday 6.30 am to 10 am. Undestand from Sunday, April 25, will take VLQ's schedule from 6.50 pm to 11.30 pm.

VLW-2, Perth 9650kc., 31.09m
8 pm to 12.30 am relays W.A. National programme.

VLI, Sydney 9615kc, 31.2m
From 10 pm to 10.45 pm to Nth America (Eastern States).

VLG, Melbourne 9580kc., 31.32m
For Western States of North America from 1 am to 1.45am.

VLR, Melbourne 9580kc., 31.32m
Sundays: 6.50 pm to 11.30 pm; Monday to Saturday from 6.45 pm.

VLG-2. Melbourne 9540kc., 31.45m
For Eastern States of Nth America from 10 pm to 10.45 pm From 11 pm to midnight to Saigon in French; 11.35 to Bongkok in Thai.

VLI-9, Sydney 7280kc, 41.21m
7.30 to 8 pm for Forces in S.W. Pacific.

VLQ, Brisbane 7240kc., 41.44m
Daily 6.50 pm to 11.30 pm. As from April 25, will be given on VLQ-3, 31.05m.

Oceania:

New Caledonia:

FK8AA, Noumea 6162kc., 48.[illegible]
From 5.15 pm to 7 pm with news at 6.18 pm. Closes 6.15 on Sundays.

AFRICA

Abyssinia:

——, Addis Ababa 9620kc, 31.19m
12.15 am to 1.30 am; 3 am to 4.15 am.

Algeria:

AFH, Algiers 12,120kc, 24.75m
5.15 am to 6 am.

AFH-2, Algiers 8960kc, 33.48m
8.30 am to 9.45 am (8.40 to 9.20 Pick-up for MBS, CBS, NBC and BBC; 9.20 to 9.45 messages for OWI in New York.

(Continued on next page)

CE-960, Santiago, 9600kc., 31.25m. Heard very well till GRY opens at 2.55 p.m. and that spoils things. (Cushen). (I thought they closed at 2 p.m.—Keast.)

THE EAST

India

VUD-6, Delhi, 25.45m. News in Englishs at 11 p.m. and a commentary 27/3/43) on the big U.S.A. bombing raid on Kiska (Perkins).

EUROPE

U.S.S.R.

Moscow on 28.72m. at 10 p.m. gives schedules. News in English is given at 8.47 a.m. on 19.70, 19.85 and 24.61 metres.(Maguire).

Moscow is O.K. when opening at 7.15 a.m. on 19.7m.. with announcements and news in English; music is also presented (Hallett).

Switzerland

Radio Suisse, Berne, 11,955kc., 25.09m Announcing in French and Italian is heard at midnight. News in English is given at 12.20 a.m. for five minutes, call sign is heard at 12.28 and station closes at 12.30. Opens again at 3.10 a.m. (Maguire).

HER-5, Berne, 11,865kc., 25.28m. seems to have gone. Have not heard since April 11, when at 10.15 p.m. news in German was read till 10.35 when the same was given in French. (Keast).

Her-6, Berne, 15,305kc., 19.60m is now testing on Tuesdays and Saturdays from 6.30 p.m. till 8 p.m. A letter from the Consulate-General of Switzerland says it is hoped reception will be improved by bringing transmissions 75 minutes earlier than last month. (Keast).

HER-3, 6165kc., 48.66m. News in English read by lady at 6.45 a.m. (Perkins).

MISCELLANEOUS

Iceland

TFJ, Reykjavik, 12,235kc., 24.52m: Heard at Invercargill at good strength, though some morse on signal from 3.15 till 3.30 p.m. (Cushen).

Egypt:

SUX, Coiro 7865kc, 38.15m
3.45 am to 4.30 am; 5.15 am to 7.45 am. Contacts BBC near 8 am.

SUP-2, Cairo 6320kc, 47.47m
Believe on continuous wave from 3 to 4 pm. Broadcasts irregularly.

French Equatorial Africa:

FZI, Brazzaville 11,970kc, 25.06m
5 am to 7.30 am; News 5.30 am; 4 pm to 4.20 pm; 11.30 pm to 11.45 pm.

Gold Coast:

ZOY, Accra, ... 6002kc, 49.98m
2.15 am to 5.15 am; news 5 am.

ZOY, Accra 7300kc, 41.10m
Same schedule as 49.98m.

Kenya Colony:

VQ7LO, Nairobi 10,730kc, 27.96m
10.45 pm to midnight; 1.15 am to 3.15 am; 3.30 am to 5 am.

VQ7LO, Nairobi 6060kc., 49.5m
8.45 pm to 9.15 pm; 2.30 am to 5.30 am except Sunday and Monday; Tuesday and Thursday, 11.30 pm to 12.30 am; Saturday 8.45 pm to 9.30pm; 2.30 am to 5.30 am.

Madagascar:

FIQA, Tananarive 9700kc, 30.93m
1 am to 3 am. Signs off with "Marsellaise."

Radio Tananarive, Tananarive, 6162kc, 48.68m
Said to be heard at midnight with good signal.

Radio Tananarive, Tananarive, 8355kc, 35.90m
Said to be heard around 2.45 am.

Portuguese East Africa:

CR7BE, Laurenco Marques 9845kc, 30.7m
4.25 am to 6.40 am. News 5.52 am.

Senegal:

FGA, Dakar 9410kc, 31.88m
3.15 am to 3.35 am. Irregular.

FGA, Dakar 15,345kc, 19.55m
10.15 pm to 10.45 pm; 5.15 am to 6.45 am. Sometimes runs till 7.40 pm. Signs with Marsellaise.

FGY, Dakar 7210kc, 41.61m
Opens at 7.55 am, signs at 8.12 am saying "Vive la France," and playing "Marseillaise." Anndunces "Alla, allo. ici Dakar, FGY en longuer d'onde 41 metres 61."

South Africa:

ZRK, Capetown 6097kc 49.20m
1.45 am to 6.45 am.

ZRH, Johannesburg 6007kc, 49.95m
Midnight to 6 am.

——, South Africa 5960kc, 50.34m
Heard in West Australia from midnight. Believe closes at 6 am.

Belgian Congo:

——, Leopoldville 17,775kc, 16.88m
This station is being heard in West Australia from 8.55 pm to 10.15 pm Sydney time.

ZNB, Mafeking 5890kc, 50.90m
Said to be heard at 5.45 am.

AMERICA

Central:

Costa Rica:

TI4NRH, Heredia 9740kc, 30.80m
Daily 10 to 11 pm; Wednesday, Friday and Sunday 1.30 pm to 2.30 pm.

TIEMP, San Jose 10,050kc, 29.85m
Think now off the air—was being heard from 1 to 2 pm.

Panama:

HP5G, Panama City 11,780kc, 25.47m
11.15 am to 2 pm, 11.15 pm to 12.30 am; 2.45 am to 6 am.

HP5A, Panama City 11,700kc, 25.64m
11 pm to 3 am; 11.10 am to 3pm.

Guatemala:

TGWA, Guatemala City .. 15,170kc, 19.78m
Mondays: 3.45 am to 8.15 am; daily 3.45 am to 4.55 am.

TGWA, Guatemala City 9685kc, 30.98m
Mondays: 9 am to 2.45 pm; daily from 11.50 am. Generally 2 pm before heard in Sydney —will improve as winter approaches.

North:

WCRC, New York 17,830kc, 16.83m
8 pm to 7.15 am; 7.30 am to 9.15 am.

WCW, New York 15,850kc, 18.9m
3 am to 7 am; directed to Central Africa.

WCBX, New York 15,270kc, 19.6m
5 pm to 7.45 pm. Directed to Brozil.

WCB, Hicksville 15,580kc, 19.28m
Heord with fair signal from 7.15 till 8 am, otherwise good signal spoilt by R7 morse.

KWU, Dixon 15,355kc, 19.53m
6.30 am to 8.15 am (Mondays from 7 am) News 6.30 7 and 8 am. 9.45 am to 12.30 pm (except Mondays and Thursdays).

WRUW, Boston 15,350kc, 19.54m
3.30 am to 4.30 am directed to Europe and in foreign languages.

WGEA, New York 15,335kc, 19.57m
7.30 am to 9.45 am.

WGEO, New York 15,330kc, 19.6m
10.15 pm to 5.30 am.

KWID, 'Frisco 15,290kc 19.62m
7 am to 11.15 pm. News hourly on the hour. Directed to South America.

WLWO, Cincinnati 15,250kc, 19.67m
7.30 pm to 9.45 am. Directed to E. South America.

WBOS, Boston 15,210kc, 19.72m
10.15 pm to 1 am; 1.15 am to 2.45 am (directed to Europe). 1.15 om to 2.45 am (European).

WNBI, New York 15,150kc, 19.81m
11 pm to 7 am.

WDO, Ocean Gate (N.J.) 14470kc, 20.73m
11 pm to 6 am. Directed to N. Africa.

WOO, New York 12,840kc, 23.36m
No information.

WRCA, New York 11,893kc, 25.22m
3 am to 6.45 am (for Europe); 7 am to 1.30 pm (for Brazil).

WBOS, Boston 11,870kc, 25.27m
3 am to 7.15 am (for Europe); 7.30 am to 2 pm for S. America). 8.15 pm to 10 pm.

WGEA, New York 11,847kc, 25.33m
9 pm to 7.15 am (directed to Europe). News 9 pm (Bad signal at present).

WCDA, New York 11,830kc, 25.36m
4 am to 7.30 am.
8 pm to 8.30 pm (Europe).

WCRC, New York 11,830kc, 25.36m
9.30 am to 2 pm.

WRUL, Boston 11,790kc, 25.45m
3.30 am to 8 am (Europe); 8.15 om to 9.25 am (Caribbean). 9.30 am to 4 pm (Cen. America).

KGEI, 'Frisco 11,730kc, 25.58m
6.58 am to 12.45 pm.

WLWO, Cincinnati ...., .. 11,710kc, 25.62m
3.15 am to 7.15 am (Europe).

KWV, Dixon 10,840kc, 27.68m
4 pm to 6.30 pm News 4 pm; sporting results 5.45 pm.

KES-3, 'Frisco 10,620kc, 28.25m
3 pm to 8 am (directed to Orient).

WKRD, New York ...., 9897kc, 30.31m
5 am to 7 om (Europe); 6.45 pm to 8.30 pm (Europe).

WKRX, New York 9897kc, 30.31m
8 am to 10.45 am. News at 10 am.

WRX, New York 9905kc, 30.29m
2.15 pm to 7 pm; 8 am to 2 pm.

WDL, Ocean Gate (NJ.) 9750kc, 30.77m
6.15 am to 9 am and 6.45 pm to 8 pm. Both directed to N. Africa.

WRUW, Boston 9700kc, 30.93m
6.45 pm to 9 pm (Europe). 4.45 am to 8 am (Europe). 8.15 am to 4 pm (Caribbean)

WNBI, New York 9670kc, 31.02m
4 pm to 6 pm (Europe). Heard at 3.40 pm in Spanish and closed at 4 pm (Keast).

WGEO, New York 9650kc, 31.08m
Not heard since March 28.

WLWO, Cincinnati 9590kc, 31.28m
10 am to 2 pm.

KWID 'Frisco 9570kc, 31.35m
3 pm to 4.45 pm (Orient); 5 pm to 8.15 pm (Australia). 11.30 am to 2.45 pm (Sth. America). News every hour on the hour.

WGEO, New York 9530kc. 31.48m
5.45 om to 7.15 am (Europe); 7.30 am to 2 pm (W. Sth. America).

KRCA 9490kc, 31.61m
3 pm to 3 am (Orient).

WCL, New York 9390kc, 31.95m
Said to be heard from 8 to 9 am; no reports this month.

KES-2. 'Frisco 8930kc, 33.59m
8.15 pm to 3 am (Orient).

WOO4, New York 8660kc, 34.6m
10 am to 4 pm (Sth. America). 4.15 pm to 7 pm (Europe).

WKRX, New York 7820kc, 38.4m
7 pm to 10 pm (Australia).

KWY, 'Frisco 7565kc, 39.66m
6.45 pm to 9.5 pm; 10.30 pm to 12.30 am.

KGEI, 'Frisco 7250kc, 41.38m
12.59 pm to 4.05 am. News on the hour. (N.E.I.).

KWID. 'Frisco 7230kc, 41.49m
8.30 pm to 11.30 pm. News hourly. Directed to Orient.

WGEA, Schenectady 6190kc, 48.47m
2.15 pm to 6 pm directed to Europe.

WCRC, New York 6170kc, 48.6m
2.15 pm to 4 pm (Europe). Sometimes continue after 4 pm.

WBOS, Boston 6140kc, 48.86m
Heard from about 6 to 8 pm. English every hour on the hour. Directed to Europe.

WLWO, Cincinnati 6080kc, 49.34m
2.15 pm to 8 pm. Directed to Europe.

WRUS, Boston 6040kc, 49.67m
4.15 pm to 6.30 pm (European)

(Continued on next page)

LOGGINGS

Continued

Mexico:
XEFT, Mexico City 9550kc, 31.40m
Continuously on the air Heard just before closing at 3 pm on most days.
XEWW Mexico City 9503kc, 31.57m
10.58 pm to 5.45 am (Jumps about a little). Good in afternoons between 3 and 3.45 pm.
South America:
Full list in April issue.
Argentina:
LRU, Buenos Aires 15,290kc, 19.62m
9.15 pm to 10.15 pm.
LRX, Buenos Aires 9660kc, 31.06m
8.30 pm to 9 pm; 10.30 pm to 12.10 pm (next day).
LRS, Buenos Aires 9320kc, 32.19m
(Note slight change in frequency) 10 pm to 11 pm; 4 am to 4.30 am; 8 am to 12.30 pm.
Brazil:
PRL-8, Rio de Janiero 11,720kc, 25.60m
Directed to Great Britain, 5.30 am to 8.45 am; to Latin America 8.45 am to noon; to Nth. America noon to 1.10 pm. Gives news at 6 am and 10 am. (Reported heard at 4 pm). Slogan: "From the U.S.A. to the U.S.B. (United States of Brazil) U.S.A., U.S.B. United for Victory"
Chile:
CE1180, Santiago 11,957kc, 25.04m
9.30 pm to midnight; 3.30 am to 2 pm.
CE960, Santiago 9600kc, 31.25m
9 am to 2 pm.
Ecuador:
HCJB, Quito 12,455kc, 24.11m
(Note slight change in frequency). Daily 9.45 pm to 11.45 pm; 2.30 am to 5.30 am; 8 am to 12.45 pm. Sundays, 10 pm to 12.45 pm.
HCJB, Quito 9958kc, 30.12m
Same schedule as 24.11m except Sundays when it closes at 7.30 am.

THE EAST

China:
XGOY, Chungking 15,205kc, 19.73m
8 pm to 9.30 pm; News 8 pm.
XGOY, Chungking 11,900kc, 25.21m
Seems to have been replaced by 19.73m.
XGOA, Chungking 9720kc, 30.86m
4.30 am to 6 am; 9 pm to 1 am. News at midnight.
XGOY, Chungking 9625kc, 31.17m
News at midnight and 12.30 am and 1 am. Irregular broadcasts to U.S.A. at 10 pm.
XGOY, Chungking 7170kc, 41.80m
Schedule unknown, but gives news at 8 pm, midnight and 2 am. (Note slight change in frequency).
XGOY, Chunking 6130kc, 48.92m
7.30 pm to 2.30 am; News 10.30 pm, midnight, 12.30 am and 2 am.
India:
VUD-3, Delhi 15,290kc, 19.62m
1.15 pm to 2.5 pm; 3 pm to 6.15 pm; 8.30 pm to 10.15 pm.
VUD-4, Delhi 11,830kc, 25.36m
10.30 am to 12.15 pm; 12.30 pm to 1.30 pm; 10.25 pm to 3.20 am.
VUD-3, Delhi 11,790kc, 25.45m
8.30 pm to midnight. News 10 pm.
VUD-6, Delhi 9670kc, 31.02m
9.30 pm to 11.45 pm; News 11.30 pm. "This is the United Nations Calling."
VUD-2, Delhi 9590kc, 31.28m
9 pm to 2.30 am. News 10 pm, 11 pm and 12.50 am.
VUD-2 .... 7290kc, 41.15m
8.30 pm to 11.25 pm.
VUD-6, Delhi 7270kc, 41.27m
11.20 pm to 4 am; 10.30 am till noon. Heard well after midnight.
VUM-2, Madras 7260kc, 41.32m
11.30 am to 1 pm. News 11.45 am.
VUC-2, Calcutta 7210kc, 41.67m
8.30 pm to 10.45 pm. On occasions is heard from 4 to 6 pm.
VUC-2, Calcutta 4840kc, 61.98m
11 pm to 2 am.
VUM, Madras 6150kc, 48.78m
8 pm to 1.30 am. News 10 pm.
VUC, Calcutta 6010kc, 49.92m
9 pm to 4 am. Good in Hindustani at 10.45 pm. News in English at 11 pm. Good at 3 am in native programme.
VUM-2, Madras 4920kc, 60.98m
Heard from 10.30 pm till 12.30 am.

GREAT BRITAIN

"This is London Calling"

During winter months reception is poor between 6.30 and 9.30 pm.

GSH 21,470kc, 13.97m
8.45 pm to 1.15 am. Doubtful if audible in Australia now.
GVO 18,030kc, 16.59m
Directed to Central America, South America and West Indies from 2 am.
GRQ, ... 18,030kc, 16.64m
8.45 pm to 1.15 am.
GRP, ... 17,890kc, 16.77m
8.45 pm to 1.15 am.
GSV, ... 17,810kc, 16.84m
4.45 pm to 7 pm; 8.45 to 11.15 pm; 1.30 am to 4.15 am.
GSG 17,790kc, 16.86m
Not reported
GRA 17,715kc, 16.94m
Not reported.
GRD, 15,450kc, 19.42m
5 pm to 7 pm, 8.45 pm to 11.30 pm.
GRE, ... 15,390kc, 19.49m
5 pm to 7.45 pm; 10.15 pm to 1 am; 1.30 am to 5 am.
GSP, ... 15,310kc, 19.6m
3.45 pm to 7.45 pm; 8 pm to 8.30 pm.
GSI 15,260kc, 19.66m
8.45 pm to 11.15 pm; 1.30 am to 6.45 a.m.
GSO 15,180kc, 19.76m
GSF 15,140kc, 19.82m
3 pm to 7 pm; 8.45 pm to 1.15 am; 1.45 am to 3.25 am
GRF 12,095kc, 24.80m
4.30 pm to 8.30 pm. Good at 6.45 pm
GRV, ... 12,040kc, 24.92m
GSE 11,860kc, 25.29m
1.30 am to 6 am; 6 am to 7 am.
GSN 11,820kc, 25.38m
8.30 pm to 1.30 am; 5 am to 6.45 am.
GSD 11,750kc, 25.53m
3 pm to 5.30 pm; 8.45 pm to 1.15 am; 1.30 am to 6.45 am; 7.15 am to 3.45 pm.
GRG, ... 11,680kc, 25.68m
3 pm to 7 pm; 5 am to 6.45 am; 7.15 am to 2.45 pm.
GRH 9825kc, 30.53m
3 pm to 6.30 pm; 7.15 am to 2.45 pm;
GRX 9690kc, 30.96m
4.30 pm to 8.30 pm; 8.30 pm to 1.30 am; 2 am to 8 am. This transmitter is used for European Service.
GRY, ... 9600kc, 31.25m
3 pm to 4.30 pm; 3.30 am to 6.45 am; 7 am to 8.45 am; good signal in all schedules.
GSC 9580kc, 31.32m
2 am to 7 am; 7.15 am to 2.45 pm. This latter session intended for Nth America will shortly be heard right through.
GSB 9510kc, 31.55m
3 pm to 7 pm; 8.45 pm to 10 pm; 11.30 pm to 1.15 am; 1.30 am to 3.15 am; 3.30 am to 7 am; 7.15 am to 8 am.
GRU 9455kc, 31.75m
4.30 pm to 8.30 pm.
GRI 9415kc, 31.86m
GRJ, ... 7320kc, 40.98m
2 am to 8 am (foreign languages)
GSU, ... 7260kc, 41.32m
GSW 7230kc, 41.49m
2 am to 8 am (foreign languages).
GRK 7185kc, 41.75m
Heard around 5.30 pm in Home Service.
GRT 7150kc, 41.96m
4.30 pm to 8.30 pm.
GRM 7120kc, 42.13m
12.45 pm to 2.45 pm; 3 pm to 6.30 pm.
GRS 7065kc, 42.46m
4 am to 8 am; 1 pm to 2.45 pm.
GRN 6195kc, 48.43m
4.30 pm to 8.30 pm, 7.15 am to 2.45 pm; Good on opening in Nth American service at 7.15 am on most days.
GRO 6180kc, 48.54m
3 am to 7.45 am. Heard well and also again from 5 pm to 7 pm.
GRW, ... 6140kc, 48.86m
Heard around 6 pm in Home Service.
GSL 6110kc, 49.1m
4.03 pm to 8.30 pm; 2 am to 8 am; 8.45 am to 2.45 pm.
GRR 6080kc, 49.34m
4.30 pm to 8 pm.
GSA 6050kc, 49.59m
4.30 pm to 8.30 pm; 2 am to 8 am, another European Service.
GRB 6010kc, 49.92m
Not reported.
GRC 2915kc, 102.9m
This one has not been reported. Understand is used for broadcasts to Canada and U.S.A. in both N.A. and African services.

EUROPE

Italy:
Vatican State:
HVJ, Vatican City 15,120kc, 19.84m
1 am to 1.20 am on Wednesdays; 7.30 pm to 8.05 Sundays.
HVJ, Vatican City 5969kc, 50.26m
4 am to 6.30 am. Talk daily except Mondays at 5.15 am.
HVJ, Vatican City 9660kc, 31.06m
Fair signal in P.O.W. session at 2 am. directed to the British Isles.
HVJ, Vatican City 11,740kc, 25.55m
Tuesdays, Thursdays and Saturdays: 5 to 5.30 pm.
Portugal:
CSW-6, ... 11,040kc, 27.17m
4 am to 8.30 am; 8.45 am to 10.45 am.
Russia:
——, Moscow 15,745kc, 19.05m
9.30 pm to 10.20 pm. News and talks to Great Britain. Fair signal.
——, Moscow, ... 15,228kc., 19.7m
7.15 am to 7.40 am; news 7.25. Opens again at 8.47 am with war bulletins. English throughout. News and talks again from 1.15 to 1.40 pm.
——, Moscow 15,110kc,, 19.85m
Same schedule as 19.7 and signal in afternoon slightly better.
——, Moscow 12,190kc, 24.61m
Exact schedule unknown, but gives news at 8.47 am. Opens again at 6.30 pm.
Leningrad Radio Leningrad 10,807kc, 27.76m
Gives the news in German at 11 pm. Closes at 11.37 pm.
——, Moscow 10,445kc., 28.72m
One of the best signals on the air at 9.35 pm with Kremlin Bells at 9.40 pm. Special news and talks to Great Britain and America. Gives schedules at 10 pm.
——, Moscow 9870kc., 30.4m
8.15 pm to 9.25 pm. Talks and music.
——, Moscow 9765kc, 30.72m
1 am to 2 am. News 1 am. Good with English commentary at 1 am.
——, Moscow 9545kc, 31.43m
9.40 pm to 10.20 pm.
Siberia:
RW-15, Khabarovsk 9566kc, 31.36m
5.50 am to 7.30 am. Physical exercises at 6.15 am; 6 pm to 11 pm.
——, Khabarovsk 5910kc, 50.76m
8 pm to midnight.
Spain:
EAQ, Madrid 9860kc, 30.43m
4 am to 5 am; gives news at 4.5 am. Signal is fair and from end of news till closing in Spanish
Switzerland:
HER-6, Berne 15,305kc, 19.60m
Testing Tuesdays and Saturdays from 6.30 to 8 pm.
——, Berne 11,955kc, 25.09m
12.20 to 12.30 am. Also heard again at 3.10 am.
HER-5, Berne 11,865kc, 25.28m
Not reported this month.
HER-3, Schwarzenburg 6165kc, 48.66m
4 am to 8.05 am; 3.20 pm to 4.40 pm.
Scandinavia:
SBT, Stockholm 15,155kc, 19.8m
1 am to 2 am. News 1 am.
SBP, Stockholm 11,705kc, 25.63m
3.56 am to 4.15 am; 5.40 pm to 6.30 pm; and on Sundays 6 pm till 11 pm.

MISCELLANEOUS

Arabia:
ZNR, Aden 12,115kc, 24.77m
2.15 am to 3.30 am. Gives identification in English as ZED-N-R every 15 minutes.
Azores:

—, Ponta Delgada 7020kc, 42.74m
6 to 7 am.

Bahamas:

ZNS-2, Nassau 6090kc, 49.25m
11 pm to 11.15 pm; 3.45 am to 4.15 am; 8 am to noon. News 11 pm, 4 am, 8.45 am, 11 am.

Canada:

CBFY, Montreal 11,705kc, 25.63m
9.30 pm to 1.30 am (Sundays from 10 pm).

CBRX, Vancouver 6160kc, 48.70m
12.30 am to 3.30 am.

CHNX, Halifax 6132kc, 48.93m
10 pm to 2.15 pm.

CBFW, Montreal 6090kc, 49.25m
9.30 pm to 2.30 pm.

CKFX, Vancouver 6080kc, 49.34m
12.30 am to 6 pm.

CFVP, Calgary 6030kc, 49.73m
1 am to 5 pm.

CJCX, Sydney (Nova Scotia) 6010kc, 49.92m
9.30 pm to 4.30 am.

Eire:

—, Athlone 17,840kc, 16.82m
10 pm to 11.30 pm; 3.30 am to 4.15 am. News 3.45 am.

—, Athlone 9595kc, 31.27m
7 to 7.35 am, News 7.10 am.

Canary Isles:

EAJ-43, Teneriffe 7275kc, 41.24m
10.30 pm to 12.30 am; 8 am to 9 am.

Iceland:

TFJ, Reykjavik 12,235kc, 24.52m
3.15 pm to 3.30 pm. Opens with Danish National anthem. Gives news in Danish for 15 minutes and leaves the air.

Iran:

EQC, Teheran 9680kc, 30.99m
1 am to 3 am (Thursdays 11.30 pm to 3 am; Fridays midnight to 3 am.

EQB, Teheran 6185kc, 48.5m
4.15 am to 6 am. News 4.30 am.

Newfoundland:

VONH, St. Johns 5970kc, 50.25m
10.30 pm to 4.30 am; 7 am to 11.35 am.

Syria:

FXE, Beirut 8035kc, 37.34m
1.30 am to 6 am, news 3.20 am. English session at 2 am. "God Save the King" is played at the end of English session. According to "ABC Weekly" is now on 8020kc, 37.41m.

Turkey:

TAQ, Ankara 15,195kc, 19.74m
7.30 pm to 9 pm. Listen for flute notes just before opening.

TAP, Ankara 9460kc, 31.7m
12.15 am to 5.47 am; News 4 am. Sometimes broadcasts to CBS or NBC from 8.45 am to 9.30 am.

Cuba:

COCY, Havana 11,737kc, 25.56m
(Note slight change in frequency). English from 2.30 pm to 3.45 pm. Opens again at 7.30 pm and is heard about 9.15 pm.

COK, Havana 11,623kc, 25.83m
Said to be on air from 2 am to 2 pm daily and on Sundays from 3 am to 9 am. Fair at 7.15 am with English and Spanish announcements.

COCH, Havana 9435kc, 31.80m
8.45 pm to 2.15 am. Heard at 9.45 pm on some nights.

COBC, Havana .... 9375kc, 32.00m.
(Note slight change in frequency). 11 pm to 3.15 am; Sunday 10 pm to 1.30 pm (Monday).

COCX, Havana 9270kc, 32.36m
10.45 pm to 3 pm.

COCQ, Havana 8830kc, 33.98m
(Another change in frequency). 8.20 pm to 2.15 pm. English at 9.45 pm. One of the regular Cubans. Good strength at 10.30 pm. Gives call sign at 8.28 pm.

Tahiti:

FO8AA, Papeete 6980kc, 42.98m
1.57 pm to 2.45 pm.

SPEEDY QUERY SERVICE

Conducted under the personal supervision of A. G. HULL

P. DeN. (Mosman) sends circuit of an amplifier for comment.

A.—Yes, this amplifier should be OK as it stands and there should be ample gain for a good D104 crystal microphone. We find that the output of these microphones will vary within fairly wide limits. The actual high tension voltage which will occur during operation will be dependant on the regulation characteristics of the power transformer, which is running underlooded. In such a condition there is sure to be a higher voltage, but just how high will vary according to the gauge of wire used, size of core, etc. We would expect that it would be about right, and with the 750 ohm field the output valves should be capable of supplying as much undistorted output as the speaker can handle. emember that the energising of the field is the most likely limit of your power output, as it is little use feeding more audio power into a speaker than you have field energising available, which is likely to be something under 10 watts, probably only 6 or 7. From your remarks about undistorted output it would appear thot you are not aware that the human ear is seldom capable of distinguishing the difference between 10 and 15 watts of power output.

Sorry we can't spare the time to go fully into the gain characteristics of your particular amplifier, but this would involve a lot of work, taking into consideration the gain of the direct-coupled stage about which we have little data, and then allowing for the inverse feedback, which is adjustable and which could be expected t ohave considerable influence on the effective gain. The "Circle" idea hos ben held over for the duration, few readers being able to spare time or arrange transport at the moment.

QUIZZERS NOTE

Dear Sir,

In reading through the March issue I noticed what I consider to be a very bad mistake, inasmuch as it ocurred in the column entitled 'Radio Quiz.' Bronze is an alloy, and it does contain tin, and copper, but at the most 18 per cent tin, usually 10 per cent or less. Bell metal, which is n t considered a bronze, contains up to 25 per cent tin, and I have not heard of a copper-tin alloy with a higher percentoge of tin than this. I think that your answer of 66 per cent coper, 34 per cent tin is a long way out; perhaps you got the figures mixed up with those for some other alloy.

Yours, etc.,
R. J. PEARSON,
Port Kembla.

★

G.S. (Hurstville) says he is building a Radiotron amplifier and wants to know it a 5Y3G will do instead of the 5V4G.

A.—Yes, the rectifier valve will be suitable, but with regard to the queries about the speaker we are unable to help you without knowing just which of the Radiotron amplifiers you have in mind. About half a dozen different Radiotron amplifier circuits have been published by us from time to time and we do not know to which one you refer.

★

J.B. (Petersham) enquires about building the "Vic. Champ" amplifier, but with 45 type valves.

A.—Yes, this should be quite OK. Field coil resistance will need to be between 750 and 1250 ohms, really depending on the size of speaker used and amount of energising required. Power output would be somewhere between 3 and 5 watts. There will be no need to chonge any resistor values, and the 75 and 45 types should be OK as substitutes. To get an extra drain of 10 milliamps from 250 volts you would need a resistor of 25,000 ohms, but as high tension is likely to be nearer 300 you will need nearer to 30,000 ohms, but this should not be critical as a few milliamps shouldn't make any great amount of difference.

★

L.W.W. (Rendelsham, S.A.). Sorry, but back numbers are not available on C.O.D. basis. Conservation of manpower does not give us the time to handle enquiries such as yours at the moment. Write stating which back numbers are required and enclose remittance and it will then be a straight-forward job for the office staff to despatch.

★

A.M.K. (Cartlon) had hum in his omplifier and fitted shielded wire to his pick-up, but the hum hos increased.

A.—Probably you have earthed the wrong lead at the input to your amplifier, or else the metal body of the pick-up is connected to the "hot" lead. Make sure the braid on the shielded wire is well earthed. If touching the braid increases the hum than the connections are wrong at the set, whilst if that decreases or does not affect the hum while touching the pick-up increases it, then things are wrong at the pick-up end. It is well to earth the frame of the motor and the metal body of the pick-up.

Note !

BACK NUMBERS

On and after April 15 the special offer of back numbers at reduced price will be withdrawn, and all back numbers available will be supplied only at 1/- each, past free.

J.H. (Merrimbee) wants to know if an amplifier can be designed to work "both ways", so that signals can be fed in at either end and obtained amplified at the other.

A.—Yes. This is quite practical and is used in telephone systems. Accurate balancing of input and output impedances is usually necessary or desirable unless special means are employed to prevent oscillation. In one system, two amplifiers with extreme A.V.C., are used back to back and with one reversed. The A.V.C. is conected so that when a signal is fed into one amplifier the other on hase its goin reduced considerably. Difficulties of the various designs increase with the frequency range ehat is to be transmitted.

★

N. W. (Orange), shielded his set with wire gauze to stop static, but results were disappointing.

A.—You have omitted to tell us what type of set you are using and so we haven't the slightest idea whether it is an all-electric superhet or a one-valve battery job. And in your case it makes all the difference, especially in regard to the fine tuning stunt. If the set has only a single tuning circuit with a single gang condenser, then it becomes possible to get finer tuning adjustment by fitting a low-capacity variable condenser in parallel with the main one. The fixed condenser and the rheostat, however, appeor to be unwanted complications.

With regard to the static, if you are quite sure that it comes from an electrical source, it can be introduced to the set by way of the power supply lines, the aerial or by direct pick-up by the wiring of the set. Your shielding should be effective only in the latter case and there would still be the chance of the noise getting in by the power lines or by the aerial. Of course, it it no use trying to shield the whole aerial, os this would stop signols too, but you might be able to shield the lead in, which is likely to run alongside power lines and pick up the noise from them.

The bock numbers have been posted direct and doubtless you have received them by now.

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