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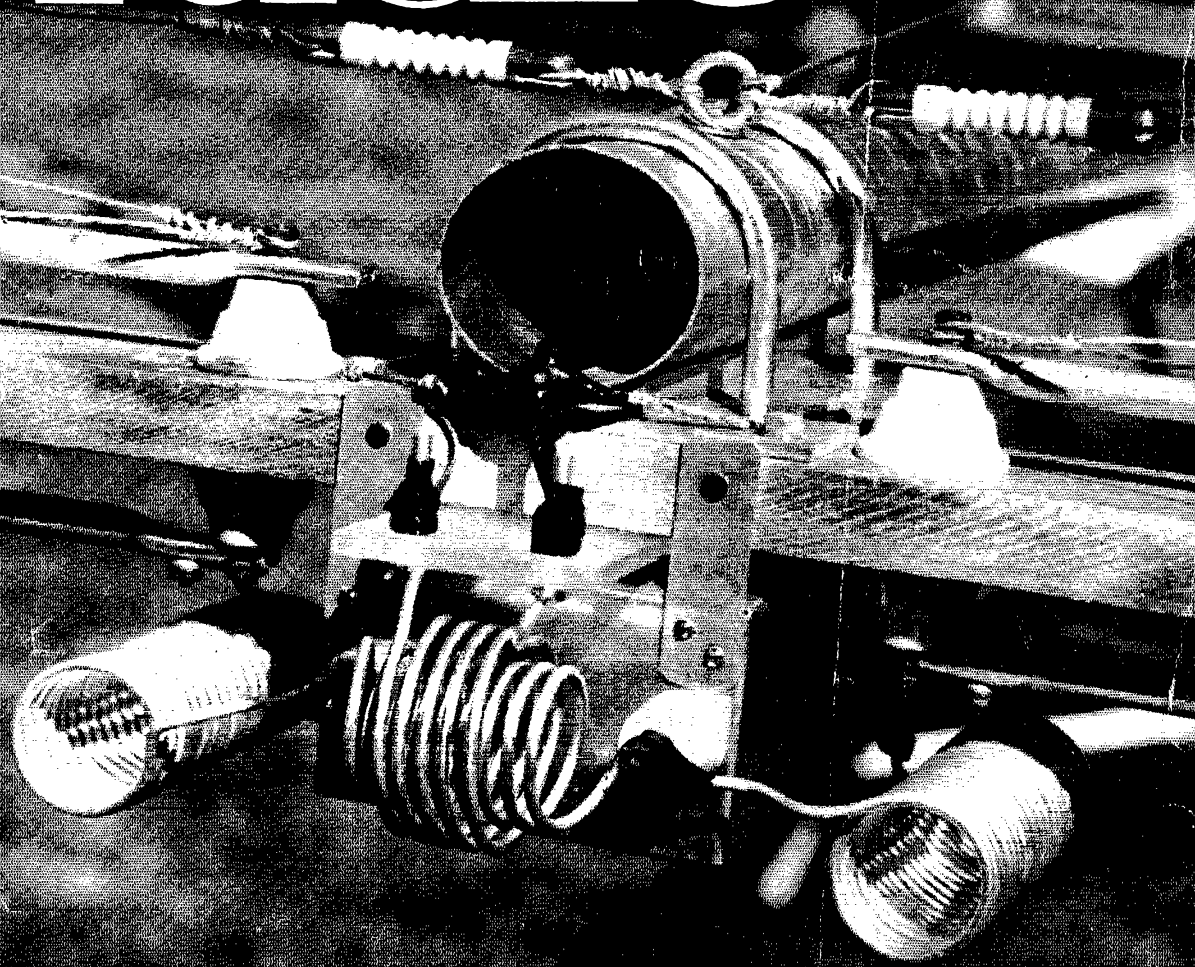

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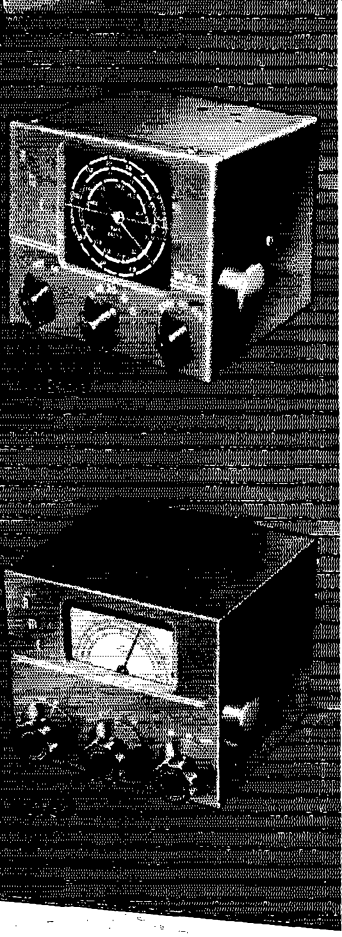

MC-55 FIVE BAND MOBILE CONVERTER

For 10, 15, 20, 40 and 80 meters. 1.25 micro-volt sensitivity on all bands. Edge-lighted dial. 25-to-1 worm gear tuning. ANL. Transmit-receive switch. Three gang tuning capacitor. Individual coils for each band. Aperiodic i.f. stage aids in providing high-gain characteristic. Input impedance 50-72 ohms. Output frequency 1550 kc. 150-180 v. at 18 ma. 6 or 12-volt operation. Tube lineup: 6BJ6 r.f. amp; 12AT7 osc-det; 6BJ6 i.f. amp; 6AL5 noise limiter. Dark gray. Size: 4⅛" high, 5¾" wide, 5¼" deep. Shpg. wt. 7 lbs. **Amateur Net**.....**$69.50**

MC-53 VHF THREE BAND MOBILE CONVERTER

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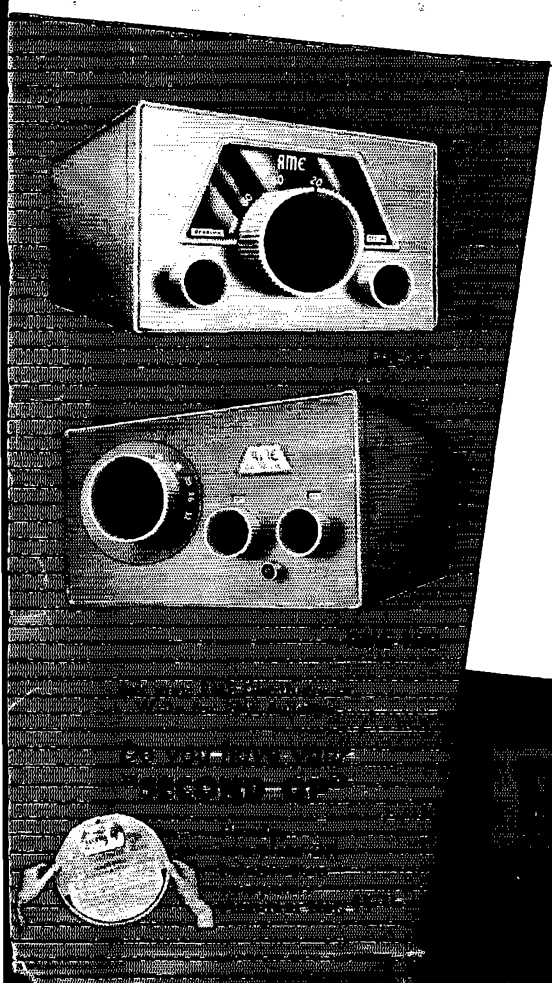
Amateur Net.....**$66.60**



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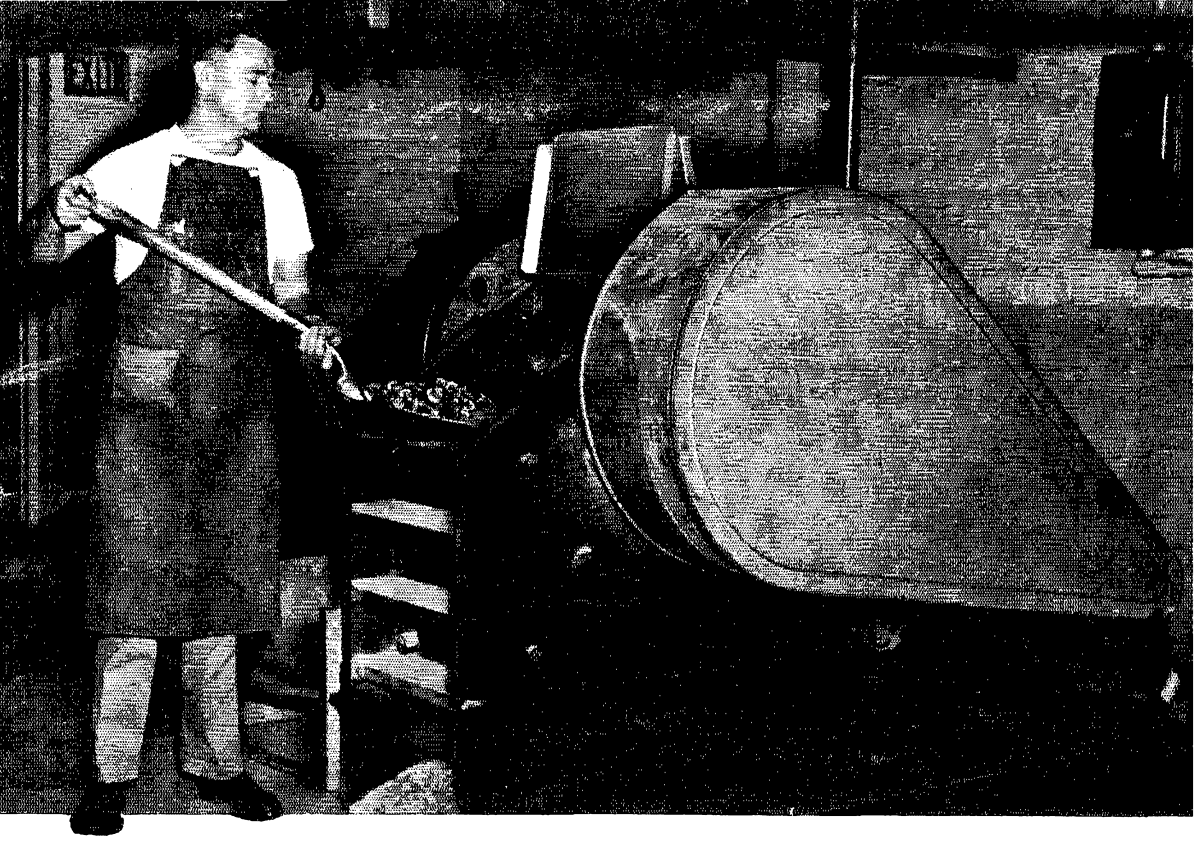

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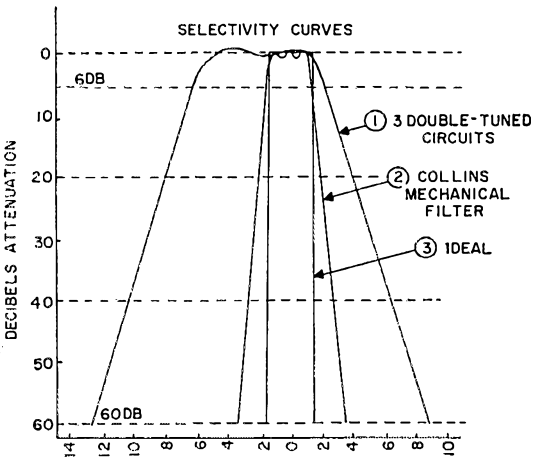
ENGINEERING NOTES

SSB RECEIVER SELECTIVITY

Consideration must be given to the design of the receiving equipment, as well as the transmitting equipment, if we are to realize the advantages offered by a single sideband communications system. If we design our transmitter to obtain maximum intelligence with minimum bandwidth, we must also consider our receiver selectivity in order to keep our system bandwidth at an optimum value. Let us discuss selectivity in terms of desired optimum response, definition of selective systems, methods of comparison and advantages of an integrated system.

For years we have been trying to obtain better and better IF selectivity. Now, perhaps, we should ask ourselves; "What is optimum selectivity?" Let's define it as follows: Optimum receiver selectivity occurs when the nose bandwidth (6 db BW) is wide enough to pass the required intelligence and the skirt bandwidth (60 db BW) is narrow enough to reject an unwanted signal in the adjacent communications channel. Extremely steep skirts on our selectivity curves are required to obtain this optimum passband. Ideally, the ratio of the 60 db to 6 db bandwidths would be 1. See curve (3) in figure below. This figure shows the selectivity obtainable from Collins Mechanical Filter Type 455C-31 and also from three pairs of double tuned, slightly over-coupled, IF transformers (coil Q's of 150). These curves are super-imposed for comparison and show how nearly the Mechanical Filter selectivity curve approaches the ideal.



Comparison of selectivity performance has generally been made by comparing the shape factors. The shape factor being, of course, the ratio of the 60 db to the 6 db bandwidths. This basis of comparison has developed from the problem of avoiding adjacent channel interference. While it is customary to define receiver performance in terms of shape factor, it is not always adequate. It can be shown that better shape factors are easier to obtain in wide band systems than in narrow band systems. The shape factor is a good comparison if the selectivity curves being compared have the same nose bandwidth. Perhaps a better method of specifying the performance of a selective system is to define the selectivity in terms of the nose bandwidth and the db attenuation per kilocycle on the slopes of the selectivity curve.

A receiver having an IF selectivity like curves (2) or (3) will have a 3 db advantage over a receiver having a selectivity curve like (1) when receiving an SSB signal whose bandwidth is 3 kc. This is due to the fact that both the receiver bandwidth and the input noise power have been halved. In addition, interference is reduced because the receiver passband is narrower, thus permitting a larger percentage of clear signals. When the correct bandwidth for a communications circuit is fully utilized, there will be more room on the phone bands for everyone.

In order to obtain optimum performance in a SSB communication circuit, it is important that we choose the correct receiver response. This optimum selectivity is easily provided by the Collins Mechanical Filter.

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QST

FEBRUARY 1955

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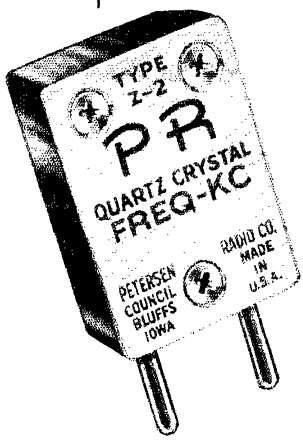

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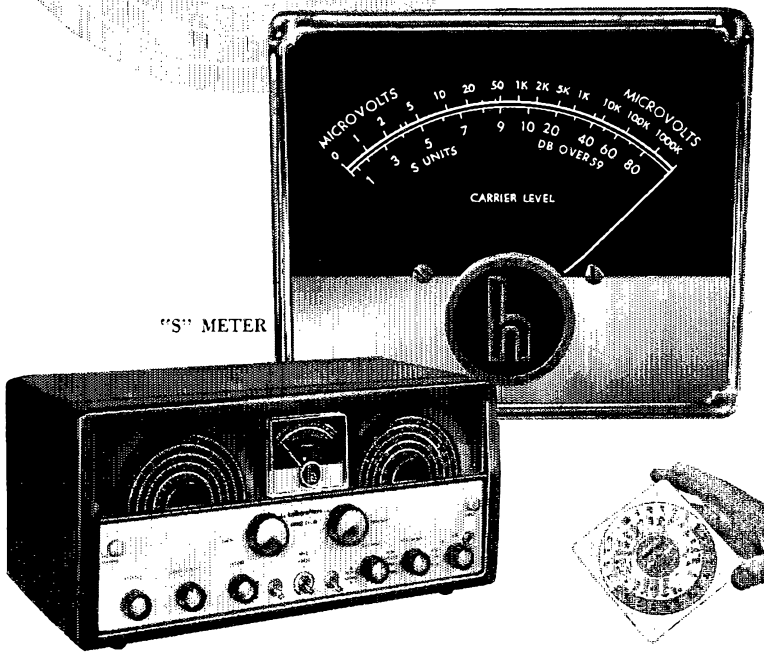

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

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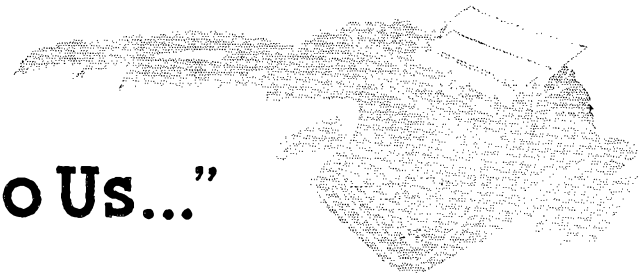


"It Seems to Us..."

RULES ENFORCEMENT

Once in a while you run across the occasional wise guy in ham radio who thinks he can "get away" with something. Who's going to find out that he runs more than a kw.? Or lets his wife operate when he's not present? Or slips an occasional cussword into the conversation? And for the Novice, why should he be rock-bound — it's impossible for anyone to tell whether he's using a VFO. Why should a fellow wait for the General Class license before getting on 75 'phone — how is an eavesdropper going to know that W9XXX holds only a Technician license, or is even a Novice who decided to forget about the "N" in his call? With something like 120,000 amateurs these days, the Commission's monitoring staff just couldn't keep track of us, especially with all the other work they have to do.

You've heard remarks like these. Hams are people, and in a group as big as ours there are always a few such smart eggs we have to bear with — until the law catches up with them. But what has been troubling us a bit of late is that a few of our more substantial citizens are beginning to wonder whether there might be a grain of truth to some of this stuff. They don't recall reading of recent instances where such birds have been called on the carpet for their misdemeanors. Maybe of late the Commission *is* too busy to bother with hams. . . .

Let there be an end to such loose talk. The Commission has been keeping its usual watchful eyes and ears on ham activities, and issuing citations for infractions of the rules. In flagrant cases, and especially where the amateur has no excuse, steps are taken to suspend his license for a suitable period. *QST* hasn't carried reports of such actions recently because an administrative mix-up temporarily resulted in our failing to obtain press copies; the lack of publicity may be the reason for the erroneous feeling that FCC is not on its toes. The difficulty has now been remedied, and *QST* will again report these FCC actions. We think such reporting is a greater deterrent to would-be violators than the license suspensions themselves. However, the wise guys we mentioned earlier are probably among the small percentage of hams who don't read *QST* regularly, or certainly not carefully, so we leave it to you regular readers to see that this editorial is called to their attention.

We have at hand a group of 13 separate notices of FCC punitive actions taken against amateurs in the last few months. The violations involved are not those of a minor nature which any of us might — inadvertently — commit. They are, without question, violations made intentionally by persons who thought they could get away with something. License suspensions ranged from 30 days to more than four years. And little enough, too, for guys who ran more than a kw., or operated 75-meter 'phone with Novice (conveniently dropping the "N") or Technician licenses, let unlicensed persons have generally free use of their stations, didn't bother with keeping any log, or more openly degraded amateur radio with the use of salty language on the air. That type of egg is no friend of amateur radio.

The institution of amateur radio has traditionally policed its own activities, largely through the organized ARRL Official Observer coöperative notice program. For such performance amateurs are regularly commended by the Commission, in the knowledge that if all 120,000 of us were frivolous cut-ups FCC indeed would not have adequate facilities to keep us in line. The great body of amateurs possess a feeling of responsibility to the public and to their hobby in keeping standards high, particularly in the meticulous observance of Federal regulation. The fact that only 13 punitive actions were required in a group of 120,000 licenses is itself a tribute. But the Commission's monitoring and enforcement activities are available — and being used — to apprehend the lads who don't want to act according to the rules, or at least play around the fringes. In such field FCC has a pretty good batting average, and it is never a question of *whether* an intentional rules violator will be caught — it's only a question of time. The continued cooperation of amateurs in reporting flagrant and intentional violations to the monitoring service is a necessary part of keeping high the standards of amateur radio operations.

NOTICE TO READERS

The publishers of *QST* regret to announce that, because of continued increases in the costs of production, and the larger issues necessary to cover the scope of a growing amateur radio, it is necessary to raise the newsstand price to 50 cents per copy, effective with this issue.

There is no change in League membership dues.

Strays

In 1930, Ward Scott, sr., K6CKN, QSOd W6BVZ. Twenty-four years later his son Ward, jr., became K6BVZ, and his first contact out-of-state was W7BVZ, who turned out to be the same ham his father worked in 1930. (*K6ATX*)

—•••—

W9DYZ is compiling a directory of amateurs employed as manufacturers' reps for electronic equipment. Hams so employed are requested to send info on their ham activities to John A. Benz, W9DYZ, 4809 West Fond du Lac Ave., Milwaukee 16, Wisc. The lists will be circulated among ham-gear manufacturers and the hams coöperating.

—•••—

No wonder the University of Washington is one of the most popular engineering schools on the West Coast — the engineering department's bulletin, *EE*, reports: "The equipment now in use [at club station W7YD] includes a *600-watt* 80-meter transmitter for Novices . . ."!

Art Crowell, VE1DQ, served amateurs of the Maritime Section more than 25 years before retiring as SCM in 1954. Art began as SCM of the old Nova Scotia Section in 1929, was elected SCM of Maritime Section Nov. 15, 1930, and held that post until Feb. 15, 1954. Few elective officials, however popular and efficient, have such a record! Always interested in emergency preparedness, VE1DQ is presently EC for Nova Scotia and Radio Aide to the Nova Scotia Communications Coördinator.

OUR COVER

This issue's cover photo shows the heart of a shortened beam for 20 and 40 meters, built by L. J. Jensen, WØMIQ. The aluminum box contains inexpensive relays to short out the 40-meter loading coils for 20-meter operation. Each element consists of two conductors fanned at the end, permitting operation over the entire band with a reasonable s.w.r., even at the band edges. The parasitic element is tuned as a reflector on 20 meters, and as a director on 40 meters. Overall length of the elements is 24 feet, and the boom is 15 feet long.

Complete details of the assembly will appear in our March issue.

21st Annual ARRL DX Contest

'Phone: Feb. 11th–13th, Mar. 11th–13th; C. W.: Feb. 25th–27th, Mar. 25th–27th

Reminder: DX Test time is nigh! Whatever your locale, you're urged to participate on 'phone or c.w. or both. Two weekend periods will be devoted to c.w., two to 'phone participation. Each of the four periods begins on Friday at 7 P.M. EST and ends on Sunday at 7 P.M. EST on the dates shown above.

Certificate awards will be given to the highest-scoring c.w. and 'phone operator in each country and in each continental U. S. A. and Canadian ARRL section. And then there will be the special certificates for club leaders and multiple-operator competitors!

One change in the rules this time bears repeating. U. S. and Canadian amateurs will transmit RS or RST reports *plus states or provinces*. Returns from overseas, though, will be the usual 5- or 6-digit numbers indicating signal reports and powers input.

Free contest report forms are now available from the ARRL Communications Department upon request. These will facilitate preparation of your log for submission, but are not required by the rules. If you request these forms, please advise us whether you expect to enter the c.w. section, the 'phone section, or both.

You can be choosy and scout only new countries or you can go out for your section award by chasing all comers. In the latter case, thumb through the results of the last DX Test (October, 1954, *QST*) to get an idea of your local competition. And by all means scan the rules (p. 65, January, 1955, *QST*) so that you know the pattern of this year's contest. Good fishing to all in February and March!

A C.W. Man's Control Unit

An Integrated One-Antenna Keying, Monitoring and Break-In System

BY T. H. PUCKETT,* W5JXM

• In March, 1954, *QST* there was an article on a control system which, while it worked fine, was a little too involved, and perhaps expensive, for most hams. Here is a system which was derived from the earlier one with the added advantages of simpler, cheaper and easier construction, with performance which should satisfy the most critical operator.

GENERALLY speaking, the topic of keying and monitoring might be compared to the situation where the forest can't be seen for the trees. There is a bewildering number of different ways of keying a transmitter and monitoring its output, and the newcomer is sometimes hard put to decide which will fit his needs. Add to this the complexities introduced by break-in operation (*real* break-in, where you hear the other station as soon as the key is opened, not three seconds later), plus the desire to accomplish this using only one antenna, so that the advantages of the transmitting antenna may be had for receiving, and you have quite a problem. What seems to be needed is an integrated, coordinated system for doing all these things, preferably without requiring a complete rebuilding job on the transmitter and receiver.

The unit shown in the photo was constructed as a try at putting together such a control unit (this phrase is used instead of the more common expression, "keyer," as the unit does a good deal more than just key the transmitter) that could be fitted into an existing amateur station with a very minimum of fuss, and would give performance which should satisfy the most finicky operator.

The primary virtues of the unit are as follows:

1) It may be attached to an existing receiver and transmitter without opening any leads, and they may be returned to their original operating condition merely by disconnecting the control unit. This is accomplished by doing the major portion of the controlling on the screen grids of the various tubes, which are simply tapped and brought out.

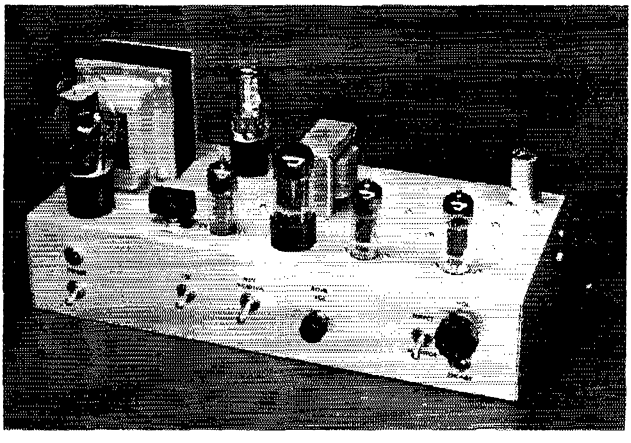
2) The transmitter keying is controlled by a grid-block type keyer, and the keying may be shaped independently of the oscillator keying characteristic. Full break-in keying is available.

3) A simple electronic antenna switch is included, so that break-in may be accomplished with one antenna. Thus all the advantages of the transmitting antenna are available for receiving. The switch is adequate for a kilowatt-input transmitter when used on a matched 52-ohm coax line.

4) A receiver muting circuit is included, so that the transmitter output may be monitored in the receiver directly. Also included are two separate monitors which may be used as desired by the operator.

Of course, there is a price for all this. Several tubes are required for the control unit, but common types are used and they shouldn't place too great a strain on the pocketbook. Also, a relay is used, but it is a small, cheap one which should be easy to come by. And of course, some connections must be made to the receiver and transmitter, the exact number depending on just which of the sections to be described are included in your control unit. Most of the sections are

* Box 2155, Boulevard Station, Norman, Okla.



Front view of unit. The power circuits are at the left, the keyer and receiver-muting section in the middle, and the "Monitone" on the right. The 6AN4 antenna switch tube is in the shield at right rear. All connections are made on the rear, other than the headphone jack for the "Monitone."

more or less independent, and only those desired need be included.

Functionally speaking, this control unit is an improved version of an earlier one-antenna break-in system,[1] but is considerably cheaper, easier to build, and easier to use. The entire unit consists of the 3 × 6 × 14-inch chassis shown in the photo, and a plug-in unit for the receiver. The plug-in section could just as well have been mounted on the main chassis and its output run to the receiver with a shielded lead. However, it was more convenient to construct it separately, as it was possible to plug it directly into the n.f.m. adapter socket of the receiver.

The circuit of the chassis section is given in Fig. 1, and the plug-in unit in Fig. 2. Fig. 1 is divided into the several sections mentioned earlier.

The Keyer

The primary section of the control unit is the keyer, made up of V_1 and V_2. The relay K_1 is a Price Electric Corporation product, their 1000 series, with a 105-ohm coil and a set of s.p.d.t. contacts. It is small and very light, and the two samples tested had no difficulty following 30 w.p.m. The particular one used

[1] Puckett, "Break-In with One Antenna," *QST*, March, 1954.

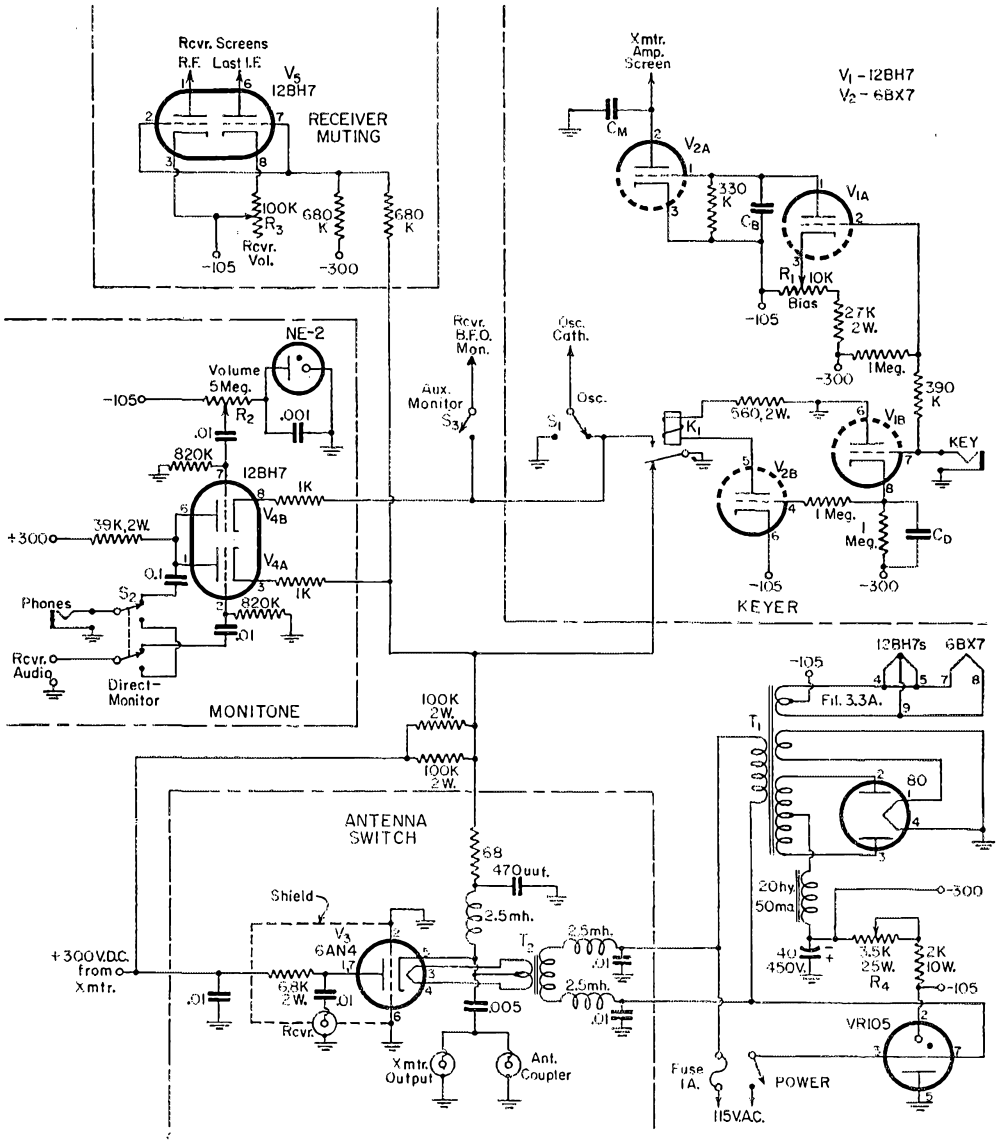


Fig. 1 — Control-unit schematic. The high-voltage winding on T_1 should furnish 350-0-350 volts at 50 ma. d.c. T_2 is a 6.3-volt filament transformer, 1.2 amp. Relay K_1 is described in the text, as are C_M, C_B and C_D. Resistors ½ watt unless marked, capacitors 400 volts working, capacitance in μf. unless indicated otherwise. Don't forget to make ground connections between all units.

here was bought at a local model airplane supply store for two and a half dollars. It is available from Cameradio, Pittsburgh, Pa.

The essential action of the keyer is as follows: When the key is closed, the relay closes immediately, turning on the oscillator in the transmitter by completing its cathode circuit. (This might be taken as an exception to the statement made earlier that no leads had to be opened in the transmitter, but most oscillators have a cathode key jack in the first place.) The screen of an amplifier stage of the transmitter is then slowly turned on to give a good "make" characteristic to the output signal. When the key is opened, the screen is gradually turned off to give a good break, and then the relay opens, turning the oscillator off. Obviously, it is necessary to have an oscillator that keys quickly; and for once, the more clicks that the oscillator has the better, since this is an indication that its output is rising and falling quickly. For the same reason, it is essential that the oscillator have no chirp. Chirps inherently last longer than clicks, so any oscillator chirp is quite likely to appear in the transmitter output. Chirps can be reduced by keeping series resistances and shunt capacitances to a minimum in the oscillator d.c. circuits. Regulated screen and plate voltages on the oscillator will also help.

The keying of the output signal of the transmitter is controlled entirely by the way in which the screen voltage of the amplifier stage is varied. Note that if this keyer is to be able to control the amplifier screen voltage, the screen *must* receive its normal operating current through either a dropping resistor or a high-impedance voltage divider. The circuit as shown is capable of keying anything up to a pair of 6146s, and larger currents may be handled by using additional 6BX7 sections in parallel with V_{2A}. Each 6BX7 half-section is adequate for about 40 ma. normal operating screen current.

The actual keyer operation is as follows: Initially, with the key up, V_{1A}, V_{1B} and V_{2B} will be nonconducting. V_{2A} will be heavily conducting and will clamp the amplifier screen to a negative potential, cutting the stage off whether it has drive or not. As V_{2B} is passing no current the relay will be unenergized, so the oscillator will be off. When the key is closed, V_{1A} and V_{1B} are both immediately turned on by having their grids pulled in the positive direction. V_{1B} will quickly charge up C_D, pulling the grid of V_{2B} in the positive direction and turning V_{2B} on. The current through V_{2B} passes through the relay and will turn it on, and thus turn the oscillator on.

V_{1A} turning on will quickly cut off V_{2A}, and unclamp the screen so that the screen voltage may rise to its normal operating value at a rate determined by C_M. Thus C_M controls the transmitter make keying characteristic.

Essentially the inverse action takes place when the key is opened, except that the rate at which the amplifier screen is clamped is controlled by C_B, so C_B controls the transmitter break keying characteristic. Capacitor C_D holds V_{2B} conducting and the relay closed until after the screen has been completely clamped, so that the oscillator is turned off after the transmitter has been turned off.

The 10,000-ohm potentiometer, R_1, in the cathode of V_{1A}, sets the bias, and should normally

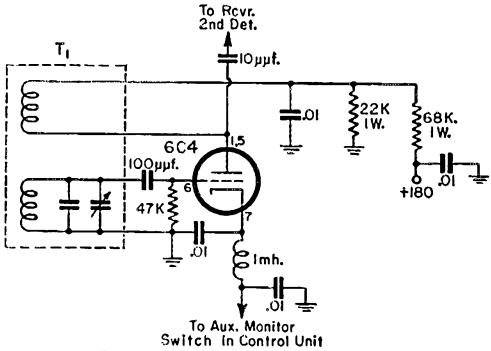


Fig. 2 — B.f.o. monitor schematic.
T_1 — Meissner No. 17-6753 b.f.o. coil.

be adjusted to the point where it just starts to decrease the transmitter output under key-down conditions. It is also a convenient control for reducing the power output of the stage. The stage is loaded up in the normal fashion, and then the potentiometer setting reduced until the output drops to the desired level.

It is suggested that a stage as near the output of the transmitter as possible be keyed. This will reduce loading effects on the oscillator and make it easier to control the keying waveshape. Heavily-biased Class C amplifier stages have a tendency to distort a keyed signal. If the final amplifier is keyed, the fact that its screen is pulled negative by the keyer means that its plate current will be completely cut off, and no noise voltage will be generated to feed into the receiver and mask weak signals. Otherwise, the final amplifier should have some fixed bias.

It is worth noting that this type of keyer may be applied directly to a plate-modulated 'phone transmitter which supplies the amplifier screen with a dropping resistor from the plate supply, without the slightest effect on the 'phone operating conditions other than the keying action. (Instead of turning the high voltage on and off, the key could be closed or opened when going from transmit to receive and vice versa. However, when receiving, be careful not to talk into the microphone or let the receiver audio from the loudspeaker be picked up, or drive the modulator in any fashion, as it will have no load and the voltages developed may be disastrous.[2])

Another point to keep in mind is that the keyer will give no protection against failure of excitation to the keyed stage. If this is a matter of concern, it is suggested that a standard clamp-tube circuit be used on the screen. This will give excellent protection and have no effect on the keyer operation, and vice versa.

Adjustment of the keyer is very simple. The

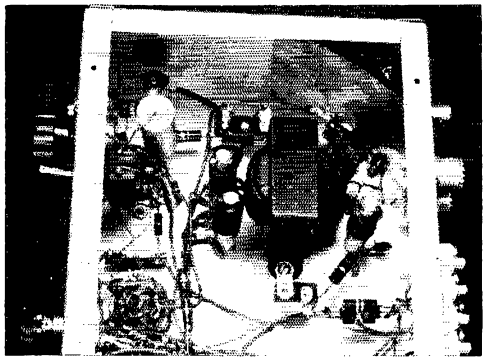
[2] If the same amplifier is also used for c.w., the modulation transformer secondary must be shorted, of course.

transmitter oscillator is turned on manually, and C_M adjusted to give the desired make. C_B is then adjusted to give the desired break. The oscillator is then connected to the relay, and the smallest value of C_D found which does not clip the break by turning the oscillator off too soon.

For keying a Viking Ranger output stage, values of 0.1 μf. for C_M, 0.01 μf. for C_B, and 0.015 μf. for C_D were used. When the Ranger was used as the exciter for a 500-watt tetrode final, values of 0.1 μf. for C_M, 0.02 μf. for C_B and 0.025 μf. for C_D were used. The switch marked "OSC" turns on just the transmitter oscillator for setting its frequency.

Antenna Switch

The antenna switch is actually a grounded-grid amplifier whose input is tied to the transmission line between the transmitter and antenna coupler, and whose output feeds the receiver. It is adjusted to have unity gain if the receiver input impedance is 100 ohms. Higher or lower input impedances will give proportionally greater or smaller gains. The cathode circuit of the amplifier returns to ground through the relay back contact when the relay is open. When the relay shuts as the key is closed, the cathode circuit is opened and the cathode rises to plus 300 volts, which comes in through the two 0.1-megohm 2-watt resistors. This shuts the amplifier off as long as the peak voltage on the transmission line does not exceed 300 volts.



The antenna switch circuit is in the upper right corner to get the best possible shielding. The brass stock which serves as the shield is soldered directly to the grid pins on the tube socket, and to two ground lugs next to the socket. The coaxial connectors for transmitter, antenna coupler and receiver may be seen on the rear lip, along with the terminal strip for the other connections.

The inherent excellent input-output shielding of a grounded-grid amplifier keeps excessive voltage from reaching the receiver input terminal when the transmitter is on. This is augmented by a shield made out of a piece of brass stock, as may be seen in the under-chassis photograph. The small metal center shield which comes on 7-pin sockets has been removed, and the shield passed directly across the socket and is soldered to the two grid terminals. Two lugs immediately adjacent to the grid pins ground the shield to the chassis. The plate resistor for the grounded-grid stage and its by-pass are mounted behind the shield.

The heater supply for the 6AN4 is connected in the manner shown in order to keep down the heater-cathode voltage. The two r.f. chokes for heater isolation are placed in the input side of the filament transformer, rather than the more conventional output side connection, as it allows smaller chokes to be used. This requires that the filament transformer be mounted off ground, which is done by mounting it on ceramic spacers.

The peak voltage on the transmission line should be kept below the 300-volt figure mentioned before. This corresponds to about 200 volts r.m.s., or about 800 watts of unmodulated c.w. in a matched 52-ohm line. Voltages to be expected with higher-impedance lines or mismatched lines may be found for your particular case with the aid of the *Handbook*. Or if you don't want to bother with it, an entirely separate receiving antenna may be used. It's unlikely that the voltage developed there will be great enough to hurt anything. In any case, if too much voltage is applied the only thing which will be damaged is the 6AN4, and not the receiver.

The transmission line between the transmitter and the coupler should pass through the antenna-switch unit, as indicated. "Tee" connections are likely to increase the voltage on the switch.

Keying Monitor

Three different methods of monitoring are available with this unit. The first, using tube V_4, is a simplification of the "Monitone" circuit which has been in the *Handbook*, and its primary advantage is that no changes have to be made inside the receiver at all. The receiver audio output is normally passed through V_{4A} to the headphones. When the relay closes during keying, V_{4A} is turned off, blanking the receiver, and V_{4B} turns on and a sidetone signal is heard in the 'phones. The sidetone is generated by the NE-2 neon-bulb oscillator. Its volume is controlled by the 5-megohm potentiometer, R_2, marked "Volume." Other sidetone signals may be fed in at this point if desired. The sidetone pitch may be varied by changing the size of the 0.001-μf. capacitor across the neon bulb. The switch, S_2, marked "Direct"-"Monitor," by-passes the circuit in the "Direct" position when one of the other monitoring methods is used.

The plug-in adapter unit, Fig. 2, is a b.f.o. type of monitor which does not seem to be as well known as it deserves to be. What it amounts to is a second b.f.o. for the receiver which is keyed along with the transmitter oscillator, and whose output is capacitively coupled to the receiver second detector along with the regular b.f.o. It gives a monitoring signal which is independent of transmitter frequency, receiver tuning and r.f. gain control setting.

A standard b.f.o. coil and circuit was used, with the extra components required mounted

(Continued on page 110)

A Crystal-Controlled 144-Mc. Converter for 75-A Series Receivers

Simple Easily-Adjusted Design with 26- to 30-Mc. Output

BY LOUIS A. GERBERT,* W8NOH

Some owners of Collins receivers are kept from trying 2-meter operation because few of the published v.h.f. converter designs are usable in their original form with these receivers. The tuning range of the 75-A receivers on the 7- or 14-Mc. ranges, normally used with crystal-controlled converters, is not wide enough for covering a v.h.f. band. The writer had a band-switching converter with a tunable oscillator, but its stability and noise figure left much to be desired. Using it on 2 was a good deal like trying to work 75-meter 'phone with a 2-tube regenerative receiver: it can be done, but there is little pleasure in it.

With the high stability and dial calibration accuracy that are available with the 75-A, it is a shame to be unable to make use of these desirable characteristics in 2-meter listening. The obvious answer is alteration of the converter i.f. range to 26 to 30 Mc., allowing tuning of a four-megacycle band with one change of the bandswitch. If the crystal frequency is chosen properly, the same calibration accuracy is then available on the v.h.f. band as with the receiver alone. Use of the 26- to 30-Mc. i.f. range may be helpful with other receivers as well. Most two-dial receivers tune about four megacycles on their 10-meter bandspread ranges, and thus a better tuning rate is available than at 7 Mc., where the general-coverage range must be used.

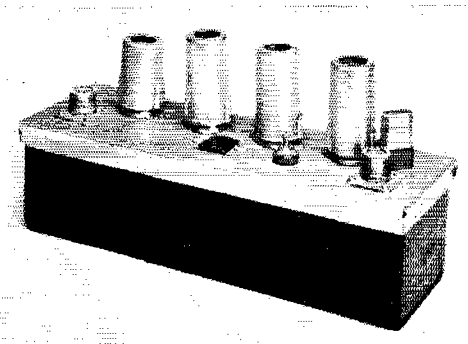
The front-end design of a converter having 26 to 30 Mc. for its output range is, of course, not necessarily any different because of this. Only the oscillator and multiplier circuits need be changed. There are, however, some front-end features in the converter to be described that will be of interest to other converter builders, as they make for simplicity and ease of construction and adjustment.

Two r.f. stages are used. The first is a push-pull neutralized stage with a 6BQ7A (or 6BZ or BK7) or 5670 dual triode. This is inductively coupled to a 6AM4 grounded-grid amplifier. All r.f. circuits are adjusted by varying turns spacing, except for the antenna input, which is made adjustable for different antenna systems. The mixer is the pentode section of a 6U8, in which the triode section is a cathode follower, coupling out the i.f. signal. Injection is supplied by another 6U8, in which the triode is a crystal oscillator and the pentode a tripler. A 39.333-Mc. overtone crystal (James Knights H-173L) is used to provide crystal-controlled injection on 118 Mc.

* 3816 Ivy Drive, N.E., Grand Rapids 5, Mich.

Construction

Mechanically, the converter is about as inexpensively built as any you're likely to see. The cover is a piece of thin scrap aluminum, bent up by hand to fit a wooden cheese box that serves as a case. The inside of the box is coated with aluminum paint and the outside is painted black. Looking at the external view, the input end is at the left. The tubes are, left to right, the first r.f. amplifier, second r.f., the mixer-cathode follower, and the oscillator-tripler. Power is brought in through a 4-pin fitting near the center of the chassis.



The W8NOH 2-meter converter is built on a sheet of aluminum, with its edges bent over to make a cover for a wooden box.

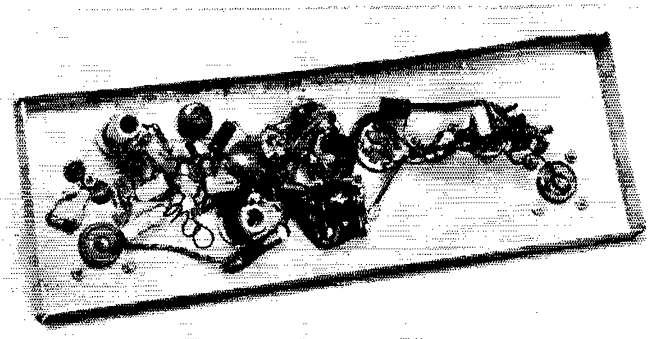
A more photogenic layout could have been made by the use of tie points for power wiring, but as mechanical stability is of no great importance in a crystal-controlled converter the components were wired in the simplest way possible. The only important point to keep in mind is to use the shortest possible leads in all r.f. circuits. Clip resistor, coil and by-pass capacitor leads to the minimum usable length. Ceramic condensers are desirable because of their small size.

Adjustment

Power for the converter may be taken from the Collins receiver supply through the socket marked "NBFM Adapter." This has the advantage that plate voltage is removed from the converter during transmission periods when the receiver B-plus is cut off. The extra load seems to be quite within the capabilities of the receiver power system.

A grid-dip meter will save plenty of time in the adjustment of the converter. By this method, all

r.f. circuits are adjusted by varying the turns spacing until they resonate at about 145 Mc. If the crystal oscillator and multiplier plate coils are adjusted to resonance at the frequencies indicated on the schematic diagram, that portion of the converter should work well enough to permit some reception at once. The mixer plate coil slug can be adjusted with the grid-dip meter first, and then later peaked for maximum noise.



Bottom view of the 2-meter crystal-controlled converter. The antenna end is at the right.

Now tune the oscillator plate coil for maximum output on the crystal frequency. Use your grid-dip meter as an output indicator, or measure the voltage developed across the tripler grid leak with a high-impedance voltmeter or v.t.v.m. Tune the tripler plate circuit for maximum output on 118 Mc. The d.c. voltage developed at the mixer grid can be used for this check. The dropping resistor in the tripler screen lead can be increased in value, if the injection is more than is necessary for good mixer action. The oscillator grid leak can be increased to cut down the output from that stage as well, if it is more than is necessary. It is desirable to keep the oscillator and tripler operating levels at the lowest usable value, in the interest of stability and low spurious response.

A noise generator will be helpful at this point, though it is not absolutely necessary. Neither is it necessary to have signals on the band, though it is comforting to hear them at this stage of the game. Ignition or the noise from an electric razor can be used if a noise generator or signals are not available. All coils except the input circuit should be adjusted for maximum response near the middle of the band. Then the input circuit should be adjusted so that a signal (noise generator, amateur or whatever) produces maximum rise over the receiver noise level itself. If you tune for highest S-meter reading only, you may not hit the point that gives the best signal-to-noise ratio.

The pin connections shown on the schematic diagram are for a 6BQ7A or similar tube in the r.f. stage. If a 5670 is used (and it is recommended) the pin connections are different. With a 5670, our converter showed no appreciable

(*Continued on page 112*)

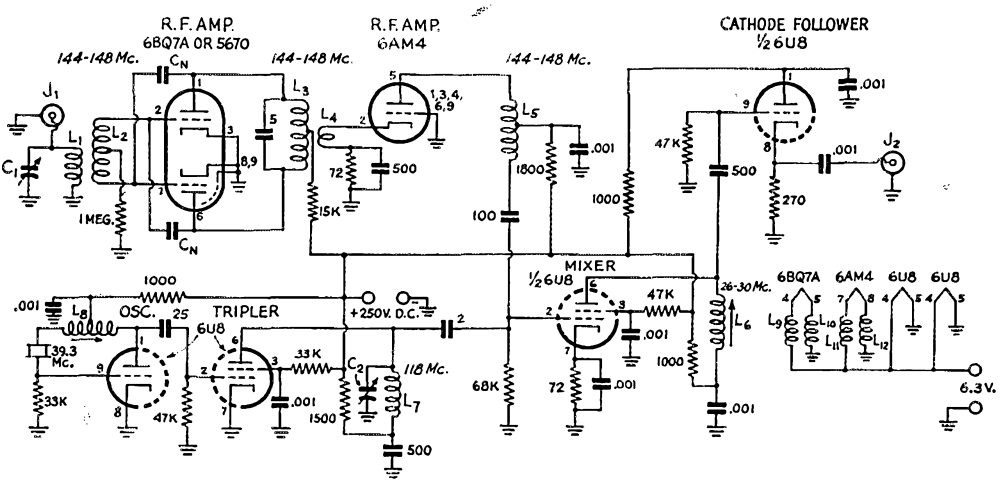


Fig. 1 — Schematic diagram and parts information for the W8NOH 2-meter converter. Pin numbers for the r.f. stage tube are for a 6BQ7A, 6BZ7 or 6BK7 tube. Connections are different for a 5670.

C_1 — Ceramic padder, about 2 to 6 $\mu\mu$f.
C_2 — Ceramic padder, 3 to 30 $\mu\mu$f.
C_N — 2 $\mu\mu$f. (see text).
L_1 — 2 turns wound over L_2.
L_2 — 12 turns, center-tapped.
L_3 — 6 turns, center-tapped.
L_4 — 2 turns wound over L_3.
L_5 — 12 turns, center-tapped.
L_6 — 18 turns spaced wire diameter on ⅜-inch brass-slug form.
L_7 — 3 turns.
L_8 — 12 turns on ⅜-inch brass-slug form, tapped at 5 turns.
L_9, L_{10} — Bifilar-wound, 12 turns.
L_{11}, L_{12} — Same as L_9, L_{10}. All coils No. 20 enam., ¼-inch diameter, unless otherwise specified.
J_1, J_2 — Coaxial chassis fittings, female.

A Variable Bandwidth Filter

Double Conversion with Dual Filter for Continuously Variable Selectivity

BY H. E. THOMAS,* W6CAB

• The system described here should appeal to the experimentally-inclined "skirt-selectivity" fan who wants the frequency separation between his steep sides to be adjustable. By inverting the signal with double conversion, two identical, but unsymmetrical, filters can be used in such a way as to take advantage of the steepest side slope in each, thus giving a symmetrical steep-sided passband.

BETTER selectivity in amateur receivers has been continuously sought from very nearly the beginning of amateur radio. The necessity for improved receiver selectivity has followed fairly closely the number of active amateurs in the various bands. Today, more than ever, a really selective receiver is essential.

Receiver selectivity can readily be shown by plotting a response curve, using frequency (usually the i.f.) along the horizontal axis and signal output (usually in db.) for the vertical axis. The curve for a typical superheterodyne receiver is shown as the dotted line in Fig. 1. A

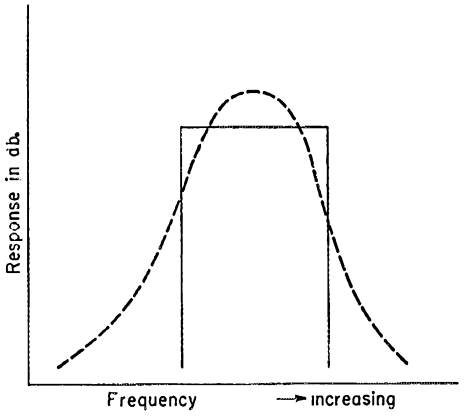


Fig. 1 — Representative i.f. selectivity curve (dashed line) and "ideal" curve (solid) having the same effective bandwidth.

theoretically ideal curve is also shown in Fig. 1 as a solid line. It will be noted that the ideal curve is flat on top and has vertical sides. The vertical sides are by far the most important consideration since the slope of these sides determines how close in frequency two signals can be without mutually interfering.

However, Fig. 1 does not show another most important and desirable feature of an ideal curve. This is the width between the vertical sides, which should be only as great as necessary to accommodate the particular type of signal being received. For c.w. reception, the curve can be quite narrow, its width depending mainly on receiver and transmitter stability, while for 'phone reception it should be about 3000 cycles wide. The ideal response curve, then, should have nearly vertical sides, be fairly flat on top and *should be capable of being varied in width* from zero to 3 kc. or more. A device has been constructed which, when added to almost any superheterodyne receiver, will closely approximate this ideal curve. The following paragraphs describe the evolution of the device.

Crystal-Filter Characteristics

In connection with the construction of a single-sideband transmitter last year, considerable experimenting was done with filters using surplus FT-241 crystals. One of the conclusions reached as a result of these experiments was the fact that an amazingly sharp cut-off could be obtained by using shunt crystals, à la W1JEO,[1] in connection with either half-lattice (two crystal) or regular (four crystal) filters. Fig. 2 is representative of the best curves obtained by this method. Fig. 3 shows the arrangement found simplest and still capable of producing a very sharp cut-off. In Fig. 3, crystals *A* and *B* should be separated by about 3 kc. and crystal *C* should be almost exactly the same frequency as

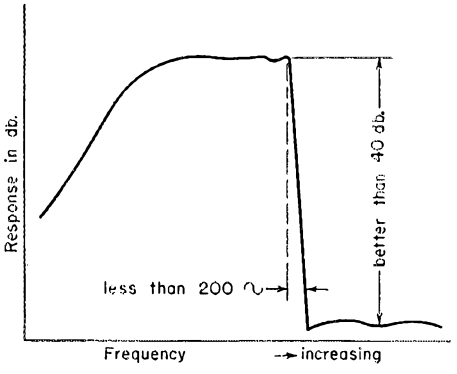


Fig. 2 — Type of selectivity curve obtained with half-lattice crystal filter and shunt crystals.

*Cmdr., USNR, Quarters H, San Francisco Naval Shipyard, San Francisco, Calif.

[1] Edmunds, "A Crystal-Filter S.S.B. Exciter," *QST*, November, 1950. See also, Goud, "A Crystal Filter for 'Phone Reception," *QST*, October, 1951.

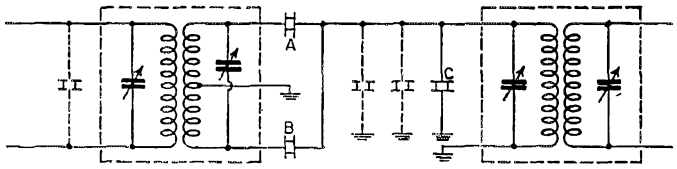


Fig. 3 — Filter circuit using shunt crystals.

the higher of *A* and *B*. Crystal *C* should be adjusted until the steepest slope is obtained. Adjusting upward in frequency is done by edge grinding the crystal and lowering the frequency can most readily be done by copper plating. The other crystals shown by dotted lines in Fig. 3 are added at such intervals as are found necessary to prevent the response curve from rising at frequencies higher than the cut-off point of the curve.

The possibility of using these filters in receivers was considered but the idea was dismercial concern in a variable bandwidth filter.[2] It was immediately apparent that this principle could be used with our lop-sided filters to make an excellent "gadget" for our receiver. The device was constructed and the results were so astonishing that it was decided to pass along the basic idea.

Fig. 4A is a block diagram showing the principle of operation. The major items required are two filters, F_1 and F_2, four mixer stages, M_1, M_2, M_3 and M_4, and one variable frequency oscillator, *VFO*. The filters are as nearly alike as possible, using FT-241 surplus crystals in the vicinity of 375 kc. M_1, M_3 and M_4 are true mixers, with M_1 and M_4 being fed the fundamental frequency from the VFO, and M_3 being fed the second harmonic from the VFO. M_2 is more properly a converter, with its oscillator portion preferably controlled by a crystal whose frequency is twice the i.f. of the receiver. The VFO is a pentode with the first two grids and the cathode comprising the oscillator which provides the injection frequency for M_1 and M_4. The plate circuit of the VFO acts as a frequency doubler and produces the proper injection frequency of M_3. A series trap to ground, tuned to the oscillator fundamental, is essential in the plate circuit to prevent the fundamental frequency of the VFO from appearing at mixer M_3.

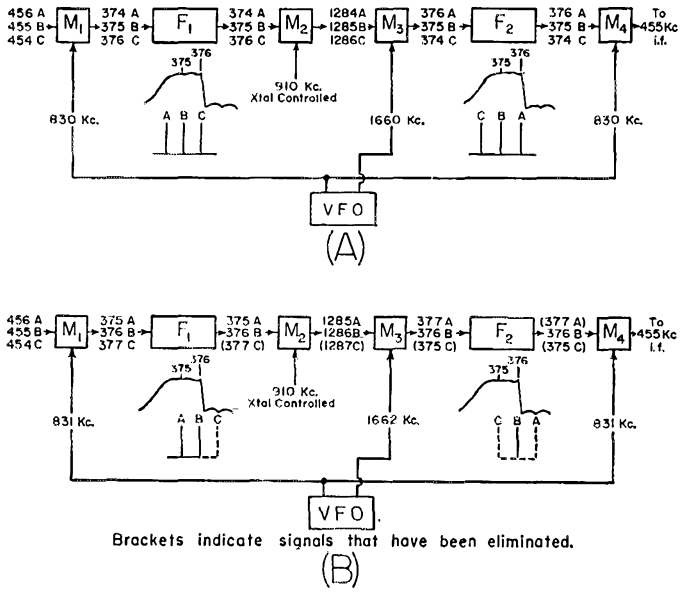


Fig. 4 — Operation of the variable bandwidth circuit. Comparison of A and B shows the effect of varying the VFO frequency.

carded since it was found that the filters were never symmetrical. Any adjustments which steepened one side of the passband always resulted in loss of steepness on the other side. However, the fact that we could obtain a drop in response of 40 db. in less than 200 cycles was startling enough to make a deep impression.

Variable Selectivity

Some time later, we were fortunate enough to run across the basic principle used by a com-

To describe how this circuit operates, let us assume that it is desired to receive one signal (c.w. in this case) from a group of signals extending one kilocycle on either side of the wanted signal. In order to more clearly follow these signals through the block diagram, we will designate the wanted signal as *B* and the extremes of the interfering signals as *A* and *C*, *A* for the high-frequency side and *C* for the low-frequency side. If *B* is tuned in on the nose with a receiver whose i.f. is 455 kc., then *A*, *B* and *C* will enter the device with frequencies of 456, 455 and 454 kc., respectively. These signals are shown in Fig. 4.

If the designed cut-off frequency of the filters is 376 kc., then for the purpose of describing the operation, the "center" of each filter can be considered to be 375 kc. This establishes the

[2] The manufactured unit to which the author has reference here is the MCL-50 Signal Splitter, produced by the J. L. A. McLaughlin Corp., La Jolla, Calif. The basic principle of varying selectivity described here is of somewhat obscure origin but has appeared, apparently quite independently, at intervals and in different places. The idea of using the second harmonic of the oscillator to give variable bandwidth with constant center frequency is, so far as is known, original with the author. — Ed.

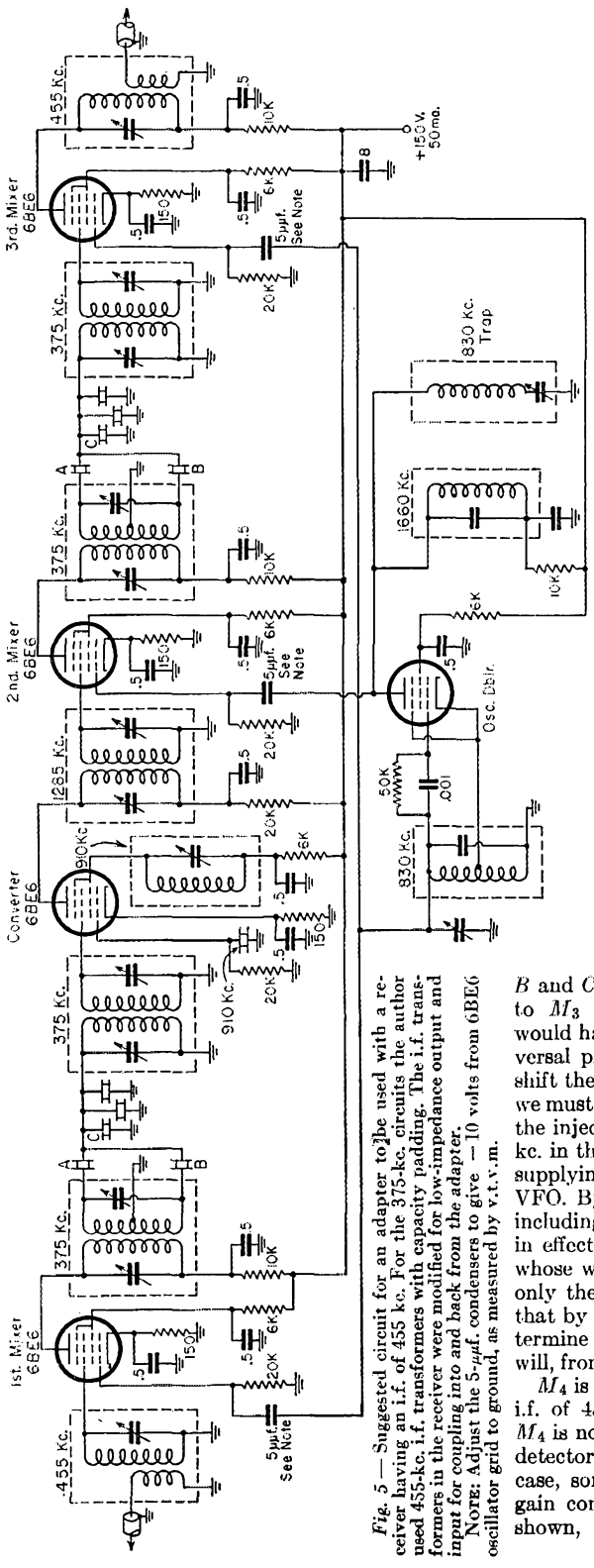


Fig. 5 — Suggested circuit for an adapter to be used with a receiver having an i.f. of 455 kc. For the 375-kc. circuits the author used 455-kc. i.f. transformers with capacity padding. The i.f. transformers in the receiver were modified for low-impedance output and input for coupling into and back from the adapter.
NOTE: Adjust the 5-μμf. condensers to give −10 volts from 6BE6 oscillator grid to ground, as measured by v.t.v.m.

normal frequency of the VFO as 455 plus 375, or 830 kc. With 830 kc. injected into M_1, signals A, B and C enter the first filter, F_1, at 374, 375 and 376 kc., respectively. All three will be passed by F_1 and will appear at the input of M_2. The signals are shown relative to the curve of the filters just under the blocks F_1 and F_2 in Fig. 4.

At this point it becomes necessary to reverse the signals with respect to F_2. In effect, we reverse F_2 with respect to the incoming signals so that the steep side of F_2 will act as the "back end" of the steep side of F_1. M_2 and M_3 are used for this purpose by first "beating up" and then "beating down."

Since M_2 has an oscillator frequency of 910 kc. (twice the i.f. of the receiver), signals A, B and C leave M_2 at 1284, 1285 and 1286 kc. and appear at the input of M_3. With an injection frequency of 1660 kc. from the plate circuit of the VFO, M_3 converts the signals to 376, 375 and 374 kc., respectively, and they will pass through F_2 as indicated. Note that in F_1, signal C was adjacent to the steep side of the filter, while in F_2, signal A was closest to the steep side. Any signals beyond A or C have been eliminated in one or the other of the filters. In effect, we have passed the signals through a filter which has very steep front and back slopes and whose width is 2 kc.

Now consider Fig. 4B. It is identical to Fig. 4A except that the frequency of the VFO has been increased to 831 kc. The incoming signals have been partially shifted out past the steep side of F_1, thus eliminating all signals between B and C, including C. If the injection frequency to M_3 had remained unchanged, the signals would have shifted lower in F_2 because of the reversal process. However, since we also want to shift the signals out through the steep side of F_2, we must recover the 1-kc. shift caused by shifting the injection to M_1, as well as moving another 1 kc. in the proper direction. This is the reason for supplying M_3 with the second harmonic of the VFO. By this process, all signals from B to and including A are eliminated in F_2. We now have, in effect, a filter with very steep sides and one whose width has been narrowed down to accept only the one desired c w. signal. It can be seen that by varying the VFO, we can effectually determine the bandwidth of the response curve at will, from zero to the designed width of F_1 and F_2.

M_4 is used to return the signals to the original i.f. of 455 kc. for reinsertion into the receiver. M_4 is not required if a separate i.f. strip, second detector, and b.f.o. are used to follow F_2. In this case, some provision should be made to permit gain control in the device. With the device as shown, the gain of the mixers is just about

(Continued on page 114)

A Three-Band Multiplier-Driver

Two-Stage Unit for 10, 15 and 20

BY F. A. MITCHELL,* W2IOK

• **This article describes a simple two-stage multiplier-driver unit for the 14-, 21- and 28-Mc. bands. It may be used as a transmitter delivering 25 watts or so to an antenna, or as a driver for a high-power final. Physically, it is attractive because it is designed to require a minimum of panel space in a standard rack.**

IN the process of rebuilding the old rig to eliminate TVI, it was a natural thing to look over the many published ideas for a suitable driver. In spite of the many fine circuits and layouts, there seemed to be an opportunity to apply some principles that would result in a unit simple to construct, low in cost, and free from TVI, without sacrificing good performance. As a primary step toward all of these objectives, it seemed that advantage should be taken more frequently of the ability of our miniature pentodes to triple, and even quadruple, with sufficient output to drive medium-power tetrodes, such as 807s, in the higher-frequency bands. This seemed especially feasible for driver stages covering two or three bands. In addition, we felt sure that there was still room for the introduction of some variation in constructional design.

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Circuit

The circuit, shown in Fig. 1, seemed so simple that it was put together with some doubt. However, it worked practically from the first trial, with very little trouble from parasitics or other instability. The 6AQ5 and the 807s were used because they were already on hand. But if they

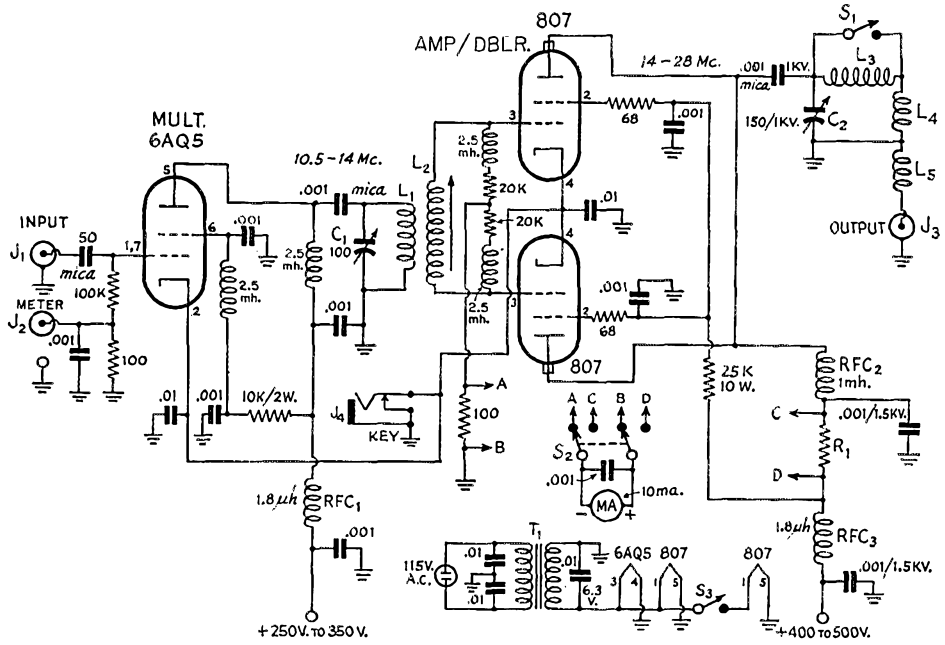
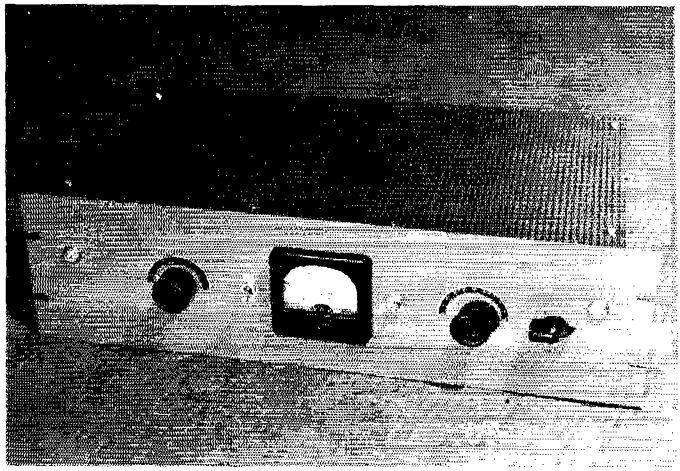


Fig. 1 — Circuit of the three-band multiplier-driver unit.

C_1 — Receiving spacing.
R_1 — 20-times shunt for 10-ma. meter (see ARRL *Handbook*, chapter on measurements, for construction).
L_1 — 12 turns ¾-inch diam., ⅜ inch long (B & W 3012 Miniductor).
L_2 — 16 turns No. 18 enam., on National XR-50 iron-slug form, ½-inch diam.
L_3 — 5 turns No. 14, 1½-inch diam., 1¾ inches long (B & W JEL-10 with one turn and link removed).
L_4–L_5 — 3 turns No. 14, 1½-inch diam., 1 inch long, 2-turn link (B & W JEL-10 with 3 turns removed opposite link end).
J_1, J_3 — Coax connector.
RFC_1, RFC_3 — Ohmite Z-144.
RFC_2 — National R-154U.
S_1 — Ceramic rotary switch.
S_2, S_3 — Toggle switch.
T_1 — 6.3-volt 3-amp. filament transformer.

Unless otherwise specified, all resistors are ½ watt, and all fixed condensers disk ceramic. All capacitances below 0.001 are in μμf.; 0.001 and above are in μf.



A compact multiplier-driver unit of 25 watts or more output on three bands. Controls from left to right are for multiplier tuning, meter switching, 807 filament, driver tuning, and driver coil switching.

must be bought new, the cost is relatively small. The unit can easily handle the reasonable amount of power needed to give an output of 25 watts or more, which is enough to drive a screen-grid final to a kilowatt.

It is usually an accepted precaution, if not a necessity, to neutralize tetrodes when operating them as straight amplifiers. A circuit that works well, with plenty of output, either straight through or doubling, is the well-known push-push amplifier. When doubling, both tubes are used. For operating straight through on the same frequency, cutting the filament of one of the tubes (by opening S_3) automatically provides neutralization for the other.

To avoid the need for a split-stator condenser in the push-pull grid circuit of the output stage, an overcoupled inductive system was used to obtain balanced output from the multiplier stage. C_1 tunes the circuit over the range of 10.5 to 14 Mc. The output stage doubles to 21 and 28 Mc., and works straight through with a single tube on 14 Mc. In the output tank circuit, part of the inductance is shorted for 28-Mc. output.

The unit can be driven satisfactorily by a crystal oscillator or VFO of a few watts, covering the 3.5- to 3.7-Mc. range, capacitively coupled to the multiplier input circuit. The 6AQ5 triples to 10.5 Mc., or quadruples to 14 Mc.

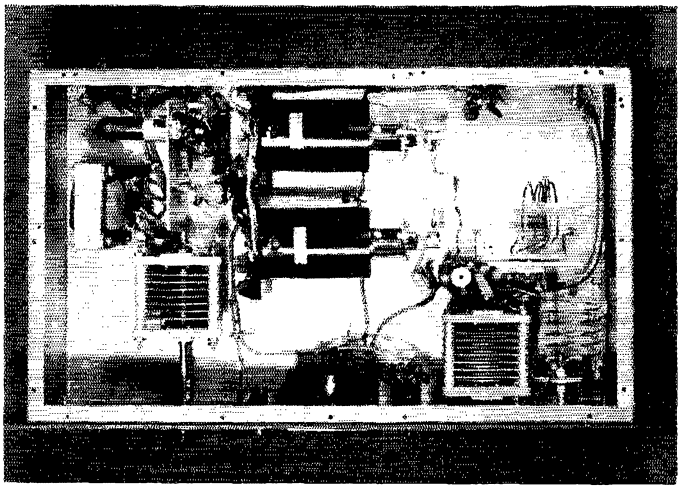
A d.p.d.t. toggle switch shifts a 10-ma. meter to read either grid or plate current of the final. A lead was brought out to a pin jack, J_2, so that a periodic check could be made on the grid current of the multiplier tube with a 10-ma. meter. For greater convenience, a rotary meter switch could be used so that the single meter could be switched to this position, also.

Both stages are parallel-fed in the plate circuit. The two 68-ohm resistors in the 807 screens are v.h.f. parasitic suppressors.

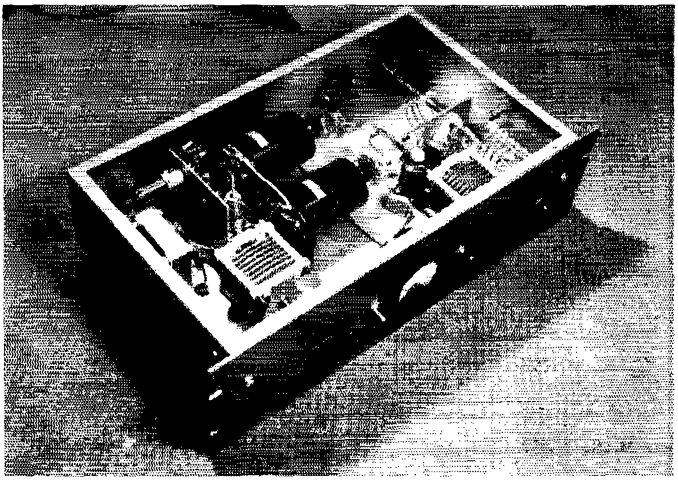
Construction

From the photographs, it can be seen that the construction is in keeping with simplicity and low cost. At the same time, it provides the necessary shielding so important in TVI reduction.

The enclosure is a 10 × 17 × 4-inch aluminum chassis with its open side toward the top. When the unit is complete, the open top is covered with a sheet of perforated aluminum. The meter



In this view, the slug-tuned coil, L_2, can be seen mounted between the two brackets holding the tubes. The r.f. choke to the rear of the output-stage tank condenser is the 807 plate choke.



Top view of the multiplier-driver unit. The 807s are suspended horizontally from a bracket. Similarly, a bracket holds the 6AQ5 to the left, above the filament transformer. This view also shows the placement of the two tuning condensers, and the two sections of the output tank coil.

is placed at the center of the 5¼-inch relay-rack panel, with the toggle switches and tuning-condenser controls spaced symmetrically on either side. The output-stage bandswitch, S_1, near the right-hand end, is placed alongside the output tank condenser, C_2.

The two 807s, with cylindrical shields, are mounted horizontally from an aluminum bracket positioned so that the plate caps will be near the rear of C_2. A second bracket, made from a piece of aluminum, holds the 6AQ5 (also horizontally mounted) and its associated small components. This bracket is spaced sufficiently from the one holding the 807s to permit mounting L_1L_2 between them.

L_1, with its axis vertical, is cemented to a small square of polystyrene. The polystyrene mounting is centered between the two brackets and fastened to the bottom of the chassis with machine screws and ½-inch spacers. L_2 is then centered inside L_1. The XR-50 form can also be cemented to the polystyrene, or supported by heavy leads. The filament transformer is mounted at the extreme left.

The output tank inductance is made up of two sections, L_3 and L_4, mounted at right angles. L_3 is shorted out for 10-meter operation. The output link coil, L_5, is coupled to L_4. The coils are B & W JEL-10 units with turns removed. L_4 has 3 turns removed, while L_3 has one turn (as well as the link winding) removed. L_4 is provided with the usual plug-in socket, mounted on a bracket, but there is no reason why the socket could not be dispensed with. L_3 is stripped of its plug bar, and is mounted with one end soldered to S_1, and the other to a rear stator terminal of capacitor C_2.

All power wiring is done with shielded wire, and power leads are filtered for v.h.f., close to their terminals.

Adjustment

Before any voltages are applied to the unit, the two tank circuits, C_1L_1 and $C_2L_3L_4$, should be checked with a grid-dip oscillator to make sure that they cover the proper frequencies. If necessary, the coils can be altered slightly.

Enough excitation should be applied to produce a 6AQ5 grid current of at least 2 ma. With plate voltage applied to the 6AQ5, but not to the 807s, C_1 should be adjusted to produce maximum 807 grid current at 10.5 Mc. when the key is closed. The slug in L_2 also should be adjusted for maximum grid current. Then C_1 should be readjusted for maximum grid current at 14 Mc. The slug in L_2 should finally be adjusted so that the grid current is the same at both settings of C_1. This will be less than the grid current obtained originally at 10.5 Mc., of course, but it should be possible to find in adjustment of L_2, between 10.5 and 14 Mc., where the grid current will be 4 ma. or better on both bands.

Plate voltage and load should be applied to the 807s in the usual manner. Under typical operating conditions, with a supply voltage of 230 volts to the 6AQ5, the screen voltage is 220 volts, and the combined screen and plate current is 35 ma. With a final-amplifier plate voltage of 400 to 500 volts, there should be no difficulty in obtaining at least 25 watts output on any of the three bands. Remember, the filament switch, S_3, should be open when working on 14 Mc., and closed on the other two bands where the output stage is doubling frequency.

Strays

The intimate details of a sea voyage that made headlines in 1948 are told by ship radio operator Conrad Burns, VE7IR, in a book just published by Pageant Press, *QRD? Snohomish*. OM Burns tells a moving account of the longest tow known to be made from the Pacific northwest, and of the almost unsurmountable perils that befell the crew. He credits his amateur radio experience with providing him the necessary background to meet the many demands for which a newly-acquired commercial ticket had not yet prepared him.

Supplementary Data on the R.F. Assembly for Mobile or Fixed-Station Work

Operation with 12-Volt Ignition Systems; also Other Facts

BY C. VERNON CHAMBERS, W1JEQ

OCTOBER, 1954, *QST* described an "R.F. Assembly for Mobile or Fixed-Station Work," and the following issue — November — carried an article, "Audio for the Mobile or Fixed-Station R.F. Assembly." This equipment has attracted considerable attention, judging from numerous comments and inquiries received here at Headquarters. As is frequently the case with equipment described in *QST*, several readers have asked for advice in making certain alterations in the original to suit their particular requirements. Many asked about conversion to 12-volt operation to suit some of the later-model cars. Others wanted to know if it might be feasible to add a second 6146 in parallel in the final amplifier. A few were interested in adapting the r.f. unit to VFO operation.

Some of these questions cannot be answered definitely until experimental work, now in progress, has been completed. In the meantime perhaps we can offer some suggestions to those who may wish to get started on their own.

Twelve-Volt Operation

To adapt the r.f. assembly for 12-volt operation, it is only necessary to rewire the heater circuit as shown in Fig. 1. In this arrangement, the

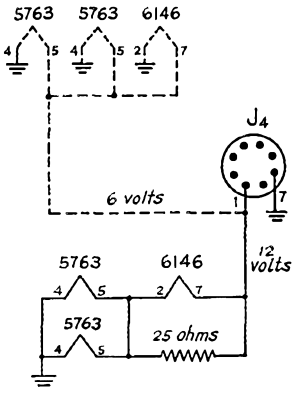


Fig. 1 — Heater wiring for the r.f. assembly. Original wiring is shown in dotted lines and solid lines show wiring for 12-volt operation.

heaters for the 5763s are first connected in parallel and then tied in series with the heater for the 6146. To equalize the voltage distribution, a resistance of approximately 25 ohms is connected between Pins 2 and 7 of the 6146. The resistor will have to handle about 1.5 watts (6 volts at 0.25 amp.). To allow an adequate safety factor, a 5- or 10-watt resistor is recommended.

The audio unit may be revamped for 12-volt

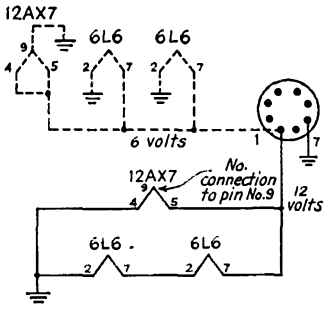


Fig. 2 — 12-volt heater circuit for the modulator. Dashed and solid lines indicate original and revised wiring, respectively.

operation by using the series-parallel heater circuit shown in Fig. 2. This circuit uses the normal 12-volt connections for the 12AX7 and operates with the 6L6 heaters in series. Pin 9 of the 12AX7 is not used in the 12-volt arrangement.

Increasing Power

In the original r.f. assembly, space was left at one corner of the chassis for the installation of a small modulator, if desired at some future date. However, it appears that the empty space looks like about the right size for another 6146 to some of the fellows who are more interested in the unit for home-station use, than in mobile operation. Unfortunately, there are several factors involved besides the one of space.

Perhaps the most important question is the one of getting enough excitation from the oscillator to drive two tubes at full rating. Removal of the loading resistor from the driver plate circuit may help. However, this is bound to make tracking of the two multiband tuners more critical and may result in instability. Incidentally, a few readers could find no mention of R_3 other than in the circuit diagram. Details of this resistor are given in the top righthand paragraph, page 15, of the October issue.

If the 6146s are to be connected in parallel, it is more than probable that the multiband tuners will require modification because of the increase in minimum input and output capacitances across the tanks. This may make neces-

(*Continued on page 116*)

Remote End-Fed Antenna with Coaxial Line

Data on Antenna System Bandwidths

BY J. L. COPELAND,* W5SQT

In a great many amateur radio station locations it is more convenient to use the end-fed antenna than it is to use the center-fed antenna. Most articles that have appeared in amateur publications describing the end-fed antenna show the circuit as in Fig. 1. Then the articles usually go on to tell of its principal shortcomings, some of which are as follows: High r.f. voltage is

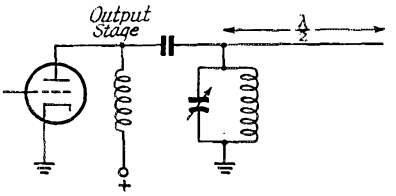


Fig. 1 — A half-wavelength antenna can be fed by connecting it to the plate tank circuit of the output stage. This often leads to trouble from r.f. feed-back.

brought into the shack where it can give much trouble such as r.f. feed-back, etc.; also, the antenna is tightly coupled for all the harmonics. These shortcomings can be overcome to a great extent by remotely feeding the antenna through coaxial cable. Those articles devoted to remote end-feeding the antenna usually show a circuit similar to that in Fig. 2. The articles that have come to the attention of the author give no information as to what portion of a band might be covered without retuning the antenna tank circuit and still maintain a flat feed line. The location of the writer's station is such that an end-fed antenna for the 80-meter band is convenient, so one was installed to be used temporarily and has been in use here for two years. The circuit is shown in Fig. 3.

After using this system and getting the feel of it, and also getting very good reports on it, I decided to run some s.w.r. curves on this antenna. Before this was done, however, it was observed that the farther the operating frequency departed from the frequency to which the antenna was cut, the more often the antenna tank had to be retuned to load the transmitter properly. This, of course, was expected. In the vicinity of the frequency to which the antenna was cut, the final amplifier loaded well for a bandwidth of about 100 kc. without having to retune the antenna tank. The antenna under discussion is 125 feet long and 20 feet high, in the form of an inverted "L." Its resonant frequency is 3770 kc. It is end-fed through a tank circuit as shown in Fig. 3 by 100 feet of 52-ohm coax. The circuit is adjusted so that the antenna tank hits resonance at 3770 kc. with C_1 at a value of approximately 135 $\mu\mu$f. An s.w.r. bridge (built according to ARRL *Handbook*) was used to make the s.w.r. measurements. The purpose of the measurements was to find out what bandwidth could be had without retuning the antenna tank and still have a flat transmission line. A flat transmission line is defined here as one having an s.w.r. of 2 or less. The resulting curves are shown by Fig. 4, F_0 being the frequency for which the antenna is resonant. The first set of measurements was made by setting the tap on L_1 and the condenser C_1 (Fig. 3) until an s.w.r. equal to 1 was obtained at 3770 kc. Then the antenna tank circuit was left set at this value, the frequency was varied, and the s.w.r. noted at several frequencies. The results were plotted to give curve *A* in Fig. 4. The frequency of the VFO was then set at 3900 kc. and the antenna tank readjusted until the s.w.r. was a minimum (the tap on L_1 was left as set originally). The VFO was then varied without the readjustment of the antenna tank, and the s.w.r. was noted and plotted, to give curve *B*. This process was repeated for the data shown by curves *C* and *D*. As can be

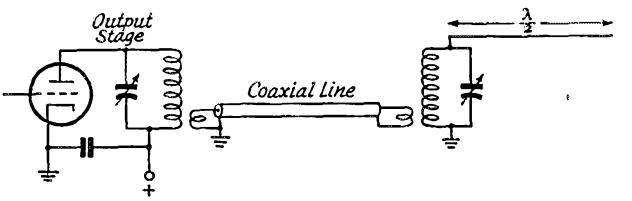


Fig. 2 — An additional antenna-coupling circuit, coupled to the transmitter through a low-impedance line, overcomes the shortcomings of the circuit in Fig. 1 but usually introduces some new ones.

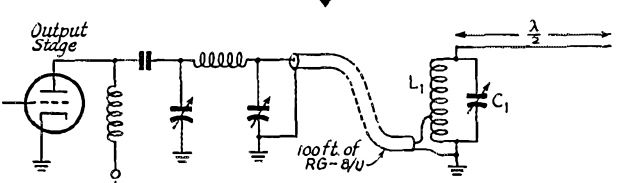


Fig. 3 — Another version of the circuit of Fig. 2, as used at W5SQT.

* Box 157, Wolfe City, Texas.

seen from curve *A*, a bandwidth of over 100 kc. can be covered without retuning the antenna tank circuit, and the s.w.r. remains at 2 or less. Examination of Fig. 4 also shows that the broadest frequency response is around the frequency to which the system is matched.

Fig. 5 shows the bandwidth plotted against frequency. For all practical purposes the frequency to which the antenna is cut can be anywhere in the 80-meter band and the curve will still apply to the relative bandwidth of the system, so long as the Q of the antenna tank is about 8 or 10.

To demonstrate the practical use of the curves, the following examples will be explained. Let us suppose you wish to work the low end of the 80-meter c.w. band — you could cut the antenna length to, say, 3550 kc. Tune up the system as previously described and you are ready to work from 3500 to 3600 kc. without retuning the antenna tank circuit. Now, if you wish to work this antenna to a frequency as high as 3700 kc., it is only necessary to make another setting of the antenna tank condenser C_1. Referring to Figs. 4

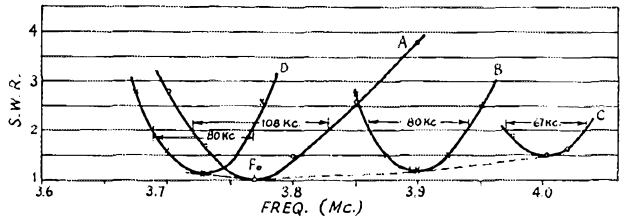


Fig. 4 — A plot of s.w.r. *vs.* frequency for an antenna cut to 3770 kc. (F_0) and tuned at various points through the 80-meter band.

and 5, let F_0 = 3550 kc. The bandwidth is 108 kc. (3608–3500). The initial setting of C_1 for s.w.r. = 1 should be noted. This leaves 92 kc. to be covered to get to 3700 kc. Now set the VFO at 3658 (3658 = F_0 + 108). Adjust condenser C_1 to give a minimum s.w.r. (this should be about 1.1), and note the setting of C_1. With two fixed settings of C_1, we can cover 3500 to 3700 kc. on the c.w. band. These settings can be made manually or by one of the many possible electromechanical means. By the same procedure, the entire 75-meter 'phone band may be worked by cutting the antenna to resonance at 3850 kc. and finding two settings for C_1, at 3850 and 3954 kc., respectively, by following the previously described procedure of adjustment. The antenna in use here was cut to work in the high end of the 80-meter c.w. band and the low end of the 'phone band. For those who might like to duplicate this antenna, the values for the antenna tank circuit are: C_1 = 150 $\mu\mu$f., L_1 = 16 turns No. 16 wire 2¼-inch diam. and 1.5 inches long. The coaxial line is tapped on 1.5 turns above the ground or bottom end.

Application to Other Bands

Since Fig. 5 is essentially a plot of selectivity against frequency, it can be assumed that bandwidth as indicated will increase directly in proportion to the frequency. That is, the bandwidth at 7 Mc. equals twice the bandwidth at 3.5 Mc., and the bandwidth at 14 Mc. equals 4 times the bandwidth at 3.5 Mc., etc. Although no detailed measurements have been made by the author to obtain empirical data on higher frequencies, practical results obtained using this method of feed for a half-wave vertical antenna on 7 Mc. and a half-wave vertical antenna on 14 Mc. tend to substantiate this assumption. The maximum bandwidth for one setting of C_1 on 7 Mc. was approximately 200 kc., and the maximum bandwidth for one setting of C_1 on 14 Mc. was 400 kc. Practical values for C_1 were 70 and 35 $\mu\mu$f. for 7.15 Mc. and 14.2 Mc., respectively. The spacing between the plates of condenser C_1 should be equal to or greater than the spacing of the condenser plates used in the final amplifier tank circuit. Although it is not necessary to ground the low end of the antenna tank circuit, it is advisable to do so as a measure of protection from lightning. This system of feed gives a measure of safety when used with the pi network, since it places a short across the plate circuit of the final amplifier in the event of a faulty blocking condenser.

• Here is some interesting information on a well-known antenna system that should generate new interest in end-fed antennas. It should also help to overcome some of the aversion to antenna couplers, since it indicates that the trouble with antenna couplers may not be the couplers but the operators who misuse them.

The antenna tank used in these measurements rests on a steel oil drum 22 inches high and 15 inches in diameter. The drum sits on the ground, so the ground lead is therefore the oil drum. If the antenna tank is insulated from the oil drum, it has only a slight detuning effect on the antenna tank and may be compensated for by slightly retuning the antenna tank circuit. Various lengths of coax from 8 to 100 feet have been tried here both with and without a ground directly at the base of the antenna tank circuit. However, a direct ground is recommended. A rod driven in the ground with a lead 24 inches long gives the same results as the oil-drum ground.

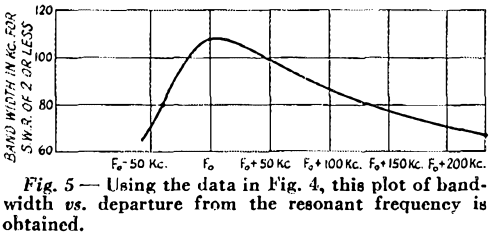


Fig. 5 — Using the data in Fig. 4, this plot of bandwidth *vs.* departure from the resonant frequency is obtained.

A Loudspeaker Enclosure for the Apartment Station

Corner Reflex for Multipurpose Use

BY CECIL C. PINE,* W2RIX, EX-W7FUQ

• Hams confined to small apartments are an ingenious lot. They have to be if they are to overcome objections to a ham station in the living room — usually the only spot where space is available. In this instance, W2RIX found that an attractive speaker enclosure helped to pave the way. It occupies a minimum of useful space and costs little to build. Connected to the station SX-62, it serves for monitoring the 'phone bands as well as for "hi-fi" b.c. and records.

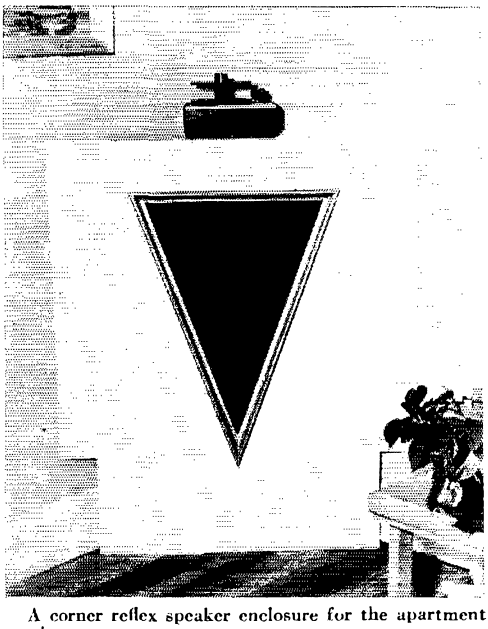
WHILE it is true that many hams are interested in "high fidelity" as a side line, the term is usually thought of as something distinct from ham radio. However, the ham who is confined to a small apartment often finds that it is to his advantage to combine functions. This not only conserves space, but it also sometimes serves as an entering wedge in winning approval for shack space in the living room — so often the only conceivable spot.

Most communications receivers cover the b.c. band, and have fairly decent audio systems, requiring only the addition of a speaker enclosure that will fit in with the XYL's idea as to grace of line and regal decor. As a result of a similar situation, the author soon found himself toying with the idea of building an enclosure that would pass criticism. The job also appealed as a palliative for the itch, that almost every ham gets from time to time, to try something different.

Suggestions for constructing a solid brick enclosure were investigated — a noble thought for a person planning a new home, but of little interest to one who must consider certain rights and privileges of a landlord. Other designs were rejected, one by one, until a final decision was made to try the corner enclosure. This design[1] seemed justified on the basis of material costs, ease of construction and compatibility with existing living-room furnishings.

* Richmond Blvd., Lake Ronkonkoma, L. I., N. Y.

[1] See G. A. Briggs, *Loudspeakers*, British Industries Corp., 164 Duane St., New York 13, N. Y., $1.60.



A corner reflex speaker enclosure for the apartment station.

Material costs for the corner enclosure are reduced by taking advantage of existing walls of the room as integral components of the cabinet. Construction is simplified, since all that is required is a front baffle fitted with a triangular-shaped top. The size of the baffle need only be of sufficient dimensions to enclose the required volume when the unit is placed snugly in the corner. Cutaways on each lower corner of the baffle provide clearance for the baseboard, and also vent the enclosure to the room as required in the bass-reflex principle.

Materials

After deciding on the cabinet design, the next problem was that of selecting suitable material from which to construct the baffle. The material selected must be of high density so as to eliminate resonant tendencies throughout the range of frequencies encountered in high-fidelity reproductions. Moreover, harshness or overtone qualities usually found in slate, marble, metal or other high-density materials should be repressed. Investigation revealed that a front panel of hardwood, such as oak, of an approximate thickness of three inches should embody sufficient density and rigidity to handle the normal power output of a 15-inch coaxial speaker. Since the price of this material was inconsistent with the original requirement as to cost, a search was made for a suitable substitute. Some experimenters had tried a one-inch coating of concrete on the interior of the cabinet. This idea was rejected, because of the difficulties envisioned in properly reinforcing the concrete and ensuring a satisfactory bond between the cement and wood.

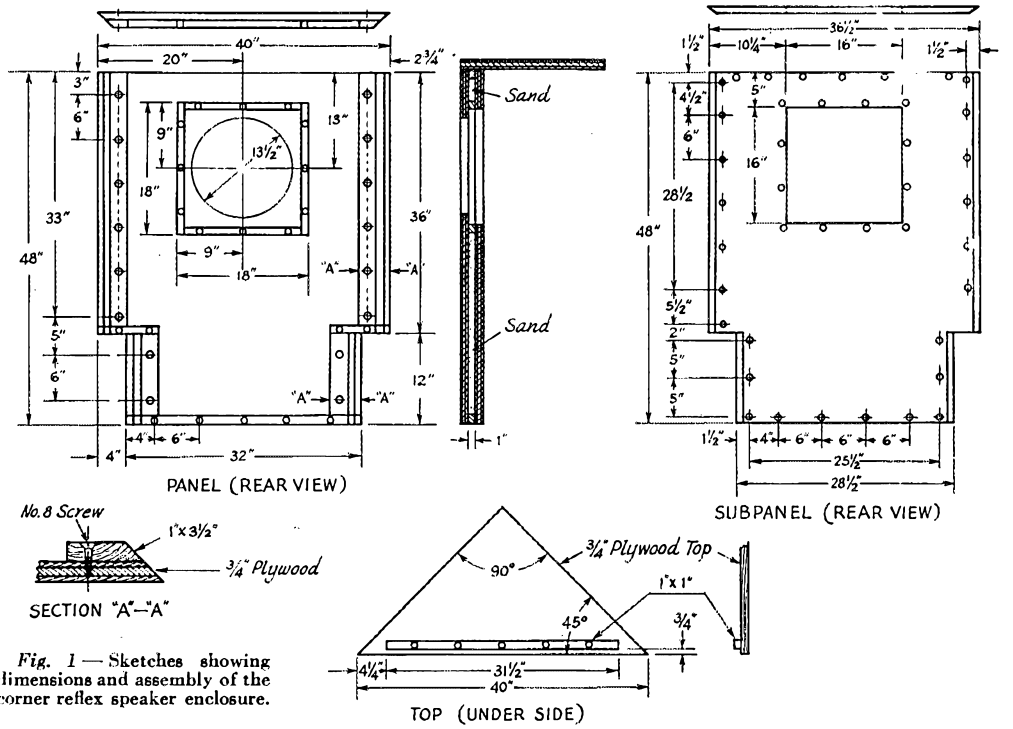


Fig. 1 — Sketches showing dimensions and assembly of the corner reflex speaker enclosure.

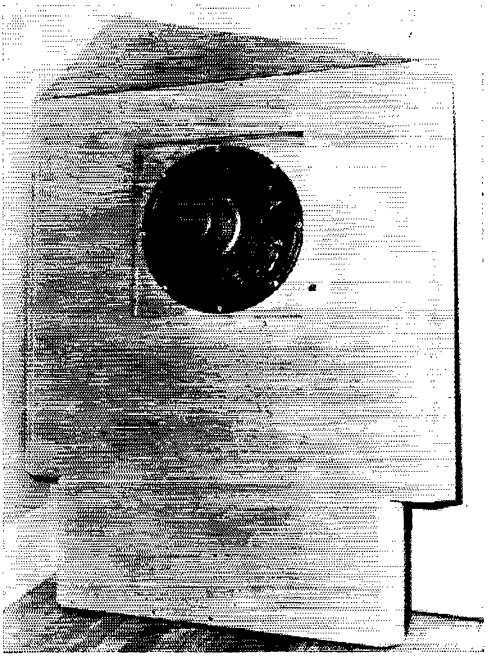
More searching of the literature revealed that a double-walled cabinet, with the intervening space filled with sand,[1] had proved an economical means of obtaining high density. Adapting this means to the single baffle of the corner enclosure appeared to be reasonable. Construction of the baffle was reduced to fabricating two plywood panels spaced one inch apart, with dried beach sand placed between them. The size of the panels was chosen to give the desired volume (approximately 8½ cubic feet) when placed across the corner of the room. A triangular-shaped top of heavy plywood completed the design.

Construction

Construction of the corner bass-reflex cabinet is so simple that anyone possessing a hammer, saw, drill and screwdriver can fabricate the components and assemble them in a few spare hours. Or, for those who are not interested in carpentry, it is possible to have the components made by a local cabinetmaker for a few dollars.

The accompanying sketches give dimensions of panels and spacers. The front panel is fabricated from ¾-inch plywood and is 40 inches wide by 48 inches high. A 13½-inch-diameter hole is cut in the panel, centered laterally and spaced with its center 13 inches from the top. The lower corners are notched out 4 inches by 12 inches to provide clearance for the baseboards and to vent the enclosure to the room. The sides of the panel are beveled at a 45-degree angle to provide a tight fit to the walls when the panel is placed in the corner. The subpanel is also constructed of ¾-inch plywood, and is 48 inches high, but only 36½ inches wide. A square opening is cut in this panel, as shown in Fig. 1. Openings on the lower corners are cut to match those of the front panel. The subpanel is also beveled at a 45-degree angle

(*Continued on page 118*)



Inside view of the corner reflex enclosure. Walls and floor serve as the remaining three sides.

A Steerable Array for 7 and 14 Mc.

Two-Band Beam Using Fixed Elements and Switched Phasing

BY JAMES A. TURNER,* W9LI

• **Here is an antenna system that shows what can be done under less-than-ideal conditions. The signal from W9LI is well-known on both 40 and 20 — this is an account of the interesting antenna system in use.**

THE antenna to be described here is of a type that is new to the amateur bands. It is useful in restricted space and gives good gain and directivity on two bands without elaborate mechanical work.

The writer has been fascinated for a long time by all the pretty pictures in Mr. Smith's pattern book.[1] This book deals primarily with two- and three-tower vertical broadcast arrays, and gives the radiation pattern for every possible configuration, spacing and phasing. There are literally thousands of patterns shown, and it seemed logical to assume that some of them might have an application on amateur frequencies.

The pattern finally settled on as being most useful is bidirectional north and south and undirectional east or west. This is tailormade for the Middle West. For other parts of the country, the whole array could be given a different orientation which would be equally useful.

Here the east-west line of the beam is actually a little south of west and north of east so that to the west it goes between ZL and VK and to the east it centers on southern Europe. The north-south beam goes over South America and Japan. However, the various lobes are broad enough so that for all practical purposes 360-degree coverage is obtained.

After deciding on the pattern, three other requirements had to be satisfied. The feed system had to use coax and had to be simple to set up and adjust. The array had to work both 20 and 40 meters, and directivity and band changing had to be accomplished without the use of relays, coil changing, or any further adjustment other than the initial tuning up.

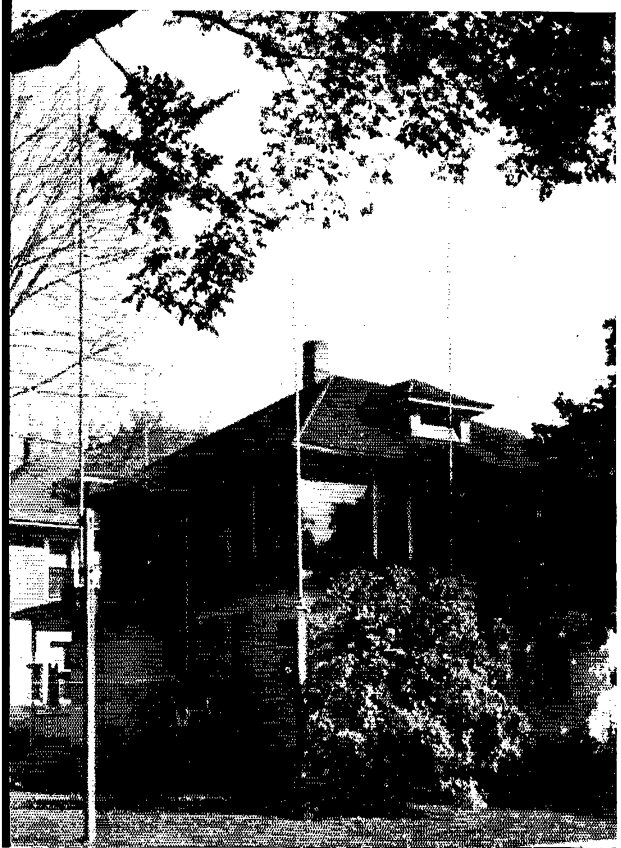
The antenna consists of three 32-foot 3-inch vertical elements mounted along an east-west line. They are made somewhat short to allow for the length of the lead to the tuning networks. The spacing is 17 feet, a quarter wavelength at twenty meters. The bottoms of the elements are ten feet above ground. Each element has a two-band network housed in a box at its base. These are tuned to 20 and 40 meters, so that the elements are voltage-fed half waves on 20 and current-fed quarter waves against ground on 40. The ground system consists of eighteen random length radials.

The directivity is controlled by the phasing and is as follows: twenty meters, north and south, all in phase; east or west, 0–90–180 degrees out of phase, with the signal going in the direction of the element with the lagging current. On 40 meters, the north-south phasing is 0–180–0, and the east-west phasing the same as on 20 meters.

Now to get down to brass tacks as to how all this is accomplished. Referring to Fig. 1, the

* 102 Monroe St., Elgin, Ill.

[1] Carl E. Smith, *Directional Antennas*, Cleveland Institute of Radio Electronics, 4900 Euclid Ave., Cleveland 3, Ohio.



The 40- and 20-meter switchable beam at W9LI uses three vertical elements. A ground system is buried in the lawn, as are the coaxial lines feeding the elements.

tuning of each element is taken care of by what might be called a two-band network. However, it isn't actually that in the sense that the term has

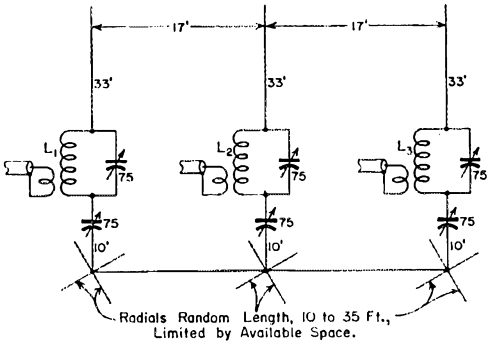


Fig. 1 — The two-band beam uses three vertical antennas mounted along an east-west line. The ground system, consisting of wire radials of various lengths, is buried, as are the coaxial lines running to the shack. L_1, L_2, L_3 — 8 turns No. 14 wire on 2½-inch diam. form. Coupling links are 2 turns interwound at "cold" end.

been used before. Rather, advantage has been taken of the simple characteristics of parallel- and series-tuned circuits.

The parallel-tuned circuit consists of a 75-$\mu\mu$f. 3000-volt variable condenser in parallel with 8 turns of No. 14 wire on a ribbed ceramic form 2½ inches in diameter. The ribs of the form are notched so that ordinarily the wire would be spaced approximately its own diameter. In winding, every other notch was used, so that the winding is double spaced on the form. At the bottom end a 2-turn link was wound in between the other turns. This circuit tunes to 20 meters and the element is voltage fed on that band.

A parallel-tuned circuit is an inductance at frequencies below its resonant frequency, so at 40 meters this circuit is just an inductance. This inductance is connected to ground through another 75-$\mu\mu$f. condenser. Connecting it in this way to the bottom end of the coil has negligible effect on 20, as the bottom end of the 20-meter circuit could be either grounded or ungrounded with no effect in performance on that band. The 75-$\mu\mu$f. series condenser also compensates for the inductance in the 10-foot-long ground lead, and on 40 meters the whole thing becomes a series-tuned circuit between ground and the base of the element. The element is a current-fed quarter wave on 40 meters.

We now have 3 elements each simultaneously tuned to both 20 and 40 meters and each link-coupled to its own 52-om coax feeder. Equal lengths of coax are brought into the shack, and if all three are connected in parallel then all elements are fed in phase.

To vary the phasing to 0–90–180 degrees, two other lengths of coax are added to the original equal lengths. Referring to the *Handbook* formula for quarter- and half-wave matching sections gives 11.5 feet as a quarter wave on 20 meters, 23 feet for a half wave on 20 or quarter wave on 40, and 46 feet for a half wave on 40. These lengths are coiled up in an out-of-the-way corner back of the desk.

Fig. 2 shows a 6-deck 6-position switch. This switch is mounted on the operating desk, and the feeder from each element is brought to it, as are both ends of the three matching sections. The switch adds the matching sections in series with the desired feeders to give the various choices of phasing.

If all three of the original equal lengths of coax are connected in parallel, the elements are all in phase and the beam goes north and south on 20 meters. If a quarter wave (11.5 feet) is added to the center feeder that element is fed 90 degrees out of phase. If a half wave (23 feet) is added to the east element feed, that element is fed 180 degrees out of phase. With this phasing the beam goes east on 20. Changing the half-wave section to the west element reverses the direction.

On 40 meters a half-wave section (46 feet) is added to the center feeder to feed that element 180 degrees out of phase, and the beam goes north and south.

Adding quarter- (23 feet) and half- (46 feet) wave sections on 40 gives the 90- and 180-degree

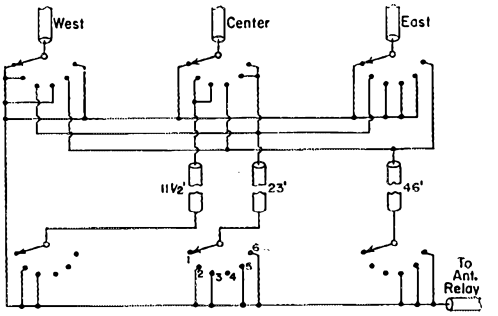


Fig. 2 — Circuit of the phasing-section switching arrangement. The outer conductors are not shown connected, but they are all bonded together.

Position	*1*	*2*	*3*	*4*	*5*	*6*
Direction	20 N-S	20 E	20 W	40 N-S	40 E	40 W

The switch is a 6-section 6-position wafer switch (Centralab P-123 assembly with Type X sections).

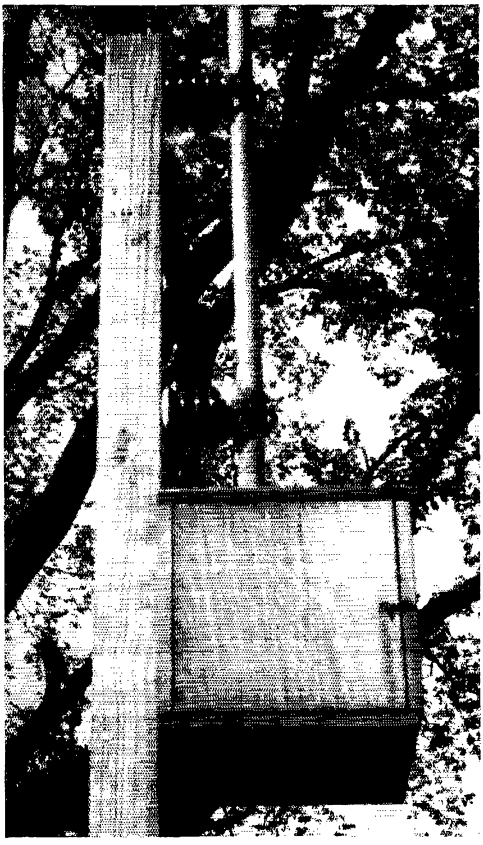
phasing for east and west, just as it does on 20 meters. You will notice that the directivity on 40 is opposite to that on 20. In other words, on 40 the beam goes in the direction of the element with the shortest feeder while on 20 it goes in the direction of the element with the longest feeder.[2]

The question of standing-wave ratio will probably occur to the reader in connection with this feed system. No attempt has been made to measure it. However, there is no change in the tuning of the final tank as the link is moved in to increase coupling so the s.w.r. may not be too bad.

Construction

Each element is of 21ST aluminum and is made up of six 6-foot pieces, starting at 1½

[2] If the theoretical phasings were obtained, this would not happen. However, the tuning of the coupling networks determines the phasing in the elements, and the results of the cut-and-try procedure were as described above.



A close-up of the base of one of the elements, showing the protective housing for the matching section.

inches in diameter and tapering to ⅞ inch in ½-inch steps. The wall thickness is 0.058 inch (17 Stubs gauge) and telescopes perfectly. The sections are held together with self-tapping screws. No guys are used and, although the tops of the elements move quite a little in a high wind, no trouble has been experienced.

Each element is supported on two stand-off insulators on a 16-foot 4 × 4. The stand-offs are two feet apart and the poles are set four feet in the ground. The whole arrangement is very easy to erect, and the elements are so light that one man standing on a stepladder can raise them into place. The stand-offs used here have U clamps through which the elements are slid into place and then tightened down. Undoubtedly, there are other mechanical arrangements that would serve just as well.

Small wooden boxes approximately a foot square are mounted just below each element. These contain the tuning networks. The coax is fed out the bottom of the box and down the pole and then underground to the shack.

The ground system consists of eighteen random-length radials of No. 14 copper wire. Six radials are run out from the base of each pole, and the groups are bonded together at these junctions. The idea was to get as much wire as possible in the ground within the limits of a small lot.

The ground wires and the coax were buried by splitting the sod with an edging tool, and then pushing the wire into the slit. A little watering followed, and within two days all traces had disappeared.

Tuning

If an array of this type is tuned for any one direction its performance in that direction is, of course, better than it is when compromises must be made to allow switching.

A 1N34 crystal diode connected in the center of an 8-foot aluminum-tubing dipole was used as a tuning indicator. Output was taken off through two 2.5-mh. chokes and by-passed for r.f. A pair of wires about a hundred feet long ran to a 1-ma. meter.

In tuning a grounded antenna with such an arrangement, care must be taken to isolate the pick-up dipole from ground or else ground currents may be read instead of field strength. This error led to several weeks of head scratching before the light finally dawned.

The elements cannot be individually tuned and then fed currents with various values of phasing because of the great mutual coupling between them. This is particularly true on 40 meters where the spacing is only ⅛ wavelength.

After many trials as to the best method of tuning, the following system was finally worked out. The pick-up dipole was placed to the west with the antenna switched west, and the center element and west element were tuned for maximum field strength on 20. Then the pick-up was moved to the east, the antenna switched east, and the center element and east element were tuned for maximum. This procedure was gone over several times, to compensate for the inter-

(Continued on page 120)

This impressive array of cables and connectors is the control point for changing the directivity of the beam.

Meet "Junior"—He's No Lid!

Robot Operator Earns 70-W.P.M. Certificate

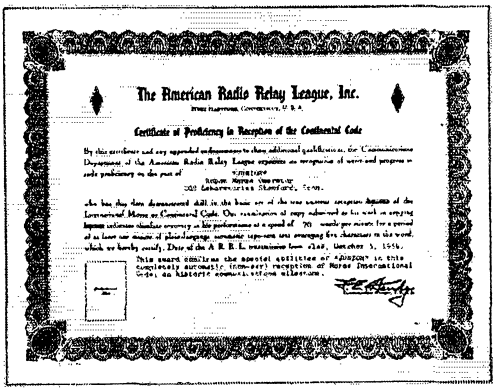
YES, gang, meet "Junior." But don't be misled by the appellation bestowed on him by his "fathers" at the CGS Laboratories, Stamford, Conn. Junior is a man-sized Morse-copying robot, as can be seen from the accompanying photograph. Built into the standard relay rack are scores of vacuum tubes, hundreds of neon bulbs, special memory circuits, power supplies, relays and intricate mechanisms that give the robot the ability to translate up to 600 w.p.m. of International Morse into teletype page printer copy — if such a printer were available.

In tests made recently, Junior easily made perfect copy of 25, 35, 50 and 60 w.p.m. from W1AW. Then came a special run, and Junior copied 70 w.p.m. until the Model 15 teletype printer (designed for 60 w.p.m.) broke down. Copy was checked, and the ARRL Code Proficiency Certificate pictured on this page was issued. In deference to the thousands of hams who have earned this award, the words "by ear" were deleted.

The Morse input to the electronic code-copying robot can be one of three forms: keyed d.c. voltage; keyed audio tone, such as the output of a communications receiver; or the output of a photo-electric scanner viewing an undulated inked tape.

One of the unique functions of Junior's circuitry is the operation to handle figure and letter groups. Morse code does not indicate when a figure group is being sent to permit the upper- or lower-case keys to operate. But Junior, copying behind, determines that a figure group is being sent and immediately generates a pulse to the teleprinter advising it to go upper case. Conversely, after a figure group has been received, the memory circuits generate a letter pulse to advise the printer to go lower case. In addition, the robot electronically and automatically advises the printer carriage to return at the end of each line and feed up for the next line.

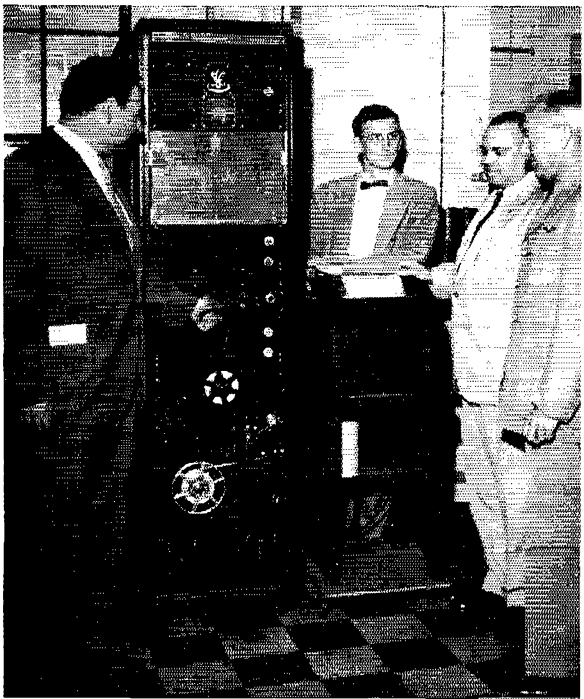
The robot was built to fill the needs of the Royal Canadian Navy, and during the past few months has been observed in operation by representatives of various governments, armed forces, and communications companies. Plans are now under way to give Junior a smaller brother, sporting printed circuits and other miniaturized components.



The American Radio Relay League, Inc.

Certificate of Proficiency in Reception of the Continental Code

Special 70-w.p.m. Code Proficiency Certificate awarded to "Junior" in recognition of his code-copying ability.



Affectionately dubbed "Junior" by its developers, this robot radio operator can convert International Morse code signals from 10 to 600 w.p.m. into pulses to feed a teletype printer. L. to r.: Carl G. Sontheimer (co-author of "The Micromatch," April 1947 *QST*), president of CGS Laboratories; W. Reid Smith-Vaniz, jr., ex-W4IHL, engineer in charge of development of "Junior"; Stanley Wolff, W2HIQ, chief liaison engineer, CGS Labs; Captain N. Lucker, jr., USN.

The Baking Pan Wavemeter

A Multipurpose Instrument for the Hamshack

BY LEWIS G. McCOY,* W1ICP

• Here is a handy little station adjunct that will pay for itself many times over. It can be used to insure that your transmitter is tuned in the band and not to some stray harmonic, it can help in getting the "soup" into the antenna, and it can even be used in adjusting the elements on that 15-meter beam. And, best of all, you can buy all of the parts with a ten-dollar bill and have change coming.

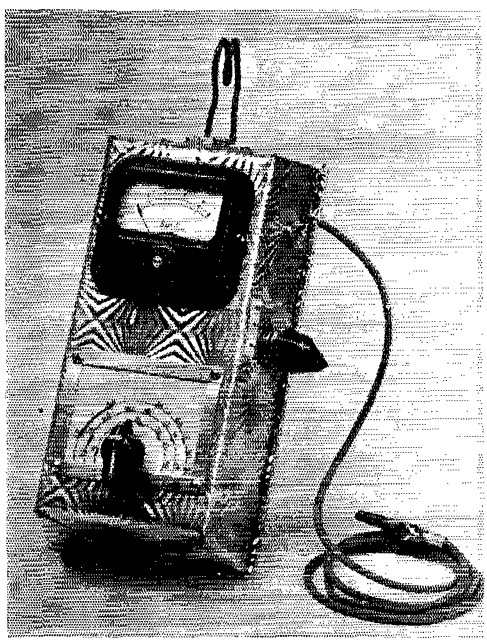
ONE of the handiest gadgets an amateur can have around his shack is an "absorption-type wavemeter." This easy-to-build instrument can be put to more uses than the proverbial Boy Scout knife. What is it? As the name indicates, it is a device used for measuring the wavelength of r.f. energy. Although we talk in terms of frequency these days, we use the term "wavemeter" to describe an instrument like this that gives only a rough approximation of the frequency, and reserve the term "frequency meter" for more precise measuring devices.

Absorption-type wavemeters consist simply of a coil-and-variable-condenser circuit that can be tuned over a fairly wide range, together with an indicating device that shows the presence of r.f. energy. When the wavemeter is brought into an r.f. field, such as exists around the coils and "hot" leads of a transmitter, the indicating device will show maximum when the wavemeter is tuned to the frequency of the r.f. present. Obviously, if the wavemeter is calibrated, it can be used to indicate the "wavelength," or approximate frequency.

How is this useful around the shack? First, and probably most important, the wavemeter will indicate the approximate output frequency of a transmitter. For the Novice who operates on 80, 40 or 15 meters, the value of such an indicating device should be immediately apparent. While it is usually easy to tune up a rig using the plate meter in the output stage, it isn't always easy to be sure that the output is in the desired band. In addition, many Novices operating in the 3.7-Mc. band have learned from FCC notices that their second harmonics near 7.4 Mc. can be strong enough to get them into trouble. With a wavemeter, it is a simple matter to determine if there is a second-harmonic signal getting to the antenna. The meter is coupled to the antenna feed line and then tuned to the region around 7.4 Mc. If there is a strong second harmonic signal going to the antenna, the wavemeter will show it, thus warning the operator to take steps to attenuate or eliminate the harmonic.

Another use of the wavemeter is as an r.f. indicator. For example, many newcomers run into difficulties determining if their antenna system is taking power. The wavemeter can be loosely coupled to the antenna feeders (not the antenna coil) and then the antenna coupler and transmitter tuned to show maximum reading on the wavemeter. If the reading should go off scale, the wavemeter coupling can be reduced to a point where an on-scale indication can be obtained. The higher the reading, the greater the power in the antenna.

When used as an r.f. indicating device, the wavemeter also makes a sensitive indicator for neutralization in r.f. amplifiers. The transmitting chapter of *The Radio Amateur's Handbook* treats neutralization in detail and mentions the use of an r.f. indicating device. The unit shown in Fig. 6–20 of the 1955 *Handbook* is the same type as the instrument to be described here.



Front view of the wavemeter. The bandswitch knob is on the side of the box. The clip lead is connected to the side of the box and is for protection against shock by accidental contacts with "hot" circuits.

Another use for the wavemeter is as a field-strength meter in checking the performance of antennas, particularly beams. It may be that the builder of a beam is aiming for maximum front-to-back ratio, or, on the other hand, just interested in obtaining maximum forward gain. A field-strength meter is a very convenient instru-

ment to use in making such adjustments, as will be described later.

The foregoing are just a few of the many uses for an absorption-type wavemeter. Any sensitive r.f. indicating device is a handy gadget around the shack. One that gives an approximation of the frequency is still more useful. The more you use the instrument, the more jobs you will find for it.

Circuit

Most wavemeters have been built with plug-in coils so that the instrument could cover a wide range of frequencies. Coupling was direct to the plug-in coil in these cases. We elected to make this wavemeter a band *switching* version, with the result that the circuit took the form shown in Fig. 1. An external coupling coil, L_4, is in the circuit in all ranges, while the other coils are mounted inside the "cabinet" with the switch, variable condenser, and other components.

The 1N34 germanium diode rectifies any r.f. that is present, and the resultant d.c. is indicated by the milliammeter.

Construction

The unit shown in the photographs was built in a 20-cent baking pan. The size of the tin is 2 by 3½ by 7½ inches. The meter is mounted at one end of the pan and the tuning condenser at the other end. A pick-up loop projects out from the meter end. The unit can be held in one hand and tuned with the other, and the entire face of the instrument is always plainly in view.

The switch, S_1, is mounted on the side of the box. The coils, L_1, L_2 and L_3, are mounted between the switch terminals and a ground lug on the opposite side of the box. Coil taps are connected to the crystal-diode side of the switch. The cathode side of the crystal (the cathode is plainly marked on the 1N34 crystal) is connected to the + side of the meter. The other side of the crystal is soldered to the arm of the switch that connects to the coil terminals. Excessive heat can ruin a crystal diode, so precautions should be observed when soldering crystals of this type. The lead of the crystal being soldered should

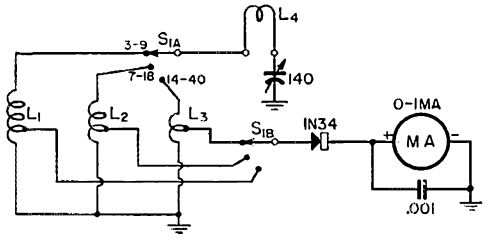
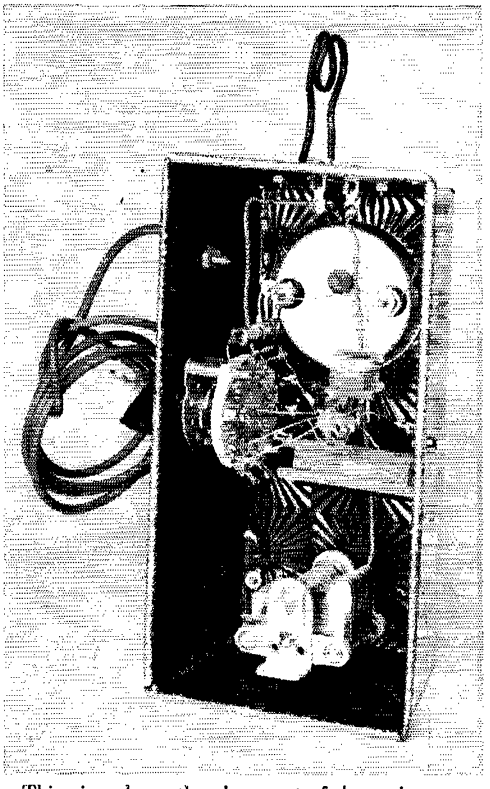


Fig. 1. — Circuit diagram of the absorption-type wavemeter.

L_1 — 56 turns, tapped 18 turns from ground end.
L_2 — 15 turns, tapped 4 turns from ground end.
L_3 — 4 turns, tapped 1 turn from ground end.
(All above coils made from B & W Miniductor stock No. 3008).
L_4 — 2 turns ¾-inch diam., No. 14 or 16 solid wire.
MA — 0–1 milliammeter (Shurite).
S_1 — 2-pole 5-position (3 used) selector-switch (Centralab type 1405).



This view shows the placement of the various components. The leads from the pick-up coil, L_4, to the switch arm and to the stator of the variable condenser are kept as far away from surrounding metal as is possible, to reduce the minimum capacity of the circuit.

be held by a pair of pliers. This will help conduct the heat away from the diode. Also, don't hold the soldering iron to the lead any longer than is necessary to make the connection.

The coils are made from B & W Miniductor stock No. 3008. It is much easier for the builder to duplicate the unit described here by using these ready-made coils than by winding his own. The Miniductor No. 3008 comes in two-inch lengths. Two lengths are needed for the three coils. One length is used for the low-frequency range, and the other can be cut into two coils for the higher frequency ranges. Because the turns are very closely spaced, the turns adjacent to the tap point should be bent in toward the center of the coil to allow space for the tap connections. After the taps are connected, the coils should be examined to make sure that none of the turns are shorted. L_4 is supported by a two-terminal binding-post strip (Jones 17-2).

The clip lead visible in the photographs is a safety precaution. It is attached to a soldering lug mounted on the side of the chassis.

Calibration

If you happen to have access to one, a grid-dip meter is an excellent means for calibrating the wavemeter. The wavemeter pick-up loop, L_4, is

(*Continued on page 122*)

Simple Mobile Selectivity

Sharpening the Car Receiving System

BY DENNEY MOORE,* W6MHP

• Here is a neat trick for improving mobile receiver performance without the necessity for touching either the converter or the car radio. It doesn't cost much to build and you can toss it together in a very short time.

THE large majority of mobile stations use a converter ahead of the normal car radio. The car radio, designed for the reception of music, leaves much to be desired in the way of selectivity. If the selectivity of the car radio is increased by some means or another, it curtails the usefulness of the radio in receiving ordinary broadcast programs. However, there is a simple way out, which adds selectivity for amateur work and retains the "broadcast quality" of the car radio for entertainment purposes. The solution is to add a filter between the converter and the car radio. It offers no particular problems so far as over-all sensitivity is concerned because a converter/radio combination usually has gain to spare.

The conventional mobile receiving combination used here had gain to throw away but intolerably insufficient selectivity. The ten dollars for parts to construct a filter was found to be well spent.

The excellent selectivity with this simple filter was obtained through the use of high-*Q* coils with very loose coupling between them. This filter might be called a "bandpass filter" or "top-coupled filter," operating satisfactorily anywhere from 1400 to 1550 kc. This system has performed very well between several different converters and car radios, and should work equally well with any combination.

The circuit diagram is very simple and no test equipment is necessary to construct and put the filter into operation, as will be seen.

The heart of the filter is, of course, the five coils, their *Q*s and the coefficients of coupling. Each coil is wound on a powdered-iron toroidal core. The cores are known as T1300-O7A and can be obtained from Lenkurt Electric Co.[1] They cost very little.

The coils are supplied dipped in polystyrene coil dope but an additional coating of coil dope should be applied and dried thoroughly before winding is started.

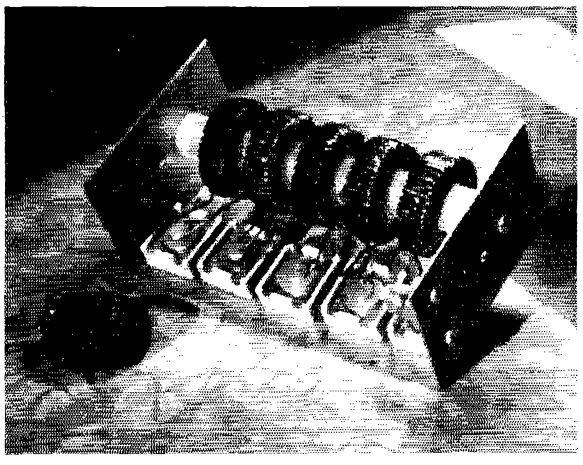
The winding is not difficult but should be done slowly and neatly. A 7-foot piece of No. 18 plain enameled wire is sufficient for one coil (52 turns). The turns should lie snugly on the core and not bulge out. Winding is much easier if the wire is folded to find the center, winding one half of the coil first and then winding the last half. This eliminates pulling a long piece of wire through the center for each turn. The turns will fill the inner side of the core snugly while spacing will be required on the periphery.

The 52 turns having been wound on the core, the two ends will be adjacent and may be twisted lightly to prevent loosening. The coil assembly can then be dipped in polystyrene coil dope. The dipping will secure the turns and add protection to the coil.

There may be some slight variation of inductance among the coils but this is insignificant in the operation of the filter.

The coils shown in the photograph were checked

* 548 Madison Ave., Apt. 1, Redwood City, Calif.
[1] 1105 County Road, San Carlos, Calif.



This filter connects between converter and car radio to add selectivity to the mobile receiver system. In this view, the coils have been cemented to the polystyrene rod but have not yet been connected to the tuning condensers. The unmounted coil is an extra one.

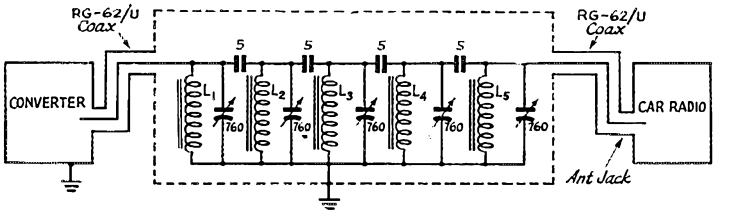


Fig. 1 — Wiring diagram of the filter, showing the connections to converter and car radio. The 5-$\mu\mu$f. condensers are zero-temperature-coefficient ceramics; the 760-$\mu\mu$f. trimmers have a range of 190 to 760 $\mu\mu$f. (Arco No. 305). The coils are described in the text.

on a Q meter and found to possess unloaded Qs of from 250 to 300. This amount of Q is sufficient to straighten out your mobile selectivity problems. The Q measurements were made at 1500 kc., and the capacitance required to resonate the coils was 450 to 600 $\mu\mu$f. Coils have been wound by other amateurs in this area without taking Q measurements and the results were excellent, so don't worry if you lack access to the measuring gear.

The coils having been dipped and dried, the next step is assembly of the filter. The most satisfactory solution to date is shown in the picture. A polystyrene rod supports all five coils. The poly rod fits smoothly through the centers of the coils, and the coils are cemented to the rod with coil dope. Equal spacing between the ends of the box and adjacent coils should be maintained to keep stray coupling to a minimum. A larger box can be used to house the unit, if greater spacing between coils is desired.

The picture shows the mounting arrangement of the mica compression capacitors and the coil assemblies. The jack accepts the output of the converter while the output of the filter is taken to the antenna jack of the car radio through a piece of low-capacity RG-62/U coaxial line. An important point is to keep the capacity between the input and output ends of the filter to an absolute minimum, for this type of stray coupling will reduce the selectivity.[2] The wiring of the filter is straightforward.

Tuning of the filter is not difficult. Close up the box and insert the filter between the converter and the car radio. Advance all gain controls full on and, unless your luck is better than mine, you will hear nothing until a couple of the five coils get close to resonance to the output frequency of your converter. Continue tuning the five mica condensers (no special sequence) for maximum response while reducing the gain controls as is necessary. The trimmers should be gone over two or three times to insure best possible peaking.

A word should be said concerning effects of the coupling condensers between the coils. While 5 $\mu\mu$f. each was used here, some might want to decrease to 4- or 3-$\mu\mu$f. coupling condensers, which will definitely increase the selectivity at a sacrifice of some gain. Either way the dial of the converter becomes sharp and clean instead of broad and cluttered.

[2] If working from a converter with low-impedance output, the selectivity can also be improved by tapping the input lead down on L_1, to avoid loading effects on the first tuned circuit.

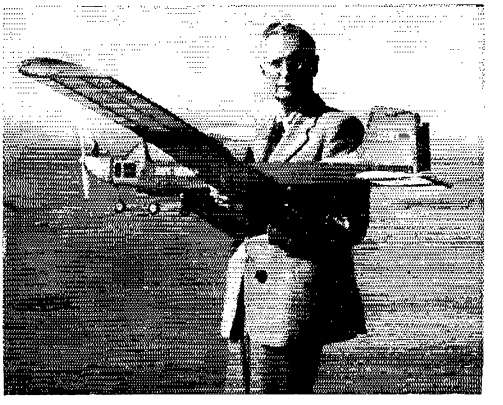
Strays

Amateurs aided in law enforcement in southwestern Minnesota and eastern South Dakota last November, playing a leading role in the capture of a mental patient who had staged shotgun holdups. WØBGJ, brother of the man who spotted the holdup car near Sioux Falls, distributed the key information to some fifteen other amateur stations to be reported to local police and sheriff offices. The calls of other amateurs known to have participated: *WØs* OXC BQS EXX UNJ UYL QIQ BHA SWB LUX LIQ.

—···—

Breaking records is nothing new to Hilton L. O'Heffernan, G5BY. He's been at it since the '20s, compiling a list of "firsts" and records that would fill this page. The latest is a new World Duration Record for flight of radio-controlled powered model aircraft, 2 hours, 31 minutes, 20 seconds, recently accepted by *The Federation Aeronautique Internationale.*

The model has a 5-foot wingspread, and is powered by a Mills 1.3-c.c. diesel engine. Its all-up weight is 61 ounces. The control frequency is 26.96 Mc. The record, which bettered the previous mark of 1 hour, 40 minutes, 35 seconds, also set in England, was made on October 7, 1954.



Hints and Kinks For the Experimenter

SIMPLIFIED KEY LEVER FOR THE "TUR-KEY"

THE key lever shown in Fig. 1 is a simplified version of the one designed by W2IMU for use with his "Tur-Key" — an electronic keyer described in *QST*, September, 1954. The new lever does have a few mechanical disadvantages not

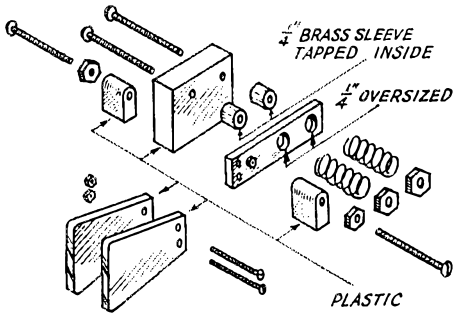


Fig. 1 — Key lever suggested by W2CQB.

associated with the previous job, but its simplified construction should appeal to constructors who have not previously tackled a job of this nature. Figs. 4 and 5, page 15, September *QST*, will supply specifications for the bolts, nuts, springs, plastic blocks, etc., that are used in the new model.

— *Bob Brandt, W2CQB*

TRAINING AID FOR THEORY INSTRUCTION

IN teaching theory to prospective hams, the writer uses a specially-prepared schematic of a typical Novice transmitter. The diagram is drawn on a large sheet of oilcloth which can be rolled up for carrying or storage. The circuit is drawn in black on white material because the sharp contrast of this color scheme presents the circuit in a lucid and impressive manner. In labeling the chart, all components are identified by standard circuit symbols.

Those who wish to make one of these chart-type schematics should obtain a large piece of white oilcloth (about 26 by 30 inches) and some black enamel paint. This type of paint is available in small quantities and may be applied to the white background with a small camel's-hair brush.

When drawing the circuit, leave enough room at one end of the chart so that it can be attached, without disfiguring the schematic, to a cardboard tube. The tube serves as a support for hanging the chart and will also protect the oilcloth when it is rolled up. Frequently, a tube can be obtained from the oilcloth dealer. A second tube, one having a diameter large enough to fit over the rolled-up chart, makes an ideal carrying case for the schematic.

The chart-type diagram is really a great aid in presenting simple theory in *black and white* to Novice candidates and most certainly helps in teaching them how to interpret the radio symbols most commonly used.

— *Carolyn J. Hull, W2YCX*

GRAPHITE AS A LUBRICANT

POWDERED GRAPHITE, obtainable in tube form from most auto stores, makes an ideal lubricant for panel bearings, rolling contacts of rotary inductors, and other control mechanisms that become squeaky or binding after a period of use. Graphite is also a good conductor and therefore will not adversely affect the operation of a circuit if, during application of the lubricant, it is allowed to make direct contact with capacitors, coils, etc.

— *Wm. C. Martin, W6PLK*

'PHONE-C.W. SWITCHING WITHOUT RELAYS

I HAVE BEEN using the low-voltage shown in Fig. 2 to provide 'phone-c.w. switching without relays. Either the positive or the negative

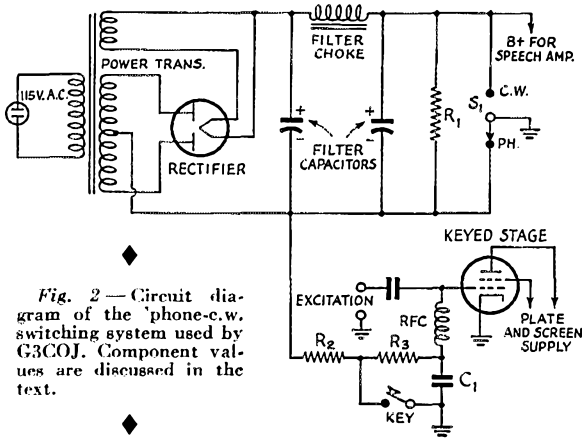


Fig. 2 — Circuit diagram of the 'phone-c.w. switching system used by G3COJ. Component values are discussed in the text.

side of the power pack may be grounded by the s.p.d.t. switch, S_1. If the positive side is grounded, a negative voltage for grid-block keying of the keyed stage is made available and, at the same time, plate voltage is removed from the speech amplifier. If the negative side of the supply is

grounded, the positive output voltage from the supply is applied to the speech amplifier and the keyed stage is turned on without need to short the key. In the 'phone mode of operation, the grid-leak resistance for the r.f. stage is somewhat larger than the normal c.w. value, but this is not usually a serious matter.

The values for components C_1, R_2 and R_3 will be determined by the type of tube that is being keyed. Further information on this part of the circuit will be found in the keying and break-in chapter of the ARRL *Handbook*. R_1 of Fig. 2 is a conventional bleeder resistor.

Notice that both sides of the power supply must be isolated from ground (prior to the closing of S_1). Therefore, if electrolytic smoothing capacitors are used in the filter, their cases must be adequately insulated, as they may have quite a large negative voltage on them.

— *Brian Bower, G3COJ*

THE "MONOCLIPPER"

THE MONOCLIPPER — so called because it employs the circuitry of both the Monitone and the Clipper (see ARRL *Handbook*) — is a unit that was built here at W6ICB. Fig. 3 will be recognized as a combination of the circuits appearing as Figs. 5-38 and 8-12 of the '54 *Handbook*, plus a Type 6AQ5 audio amplifier. The audio amplifier was added to assure adequate output for speaker operation.

An old a.c. radio chassis was used as the base for the Monoclipper. The power supply and the audio-amplifier circuits of the broadcast set were left intact and then reused as part of the new set-up. The monitor and the clipper circuits were mounted on the b.c. chassis in the space originally occupied by the r.f. components for the receiver. The actual placement of the new parts and the wiring of same are not especially critical so long as the r.f. input section to the monitor is kept away from the rest of the circuit.

The oscillator section of the Monoclipper is different than that of the Monitone in that the full output of the neon oscillator is used. With a tapped-down output circuit as originally used, the output was too low for speaker operation.

The finished product is equipped with a masonite panel and is wired to the receiver, the speaker and the 'phones as shown in the lower section of Fig. 3. In this part of the circuit, S_1 selects the source of output — either the receiver or the Monoclipper — and S_2 in turn feeds the output to either the 'phones or the speaker.

When operating the Monoclipper it is advisable to adjust the output of the neon oscillator by means of R_1 and to employ R_2 as the audio gain control. The receiver audio gain control should be adjusted for the desired clipping level. After the initial adjustment of the entire circuit, it is usually possible to leave the receiver control and R_1 alone and use only R_2 as an adjustment.

— *Don Lafferty, W6ICB*

MULTIBAND TANK AS A RECEIVING ANTENNA TUNER

RECENTLY, while spending a brief vacation at a new QTH, I found myself with a few idle minutes and no ham gear ready for operation.

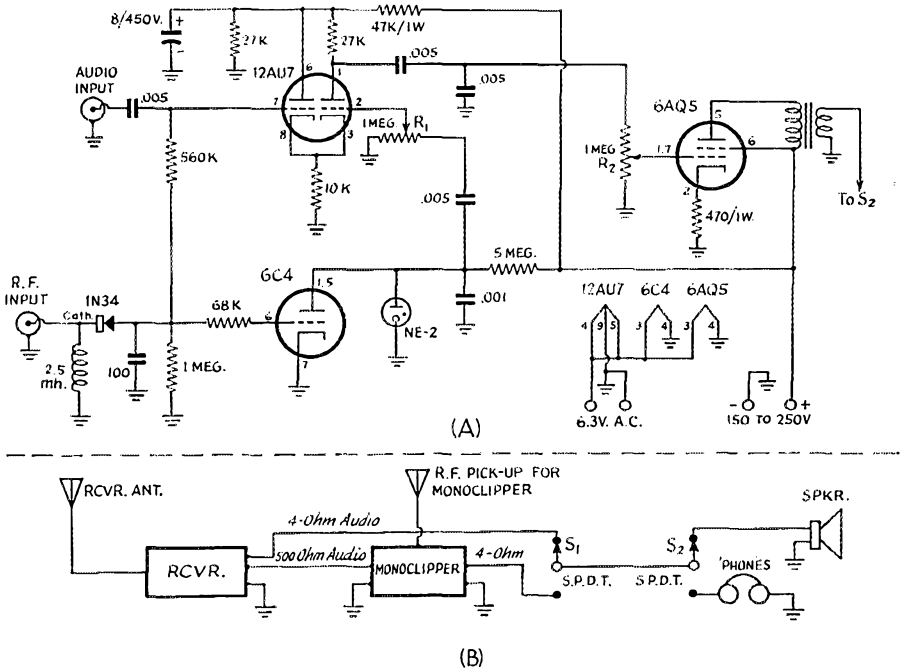


Fig. 3 — (A) is the circuit diagram of the Monoclipper; (B) shows a suggested method of connecting the unit to the receiver, speaker, and 'phones.

Because there was not sufficient time for setting up a complete station, I decided to settle for just plain listening-in. Scraps of 300-ohm Twin-Lead provided material for a hastily-constructed folded dipole that resonated a megacycle or two above the 28-Mc. band and the receiver was soon in operation. At least, a few signals could be heard above the high noise level that prevailed.

It was soon reasoned that the receiver needed help in the signal-to-noise department so thoughts turned toward an antenna tuner. The first thing spotted in the junk box was a National MB-40 tuner and the idea of using it for antenna matching was born then and there. A three-turn link, wound in between the two high-frequency inductors of the tuner, was connected to the 300-ohm feeder and, of course, the regular output coil was connected to the receiver input terminals.

With the coupler in place and the receiver back in operation, I was pleasantly surprised at the increase in the number of signals that could be heard and at the boost in strength of the few signals that had been tuned in previously. A few quick checks indicated that the 28-Mc. signals came up about 3 S points when the tuner was employed. Similar tests at the lower frequencies showed a gain of 5 to 8 S points when the MB-40 was used between the aforementioned antenna and the receiver.

— *Bob Barth, W6BSX*

SERVICE NOTE FOR THE TBS-50D TRANSMITTER

In servicing several Harvey-Wells TBS-50D transmitters used for mobile operation we have come across a condition that may have caused some of the ham fraternity a bit of concern. This model has a high-gain preamplifier and the several units that we at K-W Engineering Works have had opportunity to work with have shown a tendency to develop audio feed-back. The owners of the units did not recognize the difficulty and complained of receiving reports of low modulation.

The simplest and most effective cure that we have found for this condition is the installation of a strap from Terminal 6 (500-ohm) to Terminal 2 (ground). The other end of the 500-ohm winding (Terminal 7) should be left floating.

For those interested in checking the performance of their TBS-50D audio systems, it should be mentioned that the presence of feed-back is best detected with an audio output meter connected across the 500-ohm terminals (6 and 7) of the unit.

— *H. Charles Kaetel, W9SNK*

LINK-COUPLING TO THE GRID-DIP METER

Although this idea may be "old stuff" to many, it is a new and handy stunt here at W9AA.

In putting some new coils in a bandswitching transmitter, it was found desirable to check their frequency coverage. Unfortunately, there was no way to get at the coils with the meter without disassembling the rig. The solution was link-coupling. I made a flexible link out of a piece of 300-ohm Twin-Lead about 15 inches long with a single-turn loop at each end. The exploring end has a loop about two inches in diameter and the other end has one just big enough to slip over the coil of the grid-dipper. By opening up a small crack in the shielding, it was possible to maneuver the inner end of the link into position against the coil to be measured and the meter then performed just as well as though it were coupled in the usual manner.

Twin-Lead is ideal for this purpose as it is stiff enough to be manipulated readily from the outside but can be bent at any angle necessary to reach the most difficult location. On the lower frequencies, two or more turns at each end of the link may be needed to provide sufficient coupling.

— *Cyrus T. Read, W9AA*

S.S.B. ADAPTER CONNECTIONS FOR THE HRO-60

Since n.f.m. operation is seldom if ever used these days at W1HRC, it was decided to employ the n.f.m. adapter portion of the HRO-60 selector switch as a means of cutting in a single-sideband adapter. The required modification to the receiver is not at all difficult to complete and the step-by-step procedure is as follows:

Remove the plug-in n.f.m. adapter and then extend the i.f. tap on Pin 4 of the n.f.m. socket to idle Pin 3 of the Select-o-ject socket. Use coaxial cable for this lead. Add a coax lead between the audio-input terminal, Pin 5, of the n.f.m. socket and idle Pin 4 of the Select-o-ject socket. Then, by using an octal plug to terminate the input and output connections of the single-sideband adapter, and by adding a strap between Pins 1 and 5, it only becomes necessary to connect the shields of the input and output coaxial lines of the adapter to either Pin 2 or Pin 6 of the plug. The adapter is cut in or out of the receiver at will, using the n.f.m. position of the receiver switch to put the receiver in the s.s.b. position.

On the circuit diagram in the HRO-60 manual and also in Sams' *Photofact*, Pin 3 of the Select-o-ject socket is shown as being connected to regulated 105 volts and Pin 2 is shown as idle, but when the work was started it was found that in my particular receiver Pin 2 was grounded and Pins 3 and 4 were idle. Since power for the s.s.b. adapter was to be taken from the HRO-60 itself, it was felt that it would be more desirable to use Pin 2 on the Select-o-ject socket for grounding the shields of the adapter coaxials and Pin 6 to carry the grounded supply leads. If it is found that a receiver follows the published schematic, Pin 2 can be substituted for Pin 3 in the above description and Pin 6 used to carry all the grounds.

— *Clayton C. Gordon, W1HRC*

(*Continued on page 128*)

• Recent Equipment —

The Viking Kilowatt

ORDINARILY, when a piece of new manufactured equipment is described in this section it suffices to show photographs of the equipment by itself. In the case of the new Johnson Viking kilowatt amplifier a picture of the bare equipment would convey only half the idea. Unlike most radio gear, this amplifier unit is planned for coördination with the entire remainder of the station — mechanically, operating-wise, and decoratively. Its construction, as a result, is a considerable departure from the conventional rack or cabinet style.

The complete amplifier unit, including r.f. stage, Class B modulator, power supply and controls, is contained in an enclosure approximately the same size as one drawer section or pedestal of a standard office-size desk. The amplifier pedestal can, in fact, be used as part of a desk, and a suitable matching drawer pedestal and top are available. The idea of building a transmitter, or part of one, into a desk pedestal has probably occurred to many amateurs; some, like the writer, may actually have tried it and found that it has its disadvantages when applied to an ordinary desk — controls come in an awkward place, for normal seating position; dials and meters are hard to read without acrobatics; and the equipment is hard to get at when in need of servicing. The Johnson people appear to have the answers on these points.

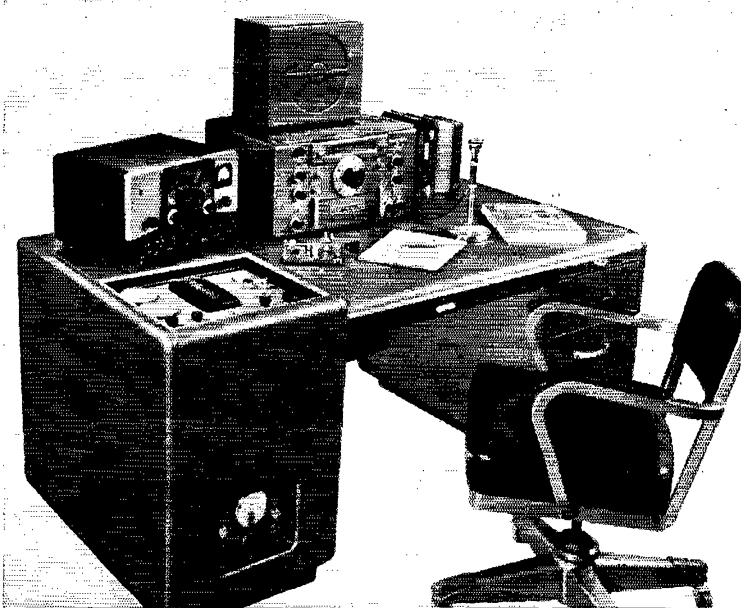
In the Viking Kilowatt all the frequently used operating controls and indicators are on a panel set into the *top* of the pedestal, where they are easy to reach and are plainly visible. (One neat trick is that the meters are set at a slight angle so that the operator sees them face up from the normal seating position.) When the amplifier is not in use, the control panel can be covered by a metal panel fitting flush with the top of the pedestal; this is stored in a slot at one end of the control area during station operation. The top control panel provides all the usual functions such as amplifier tuning, band changing, and metering of amplifier and modulator currents. Less-used controls, such as the filament switch, mode switch (c.w., a.m., s.s.b., etc.) and indicators such as pilot lights and the plate voltmeter which do not call for continuous observation are on a small inset at the bottom front. This can be covered by a sliding panel when the set is not in use.

The problem of accessibility is nicely solved by mounting the entire unit on a frame that slides out of the pedestal on ball-bearing rollers. The modulator and power supplies are available when this is done. The r.f. unit, which is separately shielded, is plug-in and can simply be lifted out after the coax r.f. input and output plugs have been detached, since all power connections are through banana plugs and jacks.

Circuit Features

The r.f. amplifier uses two 4-250As in parallel and the modulator has a pair of 810s in Class B. Less than 30 watts r.f. driving power is required for a.m. operation and the modulator driving power needed is under 15 watts. Both can be supplied without difficulty by a small transmitter such as the Viking Ranger shown in the photograph of a typical complete assembly.

The paralleled 4-250As work into a pi-network plate tank circuit capable of matching nominal 50- to 500-ohm loads with a range of variation for compensation of load reactance. Mechanically, it is a high-power version of the arrangement used in the Viking II, having a rotary



In one sense, the Viking Kilowatt takes up no room in the station because it simply substitutes for one pedestal of a desk-size operating table. Ready for connection to an antenna and a low-power exciter (r.f. and audio) it will operate at a kilowatt input on either c.w. or a.m. and is set up for the s.s.b. peak envelope power output that a pair of 4-250As is capable of giving at 2500 volts.

variable inductor (one of the Johnson high-power units) geared to the tank condenser so that both L and C are varied simultaneously. Two tapped inductors, with link input, are used in the grid circuit to give a parallel-tuned tank. Both grid and plate circuits have continuous coverage from 3.5 to 30 Mc.

The general layout of the amplifier is shown in one of the photographs. The two tubes sit on a small chassis which contains the grid tank condenser and associated grid-circuit components as well as a blower for forcing air through the tube sockets. The main chassis (vertical in the actual installation although shown horizontal in the photograph) has the plate tank circuit mounted on it, and its underside is divided off into compartments housing, respectively, the filament transformer and supply-lead harmonic filters, the grid tank coil, the output capacitors of the pi-network plate tank, and a blower for cooling the plate seals of the 4-250As. Meter leads are filtered, and the meters themselves are in a box shield mounted on the back of the control panel. A perforated-metal cover fits over the unit to complete the shielding.

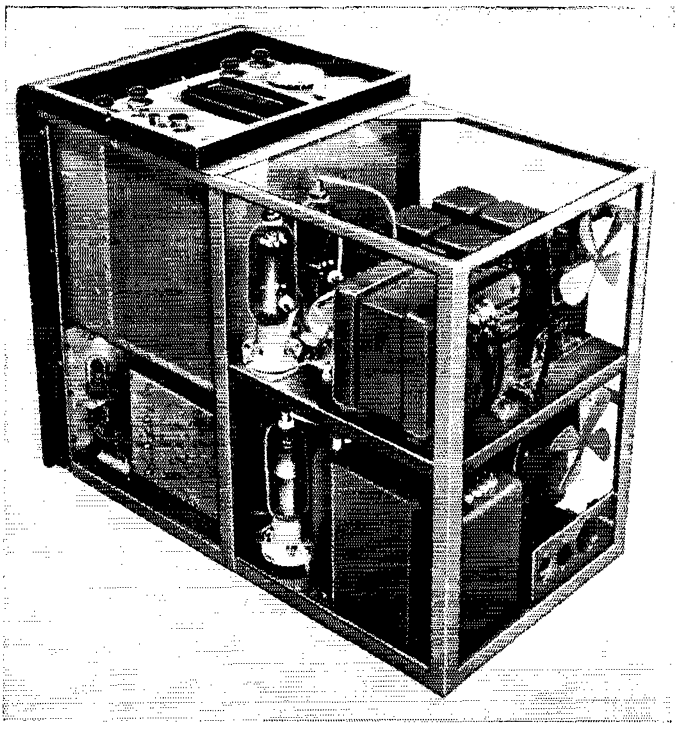
The modulator is designed for voice work and has flat response between 200 and 3500 cycles. Its plate load is adjusted so that saturation occurs in the plate circuit at the 100 per cent modulation level with a kilowatt input to the modulated stage, to minimize overmodulation.

Three power supplies — plate, screen, and bias — are incorporated in the amplifier assembly. The plate supply, with 872A rectifiers, delivers 2500 volts at over 700 ma. This supply uses a single-section choke-input filter, and in addition to a heavy bleeder it is also continuously loaded during all types of operation by the static plate current of the 810 modulators. The comparatively large static load and low series resistance help stabilize the voltage for both s.s.b. and c.w. operation. A separate low-voltage supply, using VR tube regulators, is provided for the 4-250A screens. The grid-bias supply operates with a large bleed current (150 ma.) to give good regulation of Class B modulator and Class B r.f. (for s.s.b.) bias. Each is controlled by a potentiometer. The power system operates from nominal 230-volt 50-60-cycle input.

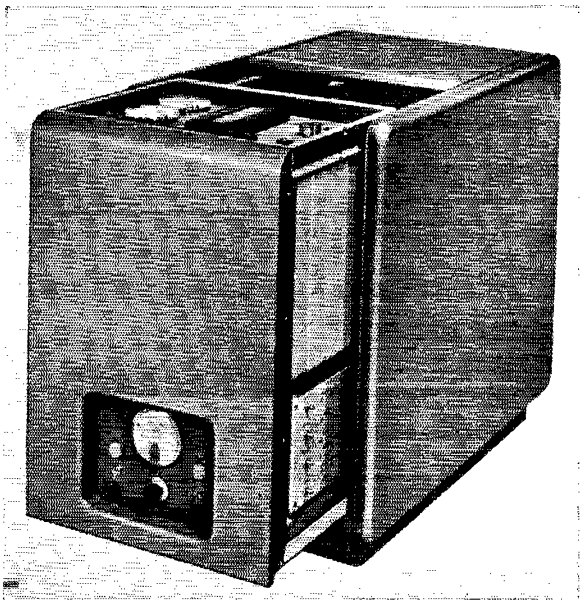
Controls and Protective Devices

The main a.c. switch, which turns on the filaments and also energizes a rear receptacle through which power can be supplied to an exciter and other equipment, is a lock type, key operated, and power therefore cannot be turned on accidentally or by persons not having a key. This switch is on the lower panel. The plate switch is on the main control panel.

There are five types of operation available with the mode switch: single-sideband, a.m. high power, a.m. low power, c.w. high power, and "tune," which is also a low-power c.w. position. The high-power positions provide a kilowatt input and the low-power positions about 250 watts. Bias, screen, and plate voltages are shifted appropriately by a relay in these two power positions. In the s.s.b. and c.w. positions another relay short-circuits the modulator grids and also the secondary of the modulation transformer.



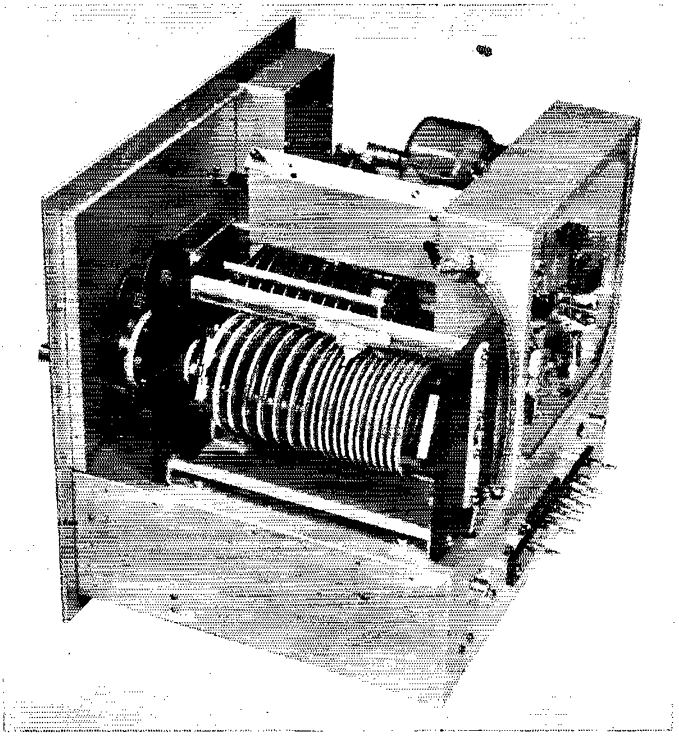
Modulator and plate power supply occupy the rear section of the frame. The panel at the lower rear corner has the power and external control receptacles mounted on it.



The amplifier slides out of the pedestal enclosure for ready accessibility. The entire unit is mounted in a steel frame having ball-bearing rollers. Bias settings are controlled by the potentiometer shafts on the panel at the lower right.

Primary power is relay controlled (by the filament switch) as is also the plate power. The plate relay can be operated from a remote point through socket connections provided at the rear of the unit. The same socket also contains contacts for audio driving power. The plate supply is additionally controlled by a time-delay relay, to prevent applying plate voltage before the filaments are up to operating temperature, and for additional protection there is an overload relay, actuated by the r.f. amplifier plate current. This can be electrically reset from the control panel.

It will be observed in the nside view of the assembly that there are two cooling fans near the power equipment (these are in addition to the two used for cooling the r.f. tubes). The lower one pumps cool air in and the upper pumps the warmed air out, so that a steady flow of air through the equipment is provided. — *G. G.*



The r.f. section without its shield cover. This is a plug-in unit that can be lifted out of the frame in case servicing is necessary. It is shown on its side in this view, the panel (at the left) being the top in normal installation.

QST – Volume II

*Foreword to Sumner B. Young's (WØCO) Index**

THIS Volume began with the December, 1916, issue. War caused a temporary suspension of publication after the September (1917) number had been distributed.

Tuska's postcard announcing the sad news was dated October 6, 1917, and read (in part) as follows:

. . . The cause for the discontinuance is that the Editor is going into the Service, and he cannot find anyone who will put up the money and also the work. The Editor has had to put up both and they are necessary. It is a fact that since we were closed up, it has taken more money to run *QST* than the wireless amateurs of the country will supply. "Yours truly" has always had confidence that all he put in would some day come back, but he cannot find any one else who is willing to take the financial chances and do the necessary work in addition.

Therefore we discontinue and proceed to take our crack at the Germans. As soon as amateur wireless braces up enough to support a magazine, the Directors of the ARRL will see to it that *QST* is republished. In the meantime, all unexpired subscriptions will be carried forward on the books. . . .

In May, 1919, the League sent out a small printed "Special Bulletin" of 8 pages, which was called a "midget issue of *QST*," but which was really no part of any Volume of the magazine. It solicited membership in the League, and asked the amateurs to buy ARRL bonds bearing 5% interest, "to be retired within two years' time from income derived from membership dues." [1] On page 6 of the pamphlet, Mr. Maxim stated that $7500 was needed, to "establish a headquarters' office, to hire and place in this headquarters a paid Secretary, and lastly, to provide the funds to reorganize our old membership and bring in new members." He further disclosed that more than $2500 of the loan had already been raised, and that a total of only $7500 in bonds would be sold.

The money was raised. The League bought *QST* from Tuska's publishing corporation, and engaged K. B. Warner as paid Secretary of the League and Editor of *QST*. Then, in June and July of 1919, the remaining two numbers of Volume II were published. The first issue of Volume III was the August (1919) number.

For a review of the ten pre-War numbers of Volume II, see Tuska's article at page 24, December 1940.

Volume II contains some interesting and significant items (about which we shall speak, in due course); *and at least two "all-time-classic" examples of amateur wit and humor:* The Old Man's story on "Rotten QRM," [2] and Irving Vermilya's autobiographical narrative called "Amateur Number One." [3]

In the December (1916) issue, Mr. Tuska said, in an editorial celebrating "*QST*'s First Birthday," that the magazine had been well-supported by the League's membership, and that it had been enlarged and improved, in consequence.

Evidently some startling improvements in amateur communication had also been taking place, for at page 20 of this same December issue, station 8NH (Mr. and Mrs. Candler, St.

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* "*QST* — Volume I," appeared in October, 1954, QST, page 40.

[1] See page 1 of the Special Bulletin. This pamphlet's contents included a leading article called "Getting Together Again"; and also items headed "Uncle Sam's Amateurs," "The Busted Radio Bill," "New Developments," "*QST* Again," "Rotten Rusty" (by "The Old Man"), and "ARRL Bonds." An application blank, and a cartoon by 8ADU showing a ham building a station, completed the document.

[2] 8 to 10, 35, January 1917. This was reprinted in the "Silver Anniversary" number of *QST*, at 25 to 27, December 1940.

There were ten "Rotten" stories by "The Old Man" in Volume II. I think his second-best was "Rotten Ground-Leads," found at 11 to 13, December 1916. All ten were plenty funny.

[3] 8 to 12, February 1917; and 10 to 15, March 1917. I wish the present Editor of *QST* would reprint this story, by Vermilya, for the edification of the present generation of hams.

In connection with the main story, see the letter of Geo. T. Droste, at 29, May 1917, and Vermilya's reply, at 24, August 1917. In Volume IV, see Vermilya's letter to S. W. Dean, at 48 to 49, August 1920; and also his letter to the Editor ("The 'BD' Mystery"), at 59 to 60, April 1921.

After World War One, Vermilya operated a famous amateur station, at Marion, Massachusetts, where he was an Asst. Shift Engineer at the big long-wave station, WSO. Its Alexanderson alternators lacked dramatic appeal so "VN" operated a big spark set at 1HAA. For a description, see Volume IV, at 35 to 36, October 1920. The station later became 1ZE, and operated on 200, 250, and 375 meters. See "Strays," 53, July 1921. Also, see 36, July 1921 (Entwistle's Report).

Vermilya was a late convert to c.w. On this, see Volume V, at 15, October 1921, where Warner read to the National Convention, at Chicago, on "C.W. Night," two letters from him, "in which the latter in characteristic style took careful aim and endeavored to shoot c.w. off the amateur map."

Once Vermilya *did* get over to c.w., he made up for lost time. 1ZE was heard in Great Britain during the Second Transatlantics; and his code words (assigned to him, during those Tests) were correctly copied there. See Volume V, at 35, April 1922.

Mary's, Ohio) published a list of "Calls Heard," which contained stations from every U. S. district except the Sixth.

In the early months of 1917, further indications of expanding amateur communication ranges appeared in print. For example: Clarence F. Bates (9ADL, Milwaukee, Wisc.) published a list of "Calls Heard" from which only Fourth District calls were missing[4]; and finally 9ZN (R. H. G. Mathews, Chicago) submitted a list on which stations from all nine Districts were represented.[5]

The relay lines early in 1917 began to show signs of improved range on wavelengths between 200 and 300 meters.[6] An undated letter from Willis Corwin (9ABD, Jefferson City, Mo.), published at 42 to 43, March 1917, shows that a transcontinental relay message could have been handled between 2AGJ, 9ABD, 9ZF, and 6EA, one Saturday night (exact date not given).

The very next issue of the magazine contained the story of the first "transcons":

On the night of January 27, 1917, the great event was successfully accomplished. A message from a citizen on the Pacific Coast was released to a citizen on the Atlantic Coast. In fact, there were three of them which came through all at once. The first one was from Seefred Bros. at Los Angeles, 6EA, to Hiram Percy Maxim at Hartford, Conn., 1ZM, president of the ARRL. The second one came from Lindley Winser of Bakersfield, Calif., to C. D. Tuska, Hartford, Conn., secretary of the ARRL. The third one was another from Seefred Bros. to Mr. Maxim.

This marks the first real amateur radio communication with a definite address. We are told that broadcast messages have been put across before, but it is an altogether different thing to get something across by luck, trusting to any station who may happen to hear it, and to handle a message to a definite address through definite relay stations.

The fortunate stations to go down in radio history as the ones handling the first Transcontinental message were,

Seefred Bros., Los Angeles, Calif., 6EA.
Capt. E. A. Smith, Denver, Colo., 9ZF.
Willis P. Corwin, Jefferson City, Mo., 9ABD.
Kenneth Hewitt, Albany, N. Y., 2AGJ.
Hiram Percy Maxim, Hartford, Conn., 1ZM.

Like many other of the big Transcontinental attempts, the first real one came from west to east. . . .[7]

[4] 30, February 1917.

[5] 56, April 1917. No other complete "Calls Heard" list appeared in *QST* until the one submitted by 9RR, published at 50, January 1921. On this subject, see letter from R. W. Bissell (8TY, of Jamestown, N. Y.), found at 59, May 1921.

I have searched carefully; but (like Mr. Bissell) I have been unable to discover any complete lists published in *QST* during the interim between 9ZN's and 9RR's.

9RR heard all his stations at Kansas City, Missouri, in the period November 1 to 9, 1920. He used an indoor aerial 25 feet high. Although his published list is silent on the subject, it is possible that some of the transmitting stations which he heard were c.w. or i.c.w. stations. But the chances are that 9ZN, *back in pre-War-One days*, heard all nine Districts on spark alone.

Between December 1st (1920) and January 27th (1921) 9ZN again heard spark signals from all nine Districts. That list, found at 63, March 1921, is the second complete one published by an amateur station in *QST* following World War One (9RR's was the first).

The March (1921) issue of the magazine is particularly noteworthy because it contains three complete lists of "Calls Heard": (a) That submitted by the Air Mail Radio Station at Rock Springs, Wyoming, showing calls heard during January, 1921 (62, March 1921); (b) the 9ZN list above-mentioned; and (c) the list of stations heard (during January, 1921) by station 9CA (Minonk, Illinois), found at 63, March 1921.

Other complete lists published in *QST* during 1921 are as follows:

Station	*Location*	*Where Found*	*Remarks*
8ZY	Defiance, Ohio	52, April 1921	All Dists. on spark
9NQ	Galesburg, Ill.	49, June 1921	Ditto
9ACJ	Chicago, Ill.	49, June 1921	Ditto
9KL	Spring Valley, Ill.	55, August 1921	Heard on a one-tube receiver
9CR	Chicago, Ill.	61, Nov. 1921	A superheterodyne receiver was used
8BBU	Columbus, Ohio	59, 66, Dec. 1921	All Dists. on spark
9OX	Louisville, Ky.	68, Dec. 1921	Ditto
9DMA	Caledonia, Minn.	68, Dec. 1921	Types of transmitting stations not distinguished
9FK	Clinton, Iowa	68, Dec. 1921	Spark and c.w. stations separately listed
9AQR	Kansas City, Mo.	69, Dec. 1921	Ditto

The five complete lists contained in the December (1921) issue constituted a new high.

[6] In the editorial "Where Are We Bound?", at 36, February 1917, we find this passage: ". . . We do not think anything at all of communicating one thousand miles with a power input of one kilowatt or under, and a wavelength between two hundred and three hundred meters. Twenty or thirty of us do this every night in the week. . . ."

My recollection is that nobody paid much attention to the legal requirement that a wavelength not exceeding 200 meters be used. In any event, the law was not rigidly enforced.

Some special amateur stations were licensed to use waves longer than 200 meters. The others operated up as high as they dared. See Warner's statements, in the editorials found in Volume IV of *QST*, at 31–32, January 1921, and at 25, April 1921 — to the effect that the over-all *average* wavelength then in use was at least 240 meters.

[7] 18, April 1917. I remember that a test message from 6EA reached Boston, Massachusetts, in 1916 or 1917, before the date of this first *addressed* transcontinental message. It read: "Send this as far as possible." I reported the event to the Boston *Herald*, which published a short account under the heading "Wireless Amateurs Relay Long Message." For many years, I kept the clipping from the *Herald*, but I can't locate it now.

Station 2AGJ is complimented by 9ZN, at page 44 of the

Station 9ZF, Denver, proved to be the most essential station in the chain. At page 18 of the April (1917) issue, it was stated:

. . . The connecting link which was solely responsible for getting across, was 9ZF at Denver, and although his distance was not as great as that covered between 9ABD and 2AGJ, he remains as the sole station in the chain across. Unless 9ZF can work both ways, we are stuck, at least at this writing. Our chain therefore is single stranded at this point. . . .

But an even-greater achievement was recorded at page 28 of the April (1917) issue. A message was sent "over and back," in 1 hour and 20 minutes!

. . . The effort was nothing less than starting a message from New York City at 1:40 A.M. on the morning of February 6, 1917, relaying it to Los Angeles, Calif., and bringing the answer back into New York City at 3:00 A.M. the same morning. Just one hour and twenty minutes to send a question across the Continent and bring the answer back. . . .

The honor list of stations and the names of the owners which performed this wonderful feat is as follows:

2PM, Faraon & Grinan, New York City.[8]
8JZ, A. J. Manning, Cleveland, Ohio.
9ABD, Willis P. Corwin, Jefferson City, Mo.
9ZF, W. H. Smith, Denver, Colo.
6EA, Seefred bros., Los Angeles, Calif.

Hats off to them, fellows. They are the big bugs of amateur wireless.[9]

On March 3, 1917, station 9ZN (R. H. G. Mathews, Chicago) realized a long-standing ambition. He was heard on the Pacific Coast. The station which picked up "Matty's" signals was 7EQ, Baker Ore. 9ZN was working 5BV, at the time.[10]

On March 24, 1917, 9ZN worked 7EG on 425 meters, using his 1-kw. spark transmitter.[11]

Station 8NH (the Candlers, St. Mary's, Ohio) was heard far and wide; and it is possible that this station was the first amateur outfit to be heard in every state in the Union.[12]

The April (1917) issue contains some interesting data, compiled by Edgar Felix from the "Official Call Book" for that year:

. . . A compilation of this year's official figures shows that there are now 5425 licensed first-grade and special amateur stations. This includes only the stations that have official calls, and there are numerous low-powered stations which can be utilized for military purposes which are not included in this figure.

These stations are distributed as follows:

District	*Regular and Special*	*Special*
First	858	26
Second	859	23
Third	813	14
Fourth	104	2
Fifth	124	18
Sixth	655	19
Seventh	208	12
Eighth	996	32
Ninth	808	41
	5425	187

April (1917) issue: ". . . Especial mention is due Hewitt, of 2AGJ, as his station has been the connecting link between the east and the west for all relay work, since he works with 9GY, 9ABD, 9ALM and 9XM, direct. . . ."

In Volume IV, at 24, November 1920, I find this statement: ". . . Old 2AGJ at Albany, we understand, was copied by a ship off lower California. . . . The date of this "DX" feat is not given.

[8] Station 2PM is called "the Star of the Second District," and is fully described, at 13 to 14, August 1917. At page 14 of that August (1917) issue, the statement is made that ". . . Mr. Ferrington of Los Angeles has heard our signals also. . . ." On this signal report, see (also) the announcement at page 69 of the April (1917) number, reading: "'Amateur Long Distance Record.'" Just as this issue goes to press we learned that J. B. Ferrington of Los Angeles heard 2PM (Faraon and Grinan of New York). Mr. Ferrington uses an RA-6 Transcontinental for receiving.

"Full details of this 3000-mile record and apparatus used will be published in the next issue. Watch for it."

There was no such article in the May (1917) issue, as promised. This may have been due to the fact that this was the so-called "War Issue" of *QST*.

In Volume IV there is a statement in an Editorial at 24, November 1920, which reads: ". . . It is claimed that prewar 2PM, New York, was copied in Los Angeles at about the declaration of war. . . ."

At page 23 of the April (1921) issue of *QST*, it is stated: "In amateur history prewar 2PM, New York City, is popularly credited with having been heard on three successive nights in Los Angeles shortly before we entered the war, but we have never been able to verify this. . . ."

Mr. Grinan, of "old" 2PM, is none other than John F. Grinan, one of the owners of that history-making station, 1BCG, of Greenwich, Connecticut, which was the first amateur station to send a complete message across the Atlantic Ocean. See 29, February 1922 (Volume V), and the photo at 33, February 1922. Also, see letter at 35, December 1916 (Volume II), announcing that A. J. Faraon and J. F. Grinan had opened up radio 2PM, in New York City, at 808 West End Avenue.

Mr. Faraon was not connected with 1BCG.

[9] See, also, 41 to 42, April 1917, where further details are given: ". . . Messrs. A. J. Faraon and J. F. Grinan, of 2PM station, report an epoch-making event on the night of February 6. At 1:40 A.M. they heard 9ZF, Denver, call them and say 'QRK' and that he was in communication with 6EA direct and asked for a message. Owing to interference it was necessary to send this via 8JZ, 9ABD to 9ZF, who in turn gave it to 6EA. A reply was received at *3:35* A.M. by the same route, and a Transcontinental relay in one night, in fact in less than two hours, over American Radio Relay League lines, had been accomplished. . . ."

Note the discrepancy in the time of completion.

[10] 44, April 1917. Mathews had already been heard on the Atlantic Coast, of course, long before March 3, 1917.

[11] 27, May 1917. Note that before World War One, there were *three* amateur stations which had succeeded in working both coasts. At 24, May 1917, in Mathews' "Central District Report," we find this passage: ". . . Since we have three stations which have succeeded in working both the Atlantic and Pacific Coasts, 9ALM, 9ZN and 9ZF, it is only logical to foresee that messages will be handled regularly from the Atlantic to the Pacific *with one relay only*. Messages have been sent 2AGU, 9ZN, 9ZF, 6EA this winter, thus using only two relay stations, and we feel that transmission either direct, or by means of one relay will be an accomplished fact next winter. . . ." (Of course, when next winter rolled around, we were at war.)

I have not yet discovered the dates when 9ALM and 9ZF got into the "both-Coasts-worked" class. On February 6, 1917, 9ZF was in touch with both coasts, for a short while. See Footnote[9].

[12] In Volume IV, at 8, November 1920, Kruse states: "Station 8ER at St. Mary's, Ohio, is operated by Mr. and Mrs. Charles Candler. 8ER under its prewar call of 8NH established a record, unequalled, I believe, by any other amateur station, of being heard in every state of the Union. The location of 8ER is unusually favorable. . . ."

The description of 8NH, at 33, May 1917, says: ". . . This great relay station has been copied in thirty states. . . ."

Regular stations, without special, 5236 . . . . [13]

This table shows that the Eighth District was still leading in the total number of licensed amateur stations just before the War, and that the Fourth District was still in last position. An interesting feature (in addition) is the fact that four Districts had become close contenders for the second position: the Second District (with 859), the First (with 858), the Third (showing 813), and the Ninth (counting 808).

The advent of World War One, in April (1917), of course resulted in the closing down of all amateur stations. The so-called "Closing Order" can be found at 3, May 1917. *Not even receiving-work was permitted.* All aerials had to be lowered; and it was ordered that both sending and receiving equipment should be disconnected and rendered inoperative for transmitting or receiving any radio messages or signals.[14]

In my Foreword to the Index to Volume I of *QST* I have dealt with the response of the amateurs to the Country's need for operators and radio experts to serve in the Nation's armed forces; and there is no need to repeat this material here.

With the cessation of hostilities, the ban on amateur transmitting and receiving continued for an exasperatingly long period of time. *Receiving* was permitted as of April 15, 1919 (see 14, June 1919). This brought about a meeting of the League's Board of Direction, in New York City, on April 16, 1919, to consider "the questions of the immediate organization of our membership, and the immediate resumption of *QST*, and immediate finance. . . ." (Again, see 14, June 1919.)

The ban on *transmitting* was lifted as of October 1, 1919.[15]

Readers of the Index to Volume II will find the following miscellaneous items of particular interest:

(a) *League affairs:* On March 10, 1917, a "Committee on Constitution," *composed of prominent Amateurs selected by Maxim and Tuska*, drafted a League Constitution, which was adopted either on that date or somewhat later.[16]

It was suggested that League members (while barred completely from the air) should submit their several views concerning plans and specifications for the "ideal amateur radio station." Originator of this idea was James M. Sommer (9JI).[17]

(b) *Broadcasting:* At pages 34 and 47 of the April (1917) issue, we find these words: ". . . Recently the DeForest Company have made occasional general announcements over their radiotelephone to the amateurs of the East, and this at once brought up the question of conducting regular advertising and news talks by radio. It would be entirely practical. The clearness of the present waves is distinctly greater than in the regular wire telephone. The voice is almost perfect and a good speaker with clear enunciation could easily speak to fifty thousand listeners and have every syllable and accent heard. It is decidedly something to think about."

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[13] 32, April 1917. Look back at the figures compiled by Mr. Edgar Felix, at 163, 185, July 1916 (Volume I).

[14] An account of how this order was enforced in the Buffalo, N. Y., area, is found at 26, July 1917 (letter of 8ARB).

James A. Nassau (3CT, of Philadelphia, Pa.) reports a "tempest-in-a-teapot" incident, arising out of his use of an ordinary buzzer for code practice after the Closing Order had gone into effect (18, Sept. 1917.)

Maxim thought that the ban against *receiving* was a foolish one. See 9 to 10, September 1917. Writing under his pen-name of "The Old Man," Mr. Maxim declared: ". . . Did it ever occur to any of you bugs that maybe we could be a big help in locating enemy wireless if we could satisfy the Government that we could be trusted?

". . . With listening going on all over the country, isn't it likely that some impure or stray stuff would leak into the phones of some nearby listener which would never reach the log of the big Navy station? . . ."

The fact remains, however, that some of the amateur stations near the Mexican border had behaved so badly, back in 1916 or early in 1917, that the War Department had immediately instructed the Department of Commerce not to renew the amateur station license of any amateur located south of Houston, Texas, until further notice; and in consequence, some perfectly-innocent amateur stations had been forced to close down, in the affected area, even before America's entry into World War One. See the editorial entitled "The Danger Signal Up," at 34 to 35, February 1917.

Back in 1916, the Army and the Navy were engaged in punitive expeditions into Mexico. Army mobile or field-wireless sets (except for the two-kilowatt automobile-tractor set) (see 32, April 1917), were inefficient; and most of the Army's communications, during the "Mexican punitive expedition," were carried on by Buzzer Lines, one of which was 400 miles long (again, see 32, April 1917.)

Even experiments involving phantom antennas were barred. See the letter from the Office of the Director of Naval Communications, published at 2, September 1917.

[15] See the so-called "Pink Sheet," which was a supplement to *QST* for October (1919) (Volume III, No. 3).

Also, see the editorial entitled "At Last!", found at 13, November 1919, which is also part of Volume III.

[16] 7 to 12, May 1917. The country was divided into six divisions, and division managers, superseding the old trunk-line managers, were named. Officers, plus a "Board of Direction," were elected. Mr. A. A. Hebert was named General Manager of the affairs of the League, *with a Headquarters office at 50 Church St., New York City, instead of at Hartford, Connecticut.* See, also, the editorial at 15, May 1917.

Clinton B. DeSoto's book, *Two Hundred Meters and Down*, states (at page 50) that from the time when Hebert was named General Manager, and up until March, 1919, "the administrative office of the League was the business office of the new General Manager, Arthur A. Hebert, at 50 Church Street, New York City; and its affairs were handled from his home in Nutley, N. J."

Mr. DeSoto gives the date of the original meeting of the persons who drafted the new Constitution as February 28, 1917. The place of meeting was the Engineers' Club, in New York City (see DeSoto's book, pages 49 to 50).

The ARRL operated under this Constitution until December 18, 1923, when a new Constitution was adopted. This embodied the principle that each director should represent a particular *district*, instead of being a "director-at-large." The first Board meeting to take place under the new Constitution was that held on July 25-26, 1924, at Hartford, Connecticut. See editorial at 7 to 8, February 1924. Also, see 22 to 23, September 1924.

A copy of the new Constitution and By-Laws of the League was published at pages XIX to XXIV, in the February (1924) number.

[17] 22, June 1917. Also 19, July 1917. Mr. Sommers' article, on the subject of "The Ideal Station," was published at 13 to 16, July 1917. After the War, the project was revived, and a contest was announced, soliciting articles, entitled: "The Ideal Relay Spark Transmitter." See 11 to 12, January 1921 (Volume IV). Winners were announced at page 5 of the April (1921) issue; and the three winning articles were published at 6 to 11, April 1921; 11 to 17, June 1921; 18 to 21, July 1921; 17 to 21, December 1921; and 13 to 15, January 1922.

(c) *"First" or "Near Firsts":* The new Editor of *QST* — K. B. Warner — published his second article.[18] It was entitled "Essentials of V. T. Transmitters," and was the first of his many efforts to encourage the use of undamped waves by amateurs. It is found at 3 to 6, July 1919.

H. E. Rawson published the first construction article showing how to build wooden radio-towers of considerable height. (They ranged from 165 to 205 feet high.) See 17 to 19, 38, February 1917.)

The first YL operator to be licensed in the Pacific Northwest — Miss Winnifred Dow (7FG, Tacoma, Wash., 14 years of age) — was written up at 70, April 1917. A photograph showed that she was pretty as well as intelligent and alert.

She became interested in wireless through her visits to the Rev. Father Sebastian Ruth's station at St. Martin's Abbey, Lacey, Wash. He instructed and helped her in the construction and operation of her station.

(d) *Emergency Work:* The one-and-only instance recorded in Volume II is a rather "tame" affair. Four battleships were lying off Stamford Harbor. A portable Navy field station was set up on shore. On June 10, 1916, it went out of order, and Stuart Sandreuter (1DX, of Stamford, Conn.) was invited by the shore operator to try to contact the *U.S.S. Michigan.* He did so, and one message, each way, was handled. The U.S.S. *South Carolina* also was in touch with 1DX. See 51, March 1917. Mr. Edgar Felix refers to this incident at 33, April 1917.

(e) *Curiosities:* An item at 39 to 40, December 1916, states: "At the Radio Club demonstration at the Fresno Fair the Navy Department assigned three fifteen-minute periods each day when Mr. Denny, operator in charge, was allowed to use a wavelength of 1000 meters, and a message was sent by the President of the Fair to the Mayor of San Francisco and the Governor, inviting them to attend the fair and act as judges in the auto races, etc. . . ."

Station 8XA, on the night of December 15, 1916, originated a message addressed to Admiral Benson, at the Navy Department, in Washington, and sent it to 2AGJ. It reached 2LK (J. O. Smith, at Valley Stream, L. I., N. Y.), who passed it to 3ZW (Washington) on the 16th. ". . . He in turn gave it to NAA at 3:00 A.M. on the 17th. . . ." (See 48, February 1917.)

At Morristown, N. J., Theodore E. Gaty received and amplified music broadcast from the DeForest factory at Highbridge, New York (about 40 miles away), and held one of the first "wireless dances." The signals were strong enough to be heard by six or seven couples. (See 47, Feb. 1917.)

(f) *Litigation:* The tangled situation re the right to manufacture DeForest's "Audion" tube was set forth in two letters — one from the patent attorney representing Marconi Wireless Telegraph Company of America, and the other from the treasurer of DeForest Radio Tel. and Tel. Co. (See 16 to 17, March 1917.)

(g) *Big Commercial and Government Long-Wave Stations:* The Japanese Emperor sent greetings to President Wilson through the Bolinas, Calif., station. (See 13, Jan. 1917.)

The Navy's new arc station at San Diego, Calif., was described as "the largest and most powerful in the western hemisphere," with an extreme range, *under favorable conditions,* of 12,000 miles. Some interesting descriptions of the towers, the aerial, the ground system, and the transmitter itself, were given.[19]

Volume II was an improvement, both in size and in quality, over Volume I. Among other things, it demonstrated that amateur radio had acquired considerable momentum, by April, 1917; and the prompt reorganization of the hams, after World War One, and the resumption of publication of *QST* showed that great things could be expected in postwar days. The acquisition of title to the magazine, by the League, was entirely logical; and it was a good stroke of business as well.

The 12 issues showed no true signs of any oncoming "C.W. Revolution"; and beginning in October, 1919, "King Spark" was to resume his reign — for a while, at least.

SUMNER B. (TED) YOUNG, WØCO

Rural Route 3, Box 94
Wayzata, Minnesota
January 3, 1954

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[18] His first was "The Famous VT-1," at 11 to 12, June 1919.

[19] See 34, April 1917. Some of these descriptions are as follows: ". . . The aerial or antenna weighs 16 tons and has a sag between towers of about 100 feet. The aerial is said to be twice as large as that strung from the Eiffel Tower in Paris.

"The helix is 14 feet in diameter and 11 feet in height. . . .

"Approximately 25 miles of piping and copper cable have been laid throughout the radio reservation of 72½ acres. A large part of this area will be kept wet at all times to insure a good 'ground' for the huge aerial.

"The three 600-foot towers are among the largest radio structures in the world, and are placed in a triangle 1100 feet apart. . . ."

The cost was placed at $300,000.00. Compared to the $14,000,000.00 spent on the Navy's "Jim Creek" station, opened late in 1953, this figure appears to be a very modest one. Of course, the "Jim Creek" station is much more powerful, and the purchasing-power of the U. S. dollar has declined.

On the San Diego station, see Volume IV, Number 5, *Proceedings of the I.R.E.*, October (1916), pages 439 to 442. The power input to the Poulsen-type arc (furnished by the Federal Telegraph Company to the Navy) was 200 kw. A 350-kw. arc set was simultaneously under construction, near Honolulu, for the Navy.

The "Jim Creek" long-wave transmitter is a "tube" set, operating in the band between 14 and 35 kc. Power is 1200 kw. In the 10-span antenna, which zigzags between two 3000-foot mountain ridges, about 30 miles of copper-weld cable was used. More than 220 miles of ground wire was buried in the earth beneath it (see page 16, of the January, 1954, issue of *Tele-Tech*). Photographs of the station appeared in the November 30, 1953, issue of *"Life"* magazine, at pages 129 to 132.

Now that submarines cruise long distances, without surfacing, v.l.f. signals are needed more than ever. They penetrate salt water, and can be received by submerged subs, on insulated antennas.

• Technical Correspondence—

LOW-IMPEDANCE TRANSMISSION LINES

USS *Bennington* (CVA 20)
% FPO, New York, N. Y.

Technical Editor, *QST:*

The transfer of radio-frequency power from a radio transmitter to a radiating system takes place in a "transmission line." Transmission lines are conductor cables of various configurations. Even the single-wire transmission line to an "off-center-fed Hertz" is, in reality, a two-conductor system, the return path existing through the ground. Transmission lines normally take several forms: the open-wire line for the higher impedances, shielded paralleled lines in cable form like RG-22/U, the plastic enclosed parallel lines common to TV and f.m., and the coaxial 72- and 52-ohm types, RG-11/U and RG-8/U. The latter types have become common since the end of the war because of their excellent weather and insulation properties and the ease with which they could be obtained inexpensively on the surplus market.

The characteristic impedances of these cables were not chosen at random: 72 ohms matches a resonant half-wave thin dipole, and 52 ohms a ground plane with slightly "drooping" radials. Sometimes, however, it becomes necessary to match a more complex load of lower resistive value. For example, a loaded short antenna, a parasitic rotary beam, or a shortened loaded beam all exhibit low-impedance inputs of the order of 8 to 15 ohms. Must we match these antennas and, if so, how can we construct a low-impedance line?

If the sole consideration were the fact that a length of RG-8/U 52-ohm is terminated in a low resistance, the situation would not be impossible. For example, take the 15 or 20 feet of RG-8/U 52-ohm line necessary to reach from the dashboard of a car to a 4-Mc. loaded whip on the rear bumper. If it is terminated in a resistance equal to the resistive impedance of a low-loss resonant 75-meter whip, say 13 ohms, the mismatch would be only 4:1, a not impossible figure to work with. But our loaded whip is not purely resistive. It is a complex impedance somewhat akin to a series-resonant circuit. On the low side of resonance it will be capacitive in nature, and inductive on the high side. If there were any guarantee that it would be operated only at resonance, then a mismatched transmission line might well be acceptable. But "looking into" the transmitter end of a line terminated in a resistance less than its characteristic impedance we see, for the first 90 degrees, a resistance of value greater than the terminating resistance (at 45 degrees equal to the characteristic impedance) in series with an inductance — the greater the mismatch, the greater the inductance. Since we postulated a resonant antenna, the input to our line at the transmitter end will not appear resonant, and it will be difficult to couple to the transmitter.

The natural step to take now is to trim the antenna down until the transmitter loads. Three things occur: (a) By trimming the antenna down its radiation resistance and therefore its efficiency fall as the square of the percentage whip length remaining, (b) the input to the antenna base becomes capacitive, and the potential at the base insulator and therefore the base losses rise rapidly, and (c) if carried far enough, the transmission line sees the equivalent of an added length of open-circuited line to make up a full quarter wavelength. The input to the line becomes a low resistance, the "grid dipper" shows a sharp resonance at the input, the transmitter loads beautifully, and the output antenna current of the transmitter is very nigh. But the line losses are very, very *high.*

There are two ways to avoid this pitfall. One is to insert a large variable capacitor in series with the coupling loop or "pi" network at the transmitter, resonate the antenna with no transmission line connected at the base, and then vary the capacitor at the transmitter until the final loads. The other is to manufacture a low-impedance transmission line to match the antenna input. If we choose the latter and succeed, the resonant frequency of the antenna will coincide with the frequency at which the input to the transmission line at the transmitter end is resonant.

One simple way to manufacture a low-impedance line is simply to parallel cables of such characteristic impedances that, just as we parallel resistors, we arrive at a lower impedance. For example, two paralleled 52-ohm cables give a 26-ohm cable. Two in series give 104 ohms. And a 52 and 72 in parallel give the product over the sum, or 30 ohms. Why is this true? Assume two cables of equal impedance terminated in resistances of their characteristic impedance. If each is transferring the same amount of power, the voltage along the line is everywhere constant, and the voltages across the loads are equal. If these voltages are equal we can parallel the two resistances without affecting the circuit. *But now looking into the two lines* thus paralleled we see the same voltage as before but twice the current flow. The characteristic impedance, or ratio of the voltage and current, is now half what it was before. A similar discussion can be developed for cables of unequal characteristic impedance, but since the voltage across the two is equal, neither the line current in each nor the power transferred by each are equal. When lines are connected in parallel, losses are always reduced; for two identical lines in parallel they are halved.

Remembering the simple fact that transmission lines parallel much as do resistors may well obviate a more complex matching network.

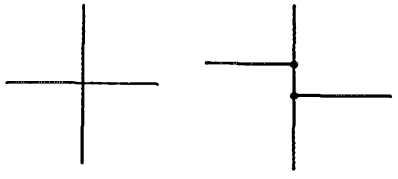
— *Lt. John J. Dougherty, USN, W2LHB*

CIRCUIT DIAGRAMS

69 Ashland Road
Summit, N. J.

Technical Editor, *QST:*

On page 42 of the January, 1954, *QST* there was an article about circuit diagrams. It stated that there are two schools of thought on crossovers — well, I would like to tell you about the third school: Western Electric. Never make a crossover that is a connection and you have no possible source of error. If you have to make a connection, make an offset in the line, so:



I have been using this system for about a year and have no trouble at all. The statement about long leads was apropos. At times I take diagrams and redraw them for the draftsmen so they are more straightforward.

— *Eugene M. Fry, K2CW*

SETTING A STANDARD TO WWV

1605 E. Randolph Ave.
Enid, Okla.

Technical Editor, *QST:*

I have just finished rereading your October, 1954, "Pointers on Using Frequency Standards," and I was particularly interested in your instructions for zeroing in a 100-kc. crystal on WWV. As you say, 50 cycles at 5 Mc. is not particularly accurate, and the thought occurred to me that there is a simple method to adjust a 100-kc. crystal at 5, 10 or 15 Mc. or higher, if the signal from WWV is strong enough, that does not require any additional equipment except an S-meter. The method is accurate to one cycle or less error at the checking frequency. After tuning into the zero-beat region, tune the crystal trimmer very slowly, watching the S-meter. As true zero beat is approached, the needle will start to quiver and gradually slow down until the beats can be counted. Continue tuning the crystal trimmer until the needle oscillates from maximum to minimum only very occasionally and I assure you your error is

infinitesimal. A beat of 1 per second is only an error of one cycle. An auxiliary trimmer of 3 plates or so makes for ease of adjustment.

— *Andrew J. Burton, W5BDX*

MULTIBAND TANK CIRCUITS

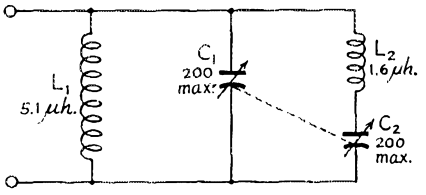
1145 East 57th St.
Indianapolis 20, Ind.

Technical Editor, *QST*:

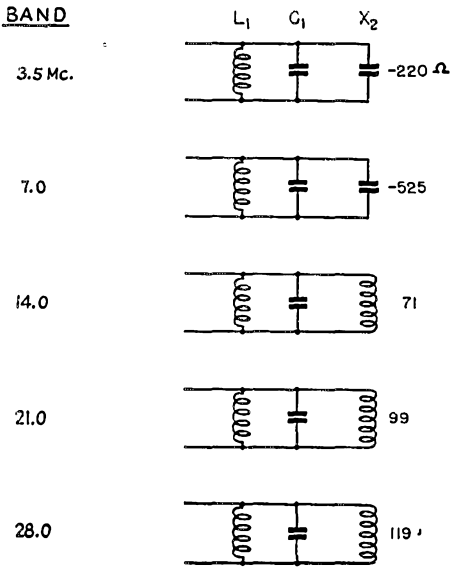
Some months ago I gave a talk to the Western Electric Radio Club and to the Indianapolis Radio Club on the subject of multiband tuning circuits and was, therefore, quite interested in the two articles in the July 1954 *QST*.

Since all the interest came from the January 1954 *QST* article, my method of attack on the subject was to take the L and C values from the above article and calculate reactances for the capacitor settings tabulated in the article, making suitable allowances for attached circuit capacitances and distributed capacitances. For an exposition of circuit functioning this method has several advantages over the equivalent-circuit method of explanation, particularly to people who do not habitually play with equivalent-circuit design techniques. In some ways it presents a better physical picture and it surely throws a better light on the L/C ratios obtained. The Novice has difficulty in comprehending that the transition from one equivalent circuit to the other is gradual, and he tends to get the impression that it is a sharp decisive change (which it is not).

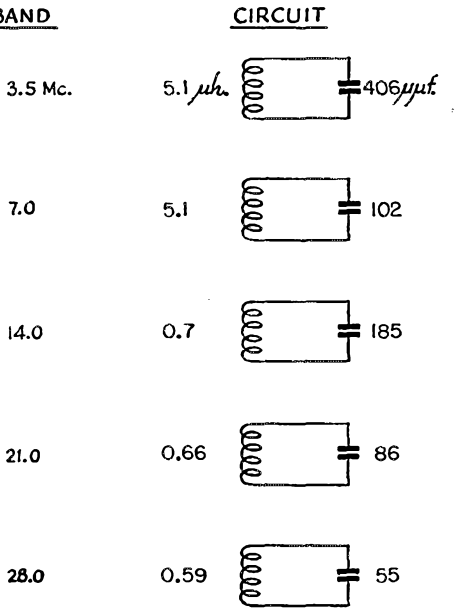
At any rate, here is the scheme I used: The basic circuit is that shown in the sketch, and the inductance and capaci-



tance values are those from the January *QST* article. Since the dial settings were given in the article, the condenser settings could be determined and the capacitance (including strays) tabulated for each band. A second tabulation was made, showing the reactances X_{C1} and X_{C2} for each band. The third table showed $X_{L2} - X_{C2}$ for each band. This reactance, $X_{L2} - X_{C2}$, was called X_2, and it immediately becomes apparent that it carries a negative sign (indicating capacitive reactance) on 3.5 and 7 Mc. and a + sign (indicating inductive reactance) on 14, 21 and 28 Mc. The next tabulation then looks like this:



This shows a circuit with either two condensers or two inductances in parallel. The two are combined as reactances and then the equivalent capacitor or inductor is calculated. This gives a new equivalent parallel-resonant circuit:



I have omitted a lot of arithmetic, but this arrangement shows how the series circuit goes from a capacitor to an inductor, and when it is explained that shunt inductors combine like shunt resistors, even the young hams get the idea. Also, it shows that, although the circuit described in the article may be good for intermediate stages, the changing L/C ratio makes it a poor deal for the final stage.

It was my thought that this would interest hams without the training to appreciate some of the material previously published.

— *A. L. Bennett, W9ADS*

CHECKING WITH WWV

4205 N. Keystone Ave.
Chicago 41, Ill.

Technical Editor, *QST*:

The article in October *QST* entitled "Two-Dial Receivers and 100-Kc. Signals" reminded me of a method of tuning the harmonic of a marker generator, or any other r.f. signal, for that matter, which can be tuned to one of WWV's exact frequency, as received. This method was *not* mentioned in that article. I believe that this method deserves more widespread use. It requires no auxiliary equipment except, of course, a receiver that will get a decent signal from WWV, and it is independent of any receiver adjustments as long as WWV and the test signal are received with not too wide a discrepancy in signal strength.

This method is to tune to WWV while the modulating tone is on (600 cycles or 440 cycles), and tune for zero beat by tuning for the flutter caused in the tone by the added signal, when very near to zero beat. This flutter appears as a change of intensity in the modulating signal, and can be easily counted down to once in several seconds, even up to once in eight to ten seconds, if the flutter is strong. The flutter will be strong if the signals are reasonably near the same signal strength. All that is required is a way to vary the injection of the marker oscillator to the receiver. When it has been tuned very close to WWV's carrier, adjust the amount of injection for maximum or, at least, easily-readable flutter.

I can hear many readers hastening to explain to me why this method cannot be reliable because of the danger of tuning the marker to zero beat with one of the sidebands of the WWV tone, thus being 440 cycles or 600 cycles off.

(*Continued on page 130*)

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

Sixth Annual YL-OM Contest

After last year's contest, we noted that the OMs who participated in the affair had a most enjoyable time, but they were disappointed in the comparatively small turnout of YLs. This year, girls, let's invade the bands en masse and really rush the gentlemen. From all indications, they won't mind a bit.

CONTEST PERIODS

'Phone: *Starts:* Saturday, March 5, 1955, at 1:00 P.M. EST.
Ends: Sunday, March 6, 1955, at 12:00 midnight EST.

C. W.: *Starts:* Saturday, March 19, 1955, at 1:00 P.M. EST.
Ends: Sunday, March 20, 1955, at 12:00 midnight EST.

Note the division of this year's contest into two sections — 'phone and c.w. — on separate week ends. Here are the rules:

Eligibility: All licensed OMs and all licensed YLs and XYLs are eligible.

Frequencies: All bands may be used. Cross-band operation is *not* permitted.

Procedure: Call "CQ YL" or "CQ OM."

Exchange: QSO number, RS or RST report, and state. U. S. possession, VE district, or country should be exchanged.

Scoring: (a) One point is earned for each station worked (YL-to-OM or OM-to-YL *only*). (b) Stations and multipliers count only once, regardless of band or mode of operation. (c) Add number of points and multiply by number of different states, U. S. possessions, VE districts, and countries worked. (d) All 'phone contestants running 150 watts input or less *at all times* then may multiply final score by 1.25. (e) All c.w. contestants running 150 watts input or less *at all times* then may multiply final score by 1.25. (f) Maryland and District of Columbia count as one state.

Awards: Highest OM score, 'phone-to-'phone — cup and certificate. Highest YL score, 'phone-to-'phone — cup and certificate. Highest OM score, c.w.-to-c.w. — cup and certificate. Highest YL score, c.w.-to-c.w. — cup and certificate. Second and third highest in each category will receive certificates. The winner of one award is not eligible for any other award. The cups are awarded on a yearly basis with a three-time winner obtaining permanent possession.

Logs: Copies of 'phone contestants' logs must be postmarked not later than April 1, 1955; copies of c.w. contestants' logs must be postmarked not later than April 15, 1955. Logs should be sent to Gilda Shoblo, W6KER, vice-president, YLRL, 3715 Liberty Blvd., South Gate, Calif. All contestants must fill in their own logs while operating — no help is permitted. Contestants are requested to send in separate 'phone-to-phone, c.w.-to-c.w., 'phone-to-c.w., and c.w.-to-'phone logs. State power input. Please send in copies of logs, regardless of size of scores, to help in cross-checking other logs.

* YL Editor, *QST*. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.

Page No.___

Station Call:_____ Operator,_____ Power Input:____

QTH:_____ 'Phone____ C.W____

Date-Time	Freq.	Sent		Received				Multiplier
		No.	R.P.T.	STATION WORKED	No.	R.P.T.	STATE or COUNTRY	

Suggested log form for YL-OM Contest.

DXCC YLs

There are now two YLs who are members of that distinctive group of operators who have worked more than 200 countries. This past year W6UHA made the grade by jumping from a total of 194 to 201 ('phone and c.w.). W1MCW, who broke the 200 mark last year with 203, has since added 11 more, making it an impressive 214 for her — all on 'phone. EA2CQ is up 14, CO2BK up 26, W1FTJ up 7, and W5UCQ up 11 over last year's totals. W1RYJ apparently is the only new addition to the list. All others maintained the same standing as last year.

'Phone Only: W1MCW 214, EA2CQ 190, LU4DMG 150, CO2BK 130, W2PBI 113, W8BFQ 110, OE5YL 100.

'Phone and C.W.: W6UHA 201, W4ITR 123, W1FTJ 120, W6YZU 120, W5UCQ 116, W2NFR 115, ZS6KK 109, G3ACC 100, W1RYJ 100.

Program — First YLRL International Convention

Following is the program for the First YLRL International Convention, furnished by W6LBO, cochairman with W9YBC, of publicity for the get-together to be held at the Hotel Miramar, Santa Monica, Calif., in June. *24th:*

Here are five of the seven licensed YLs of North Bay, Ont. The picture was taken on the occasion of the Gateway Amateur Radio Club's first ladies' night following the licensing of the YLs. Pleased OMs warmly welcomed the girls as full members of the club. Last winter the girls expressed a desire to learn the code and theory. The club arranged classes, the girls persevered, and they can now be heard pounding brass between 3500 and 3725 kc. *L. to r.:* VE3DVO, Ermine Barnaby; VE3BFE, Clare King; Mrs. Fred Reeve (call not yet assigned); VE3DVU, Mrs. Walter Totman; VE3-DVV, Mrs. Leo Boyer. Absent were VE3DUZ, Mrs. D. C. Kannegiesser, and her nine-year-old daughter Judy, VE3BRJ. (*Photo courtesy VE3AJR and VE3TX*)

registration and reception; *25th:* noon — luncheon, business meeting, program; evening — YL-OM banquet, installation of YLRL officers, program; *26th:* family picnic on beach at Santa Monica Bay; *27th:* morning coffee hour and mobile tour of Hollywood.

W6UHA will be general chairman of the Convention, W6PJU (Los Angeles YLRC president) will be official hostess, and W6CEE (YLRL president) will be the presiding officer.

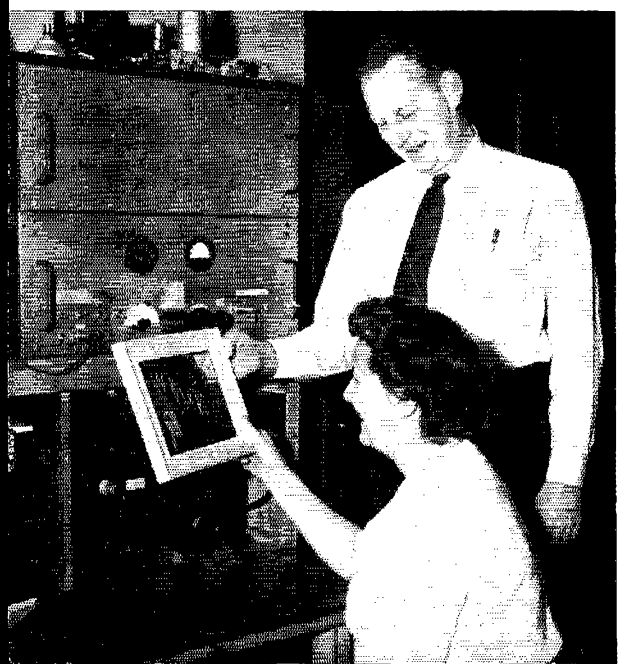
Tickets to include all events will be $10.00. Dinner tickets for OMs will be $5.00.

Lark Convention

The Ladies Amateur Radio Klub (LARK) of Chicago will sponsor a YL convention at the Allerton Hotel in that city on May 20th-22nd. Convention Publicity Chairman, W9MYC, Gladys Jones, will be pleased to give further information. All YLs are cordially invited to attend.

Keeping Up with the Girls

OM G3IDG takes friendly issue with G3GOX's estimate in the March '54 department of some 53 licensed YLs in G-land. Allan says he goes in for statistics, and can verify a count of only twenty-three — by call: G2YL, *G3s* ACC ELK EQO EWA EYO FSZ FYT GAE GDI GOX GYL HUD HUH HYL IYL JAA JZP YL, G6YL, G8LY, GM3AKR, GM3IMR. . . . W9LOY, who made 239 contacts in the last LARK contest, will hold the cup she has had for a while longer. Chris was almost as pleased about working KJ6FAA (Johnston Island) on 40 'phone as she was about winning the contest. . . . W5WXY, Bernice, of Dallas, is NCS of a new YL net which meets Thursday at 1:00 P.M. CST on 3885 kc. . . . W9PNK, Hazel, is NCS for the North Central Zone Net and alternate NC for the Illinois Emergency Net. . . . An ARRL code proficiency endorsement for 20 w.p.m. rewarded K2DSL, Merceda, for her continued c.w. practice. . . . Currently there are some 560 members of the YLRL, according to a count by Asst. Secy. W4DEE. . . . KZ5DG, who is still waiting for a few QSLs to prove she has worked 100 countries, has been appointed PAM for the Canal Zone. Grace tells of a new "club" on 15 meters originated by OM KV4BD. The seven members (known as "The Witches") are YLs W3QPQ, W3VLX, W7OOY, TI2BX, TI2PP, KZ5DG, KZ5KZ. Eligibility for membership is determined by active interest in working and helping the maritime-mobile gang with traffic. . . . OM W1TYP reports two new Novices, WN1CAP, Virginia, of Beverly, Mass., and WN1CDL, Terry, of Gloucester. . . . W5LGY, Helen, reports two new 10-year-old YLs, Paula, WN5IOZ, and Camille, WN5ILO, both of McAlester, Okla. . . . WØERR's OM recently became WØWQG. . . . W9MLE, only YL member of the Elkhart (Ind.) Amateur Radio Club, has been re-elected president.



YLs You May Have Worked

OM W3IIX suggested a story of W8NEK, Marianne Nowak, and Marianne's OM, W8NEJ, supplied the following highlights of information about his wife and himself. The couple live on the 96,000-acre Seney National Wildlife Refuge in northern Michigan, where John is on the staff of

the U. S. Fish and Wildlife Service. Licensed in 1953, Marianne handles OBS transmissions three times a week on 75 and works 20 and 15 'phone and 80 c.w. using a Viking I and an HQ-129X. The Nowaks have undertaken an interesting project in that they have been using amateur radio to acquaint all ages of students with wildlife conservation. Contact is made with an operator using a portable rig (frequently W8NSX/8 or W9OTL/9) set up in a classroom. Marianne or John, transmitting directly from the Refuge, discuss various phases of the wildlife program and answer numerous questions. Several QSOs have been tape-recorded by the Michigan and Wisconsin school systems for presentation at a National Teachers Conference. Marianne's stories of life in the backwoods and of the animals who inhabit the area are becoming increasingly well-known and, at the same time, amateur radio is being revealed to hundreds of interested listeners. (Note: Our September '54 department reported similar "education thru amateur radio" activities initiated by OM W9OTL.)

Addendum: YL Nets

Two more nets recently listed with the YLRL are:

The NYLON Net (Northwest YL Operators Net). Meets Wednesdays at 10:00 A.M. PST on 3820 kc. NCS is W7QYN, alternates W7SYF and W7NJS. Nylon Beacon (frequency-marking station) is W7FWR.

WØUDU is NCS with WØBFW as alternate of a new 75-meter 'phone net which meets Mondays at 10:00 A.M. CST on 3970 kc.

(Continued on page 130)

♦

With the presentation of a plaque by OM W1ULY, Fred Goulding, on December 3rd, W1UKR, Eunice Gordon, of Springfield, Mass., was recognized by members of the Deep Sea Drag Net for her meritorious and loyal service to the net and for her excellent example as net manager and NCS. The first YL to be so honored, Eunice weaves amateur radio into every spare moment she can during her busy schedule as wife and mother of two young harmonics. Licensed in 1951, she works 40 and 75 'phone, is OPS, a member of the TCPN, secretary of the Hampden County Radio Club, has made BPL twice recently, and has accepted the chairmanship of the All Woman Transcontinental Air Race for 1955. Between messages, Eunice has "half-wired" a Johnson Ranger, gift from her patient OM, W1KUL, who states he doesn't mind sharing his wife with amateur radio when she can serve others and enjoy herself as much as she does.

Correspondence From Members-

The publishers of *QST* assume no responsibility or statements made herein by correspondents.

"IT SEEMS TO THEM . . ."

c/o Radio Station WHOP
Hopkinsville, Ky.

Editor, *QST:*

This is in reference to your December "It Seems To Us . . ." Your thoughts on this matter are commendable, and I'm in accord with all you have put forth. However, perhaps I can point out one or two items that will still tend to increase the occupancy of 6 meters, even if 2 and 6 are included in the final outcome.

Firstly there are many in my boat, located several hundred miles from large cities where occupancy of 2 is high. This is the case with 220 Mc. and above . . . and it's rather saddening when you drum up a couple of watts on 220, build a 90-degree screen-back corner reflector, put it on a 40-foot tower, and then can't talk to anyone, primarily because your power is low and there's no one near enough. Two meters can't be that much different for me.

Secondly, fighting your way TVI-less to 220 and winding up with just a handful of watts can be pretty discouraging. Two meters is in the same category, but 6 lies within the range of several more powerful tubes: the 807 and 6BQ6-GA, to name a few. This is no small matter when it comes to the economically-minded ham. Beyond this, coils are still coils, and condensers don't have to be split-stator jobs that cost a small fortune.

Thirdly, antennas are still within reasonable size, not quite as unwieldy as 20 and 10, perhaps not as easy to build as those for 220 and 144, but herein lies another point. If you have to build three separate elements (and mountings for same) for 144 to acquire the same frontal area as one for 50, I question whether it's as easy or not.

And so, considering all the above, you've got one more (I hope) 50-Mc. enthusiast in your ranks, and as soon as the word is final, watch out for a mighty 50 or 100 watts pointed in your direction on a homebuilt rotary, and coming from homebuilt equipment.

— *Bud Ledwith, W4YHO*

208 West 11th Ave.
Huntington, W. Va.

Editor, *QST:*

. . . We, the members of the Tri-State Amateur Radio Association, feel that the ARRL was entirely right in proposing that Technicians be given use of the 50-Mc. band, but not of the 144-Mc. band. The arguments and reasoning presented in your editorial were excellent. It is important that we amateurs start using the 50-Mc. band, not only for the purpose of increasing the knowledge of propagation techniques, but also to make use of that which has been given us. There are various commercial interests which would be glad to use it. We must "use it or lose it."

A number of local amateurs, who are operating in the 50-Mc. band, like it very much. Because of their evident success, our whole local scene is shifting to 50 Mc.

The ARRL has taken a stand on this issue, and we support it one hundred per cent.

— *John Newman, W8OEW*
Secretary

P. O. Box 55
Ann Arbor, Mich.

Editor, *QST:*

As I recall, the Technician license was created several years ago along with the general revision of all amateur license categories with the express purpose of providing v.h.f. experimenters with a means of getting on the air without having to pass the 13-w.p.m. code test. That was the *original* purpose. However, the FCC unwisely left loopholes in the new law which allowed many persons aspiring to a Novice license to acquire a Technician license at the same time. These persons were not especially interested in v.h.f. operation or experimentation — just normal ham operation — but they got the Technician ticket simply because they had boned up on the written exam and found it easy to obtain. Now their Novice tickets have expired, but since they still have years to go on their Technician licenses, they want to make use of them somehow without the bother of getting the old code speed up to the point where they can get a General Class license. Are *these* the hams you had in mind when you wrote your editorial?

I disagree with your decision to seek 50-Mc. privileges for Technician licensees on the basis that it violates the original purpose of the Technician license. I do agree that increased use of 50-Mc. is highly desirable, but I don't think that juggling of license privileges is justified to achieve that end. It defeats the purpose of licensing theory, and has the effect of clouding and confusing efforts of the FCC to establish sound bases of licensing.

Your discussion of the pros and cons of 50-Mc. *vs.* 144-Mc. operating privileges for Technician licensees reflects indirectly the "codeless license" controversy. It implies, correctly, that knowledge of c.w. (a skill, really, not knowledge) has no connection with proper 'phone operation, in that proper operation of a 'phone transmitter does not depend on the frequency of emission. If we continue this line of thought further, why not open 10 meters to Technician licensees also; certainly they are capable of it. And if they can operate on 10 meters, why not *all* amateur 'phone frequencies? Do you see where the ARRL proposition would lead?

This whole business has arisen because the original purpose of the Technician license has been submerged. As I conceive it, they were supposed to be true v.h.f. experimenters, more interested in technique, theory, and construction than "hamming." This is as it should be; but since so many Novices acquired Technician tickets, the bulk of the Technician ranks are composed of frustrated would-be General Class hams who can't make the code.

Now you propose to "use" them to force occupany of a certain frequency — no doubt to forestall possible loss because of nonoccupancy. Now that just isn't right. Licensing theory should be based upon solid technical grounds, not expediency.

If the Technician license is to retain any distinction at all, let's not degrade it to the category of "second-class ham." Let's not make another "Class B" license of it. Let's not "use" it.

However, should it appear that the original concept was not valid, and that there are really not as many persons interested in it as a means to their experimental ends as was originally thought, why then let's move to abolish it. There is no middle ground. . . .

— *Jerome S. Miller, W8IDP*

Livingston, Texas

Editor, *QST:*

. . . We have a Channel 2 TV station in Houston that makes it almost impossible for anyone to operate on 50 Mc. so most of the old 6-meter gang have gone to 144. A group of South Texas v.h.f. operators, myself included, are trying to get more activity on 2 meters and above. We were counting on the Technicians to help get this activity.

Who would the Technician QSO in an area like this unless he waits for sporadic-*E* openings? If he gets permission for 144 Mc., there are already stations operating that he can work to help keep his interest up.

— *R. L. Kurth, W5IRP*

(Continued on next page)

116 N. Bailey, Apt. 12
Fort Worth 7, Texas

Editor, *QST*:

. . . It sounded to me like the Committee was trying to force the use of the 50-Mc. band. Negative thinking is very bad for any business. If you wanted to carry on with that kind of thinking you could say that all the bands below 50 Mc. should be closed. That would also make a lot of men start using 50 Mc. To me, this kind of thinking is like saying I should carry only straight-backed chairs in my store (if I had a furniture store). Would that make people buy the chairs? No, I would soon go out of business.

I want to see all of the bands in use. Mostly, I want to see all the v.h.f. bands in use. Down here there are times that 50 Mc. is a good band, and there are times when it is not. The same goes for 144 Mc.

The cost of radio equipment is very high, and use on as many bands as possible should be encouraged. Negative thinking will not help us in these times. What we need is positive thinking by the Board. The more people that can use the v.h.f. bands the better. We need more men on 144 Mc. as well as on 50 Mc.

— *Frank L. Paschal*

NO CLASSES

3816 Ivy Dr., N.E.
Grand Rapids 5, Mich.

Editor, *QST*:

Reading the letter that George Hann, W4EUK, wrote (Sept. *QST*), brings back memories of a past age. Yes, I've been a ham since 1931 — licensed, that is, and a member of ARRL for a good many years, but I've seen newcomers snubbed because they didn't wear the same necktie Joe Blow wore or because they just didn't fall in with the rest of the "klick" (I should say the rest of the "klucks").

Here, a short time ago, a fellow ham from the East Coast dropped into the local club and, being a c.w. man, got a very cold shoulder and left with the impression that all hams here just hated strangers. I am sure there are others who have received the same treatment in the past.

Now, more than ever before, we must be considerate of others. Amateur radio has developed into a large family and many are hanging onto the edges of the bands because there just isn't room for all. The low-power chap gets swamped under by the kw. boys, the c.w. man is hated by the "phoneymen," and the v.h.f. and u.h.f. folk are looked upon as something from the "Black Lagoon." If an honest move to coöperate more fully among ourselves isn't met soon it's going to be like the old saying, "Hang together or else you will hang separately." Let's all try to get along. A look in *QST* will show you that there is something for all of us. We aren't just 'phone men, c.w. men, v.h.f. and DX men — we all are amateurs. The various clubs should police themselves and weed out the troublemakers. Programs for all phases of the art should be carried out. Let's not let any more incidents like Hann has written about happen again. Religion, race and class distinction do not exist among hams so let's not make our own classes to discriminate against. Let our motto be "All for one and one for all," so far as amateur radio is concerned — whether it is v.h.f., Technician, c.w., 'phone or DX.

— *Louis A. Gerbert, W8NOH*

L.F. EXPERIMENTERS

Route No. 1
Medina, Ohio

Editor, *QST*:

I have a high regard for any ham who makes a sincere inquiry into the field that most holds his interest, whether it be u.h.f. tinkering or 75-meter traffic work. The field of endeavor or the class of license is not significant. The method and integrity of the work *is* significant.

I wished to point out the above before I went into my pitch so that it would not be construed as being partisan.

As the new higher frequencies were rapidly opened up most hams who were experimentally minded with regard to antennas went to these higher frequencies (I am including such "low"-frequency bands as 20 meters in this category). This was natural because of the small physical size of a half-wave element on these frequencies. The arrays were small and easy to handle, and it entailed no difficulty to take field-strength readings two or three wavelengths away from the radiator under consideration. Reference dipoles were simple and easy to construct. The man on the city lot could experiment with them.

I believe, however, that the antenna experimenters, especially those living in the country and on large lots, passed up a fascinating field in the study of low-frequency antennas. This field is just as complex, just as interesting, as its high-frequency counterpart. The behavior of antennas at low frequencies and the results obtained from them are much different than those obtained at high frequencies. Problems range from the effects of the near-by and ever-present ground to the vagaries of the Heavyside layer which warps and distorts any low-frequency pattern.

The average ham seems to have little conception of the factors which govern low-frequency antenna operation. One example of this is the amazement which the average ham displays every time he works someone off the end of his low (to the ground) 75-meter dipole. Usually he doesn't realize that his pattern is a skyward-pointing cone rather than the free-space double-doughnut pattern of a dipole.

Come on, you low-frequency experimenters Make yourselves known. There are some of you who work ZED-Ls on 75, and there must be a few around who beat their mittens all day long putting up a long-wire monstrosity of strange configuration on a cold November Saturday, hoping to get a low-angle radiator less than a quarter wavelength above ground! Let's show the fraternity that not all of the pioneers have left for the higher frequencies!

— *Jon Arthur Sharp, W8YOW*

DX HANDICAP

3077 Ewell Place
Wantagh, N. Y.

Editor, *QST*:

I believe I have established one of the DX records of all times. On Nov. 23, 1954, I worked W4CXA at 1903. He will bail me out on this. I was running 75 watts on 3.5 Mc. The antenna — believe it or not — was nothing but a 200-watt light bulb. Reports were terrific, as I was a solid 569. This involved a resistive antenna in my cellar, below ground, about one foot in length. Let's see someone beat this one!

— *Joe Reisert, W2HQL*

Silent Keys

IT IS with deep regret that we record the passing of these amateurs:

W1PZ, Joseph Furrier, Lynnfield Center, Mass.
W1UOO, Edwin F. Modavis, Iselin, N. J.
W1ZPL, Charles L. Allen, Marlboro, Mass.
W2COK (ex-W4COK), William D. Frerichs, Rumson, N. J.
W2GHL, Jerome M. Mandl, New York City, N. Y.
W2GLB, John B. Judson, Wood-Ridge, N. J.
KN2JMA, Morton E. Van Raalte, Lawrence, N. Y.
W4ACT, O. K. Garland, Johnson City, Tenn.
W4DW, Hugh L. Caveness, Raleigh, N. C.
W4OPY/ET2TS, Capt. A. T. Schooley, jr., Houston, Texas
K6COI, Edward C. Roberts, Artesia, Calif.
W6VPB, Lewis W. Jenkins, Vallejo, Calif.
W7BG, Karl W. Weingarten, Tacoma, Wash.
W8AUJ, Robert L. Minnich, Weston, W. Va.
W8GL, Robert Lawyer, Columbus, Ohio
W9FRM, Wayne P. Fanyo, Watseka, Ill.
W9KHO, J. C. Sanford, Ladysmith, Wisc.
WØFTW, Jack Duane Hughes, El Dorado, Kans.
WNØOVX, W. H. Kadesch, Adams State College, Alamoso, Colo.
WØNJS, Anson L. Carr, Winfield, Kans.
WØTZF, Roy H. Cole, Clayton, Mo.
VE3ZH, A. L. Ainsworth, York Mills, Ontario
PY1BGF, Rubens Florentino Vaz, Rio de Janeiro
PY1BDB, Antonio Agostinho da Silva Lopes Neto, Rio de Janeiro
PY1ATL, Joses Menezes Filho, Lins Vasconcelos
PY7RP, Lydio Madureira, Natal

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Why (cont'd):

Last month we scampered down a list of facts which pointed up the present solid state of Hamdom's DX milieu. In so doing it was impossible to avoid reference to the ARRL DX proficiency program — the DX Century Club and its companion Countries List — a program now woven firmly into the widespread fabric of amateur radio tradition. DXCC, the unique institution whose select circle hams have aspired to for almost two decades, rates more than mere reference. There's a tall question for which we should find a short answer: In such a changing world just why does DXCC retain its steadfast universal inspiration and appeal while other DX awards birth, bloom, wither and fade forgotten? Perhaps we can boil it down to three main factors. . . .

Authenticity. First off, we should recognize what the DXCC award fundamentally is. Simply this: a certification of long-distance communications proficiency. *No more authentic or authoritative certification of DX communications proficiency exists.* No more meaningful certification exists because your ARRL's 40-year service record stands squarely behind every DXCC membership awarded, and awarded with painstaking administrative care.

Stability. A DX Century Club certificate is worth as much today as it ever was. Thousands of DXers now in the 70-, 80- and 90-countries-confirmed bracket can rest assured that the DXCC certifications they ultimately receive will be as worth while as those earned by others before them. Primarily this is because the yardstick ARRL uses to measure and certify DX performance is no "rubber ruler." The primary standard from which many secondary standards have been derived world-wide, your ARRL DXCC Countries List is the gold standard by which countless ham-hours of DXing have been invested in years past and will be invested in years to come. Hence continual circumspection is called for upon every revision of the List.[1]

Flexibility. DXCC's feature of continued DX incentive is unparalleled. In this regard, the complete listing of DXCC members appearing in last December's *QST* provides interesting statistics. *Less than four per cent* of all Century Club members have 200 or more countries confirmed (less than three per cent, 'phone-only). And over forty per cent of all DXCCers have no more than 110 countries confirmed (over forty-five per cent, 'phone-only). From this we may deduce that while on-the-air countries availability unmistakably has increased, so has competition! There still are plenty of DXCC country-worlds to be conquered.

So, all in all, you can see why it is no accident that an ARRL DX Century Club certificate on a shack wall carries more punch than umpteen shoeboxes crammed with DX QSL cards. And small wonder that DXCC thrives, gains momentum and rolls on!

—•••—

Small wonder, too, that the annual ARRL DX contests roll on. This is zero-month for the 21st ARRL International DX Competition, you know, full details and rules of which appear in last month's *QST*. Every one of the thousands upon thousands of DX QSOs logged in these yearly affairs has a W, K, VE or VO at one end of it. Good cess to you in collecting your share!

What:

In the text to follow, frequencies (given in number of kc. above the lower band-limit) appear in parentheses, times without. E.g., (9) = 14,009 kc., if the paragraph deals with 20-meter work. Times are 24-hour time, zone or GMT specified, using the nearest whole-hour figure such as 7 for 0720 or 0650, 0 for 0015 or 2349. As a rule each DX call is mentioned but once per band.

Twenty c.w. is taking a big breath before the ARRL DX Test roof falls in on it. W4EPA gathered in CR5JB (20)

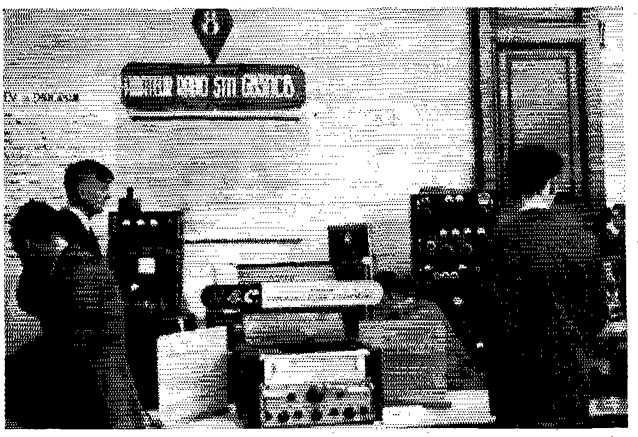
* *New Mailing Address:* Effective immediately, please mail all reports of DX activity to DX Editor Newkirk's new address: 5833 North Kenmore Ave., Chicago 40, Illinois.

[1] In ARRL DXCC Countries List additions or deletions the U. S. Department of State, National Geographic Society, Rand-McNally Company and Webster's Geographical Dictionary facilities are among authoritative sources consulted for definitive information. Fifteen additions and two subtractions have been recorded since the original postwar Countries List was announced.

21 *GMT*, F9QV/FC (55) 21, FG7XA (25) 20, FY7YE (65) 12, HB1MX/HE (105) 16, VQ2IM (25), ZB1BF (40) 19, ZD2DCP (35) 21 and others. . . . CR7s AF (55) 13 *EST*, MB (29) 12, DU7SV (87) 18, EL2P (37) 15, JAs 2HJ (72) 18, 3AA (29) 18, 6AD (39) 18, 7DK (20) 19, LX1RB (37) 11, VQ2s AB (90) 15 and W (50) 14 swapped New Year's felicitations with K2BZT. . . . ZD6BX skimmed some cream off the crop: AC3SQ 12 *GMT*, AP5TM 13, DUs 1SV 13, 9JO 13, EA9AP 17, ELs 2L (24) 16, 5B (22) 13, ETs 2AB (40) 11, 3GB 3S (12) 17, FB8BK of Tromelin Islet and QRT, HZ1AB (68) 14, KR6AZ (60) 23, MP4QAH (55) 16–17, VKs 1EG of Antarctica (23–45) 5–7, 4HJ on Thursday Island, 9DB of Papua 17, VQ3s FN (32–62) 18, KIF (60) 18, VSs 5KU (24–60) 20, 6CW. VU2s AL DF JG JK JP, YV5FV 18–19, 4S7s KH (32) 14, LB and 4X4BX. . . . At W9TGY we find CEØAD (15) 9 *CST*, TG9AQ (10) 9, VQ8CB (59) 10, a ZD2, ZSs 7F (32) 15 and 9I (59) 14. . . . W9EU cleaned up on CR6CJ (15) *CST*, HA5KBA (25–70) 8–9, JA1AQ 17, KA2USA, LU8ZS (37–70) 16, LZ1KDP 8, OQ5s CP (30) 13, RA (41) 16, ST2s AC (21) 14, AR (35) 13, TF3BG (41) 16, VP8AZ (69) 21, VQ4s EZ (40) 13, FK (5) 15, ZC4PB (97) 20, ZEs 3JO (42) 14, 5JA (46) 14–15, ZS3s (6) 15 and T (18) 15. Alex let YK1AS 20 get away. . . . From 1130 to 1330 *PST* and between 14,020 and 14,080 kc. W6WO connected with Africans CR6s CS CW, FA8AY, FF8AJ, FQ8s AG AX, OQ5s BQ

(30) 19, 4ERR (50) 19, 4SS (80) 20, 8AR (107) 19, VR2s, AA (20) 7, BZ (20) 7–8, VSs 4HK (30) 10–12, 6CR (82) 0, VU2CM (107) 14, YN1PM (5) 16, YS1O (50) 22, ZA1BB (60) 15, ZBs 1JRK (9–55) 16, 2A (21) 14–15, ZC4s GF (40) 18, JA (60–140) 14–15, ZDs 2FFB (56) 21, 3BFC (107) 8, ZEs 3JL (50) 22, 6JD (50) 19, ZSs 2MI (105) of Marion Isle, 7D (58) 18, 8E 9H, 4S7s BR (105) 11, YL (110) 14, 4X4DR (80) 14 and 5A1TZ (10) 13–14. . . . Many of the aforementioned plus CS3AC (87) 9, ET2PA, FD8AB (65) 14, HA7OL (80) 8, MP4QAJ (70) 7, VP2GW, VR3A (50) 18, VU2CS (85) 9, ZD9AB (77) 13–14 and 4X4BR are recommended by No. Calif. DX Club's *DXer*, times *PST*. . . . LUØMA/Nepal, CR8GJ and FE8PT are entries attracting fervid followings.

Twenty 'phone has the boys twirling their beams to take advantage of long-path openings. W9WHM salvaged CR7CZ (125) 19 *GMT*, CT2AG, EL9A (323) 21, FQ8AK, PJ2CE, TG9EA, VQ3RJB (180) 21, ZE2KI (131) 20, ZS3s AH (170) 20, P 19–20 and a couple of VP4s to reach 85 A3 countries. . . . CS3AC 10–11 *CST*, JA4BB, KA2s IM NA RR SM VS YA, KA3s AC RR, KA5HM, KR6s AF 17, AZ KS (190) 20, VPs 1GG 18, ISD 17 and 2DN (126) 17 had words with W9EU. . . . Passing the century mark, W4CBQ QSOd HKØAI 16 *EST*, KR6AF, LA4ND, VQ6LQ (120) 15, VP5AE (171) 21–22 of the Turks & Caicos, ZD2EHW (189) 15 and 3V8BP (164) 12. . . .



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Curious conventioneers gather about GB3NCB, official exhibition station at the Radio Society of Great Britain's convention held last September. Using an impressive home-constructed installation, GB3NCB contacted many stations on 20, 80 and 160 meters.

(Photo via W8SHW)

♦

PE, ST2NG, a VQ4 and ZD2. . . . CP3CA (45) 23–0, ZP5GM (55) and ZS3K (85) QSOd W8PCS. . . . Gleanings on 20 c.w. around the circuit, at *K2GFQ:* CR5AF (110) 21, FB8BR (35) 17. *W2QBB:* HR2AD (40) 18. *W4DFU:* HR1JZ, KG4AF. *W6BZE:* HE9LAA (61) 16. *W6LRU:* HA5KBN (40) 15, VQ4RF (90) 20. *W8DLZ:* DM2ACN. *W8QCO:* heard OK3KBT (70) 17. *W9AA:* OX3UD (35) 17, one UP5LE (100) 16, a VE8. *W9KXK:* an FQ8, VK1AC (43) 15. *WØGSV:* VP9BQ, a VQ4. *WØPRM:* CR7IZ (15–50) 20, HP1BR (40), heard SV1AZ. *WØVFM:* CN8EL (54) 15, OA4CW (40) 23. All these times *GMT*. . . . Ws 4EPA 6BZE 9TGY and K2GFQ caught ZD6BX (63) 16–17 *GMT*. . . . K2BZT and W9EU were among the many to nip off FG7XB (12) 19–20. . . . VQ6LQ fell victim to Ws 4EPA 9EU and many others around 14,060 kc. 16–17 *GMT*. . . . Heard, worked, heard called or heard worked by West Gulf DX Club's *DX Bulletin* cohorts on 14-Mc. c.w.: CE7ZU (20) 4–5 *GMT*, CRs 7AD (88) 19, 8AB 8AC (50), CT3s AB (11–38) 13–20, AN (25) 9, DU1CV (18) 0, ET3LF (20) 15, FB8s BC (106) 19, XX (40) 16, FE8AE, FF8s BB (80) 19–20, JC (80) 19, FM7WP (20–30) 19–1, FO8AC (74) 7, FR7ZA (20) 16, FY7YE (63) 13, GC3KAV (110) 13, I1BNU/Trieste (45) 15–16, JAs 6AD (40) 23, 8AQ (85) 1, ØAA (45) 23, ØCA (42) 0, one KD6AT (105), LU "Z" customers 1ZT (55) 1, 7ZM (39) 0, 9ZM (68) 0, LZ1s KAB (98) 12–13, KSP (65) 15, KPZ (75) 15, MP4s BBL (79) 14–15, KAC (102–137) 14–15, OD5LJ (50) 14, OQ5IH (60) 19–20, OY2Z (2) 23–0, SPs 2KAC (53) 14–15, 3PK (75) 13–14, 8KAF (51) 13, 9KAC (50) 13, ST2NW (154) 19–20, SVØWL (60) 19, TF5TP (49) 14, UB5KBE (75) 13, UG6WD (90) 13, UO5KAA (90) 13, UQ2KAA (50) 19, VK1s DY (27–68) 7–16, PG (44) 16, VP8s AQ (80) 1, BE (30) 3–4, VQs 2AB (80) 21, 2VT (46) 16, 2HR (56) 20–21, 4AQ (58) 19, 4BNU

Radiotelephones HA5KBA (110–150) 14 *GMT*, HZ1s AB TA, LUØMA/Nepal, M1B (180) 14 of San Marino, MP4s KAC (119) 14, QAH (120–190), VQ8AR (107) 18, VSs 2CP (169) 13, 5KU (120) 15, YI2AM (110) 14 and ZC3AC (160) alerted W5KUC and the "200" DX Club. . . . WGDXC A3 items on recent 14-Mc. record, all times *GMT:* AC4LM (270), CR6s AC (150) 14, AJ (170) 5, AT (112) 21, DU1AL (192) 15, EAs 8AI (160) 16–17, 9BC (165) 16, ETs 2US (182) 19, 3Q (54) 18, FB8BC 19, FF8AP (140) 19–20, FM7WN (150) 13–14, FY7s YE (63) 13–14, YZ (85–125), HB1PE/HE (104) 16, OD5JK (110) 14, OY2Z (121) 13, SU1CN (113) 15, SVØWK (145) 20, VK1AC (190) 7, VR2AS (170) 7–8, VU2CQ (188) 14, YA1ZT 15, ZDs 3BFC (107) 20, 6JA 21, ZM6AT (160), ZS3AB (126) 20, 4S7s RF (157) 13–14, YL (106) 14, 4X4s DC (198) 15 and DK. . . . SCDXC 20-'phone notes: EA9AR (110) 11, FO8AD (125) 8, OQ5FN (140) 12–13, VPs 2DA (137), 8AA (140) 17, 8BG (130) 17, VSs 1FS (196) 8–9, 2DS (120) 8–9, ZB2A (110) 11, ZD4BR (113) 12–13, 4S7BR (107) 9 and 5A2TR (140) 10, times *PST*. . . . NCDXC 14-Mc. A3 specifications: CR6AI (157) 22 *PST*, GDs 3ENK (140) 9, 6IA (139) 9, FO8AB 9, LU8ZS 17–18, OQ5FO 13, TG9RB (277) 7, VP2DN (125) 13–14 and VQ2DT (117) 13–14. . . . *Newark News* Radio Club loggings on twenty voice: CP5AB, CRs 4AF 4AL 4AN 5SP 6BR 6BX 6CW, CT3AN, DU1AP, EAs 8AP 8AX 9DE, EL2X, FF8s AP (190), BG, FQ8AG (195), GDs 2FRV 3IBQ, HHs 1W 2KJ, HR1s BG (310), CB, KC6AA 7, KGs 4AB 4AC (270), 6FAA 6SB 20, KT1s PU WX, KV4BT 8, LX1s BU DC, LZ1KDP, OQ5s AO BK CF EI FN NC PE, OQØDZ, PJ2s AA AQ, ST2NW 14–15, TA3US, TG9s MB (185), RB, VPs 1SD 2DI 2GW 2KB 7NG (195), 7NT, VQs 2FU 3ES 4EZ 4FK 4RF, VS2s CP DY 11, EB 6, YA1AA 15, YI2DIQ (122) 18, YNs 1JP (205), 4CB (198), YU2GD (170) 15,

VS6AE, *right*, entertains WØYDZ in his cozy Hong Kong hamshack. WØYDZ gets around quite a bit and has an elaborate DX installation of his own perking under the call sign WØYDZ/KG6. VS6AE regularly puts up his dukes in ARRL DX Competitions and you'll undoubtedly hear him boiling through in the ARRL annual DX Classic commencing this month.

ZB1CM 16, ZC5VR 10, ZDs 4BL 9AC (155) 17, ZE6s JI 15, JJ 17, 5As 1TT 3TE 3TF 3TR and 4TU, all times Eastern Standard.

Forty c.w. plods along trying to fill the void left by twenty's nighttime discrepancies. ZD6BX, who has handed Nyasaland to many, finally worked that country himself! SP9KAD, ZD6EF, ZS3HX and 4X4DR wound up in Vic's 7-Mc. archives . _ . _ . _ K6EC gets around on 40, to put it mildly: EA9DF (32), FO8s AC (28), AK (26), JAØCQ (31), that KD6AT fellow (26), KJ6AI (13), LUs 1ZT (18), 2ZC (18), 2ZI (12), 7ZO (8), OQ5GU, TG9AZ (22), VK1AC (27), VP8s galore, ZSs likewise and ZD6BX (22) borrowed Ev's receiver. EL2X (8) and FB8ZZ (22) got away . _ . _ . _ HK1TH (30) 20 *EST*, HR1JZ (5) 6 and VP7NT (60) 19 contacted W2QBB . _ . _ . _ 40-meter good fortune at this shack and that shack, first *W1BGJ:* OK1CX (42) 1 *GMT*. *W1WAI:* FG7XA, VP8AX. *W2JOA:* FG7XB (40) 12. *W2OLU:* OX3AY (5) 23. *W3UVD:* an OX3, YU2AE (50) 2. *W5TFZ:* VE8YZ near the Pole. *W6UED:* JA6AE. *W6ZOL:* our KD6AT friend. *W7VWS:* ZS6US. *W8FPR:* heard HKØAI (8–74) 2–4. *W9RRG:* DM2ABK, an EL2. *WØKMV:* DU7SV (40) 13, VP2SH. *WØPRM:* heard KM6AX (15), nailed ZK1BC (8) with 20 watts and vertical. *K2GZN:* PI1LC 22. *VE3CEM:* an FG7, HK5TE, TI2BX . _ . _ . _ CN8GB (10) 7 *GMT*, CRs 4AL (12) 2, 7CL (28) 4, EA8BF (45) 3, HB1MX/HE (10) 6, HH2LR (5) 7, JA1SR (18) 13, KC6CG (25) 8, TF5TP (10) 0, UH8KAA, UM8KAB, VKs 1DJ (23) 7–8, 9WZ (8) 13, VQ2GW (22) 3, ZK2AC (4) 8 and 9S4AX (7) 22 are outpointed by WGDXC . _ . _ . _ NCDXC adds FR7ZA (5) 7 *PST*, LU4ZB (11) 23 and VQ4EQ (21) 7–8.

Forty 'phone helped NNRC monitors to CN8MM (93), DU7SV, EAs 8BQ 9AS 9BB, HC2JR (85), HHs 2DL 5SS, HI6s EC TC (70), JAs 1AEA 1GD 1VP 7CH, KC6AA, KG6GX, KJ6AZ, TG8AA, TI2PZ, VK9FP, VPs 2DN 4TN 5DX 5SC 6FR 6WR 9BL 9BO, YVs 1AP 5AB, 4X4DK, many VKs, ZLs and ZSs. As rough as it is, one can't afford to pass up forty's A3 multipliers in the upcoming 21st ARRL DX Competition.

Fifteen 'phone blows hot and cold. Let's hope it inclines toward the former on aforesaid Test week ends! CE2HJ, KA2KC, KG4AC, KL7BFW, KV4BD, KW6BB, VQ2s AW FU, YV5FL and many ZL-ZS customers did business with W6ZZ. EA4EP made it a fast 'phone WAC for Miles . _ . _ . _ 21-Mc. 'phones CR7BB, EAØAC (105), FR7ZA (187) 16 *GMT*, VQ5BVF, VU2EH (117) 13–14, YA2KAB (200), ZD9s AB (250) 18 and AC (247) 18–19 are reported by WGDXC sources . _ . _ . _ NNRC 15-meter A3 loggings: CP5s AB EK, CR6BH, CT3AN, DU7SV, EA9AZ, ELs 3A 1ØA, FAs 3JY 3OD 8BE, OD5AJ, OQ5s PQ RU, VPs 1GG 2KB, VQs 2AW 2OT 4AR 4EZ, ZBs 1AUZ 2A, ZC4JA, ZDs 3BFC 4BQ, ZEs 2KP 2KQ 3JM 4JN, 4X4s CW DK FQ and GB . _ . _ . _ SCDXC and 200-DXC add voicers JA1CO (281), KR6OH (277), ZSs 7C (210), 3AB (200) and 9I (150) to the list.

Fifteen c.w. is the range where Novices are most susceptible to the bite of the DX bug. WN3ZKH has pretty QSLs en route from G2DPY, ZD6BX and ZS4FP . _ . _ . _ Novice WP4YT was a rather rare catch for ZD6BX. Vic also collected CN8MI 11 *GMT*, CR6AI 15–16, FAs 3OA 8DAs OA4C 16–17, OD5LX 9, OE3SE 15–16, VS6CQ 9–10, ZB1BF 13–14 and ZC4IP . _ . _ . _ KL7ZG raised KG6GX and KJ6AZ . _ . _ . _ CE3AG, DU7SV, JAs 1CJ 1CO 3AF 3AH 3AQ 4BB, KA2AS, OA4C, PJ2AA and YV5BX swapped c.w. with W6UED . _ . _ . _ WDGXC suggests 21-megacyclers CR7CK (50) 17 *GMT*, ZD6BX (28) 17–18, ZE3JP (55) 18, ZSs 3K (65) 17 and 9I (50) 18–19 for code practice.

Eighty c.w. maintained its DX recalcitrance right up through deadline time but here follow some of the multipliers you should have little trouble accumulating in the nearing ARRL Test. K2BZT picked off 9 Gs, 4 GIs, 2 GMs, 5 DJs, 4 PAØs, 3 SMs, plus DM2AGL, EI4X, F9NG, HB9MQ, OK1KPI, OZ3LF, YU3s HB and HC without much difficulty. Then he really went to work and landed CT2BO, FG7XB (12) 2 *EST*, LZ1KDP (25) 22–23 and OX3AY (2) 2 . _ . _ . _ A little 3.5-Mc. biz here and there, at *W2ESO:* LZ1KSP (8) T9c heard. *W7VWS:* KL7AYV (45) 19 *PST*. *W9RRG:* KM6AX. GD3UB, OD5AV, TA3AA, VQ2AB, HA5KAB, LA2HF, OE2JG, SU1RS, 9S4AX and several VP8s joined the 80-meter fun.

One-sixty c.w. falls somewhat short of previous seasonal highs but still is a-propagatin'. There are on record several recent G-ZL contacts and a VS6-ZL two-way, so 1.8-Mc. news isn't a North American monopoly by any means . _ . _ . _ W9FIM hooked YV5DE while W3EIS kept busy with three KP4s and a pair of KV4s. YV5DE also worked Ws 1BB and 9PNE . _ . _ . _ LU3EL made himself many friends including Ws 1BB 3FBX 4ZQ 8GDQ 9CVQ 9PNE and ØNWX. He helped alleviate the absence of good openings along the north Atlantic path . _ . _ . _ U.S. and Canadian stations active on 160 this season include W1s AHX BB EFN JRA LYV NAS TCR UXG VDB WPO ZL ZNF, W2s EQS GGL JIL KFO QHH, K2s BWR CVC DPS, W3s EIS FBV FNF HL LII RGQ TBG VAA, W4s FCB JGD KFC PNK UNE ZQ, W5WSF, W7QDJ, W8s ANO BJC CYH EJL GDQ GIY IKN KIA MTI NSF PEV, W9s CVQ FIM KRG PNE, WØs IFH NWX, VEs 1ZZ,

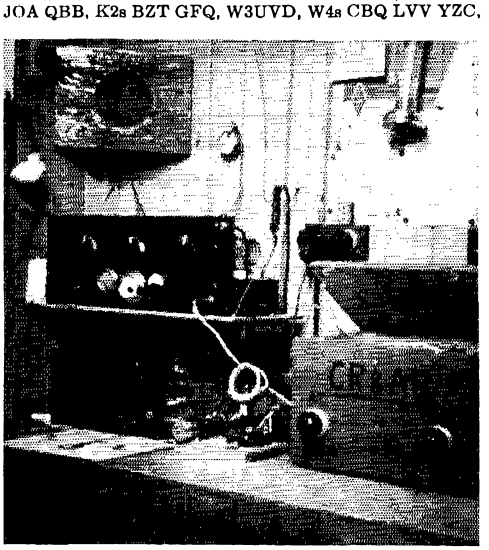
Otto Bauman, HB9X, whose call sign sounds like an RST report at first listen, has radiated potent DX-band r.f. for many years. His collection of 212 ARRL DXCC Countries List items is tops for Switzerland.

2WK, W4KVM/VO6 and VO4B ... DX stations known to be on the band: many U.K. brethren of course, HB9CM, several KP4s and KV4s, LU3EL, SU1s FA XZ, TI2BX, VPs 4LZ 7NG, VS6CQ, YV5s DE FL and several ZL DXers. DX stations with 1.8-Mc. intentions are DL1IX, GC2s CNC FMV, GD3UB, HB9T, HK4DP, HR1UA, OK1s AEH HI, PY1AJ, YVs 1AD 5BJ, YU1GM and several Cyprus long-wire enthusiasts ... Better get that 160-meter set-up cooking for the Test, OM — a few important multipliers missed could edge you out of a nice diploma. Anyhoo, it's still a young season; see you on 1.8 Mc. for the final Transatlantic Test week end of the current series, February 13th.

Where:

ZD6BX advises that ZD6EF acts as Nyasaland QSL manager: E. Finch, Postmaster, Blantyre ... VQ4EI informs W6SWG that he'll handle incoming QSLs for Kenya and Uganda ... Save ink and effort, guys. It's no longer necessary to include the phrase "care of postmaster" on APO-addressed mail ... G2RO terminates his latest Oceania-Africa roamings late this month with stops at the Cocos Islands (Feb. 6th–8th), Mauritius (Feb. 8th–12th), Kenya (Feb. 12th–18th) and thence back to London. Those dates are approximate and rarer side stops may be interspersed. If you've worked stations in these general areas with call signs ending in "RO" — VR1RO, VR2RO, VR4RO, VS4RO, etc. — ship your QSL(s) to RSGB for the attention of G2RO ... CX2AM regrets that it is not feasible for him to QSL direct to each of the many Ws he works. All cards received are answered via bureaus ... W4VZQ advises that all KC4AB Navassa confirmations have been distributed. Those still minus deserved pasteboards are invited to reapply at once. DXpeditioners W4s HBC QCW and VZQ now look for other worlds to conquer ... In addition to the QTH to follow, FG7XB also gives 44 Chemin des Petites Abymes, Pointe-a-Pitre, Guadeloupe; both can produce the desired result ... "The F7 QSL Bureau finally has gone into full swing here in France and cards for all F7 stations may be sent to: F7 QSL Bureau, F7DZ, APO 163, New York, N. Y." This from F7DZ who adds, "We have a large amount of cards on hand for stations that operated here from 1949 through 1954 and we would like to dispose of them. Anyone formerly having privileges of operating an amateur radio station in France can receive his QSL cards by (1) giving full name and address, (2) listing call(s) held in France, and (3) remitting twenty-five cents in stamps to the F7 QSL Bureau." ... W1s UED WAI WPO YYM, W2s IVS JOA QBB, K2s BZT GFQ, W3UVD, W4s CBQ LVV YZC, W9s AA CFT RBI WHM, WØVFM, PJ2CJ, CT1CB, ZD6BX, VE3CEM, NCDXC, OVSV, SCDXC and WGDXC accounted for these individual items:

AP2K (QSL via DL3ZV) ... **CN8FQ**, Lee K. Knowlson, jr. (K2IGC), NCF USAF, Navy 214, Box 50, FPO, New York, N. Y. ... **CR8AB**, Rui Alberto Vilhena, Soares, Paugim, Portuguese India ... **DL2AL**, No. 1 AFAP, % RAF, Eindhoven, Netherlands ... **DL4JD**, Tony P. Smaker, jr. (W6JDO), 853 Comm. Reconn. Det., APO 403, New York, N. Y. ... **EL2L**, Sam Butler, Monrovia, Liberia ... **EL5B**, % PAA, Roberts Field, Monrovia, Liberia ... **ET3GB**, Box 621, Addis Ababa, Ethiopia ... **ET3S**, Box 499, Addis Ababa, Ethiopia ... **FA8AN**, R. Vercoitte, Chef du Centre STS, Tamanrasset, Dept. de Constantine, Algeria ... **FB8BR**, Hubert Hoffman, P.O. Box 730, Tananarive, Madagascar ... **FE8AE** (ex-FF8AN), Marcel Veber, Box 408, Douala, French Cameroons ... **FG7XB**, Antoine Noel, Box 11, Pointe-a-Pitre, Guadeloupe, F. W. I. ... **FK8AP**, Marcel Legal, Hydrobase, Noumea, New Caledonia ... **KC6CG**, USCG Loran Stn., USCG Depot, Box 3, Navy 926, FPO, San Francisco, Calif. ... ex-**MF2AG**, Sgt. D. J. Doleman, Hq. 24th Indep. Inf., Beerbolt Camp, Bernard Castle, Co. Durham, England ... **OE8SH**, Ing. Herbert Setz, Wunderstatten 31, Post Lavamünd, Austria ... **OX3AY** (QSL via EDR) ... **PJ2AR**, Homer Waits, Lago Colony, P.O. Box 720, Aruba, N. W. I. ... ex-**PJ2CB**, J. L. Sterke, Blaricummerstraat 16, Huizen (N. H.), Netherlands ... **TG9EA**, P.O. Box 115, Guatemala City, Guatemala ... ex-**TI2TG**, T. G. Gabbert (K6INI), 1243 Meta St., Ventura, Calif. ... **VK1EG** (QSL via VK4FJ) ... **VP4BN**, CHRELE John H. Bardon, USN, Navy 117, FPO, New York, N. Y. ... **VP5AE** (QSL via W8LMO) ... **VQ2ST**, S. W. Townsend, P.O. Box 2, N'Dola, No. Rhodesia ... **VQ3FN**, Box 1313, Nairobi, Kenya ... **VS1GF**, Leonard Hall, Wenchelecea, Braddel Rise Hotel, Braddel Rise, Singapore ... **VS1GG**, R. Johnston, RAF, Tengah, Singapore ... **VS1GJ**, R. L. Lawrence, Block 80, Aircrew Mess, RAF, Changi, Singapore ... **VS4KU** (QSL to VS5KU) ... **VS5HK** (QSL to VS4HK) ... **VS5KU**, Ray Herbert, Seria, Brunei (QSL via RSGB) ... ex-**VS6HR** (QSL to VP6AM) ... **WØYDZ/KG6**, J. H. Wieting, Air Antisub Sqdn. 23, FPO, San Francisco, Calif. ... **YN1AFN** (QSL via YN1WR) ... **YN1PM**, Box 346, Managua, Nicaragua ... **ZC3AC**, Christmas Island, Indian Ocean, via Singapore ... **ZC5SF**, G. Harrison, Box 232, Sandakan, Br. No. Borneo ... **ZC7AM** (QSL via RSGB) ... **ZE2KI**, P. J. McNicol, P.O. Box 21, Causeway, Salisbury, So. Rhodesia ... **3V8BP**, Andre Chevet, Kef, Tunisia ... **4S7KH**, Ken Holmes, 248 Ryefield Ave., Hellingdon, Mddx-UK, Ceylon ... ex-**5A2FA**, G. Verdureau, Villa Coin d'Alsace, Mongil-Rades, Tunisia.



CR8AB, son of equally prominent DX stalwart CT1CB, uses this interesting layout to represent Portuguese India enclaves on 20 meters. The transmitter runs fifty watts on a crystal-controlled frequency of 14,020 kc. (*Photo via CT1CB*)

Whence:

Asia — From YI2AM, RAF club station at Habbaniya, in a missive to W1WPO: "The QSL job here is huge and we lost quite a few willing hands last summer . . . but now have a little band active again and queer noises can be heard coming from the workshop half of the shack most evenings. To the best of our knowledge we hold the only YI2 call but we may have other Iraqi stations on in 1955. The present rig is a Clapp VFO-6V6-807-813, an SX-28 receives, and the antennae are two Vees plus dipoles for 10, 20, 40 and 15 meters. Currently we are most active on 40 and 20 — 15 and 10 are dead here." ... G3CYL ships to Thailand with hopes of seeing HS stations back in the DX swim and off the ITU ban list ... W9EU hears from 4X4AM that radio gear in Israel is as difficult to obtain as ever. Fortunate in having an excellent DX location, 4X4AM rebuilds toward faster bandswitching and more effective beam skyhooks ... Ron (W6CRV) of HZ1AB reports vastly improved conditions on Arabian paths to the States. KG4AP's 40-watter amazes Ron with its consistent 14-Mc. signal. HZ1AB has a new Vee cooking and the shack has been moved three miles to elude an annoying power leak. "The MARS operators will be gone in a few weeks and that will leave me as president and sole member of the Dhahran Amateur Radio Club. . . . Say, s.s.b. is the greatest. I read them when I can't hear the others!" ... In the event of a Pakistani WAS being inaugurated you'll want to know that AP2 is allocated for

Sind; AP3, Baluchistan; AP4, Northwest Frontier; AP5, Punjab; AP6, Bhagalpur; AP7, Assam; and AP8, Bengal ... Ex-VS9AW (G3GUK) has ideas of Car Nicobar hamming but near-future possibilities look slim, indeed.

Africa — An upsurge of Ethiopian ham activity is observed by ZD6BX. ET3S tells Vic that ET3s Q LF TRC PE and GB are active under regulations which permit 100 watts input on 3.5, 7 and 14 Mc. ET3s S and LF prefer 20 meters (LF is rockbound on 14,100 kc.) and TRC is constituted as a multi-operator station ... ZD6EF looks forward to the early availability of the 50-Mc. band in Nyasaland, and meanwhile QRPs on 40 meters ... CN8s ES FX GF and GH, who are W0s GGC NMR, W8FHJ and W6FRS, respectively, have intentions toward an Ifni DXcursion next month ... FB8BR, newly active on Madagascar, is ex-FF8AX-F9AE, runs eight watts to a 14-Mc. ground-plane and receives with a Collins. K2GFQ was one of Hubert's first FB8 U. S. QSOs ... W2TXB learns that CR7AF searches high and low for a North Dakota contact to complete his WAS ... VQ6LQ QSLs are getting around and NCDXC's *DXer* provides word on him. He's a telecommunications engineer and has DXed previously under such calls as YI2BT, VU2s DX NH, ZD1LQ and EL2LQ. VQ6LQ knocked off for U. K. leave in December but should be back in business at Hargesa next month.

Oceania — Writes VS5KU from Seria, Brunei: "Also have the call VS4KU but do not know yet if there will be time to pay a visit to Sarawak. . . . Gear here is very light in weight; both transmitter and receiver weigh two pounds and are built on QSL-size chassis. Power is about 18 watts." VS5KU will QSL on a one-for-one basis as soon as he returns to England, possibly by the end of this month. Ray has prior DXpeditionary experience as 3A2AL ... VR2CY forwarded beautiful Fiji photography to W9EU and shuts down this month for return to Sydney ... An autographed photo from VK3ACD confirms that W6YC was the first U. S. A. amateur to contact Heard Island. VK3ACD/VK1 ran only four watts input at the time ... SCDXC *Bulletin* excerpts: VK6MK confirms the imminent QRT of Heard Island amateur radio but opines that Macquarie will continue available. VK1HM, back in Perth, left his rig on Cocos where the net officer awaits his ham ticket; check with VK6MK if your deserved VK1HM QSL hasn't shown ... WGDXC *DX Bulletin* Oceanagrams: CR1ØAA's return to the air is highly anticipated. VS4HK intends Brunei VS5HKing directly. The current ZC3AC regularly puts his 35-watter on 14,163-kc. 'phone around 1130 GMT. VK4IC, out on Willis Islet, is lucky to see a mail boat more often than once per year.

Europe — "I understand there are two licensed HV hams — the director and assistant director of Vatican Radio — but they have not been on the air and don't intend to get on for fear of causing too much rumpus." This from W4YHD who has been keeping an ear to the ground against the possibility of early HV activities ... DUF award aspirants are advised by F8TM to address subsequent inquiries and applications to REF, B. P. 4201, Paris R. P., France ... F7CZ (K6CDT), still seeking his 48th state, has a 143/75 DX record. Placing French 1st for A3 and 2nd for A1 in last year's ARRL DX Test, Preston doubtless points for the 1955 brawl which begins in a few weeks ... In a recent photo caption we overlooked SM5KP's accomplishment of the first European double-DXCC rating on 'phone. GM3DHD and G2PL thus make it a strong two-three ... After 5000 QSOs in three years SM7BVO welcomed SM5AHK's and OH2YV's nominations to ARRL's RCC circle ... SCDXC sources advise that LB8YB won't be available for Jan Mayen QSLs and further QSOs until he emerges from Greenland wilds *circa* July ... Bulgarian gist from an LZ1DP line to W1WPO: LZ amateurs now receive authorization in steps of 25, 150 and 1000 watts permitted input. Club station LZ1KAB sports a new 1-kw. A1 and 500-watt A3 exhaler, appearing regularly Fridays and Saturdays on 14 Mc. between 1300 and 2200 GMT ... The many ZA calls being bandied about still haven't produced much in the way of bona fide Albania confirmations. YU1AD opines via W9RBI that ZA ham radio is strictly chimerical.

Hereabouts — W2s EEN and GVZ chime in with a loud "Never give up on a QSL!" Both received LU2AX pasteboards confirming 1936 and '37 LU2AX QSOs ... RCP (Paraguay) states there is no ZP6CR. Over 300 QSLs for this one have been confiscated ... W2CUQ booms the QRP facet, reporting various fancy DX QSOs with his 12BA6-50L6 4.9-watt arrangement. ZLs, VKs and DU7SV are among Will's trophies ... HP1BR's call was borrowed by a 14-Mc. culprit and Bob is hard put to dispose of the many QSLs received on the crum's behalf ... TI2BX and XYL are heating up Costa Rican airwaves on all DX bands. Confirming a trend, Ted writes, "All bands have improved enormously here, especially 15 and 80 meters." ... W4s DHZ LVV and others report on gear difficulties at FG7s XA and XB. Any Good Samaritans around? ... W5YMX/MM's 21-Mc. activity made quite a splash in a recent *Alcoa News* as noted by W3DLI ... W5UJW journeys to Costa Rica for a short stay and thence to Ecuador and a position on the staff of famed HCJB, the 12-Mc. Voice of the Andes. W5WSM will keep in touch with him by mail until Harley's HC ham call comes through ... W2ZK, a veteran of the 1934 Byrd Antarctic expedition, heads for New Zealand where this year's Byrd effort is assembling for final loading of supplies. W2VQR points out that W2ZK was one of the three-man crew which saved the Admiral's life in an isolation predicament 123 miles from the Little America base twenty years ago ... K2BZT's first two years on the air netted him 3394 QSOs, 134 countries (54 on 80 meters) and 1100 DX stations contacted. Yet Hayden still awaits his first VK QSL ... K6GL gets in his DX licks with a long wire suspended from two of the best antenna masts that be — towering redwoods! ... Ex-OA4CS temporarily is K2CJ/9 with a Viking Ranger on several bands ... Three OAØ calls have been issued for Peruvian mobile purposes ... G3AAT/OX pasteboards shortly will be making the rounds of hamshacks far and wide.

KC6KU keeps Kusaie, Carolines-Ponape District, Trust Territory of the Pacific, available on twenty 'phone. Here operators Bob and Jack do a prowl among stacks of 14-Mc. QRM.

Strays

From AP, via the Philadelphia *Enquirer*, comes this little tale:

Green Bay, Wisc. — Oct. 9. The atmosphere was electric in Municipal Court today when the county's radar produced a charge of one volt — Howard Volt, of Kaukauna, accused of speeding.

Watt are the facts, Judge Donald W. Gleason wanted to know after Volt failed to appear in person.

It was brought out that Volt had offered no resistance to the charge but had pleaded guilty through the sheriff and was allowed to go ohm after having deposited a bond of $10 and costs.

"Ten dollars and costs," the court decreed, "or ten days in a cell."

—•••—

W2NEK, who works in a bookstore, reports running across a book entitled *813*. It turned out to be quite disappointing, though; not a word about grid bias or maximum plate ratings — 'twas just an old "Whodunit."

IN December, death took two prominent amateurs who had been intimately associated with the growth and development of the League through their service on the Board of Directors over periods of many years. The return, term after term, of a particular director to the Board is, more than the few words of tribute we pay here, striking evidence of the esteem in which he is held by the amateurs of his division. Not only because of the long association, but more importantly, because of the high standards of performance these men set for themselves in fulfilling their voluntary tasks on behalf of amateur radio, the Board family and Headquarters feels, along with their many friends and associates, a keen sense of loss at their passing.

Karl W. Weingarten
1899–1954

Karl William Weingarten, W7BG, for more than nineteen years a director and vice-director of the Northwestern Division, and just re-elected as vice-director to serve for another two years, passed away on December 2, 1954. Born in Maryland, Wisconsin, Karl moved to Tacoma in 1903, and was licensed in November, 1916, as 7BG. He was director of his division from 1923 to 1933, again from 1941 to 1947, and vice-director from 1951 to 1954.

An active amateur, Karl was a charter member of the Radio Club of Tacoma, Inc., and had held all offices in that club. In addition, he had been a charter member and vice-president of the Tacoma Amateur Radio Society, and a member of the Quarter Century Wireless Association. That Karl loved amateur radio is evidenced by his long service as a leader in his division and in the amateur organizations to which he belonged.

Hugh L. Caveness
1896–1954

Lt. Col. Hugh Lynn Caveness, W4DW, of Raleigh, North Carolina, passed away on December 18th as the result of a heart attack. W4DW had served as director of the Roanoke Division from January, 1933, to January, 1949, the second longest continuous service of any U. S. division director in the League's history. During his tenure on the Board he had served additionally on several special ARRL committees.

A graduate of Duke University, W4DW was for many years a professor of chemistry at North Carolina State College. Commissioned during World War I, he had remained active in the reserves until called to active duty in 1940. Serving until 1947, he was recalled a year later and until his death was an administrator in the state selective service system.

A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All *you* have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4¼ by 9½ inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner. (Bold-face type indicates change since last *QST* listing.)

W1, K1 — J. R. Baker, jr., W1JOJ, Box 232, Ipswich, Mass.

W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.

W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.

W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.

W5, K5 — Oren B. Gambill, W5WI, 2514 N. Garrison, Tulsa 6, Okla.

W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.

W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.

W8, K8 — Walter E. Musgrave, W8NGW, 1294 E. 188th St., Cleveland 10, Ohio.

W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wausau, Wisc.

WØ, KØ — Alva A. Smith, WØDMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.

VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.

VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.

VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.

VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.

VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.

VE7 — H. R. Hough, VE7HR, 2316 Trent St., Victoria, B. C.

VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.

VO — Ernest Ash, VO1A, P. O. Box 8, St. John's, Newfoundland.

KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.

KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.

KL7 — Box 73, Douglas, Alaska.

KZ5 — Gilbert C. Foster, KZ5GF, Box 407, Balboa, C. Z.

Strays

Noteworthy amateur-radio service in the public interest was shown in ample fashion during recent Muscular Dystrophy Drives. The Washington (D. C.) Mobile Radio Club was out in force and lauds the aid and encouragement of *W3s* AQZ EOV FZ IA IZL KZQ MBZ MSU NL NXO PTS QBC RIG RXJ TBO UCQ UZT VBP WLA WXA YAE; *W4s* BF LKJ OP YWF; W8EXZ. Nebraska mobileers demonstrated top coöperation during Ak-Sar-Ben's MDA campaign, as reported in their club publication *Ham Hum*. Plaudits to *WØs* AEM AQJ CQX FQB GNM NMN NPA NRS PHW YMU.

CONDUCTED BY EDWARD P. TILTON, W1HDQ

CHECK back through *QST*s of the middle '20s and you'll find that there was exploration of the v.h.f. region as much as 30 years ago. World-wide DX was the objective in those days. Hams had been moving higher in frequency, and in the 20-meter region daylight DX with low power and simple antennas was encountered for the first time. The next step was "5," the 10-meter band not having been assigned in those days.

So, on to 56-Mc. territory went a few pioneers, confident that new DX records awaited only the solution of tube, circuit and stability problems for c.w. operation on so high a frequency. Of course world-wide DX failed to materialize on this new band, and interest waned for several years. Who wanted to work locals?

The concept of using the "ultra-high frequencies" for low-powered 'phone work developed in the early '30s, triggered off by a series of articles by Jim Lamb and Ross Hull. They described gear that any ham could build, using low-cost parts and tubes, a blessing to a country then sliding into a period of economic depression. Complete stations could be operated from batteries, so they were hauled up to the mountains every week end. Hundreds of hams who had shunned voice work now found themselves shouting into microphones with boundless enthusiasm.

It was the idea of a simple inexpensive 'phone rig that sold v.h.f. on a large scale, and an important factor in this was the ability of 5-meter stations to "work duplex." Two-way communication with transmitters and receivers running simultaneously at both ends had been frowned on for lower frequencies because it was wasteful of crowded spectrum space, but this was no great problem on 5 meters. The ability to talk in a natural fashion with a fellow ham, instead of launching into (or having to listen to) involved monologues, caught on like wildfire, and soon almost everyone was working duplex on 5.

What has happened, then, to a technique that was once so popular? When was the last time you heard anyone working duplex on 144 Mc., for instance? Apparently duplex dropped out when we started using higher power and superhet receivers. The low-powered modulated oscillator and the superregenerative receiver were naturals for duplex work, but the multistage transmitter and the double- or triple-conversion receiver produced too many birdies and feed-back problems for most of us. Then, too, we began to standardize on high-gain beams that had to be switched from transmitter to receiver, eliminating the two-antenna technique necessary for duplex work.

Duplex conversations are not often practical for v.h.f. DX, and they probably will contribute little toward the advancement of the art, but we might well make use of the technique in the interest of more year-round activity. Particularly in the quiet of winter nights, duplex QSOs could help mightily to enliven what otherwise may be rather inactive bands. Certainly a potent factor in the upsurge of single sideband on lower frequencies is the fast exchange of ideas that is possible with voice-controlled break-in. Duplex accomplishes the same result on the v.h.f. bands, and with little added in the way of complications.

You need two antennas, first of all, but one can be your regular beam. The other can be a folded dipole, an antenna for some other band, or even a TV antenna, if you can sell the last idea to your family. Perhaps you'll want a special rig for duplex QSOs. Make it low-powered, with a minimum number of stages, starting on as high a

WØZJB....48	W5VY.....48	W9ZHB.....48
WØBJV....48	W5GNQ.....46	W9QUV.....48
WØCJS....48	W5ONS.....45	W9HGE.....47
W5AJG....48	W5JTI.....44	W9PK.....47
W9ZHI....48	W5ML.....44	W9VZP.....47
W9OCA....48	W5SFW.....44	W9RQM.....47
W6OB....48	W5JLY.....43	W9ALU.....47
WØINI....48	W5JME.....43	W9QKM.....46
W1HDQ....48	W5VV.....42	W9UIA.....45
W5MJD....48	W5FAL.....41	W9UNS.....45
	W5FSC.....41	W9MFH.....36
W1CLS.....46	W5HLD.....40	
W1CGY.....46	W5HEZ.....38	WØQIN.....47
W1LLL.....46	W5FXN.....38	WØDZM.....47
W1GJO.....45	W5LIU.....37	WØNFM.....47
W1LSN.....44		WØTKX.....47
W1HMS.....43	W6WNN.....48	WØKYF.....47
W1DJ.....41	W6ANN.....45	WØJOL.....46
	W6TMI.....45	WØHVW.....46
W2AMJ.....46	W6IWS.....41	WØMVQ.....46
W2MEU.....46	W6OVK.....40	WØWKB.....45
W2RLV.....45	W6GCQ.....35	WØTJF.....44
W2IDZ.....45	W6BWG.....29	WØJHS.....43
W2FHJ.....44		WØPKD.....43
W2GYV.....40	W7HEA.....47	WØIPI.....41
W2QVH.....38	W7ERA.....47	
W2ZUW.....35	W7BQX.....47	
	W7FDJ.....46	VE3AET....43
W3OJU.....46	W7DYD.....45	VE3ANY....42
W3NKM.....41	W7JRG.....44	VE1QZ.....34
W3MQU.....39	W7BOC.....42	VE3AIB....32
W3OTC.....38	W7JPA.....42	VE1QY.....31
W3KMV.....38	W7AQD.....42	VE3DER....27
W3RUE.....37	W7FIV.....41	XE1GE.....25
W3FPH.....35	W7CAM.....40	CO6WW.....21
W4FBH.....46	W8NSS.....46	
W4EQM.....44	W8NQD.....45	Calls in **bold face** are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.
W4QN.....44	W8UZ.....45	
W4FWH.....42	W8RFW.....45	
W4CPZ.....42	W8CMS.....43	
W4FLW.....42	W8SQU.....43	
W4OXC.....41	W8BFQ.....42	
W4MS.....40	W8YLS.....41	
W4FNR.....39	W8OJN.....40	
W4IUJ.....38	W8LPD.....37	
W4BEN.....35		

frequency as possible, to reduce the number of unwanted harmonics and spurious responses in the receiver. Shielding and coaxial-line feed to the antenna system may help. Chances are you'll want to reduce power, if you run your regular rig in duplex work, as continuous operation may be a little rough on transmitters that push tube ratings close to the limit. Cutting your power in half will make very little difference at the other end of the kind of a path over which you're likely to be working duplex, but it may save you some tube failures.

Duplex is ideal for crossband conversations, when you're testing out gear for a new band. It's easy to avoid exact harmonic combinations on 50, 144, 220 and 420 Mc., so there should be no great trouble licking feed-back problems in crossband work. And crossband duplex is great for stirring up interest in other bands on the part of other local hams. There's nothing like hearing *one* end of a conversation to get a fellow started building for another band!

Don't forget, AØ operation was recently made legal on any amateur frequency above 51 Mc. Setting up for crossband, duplex, retransmission of signals, and all the other possibilities inherent in the AØ authorization could help greatly to make all-year use of the v.h.f. bands more fun for everyone. Let's give it a try — *this* winter!

Here and There on the V.H.F. Bands

If you have a good signal with normal amateur power, much lower power levels can do surprisingly well, even on fairly long paths. It's a safe bet that we often use far more power than is necessary for good communication, even though high power is by no means as common on the v.h.f. bands as on lower frequencies. Some idea of the possibilities for low power on 144 Mc. can be gained from the experience of W5DFU, Tulsa, Okla., in working out with only his grid-dip oscillator. In a contact with WØZJB, Wichita, Kansas, Warren asked Vince to listen for his "new low-powered rig." He then coupled a one-turn loop to the coil on his grid-dipper and hooked it onto his 16-element array. Vince reported it coming through fine.

Next step was to connect a key in series with the meter and make a c.w. QSO. The signal was also copied by W5HXK, Watonga, Okla., 150 miles. Carrying the g.d.o. idea further, W5DFU and W5NDE have found that they can work very nicely by *shouting* at their grid-dip meters. Not that this is a new approach; but some of our newer hams may not know that voice contacts were made by this same technique a generation ago. Frequency modulation was not invented yesterday!

A slightly different experiment, in the big-antenna field, is also reported by W5DFU. He and W5s VKH and NDE have twice made use of the 12-bay 750-foot high Channel 8 array of KTVX, Muskogee, Okla. Using an 829-B rig hooked onto the 3½-inch coax of the big array (needless to say during a Sunday morning when no transmitting was scheduled for KTVX) they found it easy to work W5AJG, Dallas, Texas, W5HXK, Watonga, Okla., WØZJB, Wichita, WØZJY, Manhattan, and WØOZK, Winfield, Kans. Weather conditions could hardly have been worse at the time, and most of the big tower was obscured in storm clouds.

Good 2-meter weather is not the exclusive property of the warm months, however. The night of Dec. 13th was one of the best ever experienced by Tulsa-area 2-meter men. W5s NDE and DFU worked WØs MVG, Salina, Kans., EMS, Adair, UOP, Des Moines and TIO, Slater, Iowa. These were the first Iowa contacts for the Oklahoma boys, but they seemed to have exclusive rights that night. W5DFU got W5CVW, Ft. Worth, going, and the Iowa boys had several Minnesota stations hooked up, but no further DX could be negotiated either way.

One trouble a v.h.f. man encounters in trying to get activity rolling in a new area is the habit most of us have of keeping our beams set in directions where we *know* that there is activity. This can make it rough in a locality as near to concentrations of v.h.f. stations as New London, Conn., is. The tendency for beams to be stuck on the New York-Hartford-Boston axis has made it tough for v.h.f. men of the New London area for years.

In the early days of the 2-meter band activity started there with vertical polarization, and so it continued until recently. Now there is a swing to horizontal, and with it has come improved coverage over the hilly terrain that nearly surrounds this southern Connecticut city. Now W1s HXL, Mystic, UIZ and PHP, Salem, VLT and NEK, Waterford, and IWY, IXP, IOH and VGJ, New London, are working up to Hartford and Springfield regularly. They could use more contacts, however, and they ask that W1 and W2 2-meter beams be aimed at the New London area more often.

RECORDS

Two-Way Work

50 Mc.: CE1AH — J9AAO
10,500 Miles — October 17, 1947

144 Mc.: W6ZL — W5QNL
1400 Miles — June 10, 1951

220 Mc.: W8BFQ — W5RCI
700 Miles — October 9, 1954

420 Mc.: W1RFU — W4VYE
410 Miles — June 12, 1954

1215 Mc.: G3QC/P — G8DD/P
100 Miles — July 26, 1953

2300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947

5250 Mc.: W2LGF/2 — W7FQF/2
31 Miles — December 2, 1945

10,000 Mc.: W7JIP/7 — W7OKV/7
109 Miles — August 8, 1954

21,000 Mc.: W1NVL/2 — W9SAD/2
800 Feet — May 18, 1946

W4WNH, Elizabethtown, Ky., about 40 miles south of Louisville, was a long time attracting attention. Apparently 2-meter operators tend to think of Kentucky in terms of the Covington-Cincinnati area, and it took a major tropospheric opening for Shelby and his associates to make outside contacts.

Planning to try operation from Pikes Peak next summer? If so you'd do well to contact WØISL, who handled the arrangements for the W6RLB/Ø expedition reported in October *QST*. W6RLB tells us that the organization handling the concessions at the summit hires about a dozen or so teen-age youngsters each summer. Might be an attractive chance for a v.h.f.-minded young ham. Contact can be made through Robert G. Chapman, WØISL, 124 W. Columbia, Colorado Springs, Colo.

Though activity has been none too high recently, W5FEK says that about 50 hams showed up for the first annual Texas V.H.F. Round-up at the farm of W5FSC, near Caldwell. One purpose of the gathering was to organize a v.h.f.-u.h.f. group to promote and maintain activity. A committee under the supervision of W5FEK, consisting of W5AXY, cochairman, and W5s FSC, UUM and IVU, will work out complete details. Further efforts along this line are planned for the ARRL West Gulf Division Convention next June. A calling frequency of 145.1 Mc. has been established.

An Annual Midwinter V.H.F. Hamfest will be held Feb. 26th at Kalamazoo, Mich. The afternoon program conducted by W8CVQ will be followed by luncheon. Later there will be antenna demonstrations by W8CVQ and W8HDM. The event is sponsored by The Kalamazoo Radio Club, and more information may be obtained from either W8CVQ or W8HDM. There will be no charge for admission.

Here's a point that may be helpful to users of tripler stages: K2DIS, Tenafly, N. J., recently put on a rig ending

up in a 6360 tripler to 220 Mc. It seemed to have quite good output, but a more careful check disclosed that at least half the output was on *twice* the driving frequency, rather than three times. A check with Amperex brought the suggestion to try cutting out the screen by-pass capacitor, feeding the screen through a dropping resistor; no r. f. choke. This was tried, and the tripling efficiency improved, with greatly reduced doubling.

While we're talking 6360s, W2DWJ, Elizabeth, N. J., is having good luck with one as a push-push doubler to 144 Mc., driven by a 5763 doubler. This stage gives more than enough output to drive an 5894 amplifier. Bill thinks it will also do the job on 220 Mc.

Simplified Dual-Triode Crystal Oscillator

A popular circuit for use when high-order overtones are wanted for v.h.f. crystal oscillator work is the dual-triode arrangement originally described in April, 1951, *QST*, page 59, and carried in all recent editions of the *Handbook*. With this circuit, the functions of crystal oscillator, cathode follower and frequency multiplier are carried out with a one dual triode.

An improved version of this circuit, suggested by W6MMU, is shown in Fig. 1. It differs from the original in that both cathodes are returned to ground through a single r.f. choke,

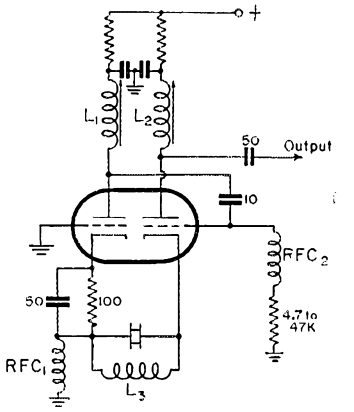


Fig. 1 — Simplification of the dual-triode overtone oscillator-multiplier, suggested by W6MMU. Improved efficiency and better balance of plate dissipation between the two triode sections are claimed for it.

and the dissipation of the two triodes is better equalized by the insertion of a bias resistor in the cathode lead of the left-hand triode.

The first plate coil, L_1, and the coil across the crystal, L_3, are resonated at the desired overtone frequency, though L_3 is not particularly critical. The second plate circuit, L_2, tunes to the second or third harmonic of the overtone frequency. The grid choke, RFC_2, may not be needed, though the efficiency of the frequency multiplier is usually improved when the choke is used. It also may prevent heating of the resistor that may result when the r.f. drive is applied across the resistor directly. The multiplier plate circuit should be low-C, preferably resonated by its slug only, as shown.

OES Notes

W2UTH, Victor, N. Y. — Rochester-area fixed-frequency net on 145.44 Mc., with members monitoring the channel constantly when at home. Mobiles passing through the vicinity can be reasonably sure of contacts if they can use this frequency.

W2UXP, Rochester, N. Y. — 220-Mc. group now includes *K2s* CEH DYC INV; *W2s* POM RTB MHU UXP QS.

W3OTC, Silver Spring, Md. — List of stations on 50 Mc. within reliable working range of Washington area growing gradually. Now includes *W3s* AHQ KMV JES OJU CGV GGR PCB LFC TOM MXW TFA UJG WOD; *W4s* KKZ UMF HVV.

W3UQJ, York, Pa. — Though signal levels have averaged much lower during the colder weather, 8 watts output from an 832-A and a 16-element array still provide at least a usable signal over a radius of 80 miles or more on 220 Mc., almost regardless of intervening terrain. York Amateur Radio Club now having net drill each Monday night on 146.2 Mc.

W4HHK, Collierville, Tenn. — Meteor-scatter tests on 144 Mc. with W2UK and W1HDQ daily when working schedule permits. Burst counts run about three times as high on W2UK, but signals are heard both ways between all three stations regularly. W1CCH, Springfield, Mass., also producing some results on 1050-mile path.

W4UIW, Hialeah, Fla. — Some 420-Mc. activity, present and promised, for Miami area, by *W4s* WUU WHT WHU. *W4s* KQG GGO RNV on 144 Mc. Polarization change to horizontal now going on.

K6ERR, Richmond, Calif. — Expeditions to Cuesta Pass, near San Luis Obispo, and Black Mountain, 20 miles northeast of the same city, to check out 100-watt 2-meter rig designed for expedition service. Also comparing the value of these locations with that of Mt. Santa Ynez for communication to Bay Area and Southern California. Mt. Santa Ynez appears to win out, being good to south and only slightly inferior to the others for work to the north. Black Mountain best to the Bay Area.

(Continued on page 184)

2-METER STANDINGS

	States	Call Areas	Miles
W1RFU	19	7	1150
W1HDQ	19	6	1020
W1CCH	17	5	670
W1IZY	16	6	750
W1IEO	16	5	475
W1AZK	14	5	650
W1MNF	14	5	600
W1BCN	14	5	650
W1KCS	14	5	540
W1DJK	13	5	520
W1MMN	10	5	520
W2ORI	23	8	1000
W2UK	23	7	1075
W2NLY	23	7	1050
W2AZL	21	7	1050
W2QED	21	7	1020
W2BLV	19	7	910
W2OPQ	19	6	—
W2DWJ	17	5	632
W2AOC	17	5	600
W2UTH	16	7	880
W2PAU	16	6	740
W2PCQ	16	5	650
W2LHI	16	5	550
W2CFT	15	5	525
W2DFV	15	5	—
W2AMJ	15	5	550
W2QNZ	14	5	400
W2BRV	14	5	590
W3RUE	23	8	950
W3NKM	19	7	660
W3BNQ	18	7	750
W3FPH	18	7	—
W3KWL	16	7	720
W3LNA	16	7	720
W3TDF	16	5	570
W3IBH	16	5	570
W3GKP	15	6	800
W4HHK	26	8	1020
W4AO	22	7	950
W4PCT	20	8	—
W4JFV	18	7	830
W4MKJ	16	7	665
W4UMF	15	6	600
W4OXC	14	7	500
W4JHC	14	5	720
W4WCB	14	5	740
W4TCR	14	5	720
W4UBY	14	5	435
W4IKZ	13	5	720
W4JFU	13	5	720
W4ZBU	10	5	800
W4UDQ	10	5	850
W4TLA	7	4	850
W5RCI	21	7	925
W5JTI	19	7	1000
W5QNL	10	5	1400
W5CVW	10	5	1180
W5AJG	10	4	1260
W5MWW	9	4	570
W5ML	9	3	700
W5ABN	9	3	780
W5ERD	8	3	570
W5VX	7	4	—
W5VY	7	3	1200
W5FEK	7	2	580
W5ONS	7	2	950
W6ZL	3	3	1400
W6WSQ	3	3	1390
W6BAZ	3	2	320
W6NLZ	3	2	360
W6MMU	2	2	240
W6GCG	2	2	210
W6QAC	2	2	200
W6EXH	2	2	193
W7VMP	4	3	417
W7JU	3	2	247
W7LEE	3	2	240
W7YZU	3	2	240
W7JUO	2	2	140
W7RAP	2	1	165
W8BFQ	29	8	850
W8WXV	28	8	1200
W8WJC	25	8	775
W8RMH	22	8	690
W8WRN	20	8	670
W8DX	20	7	675
W8BAX	20	8	685
W8JWV	18	8	650
W8EP	18	7	800
W8UES	18	7	720
W8RWW	17	7	630
W8WSE	16	7	830
W8SRW	16	7	700
W9EHX	23	7	725
W9FVJ	22	8	850
W9EQC	22	8	820
W9KLR	21	7	690
W9BPV	20	7	1000
W9UCH	20	7	750
W9KPS	19	7	660
W9MUD	19	7	640
W9REM	19	6	—
W9LF	19	—	—
W9ALU	18	7	800
W9JGA	17	6	720
W9WOK	17	6	600
W9ZHL	17	6	—
W9MBI	16	7	660
W9BOV	15	6	—
W9LEE	15	6	780
W9JNZ	15	6	560
W9DDG	14	6	700
W9FAN	14	7	680
W9QKM	14	6	620
W9DSP	14	5	700
W9UIA	12	7	540
W9ZAD	11	5	700
W9GTA	11	5	540
W9JBF	10	5	760
WØEMS	27	8	1175
WØIHD	24	7	870
WØGUD	22	7	1065
WØONQ	17	6	1090
WØINI	14	6	830
WØOAC	14	5	725
WØTJF	13	4	—
WØZJB	12	7	1097
WØWGZ	11	5	760
VE3AIB	20	8	890
VE3DIR	18	7	790
VE3BQN	14	7	790
VE3DER	13	7	800
VE3BPB	12	6	715
VE3AQG	11	7	800
VE1QY	11	4	900
VE2AOK	10	5	550
VE7FJ	2	1	365

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
R. L. WHITE, W1WPO, Asst. Comm. Mgr., C.W.
PHIL SIMMONS, W1ZDP, Communications Asst.

GEORGE HART, W1NJM, Natl. Emerg. Coördinator
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, W1ZJE, Administrative Aide

FCC Suspensions and Monitoring. Commission monitoring activities cover a wide scope in support of all our amateur regulations. From various sources we learn of citations currently received by amateurs. These range from calling to strict account those who carelessly drop the use of their prefix letter or letter-and-numeral (making theirs an illegal identification) to off-frequency operations, and citation of RTTY users whose f.s.k. "shift" deviates more than the permitted 50 cycles from 850 cycles! Novices and Technicians too must mark their step or suffer consequences. W2LS and other Official Observers who help keep a lot of amateurs out of FCC trouble by their coöperative notices tell us a big source of trouble on which all amateurs should check themselves is *second harmonics* such as cause off-frequency citations when picked up in the 7.4–7.5 and 7.6–8 Mc. ranges. Note the following two late suspensions of amateur operator's license:

FCC Ordered (18 Nov. '54) that the *Technician Class* operator license of Richard K. Fred, Atlanta, Ga., be suspended 90 days, that the license be turned in to the FCC, and W4ZRA not be permitted to be operated by any person in the 90-day period, *it appearing that licensee, operating W4ZRA June 15, '54, exceeded the Technician Class privileges, Sec. 12.23 (d) by operating below 220 Mc., namely on 3995, 3966.5 and 3973.2 kc.*

FCC Ordered (26 Nov. '54) that the *Novice Class* operator license of A. J. Genatempo, Chicago, Ill., be suspended 120 days, that the license be turned in to the FCC, and WN9HGG not be permitted to be operated by any person in the 120 day period, *it appearing that the licensee, in Sept. and Oct. 1954 violated Sec. 12.23 (e) and 12.158 of FCC Rules by using Call Signs W9HGG and W9FZB not assigned to him, by using a VFO and frequencies in 7, 14 and 28 Mc. bands not authorized Novice Class licensees.*

Amateurs using 15-meter 'phone are cautioned to check their frequencies with special care. Receiver calibrations are often inaccurate at these frequencies, and an undue amount of voice operation is apparently in for citations in the region below 21.250 Mc. Since October, ARRL OOs have been doing all they can to save operators from FCC trouble.

Courtesy Award. The Soo Radio Club, WØRTC, is monitoring the bands for possible recipients of its new award, known as the "Courtesy Award." It is reported by club trustee (WØGDZ) that any member of this Sidney, Nebraska, club may make the award to an amateur thought deserving of the honor. It is not necessary to work a club member to get the award. This is sometimes issued for organizational merit and courtesy and/or assistance to amateurs or amateurs-to-be as well as for radio operating. Operational points that make amateurs on the air eligible for consideration for the SRC's award: (1) prompt QSLing, fancy card not required, just simple confirmation; (2) slowing down on c.w. when requested; (3) repeating when necessary; (4) chewing the rag in not too much of a hurry. We take this to mean contact may be shorter than the ½-hour required for RCC but devoid of adherence to a "formula and nothing more."

Tips on Working DX. The following is excerpted from the August issue of *The DX'er*, bulletin of the Northern California DX Club, Inc., W6GPB, editor: "About the most alarming situation in the DX field today is the increasingly loose operating technique of the DX hunter . . . . We have heard nice juicy DX stations being literally driven off of the air by the continuous and relentless calling on the DX station's own frequency. . . . It seems *who can call the longest* is the goal of this type of operator. When you get three or four of these boys onto something rare, well, that's all boys, you've had it! Even G2RO and FO8AJ had their hands full in trying to get these novitiates off their frequency. . . ."

What to do about this? W6GPB suggests that other stations give a helping hand on the air, such as "UP TEN" or "NO QSO ON HIS FREQ OM." As publicized in this column some years ago and implicit in the DX Operating Code (ARRL Operating Aid No. 5, the DOC, is free to all amateurs on request) it is in the province of the *DX operator himself* to control the frequency of those he will answer or work. He can do this just by briefly directing where he *desires* to be called. The DX operator should be very explicit to give the frequency. This spreads out replies and minimizes the QRM. Another answer in the opinion of the DX specialists we have talked to is rather to place emphasis *on making short calls and short QSOs* if the DX is rare. This is not only a matter of courtesy but of good sense. Telling the guy he is your first or greatest DX isn't going to matter. He as well as those waiting for a contact will love you all the more if you limit the QSO to a report, and your name and perhaps your state if all you have in mind is a card. Should you both have communications of importance to convey to each other that is another matter. Now just as there are traffickers who stand willing to give a talk on *message handling* to brief newcomers in the emergency and traffic field on how to behave in a net, it would seem the avid DXer could benefit from some DX educating. Among some 800 active affiliated clubs, the skilled DXers might en-

courage discussions along lines of self-disciplined behavior and courtesy that similarly pays off in QSOs and helps return dividends in operating pleasure. Increased DX results are a worthy goal!

The ARRL DX Competition. February 11th–13th ('phone) and February 25th–27th (c.w.) are the DX Test week ends. Use the corresponding dates in March to polish off the score started one month earlier and as a hedge against variable conditions. Consult the rules which appeared in full in January *QST*. Advance notices were sent to rare DX stations as well as foreign societies to promote the contest. Don't forget to try to garner some points on 160 as well as 15 and 20 meters, which bands are showing up better this year. U. S. and Canadian stations send RS (T) followed by the abbreviation for state or province; DX stations send RS (T) and three digits giving power input. Good luck and give DX a try during the test, whatever your amateur interests.

— *F.E.H.*

RTTY NOTES

The RTTY Society of Southern California, sponsors of the Second RTTY Sweepstakes held last October, reports that 64 stations in 30 ARRL sections participated. Frank White, W3PYW, led all comers with 2262 points. Others scoring over one thousand points: W2JAV, W2BDI, W6CG, W9TCJ, W8ZM, W6AEE and W8BL.

The Society also reminds radioteletype enthusiasts that the Second Anniversary RTTY Contest, commemorating FCC's authorization of f.s.k. RTTY operations on the lower frequencies, will be held February 20, 1955.

FREQUENCY MEASURING TEST, FEBRUARY 8TH

All amateurs are invited to try their hand at frequency measuring. W1AW will transmit signals for the purpose of frequency measurement starting at 9:30 P.M. EST (6:30 P.M. PST), Tuesday, February 8th. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the signals before the measurement transmission starts. The approximate frequencies used will be 3711, 7114 and 14,197 kc. About 4½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 9:36 P.M. It is suggested that frequencies be measured *in the order listed*. Transmissions will be found within 5 or 10 kc. of the suggested frequencies.

At 12:30 A.M. EST, February 9th (9:30 P.M. PST, February 8th), W1AW will transmit a second series of signals for the Frequency Measuring Test. Approximate frequencies used will be 3627, 7007 and 14,056 kc.

Individual reports on results will be sent to all amateurs who take part and submit entries. When the average accuracy reported shows error of less than 71.43 parts per million, or falls between 71.43 and 357.15 parts per million, participants will become eligible for appointment by SCMs as Class I or Class II OOs respectively.

This ARRL Frequency Measuring Test will be used to aid qualification of ARRL members as Class I and Class II observers. Present observers *not* demonstrating the requisite average accuracy will be reclassified appropriately until they demonstrate the above-stated minimum required accuracy. Class I and Class II OOs must participate in at least two FMTs each year to hold appointments. SCMs (see listing, page 6) invite applications for Class III and IV observer posts, good receiving equipment being the main requirement. *All* observers must make use of the cooperative notices, reporting activity monthly through SCMs to warrant continued holding of appointment.

Any amateur may submit measurements on one or all frequencies listed above. No entry consisting of a single measurement will be eligible for *QST* listing of top results; at least two readings should be submitted to warrant *QST* mention. Listing will be based on over-all *average* accuracy, as compared with readings made by a professional lab.

HIGH CLAIMED SCORES — 1954 SWEEPSTAKES

The fates were kind in the Sweepstakes of November last. An ionospheric disturbance, predicted for the second week end, did not materialize, and SSers found the bands even peppier for the return session than they had been during period number one. With the cream of hamdom's operating talent deftly distributing SS messages, no one found QSOs hard to come by. Almost 100 brasspounders scored over 100,000 points, and three contestmen-supreme got over 200,000! 'Phone tallies continued to inch upward, too, with W6AM turning in what may be a record high for that mode. An extraordinary number report the highly-touted (and rightfully so!) "clean sweep" of all 73 ARRL sections. Clubs — many submitting their first aggregates this time — saw that their members were on the air competing for the special club certificates. And Mr. Novice, budding contester that he is, engaged other yearlings in private intrasectional battles throughout the ARRL field organization.

The figures after each call below indicate claimed score, number of contacts and number of ARRL sections worked. The full story of the 21st Sweepstakes is still to be told. It will appear in *QST* as soon as the checking is completed.

C.W.

W4KVX	209,875–1150–73	W9TGY	114,660– 642–72
W9IOP	209,601–1160–73	W4BZE	114,630– 698–66
W4KFC	204,030–1139–72	W5BTS	114,188– 661–70
W3JTK	180,540–1003–72	W8VTF	113,678– 659–69
W7KEV	171,002– 944–73	W9ZAB	113,580– 631–72
W3EIS	165,900– 948–70	W3KDP	113,400– 650–70
W9ERU	157,950– 879–72	W3EQA	112,590– 626–72
W5TFB	154,943– 849–73	WØNCS	112,140– 623–72
W9YFV	155,307– 851–73	W3JNQ	111,810– 611–73
W3FRY[1]	145,726– 801–73	W3IKN	111,783– 733–61
W8LQA	148,487– 863–70	W5VRP	111,600– 623–72
W3GHM	148,212– 835–71	W3DVO	111,348– 645–69
W6EPZ	146,091– 801–73	W4WKQ	109,890– 675–66
W8BTI	146,160– 812–72	W8ZJM	109,890– 616–72
W9RQM	143,810– 788–73	WØBCI	109,784– 622–71
WØYCR	141,575– 815–70	W1ZDP	109,683– 604–73
W5KC	141,468– 797–71	W4HJK	109,395– 646–68
W3AEL	141,050– 806–70	WØURB	110,925– 654–68
W3JBC	135,050– 740–73	W6PYE[1]	107,493– 592–73
K6BLI	133,590– 734–73	W2RDK	107,100– 613–70
W2SSC	133,175– 761–70	W9WJV	106,704– 620–69
WØTKX	133,043– 729–73	W4CXA	106,960– 672–64
W3CTJ	132,495– 726–73	W9KLD	106,920– 602–72
WØNWX	131,850– 735–72	W9WFS	106,920– 600–72
W9NPC	131,822– 787–67	W1IAP	106,400– 610–70
K6CEF	131,218– 719–73	W9OCB[1]	105,485– 627–68
W3BES	130,488– 719–73	W3LMM	104,796– 738–71
W9PNE	130,050– 724–72	W5WG	104,705– 621–68
W3GRF	130,031– 780–67	W1YMA	104,583– 741–71
W5QNZ	129,816– 904–72	W3EIV	104,190– 612–69
W4PNK	129,633– 753–69	W6UTV	104,025– 570–73
W3JTC	128,845– 706–73	VE1AR	103,850– 678–62
W8EV	127,567– 699–73	W3DLR	103,680– 576–72
W6HOC	127,567– 702–73	WØARB	103,665– 630–67
W9PEY	125,925– 706–65	W1ARR/1	103,445– 609–68
W5MCT	125,910– 705–72	W3PWN	103,328– 599–69
W8BOJ	124,222– 711–70	W2KTF	103,190– 609–68
W5WQN	123,165– 714–69	W4NH	103,012– 615–67
W8OYI	122,060– 718–68	W8HJK	102,060– 571–72
W6ULS	121,728– 670–73	W5BJA	101,948– 593–69
W7NLI	121,574– 713–71	W4LVV	101,589– 623–67
W1JYH	121,130– 673–72	W9TKR	101,558– 622–66
W3FQB	119,888– 695–69	W4CVI	101,530– 576–71
W2IVS	118,563– 682–70	W9GWK	101,353– 572–71
W7GEB	116,435– 642–73	W1BIH	101,250– 566–72
W3CPS	116,200– 664–70	WØCXN	100,820– 568–71
W8DUS	115,431– 639–73	W3ALB	100,740– 552–73
W9AMU	114,665– 650–71	WØFZO	100,050– 581–69

'PHONE

W6AM[2]	183,741– 845–73	K4ARU	65,193– 353–62
W4HQN[3]	142,786– 661–72	W9YWL	64,512– 336–64
W3JNN	111,580– 512–73	W8DPA[4]	61,008– 334–62
K2AAA	110,808– 513–72	W1TRE	58,403– 300–65
WØGDE	96,798– 683–73	WØOMG	58,357– 441–67
W9WHN[1]	89,460– 438–71	W8MLR	58,328– 360–55
W2BJR	87,640– 631–70	W9OMM	58,032– 313–62
WØQCX	87,543– 411–71	W1FZ	57,834– 307–63
W3VKD[4]	86,870– 595–73	W9AVJ[1]	57,596– 434–68
WØMLY	83,844– 411–68	W4SOV	57,216– 301–64
W7SFA[5]	82,962– 419–66	W4YTO	55,872– 292–64
WØPRZ	81,441– 565–73	WØBCF	55,510– 405–70
WØSBE	78,192– 362–72	W2SKE	54,374– 439–62
W8AJW	76,883– 384–67	W3VAM	53,985– 310–59
W6CBE	73,982– 521–71	W3JVI	52,500– 440–60
W6CHV	69,300– 350–66	W2SZ[1]	51,832– 427–62
WØNPR	66,996– 323–69	W5UBN	51,557– 261–67
WØQCC	66,030– 357–62	W1VYI	50,337– 331–51

[1] Multiple-operator station. [2] W6FRW, opr. [3] W4NTZ, opr. [4] W3WPY, opr. [5] W4JLW, opr.

W1AW OPERATING NOTE

The complete schedule of W1AW operations appeared on page 73, January *QST*. See that issue for full information on when and where to look for the ARRL Headquarters station.

The *QST* story of the recent hurricane had to be reduced from several volumes worth of raw material to seventy *QST* copy sheets, and from there to the size necessary to fit it into the two *QST* installments. The drawing and three photos were all used up with the first installment, so there was nothing left over for the second. Inquiries of those who reported have produced only one picture to date. This probably means that the story of Hazel will not appear in this issue of *QST*, as planned.

Printed pages without illustrations make dull reading, and editors balk when you submit copy without "artwork." Now we know that we don't participate in emergencies so we can get a magazine story out of it, but pictures of amateurs in action during an emergency are just as much a part of the story as the story itself. It's hard to remember in the excitement of an emergency to get out your little flash camera and snap an unposed action shot, but it would add to our publicity records if more of you did. So put those cameras somewhere near your emergency gear so you'll remember to take them with you next time you're called into action by your EC.

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Picking up some loose ends from the hurricane, we have a report from EC W4AJA that the Hampton AREC was active during Edna, handling usual routine official messages and conducting liaison with the Virginia Fone Net. Those active included *W4s* AJA RGN JHC RTZ VYZ IT POB QCA MAN and WMV.

Brookline (Mass.) EC W1PST tells us, in a letter received too late for the *QST* write-up, that his group was alerted by Brookline C.D. and by the Boston Red Cross on midmorning of Aug. 31st. Communications were set up immediately between the two points. At 1700 a group of six amateurs went to New Bedford and operated from there in communication with the Cape for a period of 28 hours, providing the only links for the Red Cross in that area.

For Hurricane Edna, the Brookline group was prepared well in advance. Portable two-meter equipments were installed in cars of the Boston *Herald*, the Boston *Globe* and the Boston *Record American*, enabling them to keep in constant touch with the Red Cross. That evening communications were conducted in front of a WBZ-TV camera. All in all, a group of about 30 amateurs were operating under Brookline C.D., the AREC and the Brookline Amateur Radio Society for a continued period of 43 hours.

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The AREC group of Johnson County, Ind., had not planned an SET, but got a workout just the same on October 11th when Franklin, Ind., was hit by a tornado at 1430. W9ZTN/m and W9UGH/m offered their assistance to local authorities, since the police communications system was out. W9KNM operated from his home station. The plan used was for one mobile to be stationed at police headquarters while the other traveled to points that needed communication, with W9KNM at his home station standing by to relay if necessary. The Indiana 'Phone Net frequency was also monitored constantly, and one message was relayed to Indianapolis.

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W5ZIH reports an incident in which amateur radio was instrumental in getting help for a hunter in trouble. On the night of November 5th at 2230 a bull session on 75 meters was interrupted by a faint c.w. signal trying to break in. It turned out to be W5RES/m on a deer hunting trip in the mountains of New Mexico. His car had broken down and he was unable to get home. At his request, a collect telephone call was placed to Hobbs, N. M., for a needed part, describing also his location in the mountains. The needed part was dispatched from Hobbs to W5RES/m in the mountains, "sixty miles from nowhere." Stations participating included *W5s* MRV ZIH and RPH. Coöperation in keeping the frequency cleared so that the weak signal could be copied was wonderful, says W5ZIH.

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Amateurs in Minnesota, Iowa and South Dakota participated in a rather exciting manhunt on November 14th. WØBGJ and WØSKQ first spread the alarm that the bandit, a mental patient, had last been seen in Marshall, Minn., after robbing a filling station in Redwood Falls. The transmission from WØSKQ furnished age and description of the bandit and car, including license number. WØSKQ, WØBGJ and WØQIQ of Marshall were in touch with the Sheriff and police at all times until the fugitive was finally captured in Sioux Falls the following day.

Amateurs who participated in the manhunt by spreading the word in their localities included *WØs* UCF CRF OXC LUX UYL DQS SWB HPN BHA LIG BQS UNG EXX GOG and W2FTI/Ø.

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At 2200 on November 27th, W7MFG, radio officer for Tacoma, was asked by the Pierce County (Wash.) sheriff's office for assistance from local hams in dealing with some of the communications problems concerning a search for a lost child. Within 20 minutes eight mobiles were on the air en route to the scene. W7KKN/m parked next to the sheriff's car and acted as NCS of the other amateur mobiles. W7OVW stood by in town as a fixed station. Other mobiles stationed themselves strategically so as to be able to act as communications points for the many searching parties afoot. The search continued until 0200, when the child was found sleeping in a field not two blocks from his home, afraid to go home because of the commotion he had caused (hi).

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On October 3rd, a practice alert was called on the amateurs that are enrolled in civil defense in the Dayton, Ohio, area. Approximately 25 amateurs answered the alert, which also had the purpose of providing operators for the Civil Defense Exposition held at the Stillwell Headquarters during the week of October 3rd–10th. The week of activity culminated in participation in the ARRL SET. The club station of the Miami Valley Radio Alliance, W8RXM, was in operation both week ends on 3860, 29,640 and 145,230 kc. W8ILC operated full tricks every day the station was open. Other operators included *W8s* OVG WYU UNV PLQ MYV MCW KOM KFC DTR DWT OEI FV BMO TH HOH DPW and IPT.

— *W8IPT, Civil Defense Radio Officer, Miami Valley Civil Defense Authority, Ohio.*

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Communications for the 1954 Colorado River Marathon were again provided by amateur radio on October 3rd. The main network operated on 3615 kc., with a supplementary link on 2 meters. W6GJP was stationed at the

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During a simulated air raid on Richmond, Virginia, on November 8th, all emergency communications were handled by amateur radio. Although all civil defense services participated, communications were the most successful part of the test. The cut shows W4MZR (at wheel) and W4MYI at the mobile communications center set up in the disaster area. Six other mobiles took part.

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turning point at Parker Dam, W6CMN at Site 6, W7JU at Topock and W6CE at the Needles control station. W6TRF operated the v.h.f. station at Site 6, W6CMN relaying communications from this link to the main net. W6GYH operated at Needles Landing. The racing committee furnished spotters who identified all boats as they passed the stations. These reports were transmitted to the Needles station and telephoned from there to the judges' stand. W6DDE was on the telephone at the Needles station. W6GYH handled nine rescue messages from his station at Needles Landing.

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The following sections and SECs are reported for October, 1954, activities: Ala. (W4TKL), W. Fla. (W4PLE), N. Y. C.-L. I. (W2ZAI), W. N. Y. (W2YTH), Tenn. (W4RRV), S. Dak. (WØGCP), Nebr. (WØJDJ), N. Texas (W5RRM), Vt. (W1SIO), San Joaquin Valley (W6EBL), E. Fla. (W4IM), Wis. (W9OVO), Colo. (WØMMT), Ga. (W4OPE), E. Bay (W6WGM), Los A. (W6QJW). Sixteen reports in all, representing 4887 AREC members, with Alabama a new section for 1954, making 29 altogether. This is a better record than we made for either 1952 or 1953 in October. Nice going, gang. Keep 'em coming — we still have a long way to go for 100 per cent.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

C. W.		*'PHONE*	
3550	14,050	3875	14,225
7100	21,050	7250	21,400
28,100		29,640	

During periods of communications emergency these *channels will be monitored for emergency traffic.* At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately* to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *'phone* — 3765, 14,160, 28,250 kc.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on February 14th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 145,600 kc. The next qualifying run *from W6OWP only* will be transmitted on February 5th at 2100 PST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions will be made from W1AW each evening at 2130 EST. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately 10 minutes' practice is given at each speed. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes the order of words in each line of *QST* text sometimes is reversed. To get sending practice, hook up your own key and buzzer and attempt to send in step with W1AW.

Date Subject of Practice Text from December *QST*

Feb. 1st: *40 Watts on the 7- and 21-Mc. Bands*, p. 11
Feb. 3rd: *120 Watts of Audio* . . . , p. 15
Feb. 11th: *Dual Regulated* . . . , p. 20
Feb. 15th: *A Thyratron-Controlled Electronic Key*, p. 24
Feb. 18th: *Technician Rig for 220 and 420 Mc.*, p. 27
Feb. 21st: *Double-Conversion Attachment* . . . , p. 32
Feb. 24th: *Recent Equipment* . . . , p. 40
Feb. 28th: *Field Day — 1954*, p. 42

CERTIFIED CODE SPEED

Courtesy W6OWP

Have *you* received a code-proficiency award or endorsement sticker? If your answer is no, it's no fault of F. A. Bartlett, W6OWP! Bart has been transmitting monthly ARRL qualifying runs from Belmont, California since February, 1948.

Ham radio as a hobby goes back more years than that for W6OWP, back to 1930 when he was first licensed in Boulder, Colorado as W9FYK. The trek to Southern California occurred in the late thirties, and regular operation by

W6OWP got under way. In 1939, Ruth Bartlett formally joined the OM's hobby and was licensed as W6SXG. At the close of World War II, Bart was rare DX signing KA1ABH from the Philippines.

The station, snapped while W6OWP was timing a qualifying-run tape, indicates a few of his many interests. A Kleinschmidt Wheatstone perforator punches the material, and the transmitter is keyed by a McElroy head. The station mascot, busily watching the "birdie" while holding the perforator down, is named Suzy (short for Su Ching Tai). Shown partially are the transmitters, homebuilt from surplus components; duplicate units each with 300 watts input to an 803. Exciters are both beat-frequency type and vacuum tube grid-block keying is employed. The receiver is a surplus Super-pro (BC-779). Bands worked are 80, 40, and 20; A-1, F-1 and F-3 (n.b.f.m.). Of major interest at present is radioteletype, with 95 stations worked to date. The printer shown is a Model 15.

The next W6OWP Qualifying Run is scheduled for February 5th on 3590 and 7138 kc.

A.R.R.L. ACTIVITIES CALENDAR

Feb. 5th: CP Qualifying Run — W6OWP
Feb. 8th: Frequency Measuring Test
Feb. 11th-13th: DX Competition ('phone)
Feb. 14th: CP Qualifying Run — W1AW
Feb. 25th-27th: DX Competition (c.w.)
Mar. 5th: CP Qualifying Run — W6OWP
Mar. 11th-13th: DX Competition ('phone)
Mar. 15th: CP Qualifying Run — W1AW
Mar. 25th-27th: DX Competition (c.w.)
Apr. 1st: CP Qualifying Run — W6OWP
Apr. 13th: CP Qualifying Run — W1AW
Apr. 16th-17th: CD QSO Party (c.w.)
Apr. 23rd-24th: CD QSO Party ('phone)
May 7th: CP Qualifying Run — W6OWP
May 12th: CP Qualifying Run — W1AW
June 3rd: CP Qualifying Run — W6OWP
June 11th-12th: V.H.F. QSO Party
June 17th: CP Qualifying Run — W1AW
June 25th-26th: ARRL Field Day

DXCC NOTES

The attention of all DXCC Award holders is invited to a change in the DXCC box starting this month. As of the dates shown, the totals of the DXCC leaders on each of the 6 continents plus the call area leaders in W/VE and the VO leader are shown.

If you can equal, or beat, the total shown for your continent or call area you are invited to submit your confirmations for inspection and appropriate crediting.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH....252	W3GHD...244	W2AGW...241
W6VFR....252	W6SYG...244	W4BPD...241
W8HGW...251	W2BXA...243	W6MX....241
W6AM....250	W3KT....243	G6RH....241
W6ENV...250	W6SN....243	G6ZO....241
WØYXO...250	PY2CK...243	W9NDA...240
W3BES...248	W3JTC...242	LU6DJX...240
G2PL....247	W6MEK...242	PAØUN...240

Radiotelephone

PY2CK....236	XE1AC....215	W1NWO...212
W1FH....224	W1JCX....214	W9RBI....210
VQ4ERR...222	W1MCW...214	SM5KP....207
ZS6BW....219	W8HGW...214	W9NDA...204

From November 15, to December 15, 1954, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

HB9IL....113	WØGTU...102	SM5ANY..101
W4ECI....108	DL6GP...102	W2PGU....100
EA3GF....107	Z85IO....102	W6SWG...100
W9TGY....103	W8PCS...101	W9UKG...100
PAØIV....103	F3YP....101	VE7ZK....100
	JA1AA....101	

Radiotelephone

G3DPJ....105	LA5YE....104	ZS2AT....102

ENDORSEMENTS

W6CUQ....231	W6GPB....190	W5OLG....145
FA8IH....220	W3CGS....182	W2WZ....141
TI2TG....211	PY2OE....181	SM5AQW..141
W5JUF....210	W1ATE....180	W2YTH...140
W1HA....202	OZ7PH....179	SM7AKG..134
W6UHA....201	ZS2AT....172	F8WK....133
G4ZU....200	W5BNO...170	K2GFQ....131
CM9AA....193	W4DHZ...164	W2BXY...130
W1AEW....191	EA4CR....156	CT3AN....121
W3KDP....191	W6NXL...150	W7CSW...120
W4CYY....191	W1AH....147	PY4AHD..120
W7HXG....191		W2KMZ...111

Radiotelephone

G2PL....200	PY4CB....161	PY1NC....131
CM9AA....186	ZS6FN....160	PY4PI....131
TI2TG....181	W3BET....150	W3CGS....121
W1ATE....180		ZS2IW....111

W/VE/VO Call Area and Continental Leaders

W5MIS....239	VE4RO....223	VE8AW....160
W7AMX....238	VE5QZ....140	VO6EP....190
VE1HG....150	VE6GH....108	4X4RE....210
VE2WW....181	VE7HC....209	ZS6BW....226
VE3QD....210		ZL1HY....231

Radiotelephone

W2APU....202	W7HIA....175	VE3KF....163
W3JNN....203	WØAIW....162	VE4RO....120
W4HA....175	VE1CR....120	VE7ZM....140
W5BGP....203	VE2WW...102	OD5AB....154
W6AM....198		ZL1HY....190

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the .....
..... ARRL Section of the .....
Division, hereby nominate .....
as candidate for Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communications Manager*

Section	*Closing Date*	*SCM*	*Present Term Ends*
Yukon *	Feb. 15, 1955	W. R. Williamson	Mar. 17, 1949
West Indies	Feb. 15, 1955	William Werner	Aug. 15, 1952
Utah	Feb. 15, 1955	Floyd L. Hinshaw	Feb. 18, 1954
Nebraska	Feb. 15, 1955	Floyd B. Campbell	Aug. 15, 1954
Saskatchewan *	Feb. 15, 1955	Harold R. Horn	Dec. 15, 1954
Colorado	Feb. 15, 1955	Karl Brueggeman	Feb. 16, 1955
Los Angeles	Feb. 15, 1955	Howard C. Bellman	Apr. 12, 1955
Santa Barbara	Feb. 15, 1955	Vincent J. Haggerty	Apr. 12, 1955
Maine	Feb. 15, 1955	Bernard Seamon	Apr. 16, 1955
New Mexico	Mar. 15, 1955	G. Merton Sayre	May 4, 1955
Wisconsin	Mar. 15, 1955	Reno W. Goetsch	May 12, 1955
Wyoming	Apr. 15, 1955	Wallace J. Ritter	June 15, 1955
Eastern Pennsylvania	Apr. 15, 1955	W. H. Wiand	June 15, 1955
San Joaquin Valley	Apr. 15, 1955	Edward L. Bewley	June 15, 1955
Iowa	Apr. 15, 1955	William G. Davis	June 16, 1955
South Dakota	Apr. 15, 1955	J. W. Sikorski	July 2, 1955
New York City & Long Island	May 16, 1955	Carleton L. Coleman	July 31, 1955

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Rhode Island	Walter B. Hanson, jr., W1KKR	Oct. 15, 1954
Sacramento Valley	Harold L. Lucero, W6JDN	Feb. 16, 1955
Michigan	Thomas G. Mitchell, W8RAE	Feb. 17, 1955

In the North Carolina Section of the Roanoke Division, Mr. Charles H. Brydges, W4WXZ, and Mr. Richard W. Redding, W4WSS, were nominated. Mr. Brydges received 126 votes and Mr. Redding received 108 votes. Mr. Brydges' term of office began Oct. 25, 1954.

In the New Hampshire Section of the New England Division, Mr. Harold J. Preble, W1HS, and Mr. John W. Singleton, W1CDX, were nominated. Mr. Preble received 56 votes and Mr. Singleton received 48 votes. Mr. Preble's term of office began Oct. 26, 1954.

In the Western Massachusetts Section of the New England Division, Mr. Arthur Zavarella, W1MNG, and Mr. Osborne R. McKeraghan, W1HRV, were nominated. Mr. Zavarella received 132 votes and Mr. McKeraghan received 50 votes. Mr. Zavarella's term of office began Nov. 10, 1954.

TRAFFIC TOPICS

We want to make it clear to you new traffic men that the great majority of traffic nets welcome all comers with open arms. This includes you. It includes you whether you are slow or fast, green or experienced, young or old. This is especially true of section-level nets. True, some of them go along at a pretty good clip (there *is* traffic to handle), but they *will* slow down if you ask them to. Try it and see. However, although your code speed might be slow, this is no reason why you should not know your QN signals — so study up on them, and have a list in front of you when you QNI. We'll send you a list gratis if you don't have one.

Some sections with a large enough contingent of beginners in traffic work run slow-speed nets to break them in easy. This is an ideal vehicle for "getting your feet wet" in traffic work. If you are interested in traffic work but afraid of the speed demons on your section net, suggest to your RM or SCM that a slow-speed or training net be started in your section. If enough do this, it will be done.

After you have put some experience under your belt, have a fling at higher, long-haul levels. That's where the real spice of traffic handling lies.

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We were all saddened to hear of the passing of W8AUJ. Bob, a mainstay in traffic circles since World War II, was stricken suddenly in November. To many traffic amateurs, he was "Mr. West Virginia," providing a very useful outlet to that state at times when it was much needed. He was a regular participant in Trunk Line C just after the war, and later in EAN, 8RN and UTL. He made BPL twenty times postwar.

Traffic Topics doesn't ordinarily go in for obituaries — but we're going to miss Bob.

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Four miscellaneous net reports: (1) The Early Bird Net traffic count for November was 581. (2) W1RNA, NCS for TCPN First Call Area, reports traffic totaling 1275, with twelve stations reporting. (3) The North-Texas-Oklahoma Section Net reports 430 messages handled in 30 sessions (986 check-ins) during November. (4) TCRN reports traffic totaling 1469 in 30 sessions, averaging 48 per sessions. Five regular stations participated.

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November NTS Reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation*
EAN	22	925	1.08	42	97.7%
CAN	22	992	1.01	45.1	98.5
PAN	25	885	0.81	35.4	96.0
1RN	22	307	0.45	13.9	89.6
2RN	47	265	0.52	5.7	88.7
4RN	26	161	0.36	6.0	40.7
RN5	47	670	0.60	14.3	62.0
RN6	47	328			
RN7	44	189		4.2	
8RN	35	185	0.44	5.3	72.4
TEN	70	2037		29.1	60.1
TRN	36	67		1.9	72.2
Sections*	363	2109		5.8	
TCC		896			
Summary	806	10,016	EAN	12.4	98.5
Record	806	10,016	——	12.6	——

*Section nets reporting: WSN (Wash.), KYN (Ky.), CN & MCN (Conn.), TLCN (Iowa), AENB & AENP (Ala.), QKS & QKS-SS (Kans.), SCN (Calif.), Tenn. Hi-Speed & Tenn. sectional.

NTS nets at regional and area level are now operating Saturday nights, or making arrangements to do so. W8SCW reports all regions of EAN were 100 per cent in attendance in November, except 4RN. W9JUJ needs more NCS help for CAN, says they cannot operate Saturday without an NCS. W7APF has been doing a FB job of representation of PAN; this net will have operated on Sundays also during the holiday season. Conn. and W. Mass. rate stars for perfect 1RN attendance in November. South Texas still missing from the RN5 report. VE1OM and VE1HJ are representing the Maritimes in TRN, and take NCS on Monday nights; VE3ATR and VE3AUU are holding down Saturday nights, and VE3AJR is a constant representative of the Ontario 'Phone Net.

W8UPB reports for Eastern Area TCC that 101 TCC functions were carried out during November, with 697 messages handled; reports are not quite complete. In the Central area, W9JUJ says TCC is doing fine, but K9FCA had to drop out; Peggy reports 199 messages during November, with very little coming from the Pacific area. W6HC reports for Pacific area TCC that from Nov. 21st to Dec. 11th all but one schedule was being kept, and 224 messages were handled. W6ADB is doing excellent work, and "WØKQD is a tower of strength administratively." Things look good.

BRIEF

In the results of the 20th ARRL International DX Competition (October *QST*), the c.w. score of WØBPA, listed as 8034 points, should have been 17,304 points. Sorry!

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for November traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	279	2119	1602	433	4433
W3WIQ	103	1346	1405	76	2930
W9JUJ	26	1146	1102	90	2364
W9NZZ	236	1046	3	1040	2325
WØBDR	32	970	954	11	1967
W9DQ	11	892	794	109	1806
W7BA	19	685	660	23	1387
W4PFC	9	640	625	7	1281
WØCPI	8	617	565	52	1240
WØSCA	0	560	555	2	1117
W7PGY	23	514	483	31	1051
W2KEB	50	554	231	203	1038
W9VBZ	193	378	338	38	947
W6PHT	43	431	322	117	913
KR6OO	110	400	364	36	910
W2KFV	39	463	228	125	855
W5MN	30	399	302	95	826
W8FYO	6	399	350	47	802
W8ELW	16	386	372	10	784
W4OGG	14	361	319	25	719
WØCFL	20	310	230	100	660
W4UHA	9	214	424	8	655
W2VNJ	10	329	232	83	654
K6FCZ	35	305	298	7	645
WØKQD	149	251	230	12	642
W2LPJ	23	292	271	44	630
KA2WW	61	288	240	37	626
W2BO	22	298	274	20	614
W3WV	20	306	178	106	610
W9TT	13	295	268	6	582
W6LYG	19	267	134	133	553
W6ZRJ	39	237	260	16	552
WØGAR	14	255	268	1	538
W6YHM	10	262	200	62	534
W1UKR	10	258	229	29	526
W2RUF	23	264	175	61	523
Late Report:					
WØBDR (Oct.)	22	835	812	11	1680

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
KG6FAA	507	2365	2040	325	5237
KØFDX	347	1635	1595	40	3617
W6IAB	55	1392	1266	124	2837
KØFDL	24	1012	7	521	1564
KA7SL	1045	215	57	158	1475
K6FDG	60	590	547	19	1216
W6YDK	25	564	503	61	1153
KR6AF	306	346	309	49	1100
KA2GE	107	500	410	69	1086
KA2AK	452	306	264	42	1064
K4WAR	229	279	451	102	1061
K7FDB	23	536	461	12	1032
KØAIR	26	455	416	45	942
W6BSD	65	427	400	27	919
K9FCA	91	0	681	29	801
KØWBB	9	391	370	19	789
K4FDY	48	366	322	26	762
KA7LJ	214	215	151	64	644
K4WBG	123	185	277	31	616

BPL for 100 or more *originations-plus deliveries:*

W3CVE	403	WØWMA	138	K6FCY	108
K1WAB	337	WN4HYV	134	K2HZR	107
KA2HQ	208	W4DDY	130	W1YYM	103
W8ARO	167	W6CMN	120	Late Report:	
VO6N	155	W3RV	118	W3RV (Oct.)	133
KA8AB	151	W1BDI	115		
WØFQB	145	W5QDF/6	114		

More-Than-One-Operator Stations

KA7HH 202

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K2EP, W4OGG, W6IZG, W7FRU, WØQXO.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U.S. possessions who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month. All messages must be handled on amateur frequencies, within 48 hours of receipt, in standard ARRL form.

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, W. H. Wiand, W3BIP — SEC: IGW. RM: AXA. PAM: PYF. E. Pa. Nets: 3610, 3850 kc. A new club, the Short Skip Radio Club, is being organized in the Philadelphia Area solely for hams working the night shift. Temporary officers are K2EY, chairman, YEP, rec. secy.-treas.; YLL, corr. secy. Interested hams are invited to write to YLL at 213 N. 10th St., Philadelphia 7, Pa., for full information. New officers of the Hazleton ARC are NHJ, pres.; THB, vice-pres.; PVY, secy.; OHX, treas. The following is a report on all official appointments on file in this office: For the one-year period ending with November there are 23 ORS with a total of 254 monthly reports possible, of which 192 reports were received. With 10 OPS and a possible 96 reports due, 53 were received. There are 13 OOs on file, of which 5 are Class IV and 8 are Class I. Five OBS sent 27 reports out of a possible 47 and 4 OES sent 26 reports out of a possible 40. Excluding EC appointments, the file on which is incomplete at this time, Eastern Pennsylvania has a total of 55 official appointees. Fifteen stations were issued Section Net certificates since the start of the National Traffic System. EPa Section Net certificates are issued to any station reporting into the EPa Net at least once a week for a period of 10 months. Four new Novice stations are WN3s ACL, AES, ANL, and ZYJ. NNV reports his two sons are waiting for their Novice calls to be issued. VPY has drift trouble with his VFO and is rock-bound until repaired. JNQ spent the whole month cutting down the remains of antennas and replacing them. EAN had his 20-meter beam down to weld it after "Hazel" and also lost his exciter during the first week end of the SS. Because of the lack of reports at this writing, and also to comply with a request from Headquarters to beat the deadline date and thus the holiday season mail tie-up, the column is short this month. In the future, kindly mail your reports promptly on the first of each month. Traffic: (Nov.) W3CUL 4433, BFF 76, TEJ 53, BIP 50, MWL 49, OZV 48, QLZ 45, DUI 44, ADE 7, VPY 5, JNQ 4, YPF 3, ID 2, ELI 1. (Oct.) W3CHU 18.

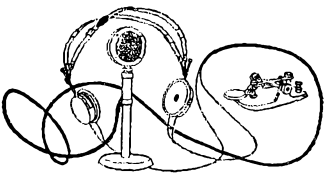
MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Arthur W. Plummer, W3EQK — VGZ got married Oct. 30th. JMA's daughter Frances recently was awarded her wings as Capital Air Lines hostess. MCG reports that between trips to New Mexico he has time to participate in the ARRL F.M.T.s and does pretty well with his new BC-221. WSE is now at Hopkins and since he is living in Baltimore is not able to keep Official Bulletin schedules. RMD has increased power from 40 to 60 watts using a 6146 final. EEB reports all of his three-element beams went with "Hazel" but he has a new Telrex not yet up. EEB, OO Class IV, passed his first F.M.T. and after the next one will be OO Class I. RV now has HRO-60 w/speaker and crystal calibrator. SPL reports the following new calls in Kent County, Del.: WN3ZPR and W3ZZY. The Eastern Shore Amateur Radio Club has been reorganized after the summer lull. DRD is humping to finish a 3-band rotary for 14, 21, and 28 Mc. before cold weather catches up with him. HGA reports that "Hazel" blew down his 72-ft. mast and wrecked a newly-completed 20-meter beam. CDQ had a fling at the recent SS Contest. Her Official Bulletin sked is to be changed from Tue. at 7 P.M. on 7030 kc. to Mon. same time on 7050 kc. RV is mobiling with some new Elmac gear. QZC had to miss both week ends of the SS Contest because business took him to Atlanta, Ga. The AKB/BWT combination reports all three new antennas are up with one rig on the air with the big one and the Viking II to be on soon. ONB, mgr. of 3RN, says he needs volunteers for NCS and an alternate. PKC contacts RV nightly on 10-meter 'phone. PRT has started an amateur radio club at Lafayette College. The station is set up and the call is GPG. K4WBK, Raleigh, N. C., is a new TCRN operator. COK still is in there pitching, as is OYX. QCB took part in the last F.M.T. WV skeds KL7FAF Sat. and Sun. on 14,085 kc. PRL spoke Dec. 13th before the Chesapeake Club on "Pointers on TVI Prevention." The Antietam Radio Assn. is giving a prize of a year's subscription to *QST* to the high scoring 'phone and c.w. contestant from that club in the recent SS Contest. There was a local battle on 'phone in the Hagerstown Area in the SS Contest between VAM and YRK. OYX is back on the air with a rock-bound 90 watts but he says the VFO is shaping up. TRF is now operating K5WSP and his address is Pvt. P. E. Kammerman, US52291343, 9577 TSU Det. 1 Hd. Co., White Sands Proving Ground, New Mex. New members of BARC are Dave Packham, WTQ; Haskel Davis, ex-4X4CZ and ex-ZC6AB; Joe Doupnik, YLO; and Bill Womack, ZBI. SKK is now CDRO for Baltimore City. VAG is new president of the Maryland Mobile Radio Club. The BARC is trying to arrange some sort of coöperation with other clubs to sponsor an Atlantic Division Convention for early 1955. If interested, please contact Dave White, FUV, 719 Walker Ave., Baltimore 12, Md. The Maryland Emergency 'Phone Net now has 68 members covering 18 of the 23 counties in Maryland, Baltimore City, Hagerstown, Cumberland, Frederick, Annapolis, Havre de Grace, Belair, Salisbury, Ocean City, and others, as well as Delaware, Virginia, Pennsylvania, and the District of Columbia. Traffic is handled on Mon., Wed., and Fri. evening nets but not on Sat. or Sun. afternoon. The Washington Mobile Radio Club has its on-the-air meeting the first Wed. of each month on 29,520 kc. at 8:00 P.M. MNR has deserted Washington, D. C., for Philadelphia. NUT reports a new member of the family arrived Oct. 18th. MSU has had the Top Secret Special changed over from the Henry J. to the new Dodge. Rector's Restaurant at Independence Ave. at the Library of Congress has been used for the last two meetings of the WARC and probably, from what I read in the *Autocall*, this will wind up being the Club's permanent meeting place. Andrews Electronics Assn. now has 36 members. AEA was visited on Nov. 19th by EQK, the SCM; PRL, the SEC; and SKK, nominee for SCM and former president of the BARC. The Eastern Shore Amateur Radio Club reports the following new hams in the area: WN3ZNG, WN3ZQM, and W3AAR. FU hopes to be home soon from the hospital in Wilmington, Del., where he has been for the past five or six months recuperating from an operation. Traffic: (Nov.) W3WV 610, CVE 477, RV 169, ONB 118, COK 56, WBP 52, PKC 32, JE 14, HC 13, EQK 5, QQS 2. (Oct.) W3RV 178, MCG 86, ONB 47, WSE/3 5, SPL 4. (Sept.) W3MCG 16.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brooks, K2BG — PAM: ZI. K2JIG has been requested to act as Radio Officer of Glassboro. CEH is the proud owner of a new Minibeam for 20 meters. RLY is building a new support for his various beams. The recent hurricane should have taught many of us a lesson, that is, to inspect our antenna supports and keep them in good shape so that they will not fail us in an emergency. The Burlington County Radio Club has elected new officers for '55. They are K2-DAP, pres.; K2BG, vice-pres.; and W2EBW, secy.-treas. VMX is now located in Collingswood. LS, of Pleasantville, continues to do a swell job as Official Observer. The Short Skip Radio Club is in the process of organizing, hoping to enroll night-shift workers who are unable to attend other club meetings. Contact 3YLL for details. The Delaware Valley Radio Assn. is sponsoring a WAS Contest. Contact the Club for details. CRU reports a very little activity on 10 meters. CFP has a new antenna, erected with the help of BDK and EWT. BMX is giving 160 meters a fling. Plans are under way for another DVRA Old Timers Nite. KN2-JGU Glassboro, KN2IJC Delance, and KN2IHXD Delance are very active Novices in the section. I urge those who hold appointments in the section to forward station activity reports to me at the close of each month. C.w. traffic nets operating regularly in the section are NJN on 3695 kc. and 2RN on 3690 kc. Other nets holding regular drills please forward reports of your activities. Traffic: W2RG 183, K2HZR 151, K2BG 31.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — Asst. SCM: Jeanne Walker, 2BTB. SEC: UTH/FRL. RM: RUF. PAMs: GSS and NAI. NYS meets on 3615 kc. at 6:30 P.M. and 3925 kc. at 7 P.M.; NYSS on 3595 kc. at 8 P.M.; NYS C.D. on 3500.5 and 3993 kc. at 9 A.M. Sun.; TCPN 2nd call area on 3970 kc. at 7 P.M.; SRPN on 3970 kc. at 10 A.M.; ISN on 3980 kc. at 3 P.M. RARA members made a trip through the cyclotron and lab at the University of Rochester. At another meeting Tom Chadrak, of Weston Meter Corp., spoke on "Instruments in the Radio & TV Test Equipment Field." This fast-growing organization meets the 2nd Thurs. of the month at the Rochester Museum. RUF visited N.Y.C. and hams en route and has been on the

(*Continued on page 70*)

(No. 1 of a Series)



WE at Hallicrafters are pleased to announce that henceforth we shall have the privilege of being the monthly sponsors of this space.

IT is our intention to devote its editorial content entirely to the service of hams throughout the world. In the months to come we plan to print informative articles on single sideband, stories on the development of new products as they emerge from our laboratories and other subjects involving circuit techniques which are of vital interest to you.

IN order that the page may achieve our intended goal — that it will provide news of the utmost interest to all hams — we should also appreciate your writing and suggesting to us additional types of material you wish to be discussed.

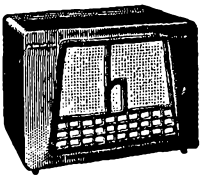
AS one of the world's largest manufacturers in the communications field we have an extensive engineering staff ready and willing to consider your suggested projects. We shall do our best, within the limits of this space, to come up with the answers.

SO, from here on out think of this as your page with the facilities of our entire company at your disposal.

Bill Halligan, Jr.

W. J. Halligan W9AC

for **hallicrafters**



air in traffic work using SJV's receiver. K2DSR has a 35-w.p.m. certificate. The Elmira ARC annual banquet and get-together at West Hill Community Cabin was a gala event. PPL and QEE gave talks on S.S.B., Crystal Filters, Phasing Exciters, Transmitter Design, Voice-Controlled Break-In and Signal Slicers at the KBT meeting. A committee of RARA members, CTA, TEX, QY, VBH, RUJ, DFS, and K2DQ, have compiled a club directory. New officers of the Binghamton ARC are UJS, pres.; JHS, vice-pres.; BJC, secy.; K2CNC, treas. Ever hear of QRM on 2 meters? It happened after 42 Erie County C.D. Sonar fixed and/or mobile units were distributed. The RARA v.h.f. group met at the QTH of OEF; the subject was 220 Mc. New officers of KBT are UHI, pres.; RUC, vice-pres.; K2CLJ, secy.; K2DYD, treas. QHH got his first deer after 5 years of trying. BTB is progressing satisfactorily after a series of operations in Syracuse Memorial Hospital. EMW has WAA certificate No. 143. More than 50 hams participated in the Monroe County c.d. test in November. Portable, mobile, walkie-talkies, and a 'phone extension were used. The Radio Assn. of the Tonawanda's officers are RPO, pres.; VCI, vice-pres.; SEX, secy.-treas. UPH schedules Puerto Rico, where his XYL is visiting. FBA's XYL says he can operate full time in the next DX Contest. The XYL of QYT presented him with a son. A joint meeting of the Lockport, Niagara Falls, KBT, RAWNY, and Tonawanda clubs will be held in Lockport April 2, 1955. K2ELK's entire family is FCC-licensed: K2ELL, Robert, age 13 and in 2nd year high; K2GYA, Fannie, the XYL; and K2GYC, Daniel, age 12. Ye SCM would appreciate a card from everyone interested in the NYSS C.W. Net (slow speed). Traffic: (Nov.) W2RUF 523, K2DYB 106, W2DXV 100, HKA 93, QHH 80, K2DSR 75, W2ZRC 62, OE 48, K2DJN 45, W2GBX 35, DSS 34, CXM 33, RQF 23, EMW 14, K2CUQ 11, W2UTH 7. (Oct.) W2RQF 23, UTH 12, CZT 2.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — SEC: GEG. RMs: UHN, NUG, and GEG. PAMs: AER and LXE. The WPA Traffic Net meets each weekday night at 7:00 P.M. on 3585 kc. The Washington County Amateur Radio Club is holding code classes each Wed. evening with about 25 attending. WJF set up a rig atop Mt. Negro (2907 ft.) for the ground-wave contest. UTX has been working 75-meter 'phone. OEO has a new 807 rig on 80 meters. IDO is busy on 160 meters, c.w. and 'phone. SUK is planning a major rebuilding on his rig. VFN handles the *WCARC Bulletin*. The Steel City Amateur Radio Club, at its recent meeting, set up committees for the coming new year and with the aid of the membership should be in for a fine year of activities. CWL is working 40-meter 'phone. NKM is struggling with SWR indicators. UUH, who recently had his mobile rig go up in smoke, is back again. UUG is busy with YLRL secretarial duties plus 40- and 75-meter Nets. NRQ is looking for a new QTH. MPO has a Collins 32V-3 that won't work on 20 meters. The Bucktail Amateur Radio Club Net meets Tue. at 6:30 P.M. on 3825 kc. with WHQ as net coördinator operating the club station, YDV. NMJ is the BARC communications chief. Traffic: W3WIQ 2930, LMM 174, UHN 64, KUN 63, YA 42, UTR 13, MIZ 12, NUG 12, NCD 10.

(*Continued on page 78*)

Worked All Pennsylvania Counties Award (WAPC)

This award is sponsored by the Western Pennsylvania Amateur Radio Club Council. Certificate will be awarded to any radio amateur who submits proof of two-way radio contact with all sixty-seven (67) counties of the State of Pennsylvania.

Rules and Regulations

1) Two-way radio communications must be established on the amateur bands with all sixty-seven (67) counties in the State of Pennsylvania.

2) All or any amateur radio bands may be used by any licensed method of radio transmission.

3) Contacts with all sixty-seven (67) counties must be made from the same location. The same location is defined as operation anywhere within the same and original county.

4) Contacts may have been made over any period of time, provided all contacts are made from the same location, as defined above.

5) Log summary must be submitted showing verification of two-way contact with all sixty-seven counties in the State of Pennsylvania.

6) Submit application for certificate award and log summary to: Western Pennsylvania Amateur Radio Club Council, % ARRL Section Communications Manager, Western Pennsylvania.

(See page 6 any *QST*)

HAMS SAY...

"I hear 'em now!... with my HQ-140-X"

"Design Engineer must be a ham."
— **W6JTV**

•

"Truly a Ham's dream."
— **W4VPU**

•

"Very pleased — sharp tuning on CW especially."
— **W1LF**

•

"Excellent noise limiter, no notice of signal loss."
— **W8PMA**

•

"TNX to the person who designed this; Band Spread, Stability, Selectivity all XFB."
— **WØQXP**

•

"Selectivity excellent on 40 meter phone band."
— **W8HUA**

•

"I think I have what every ham dreams of, that is a HQ-140-X."
— **KN2EQH**

Here are a few typical comments from the hundreds of HQ-140-X receiver owners. Hams everywhere are enthusiastic about this receiver because they've learned that it's built to Hammarlund professional quality standards. They are finding that the extra care in design, circuitry, and construction, not usually found in an amateur receiver, pays big dividends in —

FREQUENCY STABILITY — less than .01% frequency drift after warmup anywhere from 540 Kc to 31 Mc.

EXTREME SELECTIVITY — sharp signal separation even in the most crowded bands.

LOW NOISE LEVEL — a noise limiter that really works!

RUGGED CONSTRUCTION — built for easy use for many years.

For the receiver that gives professional performance, hams vote "HQ-140-X." Now it's even available for rack-mounting. Write for complete details on construction, specifications and other technical data. Ask for Bulletin R-2.

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CENTRAL DIVISION

ILLINOIS — SCM, George Schreiber, W9YIX — Section Nets: ILN (c.w. 3515 kc.); IEN (phone 3940 kc.). SEC: HOA. Asst.: VTL. PAM: UQT. RMs: BUK and MRQ. Cook County EC: HPG. The Illinois Slow-Speed Net is slowly expiring. Isn't there someone who would like to take it over? HUX renewed his OBS and OO appointments. What's the date on yours? AA complains, and rightfully, that too much traffic is arriving in Illinois with incorrect addresses. Out of 72 Chicago messages, he had 11 returned by the post office for incorrect address. OIN enjoys the contests, especially the SS. He needed Idaho for WAS but didn't make it, although he is still trying. PVK is testing a new antenna for working mobiles on 220 and 420 Mc.; he also is building a modulator for 75-meter 'phone. 2NZM/9 is now heard from in Illinois. BPU is experimenting with all kinds of antennas. DO is the first section amateur to earn the ARRL traffic medallion for a single-operator station; K9FCA won it as a multiple-operator station. JVG got his General Class license and plans a 40-meter 'phone to supplement his c.w. work where he runs 150 watts. Congrats to VNI, who stuck to his mike and managed to get two badly-needed iron lungs from Chicago to the West Indies. GDI is getting excellent results with his new 44-ft. vertical. New on 2 meters are EWR, CQG, and KWK, the latter mobile. PEB says he blew out the modulation transformer and now allows his neighbors to enjoy TV. DEI sports two antennas now, a 20-meter midget beam and a T2DF. JEC finds 220 Mc. exciting and gets plenty of contacts. OAV spent a month in Mexico and took a receiver but no transmitter. NN is on with a new multi-band vertical looking for new worlds to conquer. EU, watch out! BBU moved to a new QTH and finds conditions to his liking. PGW advises all mobile hams who are Florida-bound to try Daytona Beach where he worked DX right and left with his mobile. CKU finds 40-meter DX good from 1 to 5 A.M. when everyone else tires out fighting skip. DPY needs only a few more cards for his DXCC. New officers of the Kishwaukee Radio Club are Gilbert Bodeen, pres.; KCM, vice-pres.; WAX, secy.; and WTF, treas. New Novice call heard is LWU. KZO has moved to Wisconsin. TZZ is back on the air after moving to a new QTH. SKR complains that all he can hear on the ham bands lately are TV oscillators. CLH has fun with a BC-457 and BC-459. KSN was elected judge of Cumberland County. BA and other mobiles down-state put on a rousing demonstration of radio for CAP and c.d. officials. The St. Clair Amateur Radio Club visited K9FCA at Scott AFB and drooled over the equipment available there. Traffic: (Nov.) W9DO 1806, K9FCA 801, W9AA 186, USA 169, IDA 120, YIX 106, QR 65, VHD 51, LXJ 20, STZ 18, SME 9, BA 6, MRQ 6, CLH 4, KQK 2, LMC 2. (Oct.) W9IDA 77, BPU 2.

INDIANA — SCM, George H. Graue, W9BKJ — The Tri State Radio Club promoted a very successful banquet, an evening long to be remembered. The Ft. Wayne Radio Club also held its 33rd annual banquet. The FWRC mobile group augmented the Sheriff's Dept. during Halloween week, and likewise furnished communications for the Veteran Day Parade. The Lilly Radio Club of Indianapolis is now affiliated with ARRL and has applied for a club station license. Traffic on 1FN as reported by Net Manager NTA is 233. OLX traffic report on QIN is 723. DHJ received the coveted A-1 Operator's certificate. NTA is resigning as PAM for this section. TARS is reorganizing its AREC group. ZIB is the new station trustee for AB. SIQ is building antenna-switching for AB. The Mobile Amateur Radio Club held a pot-luck Christmas Party. DLM has a new chassis for his mobile gear. UHV vacationed in Florida. JLE is being transferred to Oregon. New in Evansville are N9LCQ, LVL, and KLX. UWU has 122 confirmed on his DXCC. JUH has 2-meter mobile. Big winds blew down PNE's DX antenna. KLR has 600 watts on 2 meters. The TARS station's call is LIT. N9KUH is new at Franklin. CEA has a new antenna. NTR is forming a boys' club at school. PPS is regularly at YB, Purdue. N9LXO is new at Muncie. NH worked all sections in the SS Contest. FYM has WAC and WAS certificates. BBD is new at South Bend. DLI has a new rig on 144 Mc. 8IQJ/9 is new at New Albany. TT's new rig is near completion. Traffic: W9JUJ 2364, NZZ 2325, TT 582, SNT 425, IQV/9 343, UQP 172, UWU 108, WRO 103, QYQ 66, STC 65, DHJ 54, EHZ 42, SVL 40, BKJ 29, NTA 29, TG 29, EQO 23, CC 22, CTF 22, KDV 21, YIP 20, TQC 18, FYM 14, NH 14, ZRP 14, WUH 13, BDP 12, DOK 12, GDL 11, NTR 11, PPS 11, QR 10, CMT 9, DKR 7, CEA 6, UTL 3, DGA 2.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAMs: ESJ and GMY. RMs: IXA, RTP, and UNJ. Nets: BEN, 3950 kc., 6 P.M. daily; WIN, 3625 kc., 6 P.M. daily; WPN, 3950 kc., 1215 Mon.-Sat., 0930 Sun. Mobile and c.d. frequency: 29,620 kc. SS Contest, CD Party, and Wisconsin QSO Party participation keep VBZ the section's busiest operator! RKP, with 420 in 70 sections, barely nosed out GIL, with 410 in 69, in the SS. MQV, former WIN mgr., can be heard regularly as K4AQQ in South Carolina. AFT and IOI have new B. & W. 5100 transmitters. New hams in Waukesha are GYO, GUU, GZL, HDQ, JUL, and HAT. CHD worked KL7, G3, and KP4, while CCO cornered a KH6. The Waukesha High School Club,

(*Continued on page 76*)

New Heathkit VFO KIT

MODEL VF-1

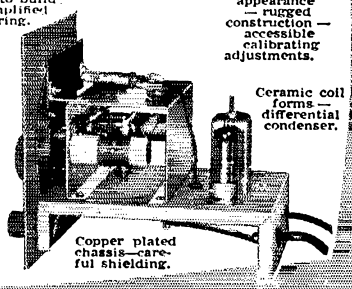
$19.50

Ship. Wt. 7 lbs.

- Smooth acting illuminated and precalibrated dial.
- 6AU6 electron coupled Clapp oscillator and OA2 voltage regulator.
- 10 Volt average output on fundamental frequencies.
- 7 Band calibration, 160 through 10 meters, from 3 basic oscillator frequencies.

Here is the new Heathkit VFO you have been waiting for. The perfect companion to the Heathkit Model AT-1 Transmitter. It has sufficient output to drive any multi-stage transmitter of modern design. A terrific combination of outstanding features at a low kit price. Good mechanical and electrical design insures operating stability. Coils are wound on heavy duty ceramic forms, using Litz or double cellulose wire coated with polystyrene cement. Variable capacitor is of differential type construction, especially designed for maximum bandspread and features ceramic insulation and double bearings.

This kit is furnished with a carefully precalibrated dial which provides well over two feet of calibrated dial scale. Smooth acting vernier reduction drive insures easy tuning and zero beating. Power requirements 6.3 volts AC at .45 amperes and 250 volts DC at 15 mills. Just plug it into the power receptacle provided on the rear of the AT-1 Transmitter Kit. The VFO coaxial output cable terminates in plastic plug to fit standard ½" crystal holder. Construction is simple and wiring is easy.



Heathkit AMATEUR TRANSMITTER KIT

MODEL AT-1

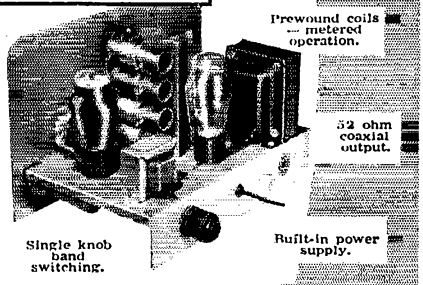
$29.50

Ship. Wt. 16 lbs.

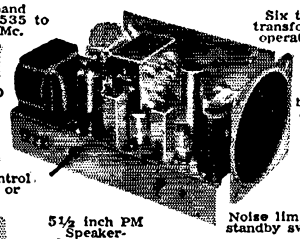
SPECIFICATIONS:

Range 80, 40, 20, 15, 11, 10 meters.
6AG7 .....Oscillator-multiplier.
6L6 .....Amplifier-doubler
5U4G ..... Rectifier.
105-125 Volt A.C. 50-60 cycles 100 watts. Size: 8⅛ inch high x 13⅛ inch wide x 7 inch deep.

Here is a major Heathkit addition to the Ham radio field, the AT-1 Transmitter Kit, incorporaring many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, stand-by switch, key click filter, A. C. line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis, and detailed construction manual.

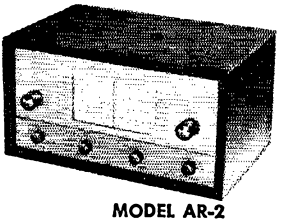


Heathkit COMMUNICATIONS RECEIVER KIT



SPECIFICATIONS:

Range.....535 Kc to 35 Mc
12BE6 .....Mixer-oscillator
12BA6 .....I. F. Amplifier
12AV6 Detector—AVC—audio
12BA6 ...B. F. O. oscillator
12A6.....Beam power output
5Y3GT .....Rectifier
105-125 volts A.C. 50-60 cycles, 45 watts.



MODEL AR-2

$25.50

Ship. Wt. 12 lbs.

A new Heathkit AR-2 communications receiver. The ideal companion piece for the AT-1 Transmitter. Electrical bandspread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.

CABINET:

Proxylin impregnated fabric covered plywood cabinet. Shipg. weight 5 lbs. Number 91-10, $4.50.

HEATH COMPANY
BENTON HARBOR 9, MICHIGAN

ONE DAY SERVICE

QUARTZ CRYSTALS

ONE DAY SERVICE

Precision Crystals

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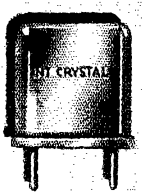
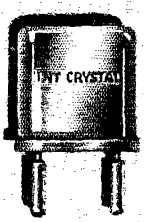
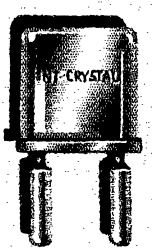


F-605
Pin dia. .050
Pin lngth. .238



F-609
Pin dia. .095
Pin lngth. .445



F-612
Pin dia. .125
Pin lngth. .620

Pin Spacing on each of above is .486.

ONE DAY PROCESSING

F-6 1500 KC to 50 MC

Wire mounted, plated crystals, for use in commercial equipment where close tolerances must be observed. All units are calibrated for the specific load presented by equipment.

Holders: *Metal, hermetically sealed.*

Frequency Range: *850 KC to 60 MC*

Calibration Tolerance: *±.0025% of nominal at 30° C*

Temperature Range:	−55°C to +90°C	−30°C to +60°C
Tolerance over temperature range from frequency at 30°C	±.005%	±.002%

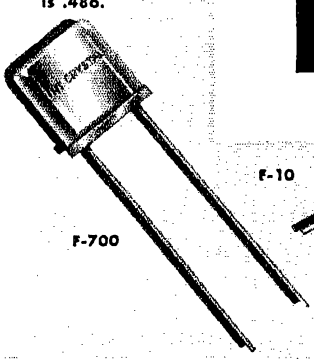
Circuit: *As specified by customer. (Crystals are available for all major two-way equipments. In most cases the necessary correlation data is on file.)*

Drive level: Recommended—*10 milliwatts for fundamental, 5 milliwatts for overtone.*

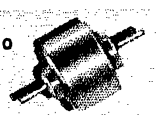
Prices: *Available upon request.*

Delivery: ONE DAY PROCESSING. *All orders of less than five units of any one frequency in the range 1500 KC to 50 MC will be mailed within 24 hours from the time received.*

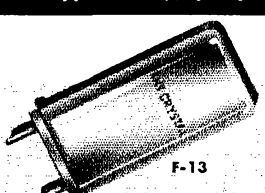
WHEN ORDERING SPECIFY:
(1) Frequency (2) Holder Type*
(3) Circuit Data (32 mmf load, series resonance, etc.)
(4) End Use (Equipment type & manufacturer, development, etc.)
**Adaptors can be supplied for ¾" pin spacing.*



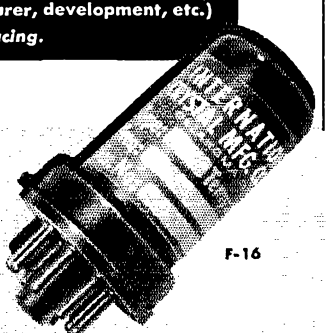
F-700



F-10



F-13



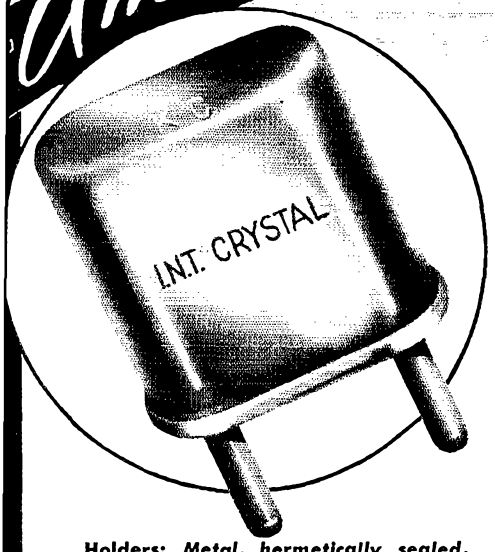
F-16

Crystals available from 90KC to 100MC. Write for FREE Catalog.

International CRYSTAL Mfg. Co., Inc. 18 N. Lee Phone FO 5-1165 OKLAHOMA CITY, OKLA.

Spot Frequencies for

Amateurs and Experimenters



ONE DAY PROCESSING

FA 5, FA 9, 2000 KC to 54 MC

Wire mounted, plated crystals for use by amateurs and experimenters where tolerances of .01% are permissable and wide range temperatures are not encountered.

Holders: *Metal, hermetically sealed, available in .093 dia. pins (FA-9) or .050 dia. pins (FA-5).*

Frequency Range: *2000 KC to 54 MC.*

Calibration Tolerance: *±.01% of nominal at 30° C.*

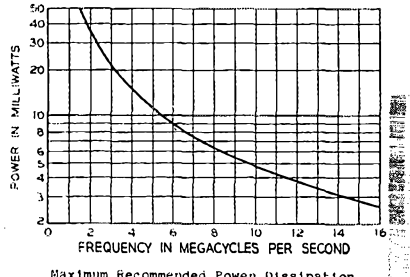
Temperature Range: *−40° C to +70° C.*

Tolerance over temperature range from frequency at 30° C. ±.01%.

Circuit: *Designed to operate into a load capacitance of 32 mmf on the fundamental between 2000 KC and 15 MC. Designed to operate at anti-resonance on overtone modes into a grid circuit without additional capacitance load. (Write for recommended circuits.)*

Drive Level: *Recommended — Maximum 5 milliwatts for overtones. See chart for fundamental:*

Condition of Operation: 32 mmf



Maximum Recommended Power Dissipation in Crystal Unit

PRICES

FA-9* (Pin Diameter .093)*
FA-5 (Pin Diameter .050)

*Pin Spacing .486 (*FA-9 fits same socket as FT-243)*

RANGE	TOLERANCE	PRICE	
Fundamental Crystals		FA-9	FA-5
2000-9999 KC	.01%	$2.80	$2.70
10000-15000 KC	.01%	$3.90	$3.80
Overtone Crystals (for 3rd overtone operation)			
15 MC—29.99 MC	.01%	$2.80	$2.70
30 MC—54 MC	.01%	$3.90	$3.80

HOW TO ORDER

In order to give the fastest possible service, crystals are sold direct and are not handled by any jobber. Where cash accompanies the order, International will prepay the Airmail postage; otherwise, shipment will be made C.O.D. Specify your exact frequency and the crystal will be calibrated to .01% or better of this frequency with the unit operating into a 32 mmf load capacitance.

Delivery: **ONE-DAY PROCESSING**

Orders for less than five crystals will be processed and shipped in one day. Orders received on Monday thru Thursday will be shipped the day following receipt of the order. Orders received on Friday will be shipped the following Monday.

ONE DAY SERVICE

QUARTZ CRYSTALS

ONE DAY SERVICE

International CRYSTAL Mfg. Co., Inc. 18 N. Lee Phone FO 5-1165 OKLAHOMA CITY, OKLA.

(*Continued from page 72*)

TBV, has a new rig ready to go. FFC purchased some 2-meter gear. According to IIU, the Polecat Net has a rag chew session at 1215 daily. MQB is NCS, with RUJ and IIU as alternates. IIU received a new NC-183D for Christmas. HKL and RUJ have new 20-meter beams. UJF is going high power. VTM is having antenna troubles. A QSL from FQ8AG sets KXK up with 125 countries confirmed. We regret to report as a Silent Key, KHO, president of the NWRC Club. The Eau Claire Radio Club elected as new officers HEA, pres.; PZV, vice-pres.; WN9FYI, secy.; ZEI, treas. LEE temporarily suspended his 2-meter skeds and OBS skeds to rebuild the rig. JBF acquired a Viking I and VFO. EC reports for November were received from GMY, IHW, LVB, MQC, MYG, RKT, RQQ, and SAA. YOS worked 104 stations in the SS with 30 watts. The Wisconsin Section QSO Party was a howling success, thanks to the MRAC contest committee, VBZ, GIL, and FDX. Traffic: W9VBZ 947, IXA 73, SAA 52, RTP 51, IQW 29, LSK 28, GMY 16, FXA 14, RQM 8, UIM 7, CCO 6, RKP 2, SZR 2, OVO 1.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Earl C. Kirkeby, WØHNV — The North Dakota C.W. Net has moved back to 3670 kc. and is looking for more members. At a meeting in Starkweather the Lake Region Radio Club was organized. Officers elected were HNR, pres.; QOB, vice-pres., and act. mgr.; and OLV, secy.-treas. We all wish you much success. PAM GZD has the North Dakota 75-meter 'Phone Net going great. The Net handled 137 pieces of formal traffic and 23 informal during October. UBH is new on the air from Devils Lake. JBM is now using a new Globe Scout. Very few reports were received this month. Traffic: WØKTZ 101, FVG 28, HNV 6.

SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — Asst. SCMs: Earl Shirley, ØYQR and Martha Shirley, ØZWL. SEC: GCP. PAMs: GDE, BNA, NEO, PRL. RM: SMV. OOZ has a new Elmac transmitter and receiver in his Ranch Wagon. SMV passed out cigars — it was a girl. LXQ is Class IV OO. New calls: NØYEJ, at Marvin. Ex-5YOH is ØWZS at Ellsworth AFB. With DKJ back from Naval service, Aberdeen hams are working on a local c.d. communication plan. KFC has moved from Flandreau to RFD 1, Huron. SEQ, the daughter of IER, now is General Class. The 160-Net is standing by after the initial call on 1895–1905 kc. before roll call, to pick up possible traffic. SCT is looking for a gasoline generator of about 3 kw. EBO, formerly of McLaughlin and Lennox, now lives in Canton. GWS is modulating his 15-watter. New reports: 160-Net, 30 sessions, 692 QNI, traffic 27; evening 75-'phone Net, average QNI 37; traffic, 230 formal and informal; NQJ Net, average 23 QNI for 22 sessions, traffic, 120; C.W. Net, 13 sessions, 84 QNI, traffic 40. The Redfield ARC has affiliated with ARRL. DKJ has formed a club among his high school students at Aberdeen, and KVB is conducting ham classes for a group of telephone men. Traffic: WØGDE 52, MPQ 50, SMV 39, SCT 38, YQR 17, AYD 11, GCP 7, DKJ 4, RRN 3.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, ØGGQ. SEC: GTX. RMs: DQL and OMC. PAMs: JIE and UCV. Don't forget to check into our traffic nets. MSN meets at 1830 on 3595 kc., MJN or the Novice Net meets at 1800 on 3690 kc., MSN 'phone nets meet at 1205 and 1800 on 3820 kc. QDP now has a WAS certificate. Gary has a new Viking Ranger and a vertical ground plane for 20 meters. MVJ has erected a new Doublet on 80 meters. EFK has been visiting the Twin Cities from his post as operator for North West Airlines in Tokyo, Japan. The St. Paul Mobile Corps has elected HKF, pres.; KWC, 1st vice-pres.; THY, 2nd vice-pres.; PAK, secy.; and FGN, treas. WTP, of Austin, moved to St. Paul. AGD will be on soon with a kw. MTH has a new 20A s.s.b. exciter. EA has been using very low power from Bemidji. AGD soon will be on the air with a kw. QJV checks into the Iowa 160-meter Net. The St. Paul Mobile Corps is building 11 pack sets for 6 and 10 meters. The Minneapolis Radio Club has elected new officers for the coming year. They are TKX, pres.; TYX, vice-pres.; IXR, secy.; and RGR, treas. EXC has a 522 on 2 meters. His antenna is a 4-over-4 beam. MBP is building a receiver for 220 Mc. The following Technicians are on the air every night at 7:00 P.M. on 220 Mc.: OFY, OFZ, MVP, HPS, and PYC. The range of coverage is Minneapolis, St. Paul, White Bear, and Brooklyn Center. OFY and MVP use a collinear antenna. We had an all-ham wedding at Fergus Falls recently. The groom was TMZ, the bride is studying the code, best man was ETA, bridesmaid was WOJ, the minister was NHU, and the pianist was DYD. Among those attending were EYW and NGV. As your SCM was taken to the hospital Dec. 6th the above report was prepared by DQL. Traffic: WØKLG 306, WMA 268, MVJ 151, UCV 122, TUS 83, KNR 62, IRJ 59, TKX 53, KFN 52, DQL 51, KJZ 50, GTX 43, LUX 38, OJH 32, RVO 32, QDP 27, HUX 26, EYW 19, LST 18, KØWAA 18, WØTQQ 16, GGQ 13, BUO 11, QGD 11, ABA 9, ALW 6, LIG 6, NJT 4, OPA 3, TUO 3.

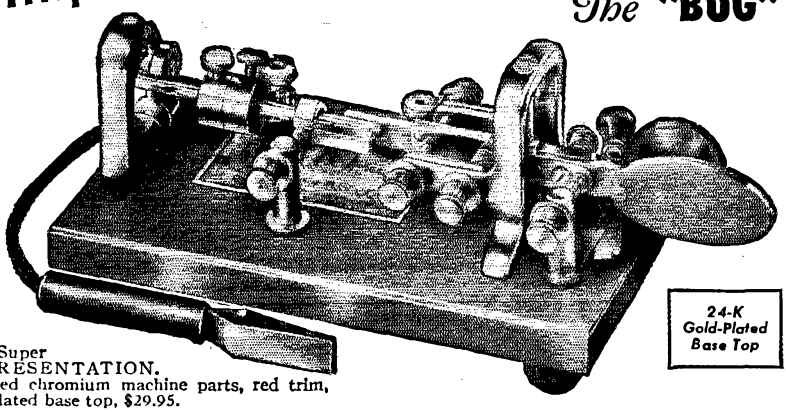
(*Continued on page 78*)

30 years
in *QST*

"New and Improved VIBROPLEX"

The "BUG"

A small 2-inch ad. in February 1925 *QST* with the caption "New and Improved Vibroplex" was our first attempt to interest radio amateurs in the many advantages offered by the Vibroplex. From this modest beginning 30 years ago, Vibroplex has come into general use all over the world, and is accepted as the No. 1 semi-automatic key by thousands of amateurs on land, sea and in the air.



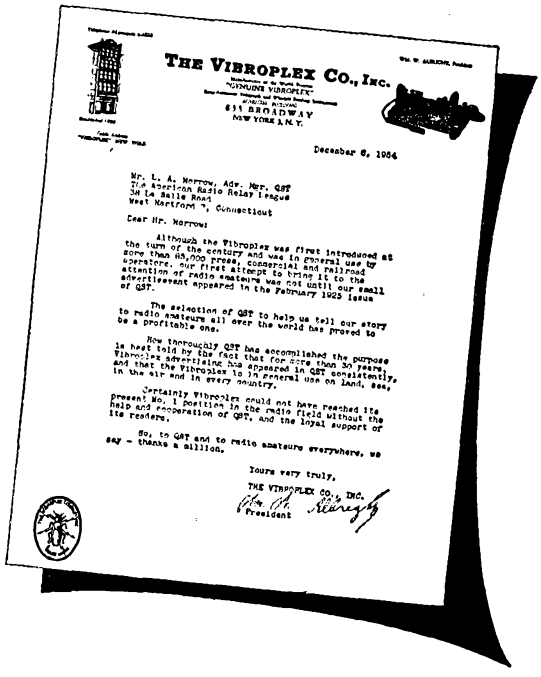
24-K Gold-Plated Base Top

Vibroplex Super DeLuxe PRESENTATION. With polished chromium machine parts, red trim, 24-K gold-plated base top, $29.95.

Every radio amateur needs this famous VIBROPLEX semi-automatic key

The Vibroplex does all the arm-tiring work for you — **automatically.** It relieves nervous and muscular tension while sending. Enables you to send hour on hour without fatigue. Requires no special skill.

The Vibroplex is adjustable to any desired speed and key tension. Suits any hand. A **super-speed control mainspring,** exclusive with the Presentation model, gives you the widest speed range ever, and lets you send at slowest speed without extra weights. The use of **Patented Jewel movement** that insures easier, better keying, is another reason why every radio amateur needs this Vibroplex.



THE VIBROPLEX CO., INC.
"GENUINE VIBROPLEX"
811 BROADWAY
NEW YORK, N.Y.

December 6, 1934

Mr. L. A. Morrow, Adv. Mgr. QST
The American Radio Relay League
34 La Salle Road
West Hartford 7, Connecticut

Dear Mr. Morrow:

Although the Vibroplex was first introduced at the turn of the century and was in general use by operators, our first attempt to bring it to the attention of radio amateurs was not until our small advertisement appeared in the February 1925 issue of QST.

The selection of QST to help us tell our story to radio amateurs all over the world has proved to be a profitable one.

How thoroughly QST has accomplished the purpose is best told by the fact that for more than 30 years, Vibroplex advertising has appeared in QST consistently, and that the Vibroplex is in general use on land, sea, in the air and in every country.

Certainly Vibroplex could not have reached its present No. 1 position in the radio field without the help and cooperation of QST, and the loyal support of its readers.

So, to QST and to radio amateurs everywhere, we say - thanks a million.

Yours very truly,
THE VIBROPLEX CO., INC.
President

Gives You Every Practical Feature for Easier, Better, Faster Keying

Patented Jewel Movement — Maintains perfect balance and easier operation

Touch Control — To suit any hand

Super-Speed Control Mainspring — Gives you widest speed range possible

Extra Large Contacts — DIE CUT for perfect alignment

Finger-Tip Circuit Closer — Open and close circuit without moving fingers from operating position

Sure-Grip Finger and Thumb Piece — Promotes operating skill

Non-Slip Rubber Feet — Hold key firmly to table

Durability — Built for long life and rough usage

Choice of Four Models

PRESENTATION — The finest key Vibroplex has ever produced, $29.95

ORIGINAL — Famous for smooth, easy action and all around sending excellence, Standard, $17.95; DeLuxe, $22.50

LIGHTNING BUG — Has many improved features for easier, better keying. Standard, $15.95; DeLuxe, $21.50

BLUE RACER — Small, compact, handy. Saves space. Wt. 2 lbs. 8 oz. Standard, $17.95; DeLuxe, $22.50

CARRYING CASE — Protects key from dirt and moisture. Insures safe-keeping when not in use. With lock and key, $5.75

At your dealer or direct *Write for illustrated folder*

THE VIBROPLEX CO., INC., 833 Broadway, New York 3, N. Y.

N. W. ALBRIGHT, President

IF YOU TELEGRAPH YOU SHOULD USE A VIBROPLEX KEY

DELTA DIVISION

ARKANSAS — SCM, Owen G. Mahaffey, W5FMF — New ECs for the month are ASO at Mountain Home, PX at Traskwood, and SXM at Russellville. CAF is ORS and is doing a good job with c.w. traffic. YZI has a new code class of about 20 at the Ozark Academy. They are doing fine. Watch the dates on your certificates for endorsement. Traffic: W5CAF 132, FMF 22, SXM 1, WXN 1.

LOUISIANA — SCM, Thomas J. Morgavi, W5FMO — VIC is now OPS in Alexandria. MXQ is active on 75 and 80 meters with RN5, CAN, and MARS. YKA, of Cameron, wants information on activity in the Lake Charles Area. YCO, Shreveport EC, reports 24 AREC members for a gain of 6. One simulated tornado test was held in November. EA reports he is badly in need of a BC-669. Can anybody help him? KTB is on 75 meters with single sideband and 811 linear final. ABS is off the air temporarily because of a spell in the hospital. GIX reports activity on 2 meters is very low because of poor conditions. HEZ and KUM have been delayed in completing their rigs because of overtime work getting WAFB-TV on high power. UJK is back on the air after a spell of inactivity. BAC is a new EC in Crowley. UQK is EC for New Orleans. WLV is building a new QTH. Since his Cuban and South American tour Jim's Spanish is improving with each QSO. Because of a broken bone FMO was unable to make the Shreveport Hamfest and picnic. HEJ has been sharing the NCS of the Delta Net with OTD. The Delta Net has been meeting on 3905 kc. for many years at 7:30 A.M. Sun. Report in for getting acquainted or passing along traffic. Traffic: W5MXQ 151, NDV 134, TVW 24, EA 16, FMO 6.

MISSISSIPPI — SCM, Dr. A. R. Cortese, W5OTD — We have two new nets formed in the State this month: The Dixie C.W. Net which meets on 3712 kc. every Sun. at 2:00 P.M. CST with WN5FPI as NCS; and the Interstates Relay Net, which meets on 3870 kc. from 10 to 11 A.M. Mon. through Sat. with 5BTM as NCS. VME is back on the air after an operation. CTY is in J-Land. TGD has a Ranger. Let's get the c.w. net back in operation. Give AMZ a buzz. Traffic: W5VME 305, EWE 105, TIR 104, CTY 28, OTD 3.

TENNESSEE — SCM, Harry C. Simpson, W4SCF — SEC: RRV. RM: WQW. PAM: PFP. The Memphis Club school graduated 30 students last spring. Imagine Director DCH's surprise when *86* potential hams turned out for the fall classes at Memphis State College. DCH is assisted by LRO, WBK, PKI, BCA, ZER, CLL, WTI, WTJ, and FXI. Thanks to WQW and C.W. Net members, c.d. officials were highly appreciative of c.w. activities during the recent communication alert. 'Phone stations did their usual fine job in all cities. Welcome to WXL, who QSYs from Kentucky to Tennessee Tech. at Cookeville. WQT, VFL, VUA, CVM, and OGG reported good SS scores. PVD worked Poland and is now up to 109, with 82 confirmed. VUA has a new 900-watter on the air. Cookeville AREC received nice publicity in the local paper for S.E.T. activities. Johnson City, Elizabethton, and Jonesboro amateurs have formed the Watauga Amateur Radio Club, with VFL, pres.; and BBD, vice-pres. Other officers are VDN, PMR, TCW, and KIW. ZSE is holding code classes at Sewanee. WQT says two Novices in the Clarksville Area, KN4ACG (CVM's harmonic) and KN4ACF entered the SS Contest. ACG worked more than 60 stations. CVM now is on 6 meters. WHC is leaving for Alaska. KN4AJC is VKE's father. VKE is studying at Northwestern. LRL is operating Navy Base station, ODR. Active long-distance mobiles include PFP, RHO, ZLM, and SCF, who took part in a five-way round table with TZD. The four mobiles were in four different states. Traffic: (Nov.) W4OGG 719, K4FET 197, W4UWA 157, WAX 133, TYU 129, HB 125, HIH 106, BQG 90, WQW 88, SCF 65, TZD 52, VJ 37, IV 32, NJE 27, YMB 27, PMR 25, UVS 24, CXY 23, RRV 22, WQT 22, RHK 18, UOA 18, YPG 17, PVD 16, UIO 16, PAH 14, RET 13, TJI 10, PNG 9, DCH 6, RMJ 4, WXL 4. (Oct.) W4VUA 34, YPG 20, TUO 8.

GREAT LAKES DIVISION

KENTUCKY — SCM, Robert E. Fields, W4SBI — We learn by the grapevine and smoke signals that JUI gave a talk and demonstration on frequency measuring at the Louisville ham club (ARTS) on Nov. 19th. We're sure he knows what he was talking about, too. UTO presented OMW with an 8-lb. 12-oz. baby girl in November. ZLK has just procured a new electronic keyer. VBA has a TVI problem and is rebuilding his VFO and part of the exciter in an effort to get rid of it. GFG is building a new 300-watt 'phone and c.w. rig. K4WBG has a new operator now, 8IQJ/9. CDA has been pinch-hitting as NCS on the KYN. AZQ has taken a job in Ashland, Ky., and expects to have a station going in several months. Traffic: K4WBG 616, W4KKW 231, K4FBW 166, W4BAZ 136, ZLK 134, CDA 55, NBY 44, VBA 32, SBI 30, NIZ 27, RPF 27, JCN 17, GFG 11, HSI 11, JUI 7.

MICHIGAN — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Joe Beljan, 8SCW; Bob Cooper, 8AQA. SEC: GJH. New appointments: DSE, HSG, and QQO as ORS; KOX as OO. ELW made BPL again, his fourth consecutive month. Here's the pay-off though; he has sold the house and

(*Continued on page 80*)

MALLORY HAM BULLETIN

Better Protection for Your Transmitter and Yourself... When You Use Mallory Wire-Wound Resistors

Wire-wound power resistors of the vitreous or baked enamel type have always been an important component in the construction and operation of amateur and commercial transmitters, yet, too often these resistors have been selected and purchased entirely on a "sight-unseen" basis with no thought given to the technical merit of the unit purchased.

This is unfortunate, because the undetected failure of just one of these resistors in a transmitter can be of serious consequence not only to the personal safety of the unsuspecting operator, but also in the costly replacement of expensive transmitting amplifier tubes.

Generally, the failure of wire-wound enamelled power resistors can be attributed to one or two important chemical-mechanical factors.

For example, resistors carelessly manufactured with an inferior grade of enamel, composed of chemicals of highly alkaline characteristics, soon fail because of corrosive action on the wire windings of the resistor coil. Leakage of moisture through the carelessly applied enamel also accelerates the corrosive action and results in a resistor of "high resistance" characteristics. In these cases, an original 10,000 ohm resistor may have a measured resistance of 100,000 ohms or more.

In addition, some resistors fail because of a mechanical tension created as a result of the unlike coefficient of expansion between the enamel coating and metal end-straps to which the resistor coil is terminated. Since the enamel as well as the metal end-straps firmly grasp the tiny resistance wire, any difference in temperature expansion results in increased tension on the resistance element, with eventual breakage of the wire. The end result is an "open" resistor.

All these factors have been carefully analyzed in the design and manufacture of Mallory wire-wound power resistors, and corrective measures taken to minimize the chance of failure. All Mallory resistors use a special non-alkaline, non-hygroscopic enamel which seals the resistor coil completely under a tough glass-like, moisture-impervious barrier. This enamel is carefully applied and cured to eliminate pin-holes and internal air bubbles which can be so troublesome.

In addition, the metal terminal straps of Mallory resistors are made of a special alloy whose coefficient of expansion is practically identical to that of the enamel covering. This means that the opposing forces normally resulting from unlike temperature coefficients are for all practical purposes equalized, thus reducing the possibility of lead breakage at the junction of terminal strap and resistor coil.

Your Mallory Distributor has these resistors for your inspection. Examine the smooth, even enamel on these resistors. You will see a difference right away. Check their price, too. Surprisingly enough, you will find you can buy Mallory premium quality at standard prices.

P. R. MALLORY & CO., Inc.
INDIANAPOLIS 6 INDIANA

P.R. MALLORY & CO. Inc.
MALLORY

expects to be off the air for three or four months! Any of you fellows want to take his place? NUL has been plenty active, too, but says that the late sked of 8RN makes copying conditions pretty rough. FX still is fighting line noise and electric motor QRM. He is in the market for suggestions for a real cure. DAP has a new Viking Ranger, but since he works seven days a week he gets little chance to use it. WVL has become a week-end QMNer since he went back on the late afternoon shift at Ford. EGI says he envies the fellows who have week ends off; he had to work the SS Contest while at work! DLZ got a new signal slicer and really likes it. Don't forget that CW has been s.s.b. for years, Norm! KOX is editing a very newsy bulletin of the Motor City Club. By this time you have seen how your FD scores compare with the others. All the comments we have heard add up to the same thing — we'll do better next year! By the time this is in print it will be time for the Grand Rapids Convention again. Hope to see you all there; we know it will be a dandy one. Traffic: W8ELW 784, NOH 305, NUL 255, ILP 220, ZLK 116, FX 71, JKX 57, WXO 56, HKT 39, IUJ 32, OQH 30, DSE 28, SJF 20, TQP 18, DAP 14, SCW 13, WVL 12, AUD 6, EGI 5, DLZ 3, FSZ 2, HSG 2.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: J. C. Erickson, 8DAE; W. B. Davis, 8JNF; and E. F. Bonnet, 8OVG. SEC: UPB. RMs: DAE and FYO. PAMs: EQN and HUX. ARO and FYO made BPL for November traffic and join ARO with two legs apiece toward the BPL medallion. We regret to report the passing of VRK. The PMJs have added another jr. operator. UK8 is moving to Massachusetts. YCP's fifth harmonic turned out to be a girl. DQG reached 42,770 in the Sweepstakes. GZ reports 97 countries worked on s.s.b.s.c. HNP, one of our outstanding ECs, is turning over the Lucas County appointment to HHF. DAE reports a dearth of Eastern Ohio stations on BN. GDQ worked YV5DE and LU3EL on 160 meters. NBD and KPJ finished first and second in Toledo's hidden transmitter hunt of Nov. 14th. Toledo mobiles KIX and YKF were responsible for saving a burning auto by directing the Sylvania Fire Dept. to the scene of the fire. Novices QIG, QJI, and SAQ are having a race for WAS down Kenwood way, while UAR is the newest Novice in the area. Dayton's *RF Carrier* reports that ZOA gave a talk on oscilloscopes at a recent club meeting; the DARA Christmas Party committee was composed of HOH, PTF, and YCP; GQ recently installed a vertical antenna; and the new TVI committee is composed of QFA, MGH, ORH, and WYL. Cincy's *Mike and Key* has published a 1954-55 Directory which lists all the W4s and W8s in the area. The GCARC again is sponsoring a Mid-Winter Dance to be held Feb. 19th at the Makatewah Country Club. The Columbus *Carascope* lists the CARA's newly-elected officers as ZQX, pres.; NPF, vice-pres.; LVC, treas.; and LWO, secy. TSE, WXY, and ZCQ will serve as directors. QEF has received her General Class license. Newly-elected West Park Radiop officers are ZEU, pres.; OPX, secy.-treas.; and AGA and FBK, trustees. Northeastern Ohio's *Ham Flashes* states that HLA has erected a 40-ft. self-supported tower; the STDs were visited by the stork; RIN recently spent three weeks in Florida; and the Conneaut Radio Club again is meeting at the local fire station. We are sorry to learn that JRS recently passed away. RZ received 50 QSL cards from the Bureau in one mail! Our congratulations to the section's leading Field Day groups, the Ohio Valley gang, who produced an outstanding score for first place in the seven-transmitter classification, and the Cleveland West Park Radiops, who again walked off with the Club Aggregate Mobile laurels. A pat on the back also goes to the Cleveland Brasspounders and the aforementioned West Part Radiops for running second and fourth in the three-transmitter category, which numbered over 160 entrants. RXM, civil defense station in Dayton, was operated by ILC during the SS Contest, and 318 contacts were made. LYD/8 is the call currently used by the Cleveland Civil Defense Headquarters station. Traffic: (Nov.) W8FYO 802, ARO 471, UPB 296, MQQ 190, DQG 144, DAE 106, LHV 82, HNP 65, LMB 51, RO 48, AL 45, HUX 43, ILC 38, HHF 33, HPP 22, LZE 20, EQN 17, GZ 16, DG 15, TLW 15, AJH 14, AJW 14, LYD 12, KIH 10, QIE 10, ET 7, IJH 6, LER 6, GDQ 4, HFR 4, NQQ 4, PIJ 4, THJ 4, CSN 3, CRA 2, LGR 2. (Oct.) W8UPB 309.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RM: TYC. PAMs: GDD and IJG. The first meeting of the ENY Council of Radio Clubs was held in Pok on Nov. 13th. Delegates from the SARA, AARA, IBM, CRC, WARA, and the Kingston Mike and Key Club were present. ILI acted as chairman and was assisted by committee members RTE, CGT, and GTC, who acted as secretary in the absence of EFU. Director George Cooke, OBU, highly endorsed our program and urged all in Eastern New York to take part. If your club has not yet filed an application, please contact our Acting Secy., EFU. The MHTN has reorganized and is holding sessions each Sun. at 1300 hours on 3716 kc. Code speed is held down to about 10 w.p.m. Attention: Your SCM is now associated with IBM in Pok. However, your reports will still reach me

(Continued on page 82)

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4X150D	304TL
4X150G	450TH
4X500A	450TL
4X500F	592/3-200A3
4E27A/5-125B	750TL
3K20,000LA, F, K	1000T
3K50,000LA, F, K	1500T
3W5000A3	2000T
3W5000F3	2-25A
3W10,000A3	2-50A
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3X2500F3	2-240A
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if sent to my Troy address. Please make note of this, since your regular reports are expected and appreciated. Congrats to K2EOQ, who has a new son. RUF paid a personal visit for a look-see. ZBS has 100 watts and a sixteen-element beam on 144 Mc. LDS has a new jr. operator. CGT won a Gonset at the L.I. Hamfest. Dan was among the IBM group who paid a visit to ARRL Headquarters. IJG has a new Panadapter. QGY, MHE, and WVS, also K2s BXE and BEK have converted AP 13s to 430 Mc. LEL has a new sixteen-element beam on 144 Mc. and is doing real well with it. New members of the SARA are TGY, KN2IUM, and K2s EKS and GOG. The Schenectady AREC Net operates every Sun. at 1400 hours on 3950 kc. WWK is the manager. Don't lose your appointment, check your endorsement date now. New in Yonkers: KN2JPH, son of MQS, and KN2IOM, whose OM is K2HGN. Traffic: (Nov.) K2BJS 244, EOQ 32, BE 30, W2GDD 27, LRW 26, SZ 11, ITX 9, K2EHI 7. (Oct.) K2BJS 121.

NEW YORK CITY AND LONG ISLAND — SCM, Carleton L. Coleman, W2YBT — Asst. SCM: Harry J. Dannals, 2TUK. SEC: ZAI. PAM: JZX. RMs: VNJ and LPJ. Please continue mailing activity reports to TUK. The section was well represented in the SS. TUK worked 63 locals, with many more active. ZAI reports AREC activity is good, with many stations qualifying for Net Certificates as a result of good attendance. K2CRH now is EC for Brooklyn 80-meter AREC Net. NBT joined the married ranks. Note that the XYL/OM combination of KEB/KFV leads the traffic list this month. VNJ, LPJ, and BO also have excellent BPL totals. Our PAM, JZX, reports that work with the Braille Technical Press, plus the arrival of two granddaughters (one to son, LJJ) kept her radio activity down. VNJ's son is awaiting his KN call. Vic also reports that the NLI Net meets Sat. at 1900 on 3630 kc. in addition to the regular weekly time of 1930. LPJ has a new antenna coupler and now is handling West Coast traffic direct. BO is awaiting a 14-Mc. beam to assist in overseas traffic-handling. New officers of the North Shore Radio Club are: JVO, pres.; K2EU, vice-pres.; WHY, secy.; and GDL, treas. All officers of the Club and 70 per cent of the active members are using s.s.b. K2CQP needs only 4 states for WAS. JOA received WAS and added some DX between school studies. OME changed cars and is reinstalling mobile gear plus new Super-ceiver. The 75-meter station demonstration at C.C.N.Y., HJ, resulted in 15 new club members. NTB and K2s CRH, DVT, EIO, and EVY handled traffic chores. IAG reports that the Queens 10-meter AREC gang is building loop antennas for transmitter hunts. The grapevine indicates that IVS won the c.w. SS section award, with RDK and KTF close behind. IN now is on s.s.b. EEN is adding high power final to the new Ranger. BKP is secy. of the reorganized Radio Club of Brooklyn. K2AMP is planning new VFO for DX-chasing. AEV has top-loaded vertical for low frequencies. A note to all Novices — keep trying — K2DZD dropped the "N" on the fifth try! New Tuboro members are FKR and K2EEH. K2AED gave KN2JTW the Novice Class exam. OBU still manages to report into the NLI Net despite more than 1,000 miles of travel as Hudson Division Director. K2CJN has 78 countries on 'phone, but still needs Asia for WAC. K2AMM is planning 50-Mc. mobile operation. KN2s JXD and JYF are a new father/son team on 80 meters with TBS-50 and SX-25. BZH and NBR are building Viking Rangers. K2CMV has completed all-band QRP mobile. K2DDC/4 is at Camp Gordon, Ga. GG added 75A-1 and YRS-1 S.S.B. Selector. RB now is pumping 100 watts into 144-Mc. antennas 40 feet in the air. With your SCM, YBT, busily engaged in building a new home in East Hampton, TUK will continue writing this column and, in addition, will take on any club visits. All club secretaries are urged to submit current club data so that section files may remain up to date. Traffic: (Nov.) W2KEB 1038, KFV 855, VNJ 654, LPJ 630, BO 614, K2CQP 391, W2MUM 111, JZX 107, JOA 102, K2CRH 94, W2OME 83, K2ABW 38, W2HJ 33, GP 28, GXC 20, IAG 14, OBU 14, DSC 13, K2HID 10, W2IVS 9, PF 9, K2DDU 7, W2EC 4, IN 4, K2EZH 2, W2TUK 1. (Oct.) W2BO 311, IVU 208, VNJ 138, JZX 80, OMG 19, PF 17, LGK 16, K2AED 7, W2OBU 6, DIC 4, K2CJN 2.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — Asst. SCM: Charles Teeters, K2DHE. SEC: IIN. PAM: CCS. RMs: NKD, CGG, EAS. GZT is back on the air with 18 watts on 75-meter 'phone. K2GER also is on 75-meter 'phone with a new Globe Champion. The RVRC has active programs for club meeting nights. Recent speakers were CWK on DX and ANG, of the Bloomfield Club, on operating procedures for contests. Code classes are held before meetings for all classes of operators. The club meets the 2nd and 4th Tue. at the club house, Wilson Road, Middlebush. GRZ is back in the old stamping grounds at Highland Park. IAT was off radio for the holidays; he's in the post office. K2EUN holds a regular shift on NJN and is a prime mover of the RVRC c.w. gang. K2GAS likes contest work at the RVRC club station. As long as the coffee holds out Dick will never let go of the key. New officers of the North Jersey Mobile Radio Club (Essex County) are WIY, pres.; IMM, vice-pres.; TLH, secy.; HIK, treas.; KLA, comm. chief. Newly-licensed KN2JJF is on 3.7 Mc. with a single 6V6 oscillator and one-tube

(*Continued on page 84*)

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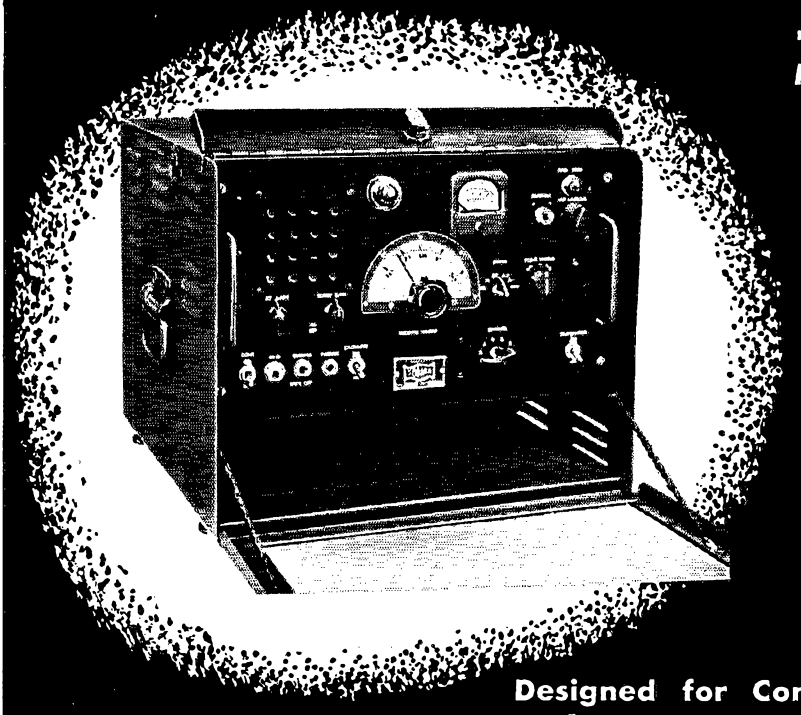

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receiver. JKG has a new rig on 28 Mc. LIO and his XYL were guests of honor recently at the Windblowers V.H.F. Society's installation dinner. K2CMB was awarded the Society's trophy for outstanding work on 144 Mc. ABL was very active in the SS Contest. He keeps skeds with his son, ZEP/7, in Phoenix, Ariz., three times weekly on 7-Mc. c.w. K2EUN and W2CVW ran up good scores in the SS Contest. YVQ has been inactive because of his work on the road which keeps him away much of the time. K2ICE has a new beam up on his tower for 144 Mc. Traffic: (Nov.) W2CQB 187, K2GAS 157, EUN 80, GFX 72, W2FPM 54, CJX 24, DMJ 11, BRC 8, K2GER 8, W2CVW 4, ZPD 3, NIY 2. (Oct.) K2GFX 53, GAS 34.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — BDR now has a new dipole for 40 meters. LGG is Wed. night NCS of TLCN, the first YL NCS, and is doing a fine job. BDR met with the Clinton Radio Club in his campaign for SCM. A new Burlington Technician is VYC, ex-9QGU. TQG has all the parts for a new 813 rig. The bug has bit ALC again and he's busy with a Viking kit. SCA has 40-meter skeds with 9JMJ, KØWBB, and WØGAR. LCX comes through with a big traffic report. LJW finally has won the coöperation of the power company in running down some noise. TLCN needs some new members in the Sioux City Area. HWU has a new Morrow 5BR-1. The club at Luther College is making satisfactory progress and expects to have its club station on the air soon. PAN expects to have a new VFO going soon. TED is back in Waterloo after a hitch in the USAF. USP wants someone in Iowa City to contact him about 220-Mc. experiments. BDR sent along good traffic counts for October and November. News being scarce I'll take this opportunity to alert you to the election to come up soon for SCM. Because of my work I no longer can do justice to the job, so consider carefully and nominate a good impartial ham for the job. Traffic: (Nov.) WØBDR 1967, SCA 1117, LCX 448, CZ 211, LJW 102, QVA 71, KVJ 27, BLH 26, NGS 26, PUR 10, HWU 9, DDV 5, W9BQC/Ø 4, WØPAN 3, NYX 2. (Oct.) WØBDR 1680, SEF 6, FDM 2.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. RM: KXL/NIY. PAM: FNS. The CKRC c.d. organization of Salina worked with the Police Dept. Sat. and Sun. of Halloween with nine mobiles. Those participating were MBH, MVG, GJG, HAJ, LXA, BGW, JAS and W7SXY/Ø. The club is planning incorporation. The KVRC of Topeka plans to meet at its new c.d. control center at SBA Hill, or WIBW-TV Hill as we now call it. The Club now has Viking II, HQ-140, Matchbox, and emergency-power supply. EIG, SZE, and GPV are in school at Port Arthur, Tex. UAT has his Heath VFO working FB and is using an RME-45 receiver now. TOL, of Manhattan, has a new NC-125 receiver. PAH sent me a copy of the information sheet for Kansas Emergency Communications. If any of you ECs haven't sent in your report to Bill, please do so *now*. Also we need ECs for Zone 20 (Decatur, Norton, Phillips, Smith, Sheridan, Graham, Rooks, and Osborne Counties) and Zone 22 (Hamilton, Kearny, Finney, Stanton, Grant, Haskell, Morton, Stevens, and Seward Counties.) We sure would like volunteers for EC in both of those zones. Write Bill or myself. Traffic: KØFDL 1564, WØBLI 470, NIY 425, TOL 131, MXG 89, EOT 76, UMV 62, FDJ 35, ECD 31, FSE 30, ICV 28, ABJ 27, NFX 21, ONF 20, SVE 20, FNS 19, UAT 18, KAJ 17, DEL 15, TNA 15, RBO 11, REP 10, SAF 7, BET 6, KFS/Ø 5, QMU 5, LBJ 4, KSY 3, YFE 3, WNØUML 2, WØZUX 2.

MISSOURI — SCM, Clarence L. Arundale, WØGBJ — SEC: VRF. PAM: BVL. RMs: OUD and QXO. YKE has been issued to the Southwest Missouri State College Radio Club, with LQC as trustee. The Northwest St. Louis Amateur Radio Club has its station located at the Normandy Fire Department. The Suburban Radio Club is filing incorporation papers. ITX and NDS are on s.s.b. SAK has received his General Class license and is now acting as net recorder for MON. ULY has a 1-kw. job ready to go as soon as he receives his General Class ticket. GAR is clearing some of his traffic on the morning sessions of MON. CPI is revamping his station and it is to be the console type. CXE, because of illness, is not very active. QMF is installing 2-meter mobile equipment. RTW has completed his Heathkit VFO. GCL has the new 813 rig almost completed. OMM worked LBR, who is now located in Alaska. WIU and WIV are new Novices in Jefferson City. The St. Louis University Club reports YLF and YLG as new Novices from among its members. TGG is erecting a new doublet for 15 meters and plans some DX hunting. WAP has his antenna up and is back in traffic work. LHU is back from the Navy. The St. Louis University Club outscored Washington University in the SS Contest. BPL certificates go to CFL, CPI, and GAR. Traffic: (Nov.) WØCPI 1240, CFL 660, GAR 538, BVL 198, KA 149, EBE 64, CKQ 63, GBJ 61, KIK 52, RTW 50, SUV 50, OUD 39, BZK 32, BUL 31, HUI 31, OMM 28, BKV 24, ECE 16, VPQ 16, SAK 13, ETW 8, LQC 8, TSZ 8, TGG 7, MFB 4, QMF 4, WAP 2. (Oct.) WØCFL 324, OMM 12, SAK 12.

(Continued on page 86)

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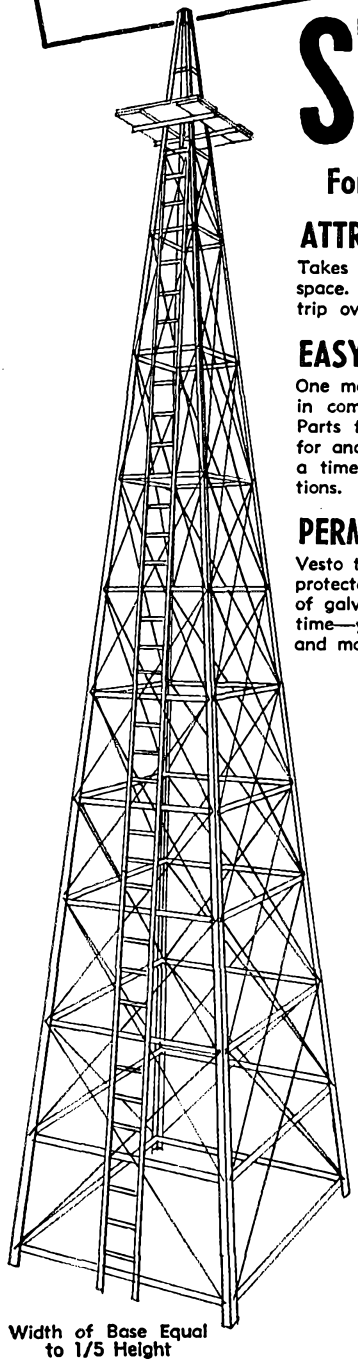

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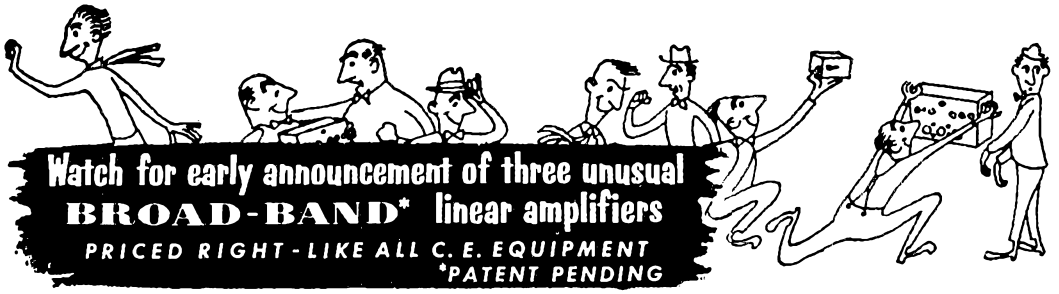
NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM: Tom Boydston, ØVYX. SEC: JDJ. NCS 'Phone Net: HTA. NCS C.W. Net: RDN. CVC is back from a very nice trip to Arizona. EWK has a new antenna. WNØWLO now has 36 states logged. LRK and KXD are on 15 meters. IBA is getting results on 15 meters. The North Platte Net is growing with leaps and bounds on the Mon. night roll call on 3948 kc., with UOV as NCS. RDN reports 33 traffic count on one night of the C.W. Net. RHL is now stationed at Offut Air Force Base. FQB was appointed chairman of the Fireman's March for Muscular Dystrophy in Omaha. The Ak-Sar-Ben Club's 10-meter mobiles assisted the Muscular Dystrophy Drive Nov. 29-30. FQB was in charge of the campaign, with mobiles AQJ, AEM, CQX, GNM, PHW, NPA, NRS, and YMU taking part and NMN operating the base equipment. LRK has a vertical on 20 and also 15 meters. KXD revamped his 10-meter beam for 15 meters. KWQ has a new homemade 'scope. North Platte mobiles OHK, LRK, and KXD assisted the JCs recently in their drive to get money for the new Rescue Unit to replace the Fire Department's old model. IBA and CBH were control stations. KXD now has a 140X receiver. The Nebraska C.W. Net meets daily on 3525 kc. at 1845. CBH is vice-pres. of the newly-organized IBEW at North Platte. OKF recently gave a talk to the North Platte Club which was very much enjoyed by everyone present. Traffic: KØAIR 942, WØRDN 277, ZJF 259, FQB 170, KDW 63, HTA 54, MAO 45, AEM 44, RNH 41, EGQ 35, FGQ 32, ERM 18, ORW 14, CBH 10, DJU 10, JHI 9, LRK 6, KØWBF 6, FBD 5, WØBEA 4, CIH 4, HXH 4, OFL 4, OOX 4, PDJ 4, PNX 4, PPT 4, QOU 4, PQP 3, AIN 2, KFX 2, KLB 2, OCU 1, RRH 1, TPX 1.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Milton E. Chaffee, W1EFW — SEC: LKF. PAM: LWW. RM: KYQ. MCN and CN: 3640 kc. CPN: 3880 kc. CAN: 29,580 kc. New schedule for CTN (slow-speed training net) is Sun. at 0900 on 3640 kc. This is medium for those who need practice at a lower speed in traffic-handling to do it easily. Old-timers and new operators are equally welcome. Code and theory conducted by the Manchester Radio Club have produced licenses for AKX and Novices ANV, ALO, AMW, AOJ, AOO, AMY, ANH, CDC, CDD, and CHT. DJC has taken over the c.d. director post at Manchester. Others on the same level are IYI Bolton and DTG Stafford, while EFW is deputy at Southington. UJG furnished the only OES report this month, saying the pressure of other work is delaying his 2-meter converter. TD maintained OBS schedule on 2 meters but with a new antenna is back on 80 meters. WEE is a new reporter in Meriden. The only OO report this month came from BVB, who is a regular on MCN. CN, plagued by poor conditions, still handled 280 in 25 sessions. High QNI honors go to KYQ, RGB, and LV. On MCN, 173 were cleared in 24 sessions, with QNI honors to IBE, YYM, and LV. QXT has a new rig on 75 meters. The HCARA conducted a successful TVI demonstration, with ICP in charge. ORS appointment renewals: BFS, WPR, YYM, EOB, GVK, LHE, and RAN. YYM also renewed OPS appointment. Have you checked your appointment expiration date lately? The Middlesex Radio Club completed affiliation with ARRL. RDV gets out a nice bulletin for the Club. The Bristol Radio Club visited the Southington Radio Club recently. How about more news from the clubs? Let's have a report from every club each month. Traffic: W1YBH 290, KYQ 198, YYM 165, BDI 139, AW 138, EFW 130, NJM 102, RGB 82, LIG 81, QJM 70, HYF 68, LV 64, BVB 34, RFJ 30, YU 26, UED 17, KV 12, ZID 2.

MAINE — SCM, Bernard Seamon, W1AFT — SEC: BYK. PAM: WRZ. RM: OHT. The Barnyard Net meets Mon. through Sat. on 3960 kc. at 8 A.M. The Pine Tree Net meets Mon. through Fri. on 3562 kc. at 7 P.M. The Sea Gull net meets Mon. through Fri. at 3940 kc. at 5 P.M. It is with deepest regret that we announce that the Sea Gull Net, after some 16 years of operation on 3960 kc., has been compelled to shift to 3940 kc. because of insurmountable QRM from the BBC. We hope to be able to resume our old frequency when propagation conditions will allow. We welcome the following new OPS appointees: YYW, TKE, and ZBN. DEG has moved to Tampa, Fla., where he is in the engineering department of a new TV station. TYG is stationed at Keesler AFB, where he is teaching electronic theory. YYW made 129 contacts in 39 sections during the recent contest. ZBN is going to add a couple of quarts soon. During November BPI entertained the Cumberland County C.D. gang and the Oxford County Amateur Radio Club (Western Division)! Turn back the clock! AFT, KLH, and PU were in a three-way one P.M. lately. It was our pleasure to listen to the New Hampshire Wing of the CAP during the recent rescue of the survivors of the Northeast Airlines crack-up. New Novices in the Portland Area are BCB, BCD, BBB, CBQ, and CSD; also an OT from the spark days who has just regained his ticket, BDJ. Traffic: W1WTG 138, LKP 111, LYR 42, UDD 35, YYW 24, AFT 21, VYE 19, YTE 17, FD 5, JIS 3, WRZ 3.

(*Continued on page 88*)



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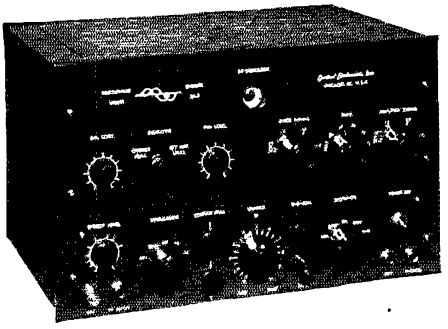

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Choice of grey table model, grey or black wrinkle finish rack model.

Wired and tested.....**$249.50**

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- **Perfected Voice-Controlled Break-in on SSB, AM, PM.**
- **Upper or Lower Sideband** at the flip of a switch.
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NEW AP-2 ADAPTER

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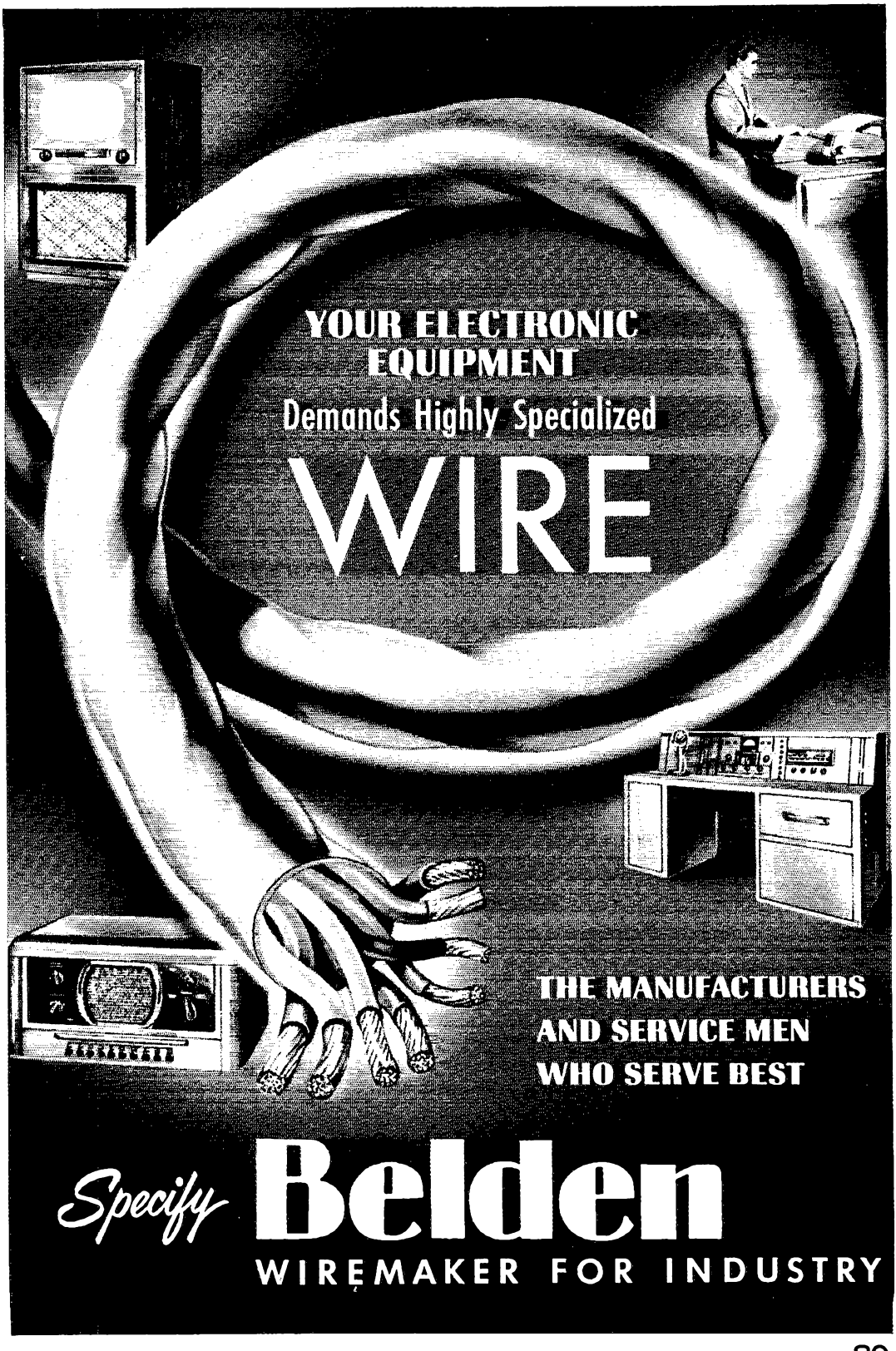
Watch For Early Announcement Of The New DeLuxe MULTIPHASE VFO.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — VAN is new EC for Norwood. Appointments endorsed: BL as SEC; TVZ Hopkinton, EK Newton, DOF Revere, MOJ Millis, MB Scituate, SMV Cohasset, MEG Framingham, MF Salem, as ECs; DOF as OPS; GDY and MEG as OBSs; MEG as ORS. Region 5 Radio Comm. held a meeting with CQ, OTK, BL, ALP, DFS, and KTG present. New Novices are CZB Squantum and CSH Milton. GOU, GFO, DXO, YMV, VMU, PMZ, and PWK are on 15 meters. RUU, Easton EC, says they have 2 Gonsets and a TBS-50 and the Old Colony Amateur Radio Club now meets in the Unitarian Church Vestry in Norton, courtesy of WVD. The Wellesley Amateur Radio Society held a meeting with JFG speaking on 20 years of DX Hamming. GDY has a stacked array for 10 over his 20-meter beam. QQW has a new QTH. The South Shore Club held a regular meeting. ALP visited the Winthrop c.d. group at UOC's QTH. ALP got the first Gonset Communicator for the City of Quincy's c.d. group. Heard on 2 meters: RUU, YHK, EAE, CFH, JAJ, AQR, CBA, AEQ, ZKT, AKC, CHS, CGU, NQA, ZSR, ZML, and NQA. On 10 meters: QVK, RK, TIV, CPP, NO, and IQY. CZF is in Medford. ASL, Carlisle, has a Viking I and Millen job on several bands. ADT has General Class license. WSN has a new 813 final and new 10-meter mobile. CLF has Collins 75A-3 and Viking 1 VFO and Matchbox. BUR is a new ham in Chestnut Hill. VIN, Carlisle EC, has AKC, YWY, YYI, and WET helping him out. AQE now is in Bedford. OSS is EC for Townsend. AGA, new in Hamilton, has a Viking II, HQ-140X, and NC-33. JXM moved to Brookville. The Arlington 6-meter Mobile C.D. Net drove to Lexington for "Neighbors Night." LXR has 2-meter ground plane on the hood of his car. The South Eastern Mass. ARA has an HT-9 transmitter and HQ-129X receiver at Club headquarters. ZPE, WGN, and AVY have new HQ-140 receivers. CNT has a nice signal. ATI is on c.w. AIE-3PZS is mobile on 75 meters. LAZ has morning contacts with 2NSA, PXU, and AHX daily. AEN has ground plane on 10 meters. AER is out in California. AGW still is on 20-meter 'phone. AWH is on 10 meters. AZY is on 15 meters going for 200 countries. AZU has a Viking II. A new club, the Sea Coast Amateur Radio Club of Newburyport, has been formed. The members were called out during the two hurricanes and our EC, WCI, had the following operators: YJM, BYL, YVE, TLX, YNJ, AFE, YYB, YYL, VVG, YVL, DOX, George Mann, Ted Rohr, and George Bartlett. SMO is in the V.A. Hospital in Brockton. Radio Amateur Open House had OOP speak on the Vackar Oscillator. The Winthrop c.d. group had MQB, UOC, HFJ, BDU, CMW, BOX, VIS, DJ, OIR, AGB, and MMX, along with many YLS, working on their TR-4s. CHS is a new call. IBE sent his EC certificate in for endorsement. RSY, Bedford EC, reports the following helped out during the hurricanes: ACE, BFV, DTA, EIQ, KJO, KYX, MSJ, NAD, NDI, OG, QJB, QZV, RSV, SAP, TCG, TRD, UHV, VCX, VGC, WIZ, WNB, YFP, ZHN, and ZSG. Others were K1FCR, ALX, KEK, LEH, MFY, NCO, PDQ, PFX, PIU, QNC, RAL, RES, RIL, SLM, SSA, TYN, UYK, VBC, VEL, VIA, WAE, WME, YKD, YXN, ZL, and ZPL. QLT reports that the Falmouth Radio Club has a TBS50D. TJW is building a new all-band-switching transmitter. UXG is on 160 and 40 meters. DVS has new B.&W. transmitter and is working across the pond on c.w. before breakfast. LYV is on 160, 75, and 2 meters. SUE is going on c.w. DJK, on 2 meters, is building a 6-ft. conical for DX. QLT is working on the rig but is busy with school work and kids. The South Shore Club held a meeting at which MME and ALP spoke. WSN is mobile on 10 meters. KKX and ZSR are on 2 meters. FVD has a new transmitter. Traffic: (Nov.) W1UKO 329, EMG 297, LYL 158, EPE 135, IBE 59, AVY 47, UE 42, NUP 15, TY 10, QLT 9, BY 8, WU 8, WPW 7, ATX 2. (Oct.) W1WSN 80, NUP 13, IH 9, CLF 7.

WESTERN MASSACHUSETTS — SCM, Arthur Zavarella, W1MNG — SEC: CJK. RM: BVR. PAM: QWJ. Assistant SCMs for special activities are JYH and RFU. The WM C.W. Net meets on 3560 kc. Mon. through Sat. at 1900 EST. New ECs are RRX, Holyoke, and VNH, Agawam. MNG and CJK were guests at the Pittsfield RC November meeting. COI is using a new B.&W. coax switch to select his rhombics. JAH is on WMN with a temporary antenna pending repair of storm damage. The SS was too much for YXV's 60-watter. Other participants in the SS were CJK, KFV, JYH, MNG, AOT, RRX, ABD, AJX, WEF, SRM, ZIO, K1WAB, WCG, WCC, BDV, WDW, RLQ, LHY, MVF, WN1CLW, YK, UKR, and NGE. Ten-meter activity is increasing, with the following stations heard on the HCRA, Inc., Backyard Net Tue. at 2100 EST: ABD, NY, LIW, ZRP, MNG, MSN, KFV, DXW, FWJ, VBG, VNE, CJK, PHU, RRX, and SRM. WEF has a transistor audio oscillator built into a 1"x1"x2" box. The Holyoke c.d. is in high gear with code classes each Mon. at city hall under the direction of Comm. Officer EVZ, Radio Officer HOD, and EC RRX. HRC was elected Vice-Director by a thumping majority. Our congratulations to him and to our new Director, DBM. GVJ has moved to Connecticut. UXK is now in Korea but is looking forward to returning to Western Massachusetts in June. K2CBD/1, operator at K1WAB, and

(Continued on page 90)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WIREMAKER FOR INDUSTRY

Eunice, UKR, made BPL this month. UVI reports up to 18 units in the Westfield RACES Net. OBQ and CJK visited KK and JYH for s.s.b. demonstrations and soon may be active on this mode. KUE has a new, shiny shack in the attic. PHU has a new QTH in the country with lots of antenna room. BXB is holding 2-meter skeds with friends in New Jersey QTH and is the first of several v.h.f. men relocating in Western Massachusetts to swing into action. AAY is using his *Handbook*-built VFO-813 rig in getting reacquainted with old friends. YCG and ZXM, in Amherst, are moving college traffic on 2-meter MCW. Traffic: W1UKR 526, KIWAB 413, W1HRV 150, WCG 123, BVR 73, DVW 38, TAY 36, WCC 30, SRM 24, RRX 23, MNG 16, HRC 11, JYH 7, UVI 6, BH 3, JAH 3.

NEW HAMPSHIRE — SCM, Harold J. Preble, W1HS — SEC: BXU. RM: CRW. Asst. RM: TBS. PAM: AXL. Thanks to GMH for preparing last month's report while the new SCM was trying to get organized. IP was heard recently testing a new Viking Ranger on 10 meters. The Concord Brasspounders held a Christmas party at the QTH of BFT and FTJ for its December meeting. WUU is keeping Sat. night skeds with UNV at K4MC for his folks and XYL. The Manchester Radio Club fared very well in the recent hamfest. YHI is NCS for HCEN Fri. nights at 1900 on 29 Mc. PCK recently spent a week with BCN in Bangor. RVQ is the proud daddy of a new YL. RCEN meets Sun. at 1000 on 3685 kc. and welcomes all New Hampshire stations. COC, NCS for the new slow-speed net on 3685 kc. Mon. through Fri. at 1830, is looking for additional members. This is an excellent opportunity for rusty operators to get in some code practice. The Concord Brasspounders has appointed LVG to conduct Novice Class exams for the Concord Area. YQH, in Chichester, is putting out an FB signal on 75-meter 'phone. Ed. (who, incidentally, is blind) is using a TBS and Windom skywire. TPS, in Newport, also is on 75-meter 'phone. ZFP is chasing Europeans on 20-meter c.w. ARR, and Novices DAE, TDR, and ZYK represent hamdom at Concord High School. Traffic: (Nov.) W1GMH 87, WUU 38, COC 24, HS 20, ARR 5, YHI 2. (Oct.) W1CDX 38, POX 37.

SIXTH NEW HAMPSHIRE QSO PARTY

The Concord (N. H.) Brasspounders, W1OC, announce their sponsorship of the Sixth New Hampshire QSO Party, and cordially invite all interested radio amateurs to participate. Here are the details:

(1) Contest period: Saturday, February 19th, 6 P.M. EST, to Sunday, February 20th, 6 P.M. EST.

(2) No time limit and no power restrictions.

(3) Scoring: N. H. stations count 5 points for each N. H. contact, plus 1 point per outside contact; stations outside the state count 5 points per N. H. contact; both multiply by the number of counties worked (10 maximum).

(4) Engraved certificates will be issued to all participants reporting, with special endorsements for the highest-scoring stations, both in N. H. and outside, in the following categories: 'phone only, c.w. only, combined 'phone and c.w.

(5) The same station may be worked for additional credit on more than one band, 'phone or c.w. Suggested frequencies to congregate near are as follows: 1810, 3550, 3685, 3915, 7200, 14,100, 14,250, 27,000, 28,100, 28,800 kc.; 51.145 and 221 Mc. (Suggested time schedule for the above frequencies will be mailed upon request.)

(6) General call: "CQ NH" on c.w.; "CQ NH QSO Party" on 'phone.

(7) Contact information required: Report and QTH (including county of N. H. stations). Logs and scores must be postmarked not later than March 7, 1955, and should be mailed to the Concord Brasspounders, Box 312, Concord, N. H.

(8) The WNH (Worked New Hampshire) certificate will be awarded to stations working all ten counties during this QSO Party, participating logs confirming.

RHODE ISLAND — SCM, Walter B. Hanson, jr. W1KKR — SEC: TQW. RM: BTV. PAM: VXC. RIN meets Mon. through Fri. at 7 P.M. on 3540 kc. RINN meets Mon. through Fri. at 6:30 P.M. on 3743 kc. The R. I. 'Phone Net meets Sun. at 11 A.M. on 1890 kc. We wish to thank JBB for a splendid job during the past two years as SCM and are sorry he's leaving the section in June. Good luck wherever you go, Merrill. BTV must be twins; he's putting up 10 and 20 beams, lecturing at schools on ham radio, handling the RM post beautifully, got a citation from New York City on election-return traffic, teaches code classes, and is president of CRA. UTA teaches theory and code at Mt. Saint Charles Academy and is stimulating activity in

(*Continued on page 92*)

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by Harvey-WELLS

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BAND-SWITCHING
Factory built & tested
(NOT A KIT)

T-90
90 WATT TRANSMITTER
The midget with a MIGHTY PUNCH
$179.50*
Complete with tubes less power supply

R-9
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DOUBLE CONVERSION
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Accessories include Mobile and AC Power Supplies and Speakers

Worth waiting for!

and STILL BEST IN ITS CLASS

TBS 50 Series

Versatile, popular, efficient for mobile or fixed operation. Thousands have been sold and WILL STILL BE SOLD. The TBS-50 Series is available for immediate delivery — 50 watts, band-switching. Send for descriptive literature.

Senior Model TBS-50C **$111.50**
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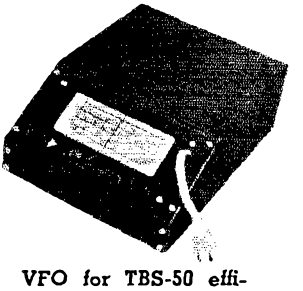

VFO for TBS-50 efficient on all bands — **$47.50**

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Woonsocket. ZXA is doing the same at Providence College. QWU needs only three more for WAC. the CRA obtained an ARRL charter and celebrated with a banquet at Vilmaray. 4CVO/1 is active nightly on 3835 kc. and daily on 10- and 20-meter mobile. TRX reports choice DX on 15 meters. FDS uses a Viking and a BC-348. We need more AREC members in the section. Application forms are available from the SEC, EC, or SCM. Traffic: W1BTV 84, UTA 42, ZXA 36, WFZ 26, WN1BXN 14, WN1BQB 13, WN1BIS 9, W4CVO/1 8, W1FDS 5, WN1ZXF 4, WN1CFV 3, WN1CJM 3, WN1CGV 1.

VERMONT — SCM, Robert L. Scott, W1RNA — SEC: SIO. PAM: RPR. RM: OAK. Nets: VTPN — 3860 kc., 0930 Sun. only; VTN — 3520 kc., 1900 Mon. through Fri.; GMN — 3860 kc., 1200-1300 Mon. through Fri.; Vt. C.D. Net — 3993 and 3501.5 kc., Sun. 1000 hours, with the frequency alternating between 'phone and c.w. It has just come to my attention that MLJ has moved to California. The best to you and yours, Leo. There may be lots of news around the State, but none of it has floated this way. Traffic: W1OAK 102, AVP 89, RNA 72, BNV 31, IT 31, BJP 28, VZE 16, JLZ 9.

NORTHWESTERN DIVISION

ALASKA — SCM, Dave A. Fulton, KL7AGU — There seems to be some confusion regarding call letter license plates. The plates will be issued once a year only. Applications have to be in Juneau no later than the first of November for the following year. A mobile rig in the car is required. Anyone desiring information regarding call letter license plates, please write the Anchorage Amateur Radio Club, Box 211, Anchorage. MF recently moved to Anchorage from Juneau. AYZ, on Nunivak Island, is building an all-band mobile about 10 watts and will be mobile from a dog sled about the time this hits the press. He also reports good 75-meter 'phone and contacts ZL, KG6, etc. ASQ and his XYL, BEW, are on vacation in the States. Both are very active on 20-meter DX. We understand that EN still is looking for a lost transmitter sent up from the States and that AEC might know something about it. VT soon will have 100 watts on 6 meters and will be looking for contacts.

IDAHO — SCM, Alan K. Ross, W7IWU — Gifford: VWS, now a full-fledged Conditional Class licensee, is active on c.w. nets NCN, OSN, WSN, and RN7. He also was active in the SS Contest, working 129 stations in 38 sections, all on 80-meter c.w. Lewiston: WN7VIO dropped the "N" and now puts out a good signal on 75 meters. ONP is building an s.s.b. rig. Our newest ham, WN7YBV, is having difficulty bucking the Novice QRM on 40 and 80 meters. RGZ is adding to the house — not for hamming but for recent additions to the family. Boise: About 18 mobiles on 10 meters, 2 fixed stations, and 8 dispatchers helped out in "Operation Cerebral Palsy" to pick up donations spurred by KIDO's 24-hour fund-raising drive. Nampa also took part with mobiles and control station on 3935 kc. Meridian: MKS is the new 'Phone Activities Manager for Idaho. Traffic: W7RSP 89, VWS 19, TYG 10.

MONTANA — SCM, Leslie E. Crouter, W7CT — NCS gave a demonstration for c.d. men on 3910-kc. 'phone. Approximately ten stations took part, including one mobile in Idaho and another in Washington. PCZ reports many East Coast stations need Montana for CD multiplier and DX stations need Montana for WAS on 14 Mc. EWR is remodeling the ham shack. November appointees sent 18.2 per cent "reports due." ORS sent 2 of 6, OPS 0 of 5 reports. Recent endorsements or appointments: NZJ as ORS, FTO as EC, and PCZ as OO. Traffic: (Nov.) W7CT 25, TKB 10, FUB 6, COH 2. (Oct.) W7MM 194, PCZ 13, EWR 2. (Sept.) W7PCZ 10.

OREGON — SCM, John M. Carroll, W7BUS — THY is rebuilding a new station and will be back on shortly. WAT now is Asst. SEC, with more work than he can do. ESJ's cartoon in *UHN* brought responses from all over the State with applications for appointments. All are very much appreciated. Some applications came in from Washington and were sent to the SCM there. THY, UYR, VJT, and VBF signed up for the AREC. PRU and QWZ tied for check-ins on the Cascade Net. HUI, net director, was high in net control also. VYV is planning a net for WNs. The Oregon State Net had 19 sessions with 156 in attendance and all AREC stations are urged to check in. WWG is news editor for the OARS. PGR shortly will have a W6 call. The OARS is remodeling its club house. GNJ is trying to get his one-eyed monster on TV DX. VCH now has three jr. operators. NWE and BUS are going s.s.b. UDZ is the new president of the Tillamook County Club. SO, FSY, and OU are active on 2 meters. EZR is new OBS for the Rogue River district. QFY is very busy with the PARC, convention plans, and MARS, not to mention his regular job. VBW sold all his gear. TLV has returned to Hermiston. CZ is building a new QTH next to a swamp. GER is an engineer on the UPRR. The deadline is earlier this month and any reports received late will be included in the report for December. Traffic: W7QKU 255, WAT 114, JHA 46, THX 13, HDN 31, AJN 29, PRA 13, OMO 4.

WASHINGTON — SCM, Victor S. Gish, W7FIX — The passing of BG, Vice-Director of the Northwestern Division and a long time ARRL official, came as a shock to all

(Continued on page 94)

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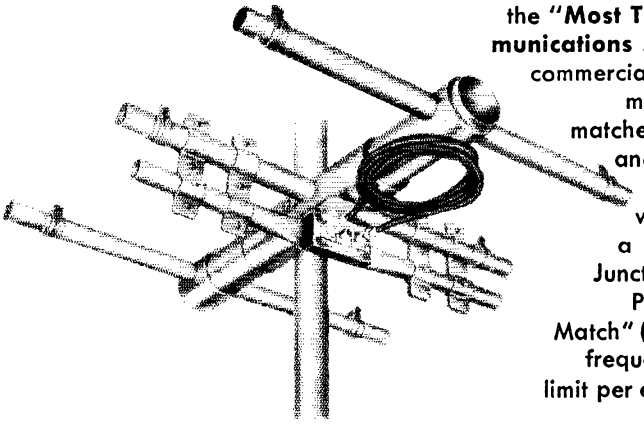

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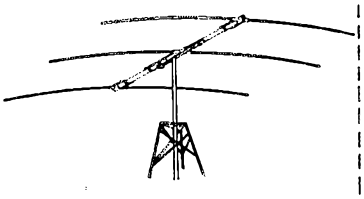

40-METER ROTARIES

- Full Size 3-Element (100% Aperture) Wt. approx. 92 lbs. Turning Radius 35½ ft.
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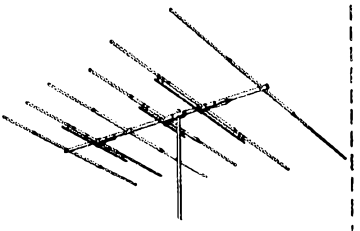
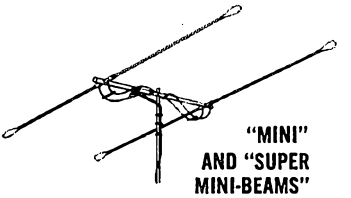
- 2-Element "Mini-Beam" (64% Aperture) Wt. approx. 44 lbs. Turning Radius 17½ ft.



FULL SIZE "DUO-BAND" AND "TRI-BAND" SERIES

- Full Size 10-11 Meter on one boom 3-el. on 10; 2 El on 11 Wt. 30 lbs. Turning Radius 11½-ft.
- Full Size 10-15 Meter on one boom 3-el. on 10; 3 El on 15 Wt. 60 lbs. Turning Radius 15-ft.
- Full Size 10-15-20 Meter on one boom 2-el. on 10; 2-el. on 15; 2 el. on 20 Wt. 86 lbs. Turning Radius 19½-ft.



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- 2-Element 15-Meter "Super Mini-Beam" (86% Aperture) Wt. approx. 12 lbs. Turning Radius 9½-ft.
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in the section. The Washington Amateur Radio Traffic System (WARTS) is sending out certificates to all Charter Members, signed by the founder, CKT. WARTS meets daily on 3970 kc. at 1800 PST. PKR is back on the air with an a.c.-powered BC-375. PGY's rotor stripped its gears in the big blow and has been replaced with a prop-pitch rotator. WEV reports c.d. is getting started in Ephrata. EHH bemoans the fact that dinner time cuts into his skeds. ULK is on both the YLRL and NYLON Nets but is afraid to tackle WARTS until she gets more experience. AIB participated in the SS and made a score of about 32,000, running 100 watts. JEY finds skip too much for WSN so takes on the job NCSing MTN C.W. on 3685 kc. CWN is on 20 meters and is building all-band portable in addition to mobile. USO reports the Clark County Amateur Radio Club (Vancouver) meets every other Wed. in the Red Cross Bldg. Code classes are held twice weekly. UQY reports from Richland that NLI worked 700 stations in all but two sections in the SS. RJO has a new 75A-3. QNE is a new AREC member from Diablo Dam. The Lake Washington Amateur Radio Club meets the 1st and 3rd Thurs. at 8 P.M. in Highland Community Center, Bellevue. Club officers are JWE, pres.; PZT, vice-pres.; QGF, secy.; IEE, treas.; PZO, sgt. at arms; TES, publicity. The club call is W7BB. AHQ has a 50-watt WRL rig on the air. BBP ordered a 1-kw. s.s.b. rig. The Skagit Radio Club elected PQT, pres.; REC, vice-pres.; LVB, secy.-treas. GAT and JBH have 6-meter rigs ready and waiting for an opening. GAT is trying to arrange a tour of Jim Creek for the Skagit Club. TIQ has an Eldico on 20 meters, working the East Coast with 60 watts. BA reports a fine vacation in KH6-Land visiting hams. JXR is building a high-power amplifier. HRC (Hot Rod Charlie) is back from the hospital and feeling fine. RGD sends in a fine report from Tacoma on AREC work. Please get your reports in to the SCM by the seventh. Traffic: W7BA 1387, PGY 1051, EHH 93, FIX 89, VAZ 78, USO 59, AMC 43, OEB 40, APS 25, JEY 20, ZU 18, WEV 13, GAT 12, ULK 12, VCF 11, AIB 10, TGO 6, ETO 4, EVW 4, AHQ 3. (Oct.) W7RXH 52.

PACIFIC DIVISION

NEVADA — SCM, Ray T. Warner, W7JU — ECs: PEW, TJY, and ZT. OPSs: JUO and UPS. ORS: MVP, PEW, and VIU. OBS: BVZ. Nevada State frequencies: 'Phone, 3880 and 7268 kc.; c.w., 3660 and 7110 kc. These frequencies were picked giving consideration to existing nets and are the selections of those consulted both in the northern and southern part of the State. All Nevada hams are urged to make use of these frequencies when fixed or mobile. UPS has been appointed Asst. EC for Elko. PEW is enjoying 15-meter c.w. DX. VDC checked out of MARS K7FDB and is active from his home QTH. K7FDB keeps up its FB traffic count with 1032 messages handled. YCT is Boulder City's newest ham. "Worked 25 Nevada" certificates have been awarded to 6BSY, BTC, UPS, and SNP. A new XYL in Las Vegas is WN7YEI. Latest Henderson Novices are VIP and YAI. K6HKQ has returned to Las Vegas and is active again. Traffic: K7FDB 1032, W7VDC 15, JU 11.

SANTA CLARA VALLEY — SCM, R. Paul Tibbs, W6WGO — The SCCARA at San Jose recently elected RNG, pres.; KRF, vice-pres.; LKY, secy.; APV, treas.; and CFK, FON and EOA, board members. HC and WGO are two directors carrying over for another year. MMG is QRL working the grave-yard shift, but reports working in the SS Contest. IJU is active on 21 Mc. JSR moved into a new ham shack and is thinking about installing a vertical antenna. EXX finished the new 144-Mc. rig with 829-B and is planning 813 final. AIT built a new VFO and believes he has his troubles under control at last. YHM needs more signal or more receiver to work his TCC skeds. K6BBD worked in the SS and CD Contests. K6BAM now has a two-element beam for 14 Mc. and hopes for better DX. CFK now has two TV masts 50 feet high for his 3.5-Mc. antenna, raised with the help of WGO. UW, club station of the SCCARA, located in the Red Cross Chapter Bldg. in San Jose, is now open Mon. and Thurs. nights from 7 to 10. Those wishing to join the gang in operating the station, bring your ham ticket and drop down and meet the gang. UTV worked all sections in the SS and made 570 contacts. HC still wants c.w. stations to handle TCC skeds. Interested? Get in touch with Harry. KN6EMO was active in the SS Contest. 4YIP/6 is located at Moffett Field. Traffic: W6YHM 534, UTV 77, HC 46, K6BAM 5, W6WLI 4, K6BBD 1.

EAST BAY — SCM, Guy Black, W6RLB — Asst. SCMs: Oliver A. Nelson, Jr., 6MXQ, for v.h.f., and Harry T. Cameron, 6RVC, for TVI. RMs: IPW and JOH. PAM: LL. ECs: CAN, CX, FLT, QDE, TCU, ZZF, and K6ERR. A letter from ex-JDO advises he is now DL4JD in Heidelberg with 35 watts and an HQ-129X on all bands. He reports working PKI, BAX, and YY and hearing K6EAF/JUW. BNB reports an Area 8 (South Alameda County) c.d. drill on Nov. 29th. Region 3 ran a drill with the twelve operational areas on Dec. 6th, and has a regular series scheduled for the 1st and 3rd Mon. of each month. K6RK described commercial radio in Japan to the Oakland Radio Club. IPW reports the job is keeping him away from ham radio too much! HBF is trying to think up polite words to use

(*Continued on page 96*)

when describing parasitics. LIL is driving nearly 4 hours a day to and from work, so he is mobile with his new Elmac a good deal of the time. The Skyriders have social type meetings where the XYLs have as good a time as the OMs — like their Halloween Party. BDF/7 is in Seattle. QPY now handles three TCC skeds a week. HC, who is Pacific Coast coördinator of the TCC, is beating the bushes for competent operators for some of the untilled skeds. BXE ran up a healthy score of 48,905 points in the 'phone SS. YDI wishes there was more traffic for Martinez. ACN made a good recovery from his illness. It's time to give Archie and the CCRC license plate committee your support. His QTH is 3234 Prentiss St., Oakland 1, Calif. Remember, the present privilege is not permanent as yet. New officers of the Mt. Diablo Amateur Radio Club are LIL, pres.; CGS, vice-pres.; LGW, treas.; EFI, secy.; K6DQM and OHR, board. When 372 miles out at sea on the *Hawaiian Rancher*, on which he is mate, SXK heard K6GWE in the Bay Area on 2 meters. ZX, recently hospitalized, has hundreds of ham friends — 1FEQ, in Rhode Island, reports a long letter from this OT. Traffic: (Nov.) K6FDG 1216, W6QPY 208, K6WAY 265, W6LPW 132, LL 83, YDI 2. (Oct.) W6IPW 127, HBF 6, K6CCQ 4, W6LIL 2.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC — SEC: NL. The San Francisco Radio Club was host to FDJ, senior technician for the Shell Development Co. Roger spoke on "Fundamentals of Teletype and Design of Terminal Equipment." AHH presided as president of the club for the first time. Congratulations on a nice job, Bob. The HAMS 6-meter project is going strong. About eight fellows join in every Sun. night between 8 and 9. The San Francisco Naval Shipyard Club is trying to get more XYLs to join in on the meetings at the Red Cross Bldg. The 29ers have a new net control, OST. FVK is now playing with the Naval Band at San Diego. The boys presented GGC with a compass on the last transmission hunt. He was the last one in as usual. The Humboldt Radio Club's new officers are ZZK, pres.; LE, vice-pres.; K6DVV, secy.; ZSE, treas.; NLL, act. mgr. TRR is a new arrival at Arcata Airport. K6HTF and KN6IRD are two new calls heard in the area. Congratulations, boys, and welcome into the fold. On Nov. 12th radio men from the *SS Hailieh* from Formosa were entertained by the Eureka Club. The ladies of the YLRCSF now have a new Novice, KN6IKO. KN6EEV is moving to Stockton with old man MXJ. The Ladies' Club presented KN6EEV with a little parting token at its last club meeting. The Tamalpais Radio Club has a new meeting place in Navoto, the American Legion Bldg. There was a big turnout at the first meeting in the new QTH. The Sonoma Co. Radio Club was the first of the locals to have a Christmas Party. CBE reports that the Sweepstakes worked out fine with his new 55-ft. vertical antenna, 521 contacts in 71 sections. BIP reports 275 c.w. contacts in 73 sections. CTH now is handling traffic with KH6-Land via RTTY. OPL again is active in San Francisco, is interested in joining NTC, and has requested OBS appointment. BSO is active on the air in San Francisco with a 20-meter Gonset beam. K6ANP expects to be active on 10-meter mobile in the near future. Welcome back to San Francisco, OCZ. PHT is proudly displaying her new Master Traffic Handler's certificate. YC received a large autographed photo from VK3ACD showing the 4-watt transmitter. Gene reports that he was the first U.S.A. ham to QSO "Heard Island." SWP reports that the local QRM Bureau has promised help in trying to eliminate some of the noise that is interfering with his hamming. QMO is busily writing up notes as the new secretary of the Club. PCN is doing a fine job getting out the *San Francisco Radio News* each month. GQA reports sending out many pink slips, mostly for out-of-band and second harmonics. GQY has the rig back on the air and expects to be active in nets real soon. Traffic: W6PHT 913, QMO 384, SWP 196, GQY 15, GGC 8, YC 6.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — LLR is on again with a BC-610. HSV, NJF, FR, and QDT are active on MARS. DBA is on 'phone. New officers of the McClellan Club are HIR, pres.; ESZ, vice-pres.; and LLR, secy. RDW, now in British Columbia, is on the 3295-kc. MARS Net. ESZ did some lathe work on parts for the new vertical antenna system. EII is on with kw. on 20 meters. ASI has coax trouble in his mobile. TYC, our PAM, has developed vertical on all bands very efficiently. JZ, Pacific Division Director, visited the MARS McClellan Club. HUF's new QTH is San Francisco. OAI is on s.s.b. GMH is back on 75 meters. GR, an old-timer, is back again. DEO is on c.d. at Marysville. MYT measures frequencies on a 'scope. OOR is building a new rig. TPH has left Sacramento. OPY, our RM, is on c.w. and meets a few traffic nets. ULP is on 75-meter mobile. FNS is an OO. ICB is instructing two nights a week and more new hams should be heard soon. MIW is on 144 Mc. JJW is in the section from Burbank temporarily. EAX is going to school in San Luis Obispo. 4DJM now is K6ISU in Sacramento. HTS is helping on c.d. nets. HSB has a new vertical. BLL expects to leave Sacramento for Japan soon. WCW now is on c.d. UNT is active on 144 Mc. DL7CI is awaiting naturalization to get a K6 call. ATN is on s.s.b. CMA is holding down the Fish Net on 75 meters. ER is on 75- and 40-meter 'phone. CLO is with Western Electric. DMA is Radio Officer for Yuba County c.d. ILZ has 4–400A final. We welcome AD

(*Continued on page 98*)

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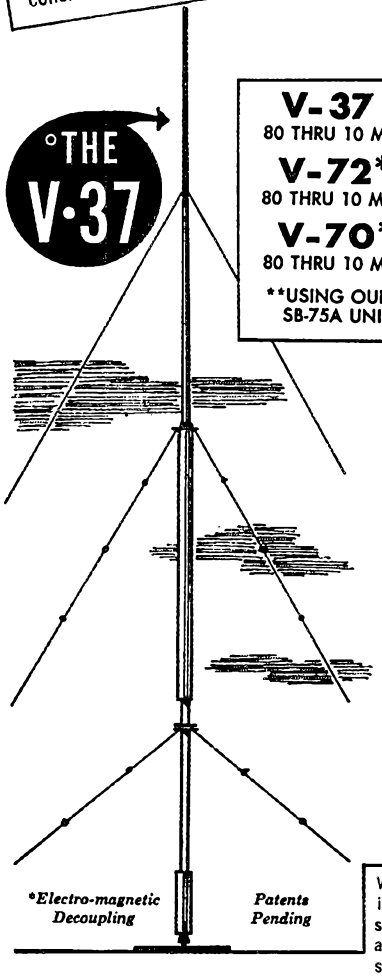

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back to the Sacramento Valley section. DTW is active on 75 meters. PVI, one of the section's old traffic men, keeps an eagle eye on 144 Mc. as TVI keeps him off 80-meter c.w. RMP recently brought back fond memories for ZF of 28 years of friendship with 7ADJ, in Portland, with ZF sitting on the sidelines copying both operators. RNR still is having trouble with his 4-250As. AK recently purchased a Vacuum Variable for his high-power linear. VBI built a new exciter that's a honey. The Tehama County Amateur Radio Club's new officers are OEY, pres.; SBH, vice-pres.; TMP, secy.-treas. Traffic: W5QDF/6 407, W6OPY 29, JDN 23, K6CFZ 15, BJO 12, W6ILY 6, IOM 6, HBV 4, TYC 3.

SAN JOAQUIN VALLEY — SCM, Edward L. Bewley, W6GIW — SEC: EBL. RM: K6BGM. PAMs: ZRJ and WJF. Formation of a Central Valley Amateur Radio Council got under way with a meeting at Merced, with representatives from the Turlcok, Merced, and Fresno Clubs. Since the meeting Stockton, Delano, and the newly-formed club at Castle AFB have expressed a sincere interest and expect to have representatives at the next meeting. The Fresno Club voted unanimously at its last meeting to ask for the 1955 Pacific Division Convention. This means that instead of the annual Fresno Hamfest, the Fresno Club will sponsor the Division Convention. Also at the same meeting, the Club enjoyed a talk on the new V-37 antenna. SDR has one and will demonstrate it to anyone. The San Joaquin County Emergency group had a very successful test, using 2-meter gear and working with the Ground Observer Corps. The San Joaquin Valley Round Table on 3900 kc. at 1100 Sun. is becoming very active, and EBL, the NCS, invites all interested amateurs to participate to discuss AREC, club, or personal matters. The CVN is changing back to 3525 kc. because of QRM from RTTY on 3635 kc. Section Net certificates have been issued to SNF and K6EVM. ADB is a new ORS and is active on TCC. ERE is quite pleased with the 2E26 2-meter rig built per *QST*, and is now building a GD beam. K6BMM has a BC-610 on the air. BRAT awards this month went to K6BGM, W6ZRJ, and OPY. Traffic: W6ZR J552, ADB 138, K6BGM 54, W6FEA 52, GRO 40, EBL 19, K6BMM 10, W6GIW 5, WJF 4.

ROANOKE DIVISION

NORTH CAROLINA — SCM, Charles H. Brydges, W4WXZ — A very nice letter was received from ZMG on activities in the Rocky Mount Area. The club, called the Costal Plain Amateur Radio Club, has a project on emergency gear, as many others also do. Rigs are for 10 meters and run 15 watts. TLA is the new EC for Nash County. DRC was on the sick list but now is active on 75 meters and MARS frequencies. A very nice card was received from DRC. He has really been moving the QTC. WYA has a new antenna. EOU is moving to Florida. The Charlotte mobiles cooperated with the Marine Corps in Charlotte in another Toys for Tots drive. CVX has a new three-element Telrex 20-meter beam. Tom also is now Official 'Phone Station, as is BUA. CZR is a new Official Bulletin Station. YPY really is knocking at the S-meters with his "kil-a-ma-watt." The Tarheel Teen-Age Net is really going great guns on 3885 kc. Mon. through Fri. at 4 o'clock. Plans are almost a reality on a two-state c.w. net. North Carolina and South Carolina c.w. men are working on combining into one net for quicker QTC moving and to produce a better and more active net. Traffic: W4VHH 55, RRH 54, WXZ 20, CZR 8, SGD 4, BTZ 2, BUA 2.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — ERG is EC for Bamberg and ZRH is EC for Charleston County and Coastal Carolina. The Georgetown Club is planning ARRL affiliation and incorporation. K4AQQ is EC for Horry County and also is ORS. LXX is ORS. Husband/wife team UNO/UFP are in school in Atlanta and finishing a mobile rig and a 500-watt fixed station. FM is helping WN4HOZ get on the air and reports he has run out of junk box material. CPZ is in a new QTH with a sixteen-element beam on 2 meters. Two Greenville hams deserve special mention, FM for sending activity reports to the SCM faithfully every month and CHD for being a most faithful member of the traffic nets for the past several years. STH reports a most successful first year of the Aiken Club and with KYN publishes a club paper. The December meeting featured a panel discussion on mobile construction, installation and operation conducted by Hugh G. Minton, with panel experts being Bob Girdler, LeConte Cathey, and Charlie Hill. The South Carolina C.W. Net operates Mon. through Fri. at 7 P.M. on 3525 kc. and all are invited to report into this net. WIY reports his XYL, KN4AOH, is on 3721 and 3755 kc. looking for South Carolina contacts. Traffic: W4AKC 338, K4AQQ 65, W4ANK 31, FM 5.

VIRGINIA — SCM, John Carl Morgan, W4KX — By the time this appears in print the first Roanoke Division QSO Party will be history. The Roanoke Club station, formerly PCC, was issued the call 4CA in honor of the late Fred Wohlford. The Tidewater Mobile and Peninsula ARC will produce the 1955 Division Convention. We need traffic liaison stations for VN/VFN and especially from VN to 4RN and back. Don't be bashful because you're not the hottest operator on the air. What's required is reliability. If you can give just one evening a week on a fairly regular basis, let the SCM know. We might point out that a

(*Continued on page 100*)

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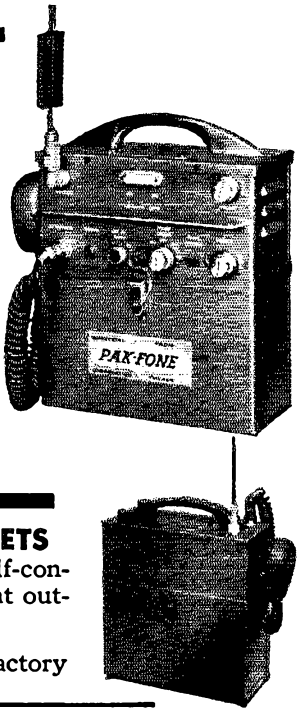

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8 Tubes — Crystal Controlled
FM DEVIATION: ± 15 KC
SPURIOUS RADIATIONS — At least 40 db below carrier level.
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OUTPUT — 1 Watt

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station usually can QNI VN, take whatever traffic is needed, and still report into VFN before the VFN roll-call is completed. KFC can't figure where KH6s hid during the SS. Hawaii was the only section Vic missed. YVG passed out blue-banded cigars celebrating the birth of son No. 1. DWP had her Brownie troop in to observe ham radio in action and they were much impressed at the QSO between DWP and KX. IA says it seems like everybody QSOed knows someone in the Washington Area; plenty of 'phone-patch traffic but none for the record. DNB passed General Class exam and says his brother, DNC, is about ready to try for his. CGE is having trouble being heard on VN and VFN trying various antennas. The Alexandria ARC put on a big demonstration for the local civic and Red Cross officials as part of the official opening of club station HFH. WDZ says the answer to "What's cooking?" is his plate transformer, and he's off the air pending replacement. BLR is QRO, but is rock-bound and has no modulator temporarily. VYZ still is unscrambling his beams, the victims of "Hazel." If you're not on the mailing list to receive the *Virginia Bulletin*, contact LW. PFC at Quantico (operator 3QQE) really is making a career out of traffic. Traffic: W4PFC 1281, KX 146, K4MC 101, W4CA 94, YKB 70, DWP 57, YVG 30, TFZ 24, IF 23, JAU 22, VYZ 17, BLR 16, LW 15, OWV 13, WDZ 10, CFV 7, IA 7, DBE 5, YOL 5, BYZ 2, CKI 2, JUJ 2.

WEST VIRGINIA — SCM, Albert H. Hix, W8PQQ — It is with deep sorrow that I announce the passing away of AUJ. Bob was West Virginia's greatest traffic man. He was a ham through and through and will be missed greatly by all who knew and worked with him. As this is read let's all pause a moment in remembrance of him. WN8OIV is now with the Navy and will be doing electronic work. WN8TVK, a new ham in Charleston, is welcome to our ranks. MLX will be taking the General Class exam soon. The MARA recently elected JWX, pres.; Cecil Rhodes, vice-pres. and act. mgr.; and WN8SNF, secy.-treas. WN8SSA is now in Beckley. BKI continues skeds on 2 meters with 8BAX and 4PCT. He has a 32-element beam. ETF has 2- and 6-meter beams up and will be on those bands soon. BWK announces that a rig is in operation at WTRF-TV on 28,700 kc. under the call ZHH and that he would like to meet any of the fellows passing through Wheeling. IYG is a new OPS, IXG is a new ORS. RRD is a new OBS and ORS, and RRV is a new OES. NLT is putting up a new three-element 20-meter beam. QHG is building new high-power final to go with his Ranger. IXG is working out well with the 10-watt mobile rig. RKV is doing a good job with his Ranger. PQQ visited 2BJ and 2AGW recently. IRN is building a new modulator for his kw. rig. Traffic: W8GEP 58, JWX 34, ETF 29, IXG 28, NYH 25, KDQ 10, PQQ 2, LLJ 1.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Karl Brueggeman, WØCDX — SEC: MMT. A drill was held on Dec. 5th as a preliminary to show our state-wide c.d. and traffic organization to the members of the State Legislature. The big one was held Dec. 12th. This will show what we can do and should help get through our license legislation. This is a good start but we must not let the ball stop rolling. Keep in touch with your county and district delegates so that they won't forget we are around. Also, the costs of our campaign are mounting so we will need donations to continue. Please send them in care of our Director, IC. Remember, this is our last chance for two more years so we must do as much as we possibly can to get it through this session. Ex-WNØOVX has joined Silent Keys. He received his Novice license at the age of 73 and was secretary of the Sky Hi Radio Club. TVI is a new call in Littleton. Wayne gets a lot of cracks about that one. HOP, DRY, and KQD have received RACES authorizations. NPS has a new Viking. TVB is the new EC at Craig. WNØWFR is a new call at Cortez. APK is building a new s.s.b. which includes home-built phasing network. SWK is a new YL call at Longmont. She reports that the Longmont Club will be checking into the CEFN shortly. EKQ is back handling traffic for the winter. BWJ has recovered from a case of mumps. The Hi Noon Net handled 222 messages in 19 sessions. Traffic: KØFDX 3617, WBB 789, WØKQD 642, YQ 95, EKQ 60, LNH 57, APK 55, IUF 35, BON 28, BWJ 28, IA 20, TVI 7, HOP 5.

UTAH — SCM, Floyd L. Hinshaw, W7UTM — PIM reports very rough going with traffic this month, but turns in a good total for this area. CCC/6 is using a Viking Ranger in California for a short while. SAZ advises the Ogden Club has completed election of officers with NAY, pres.; RQT, vice-pres.; and WN7VHS, secy. MVD and GPI were elected directors. QWH is doing his best to keep the DX boys happy. Results of the SLC Club membership drive will not be available until next month's report. RRM, BRV, VEL, and SPD have reopened the Mon., 29.2-Mc. round table and are looking for the rest of the gang. The time still is 9 P.M. 6SLF/7, in Clearfield, reports a good SS score, but also bemoans the loss of his kw. final and says too many standing waves caused the burn-out. RXZ has a new Viking and a 40-meter vertical antenna. Traffic: (Nov.) W7PIM 158, UTM 26, QWH 2. (Oct.) W7CCC/6 24.

(Continued on page 102)

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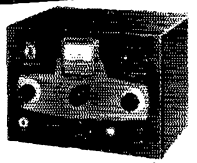

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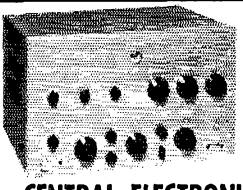

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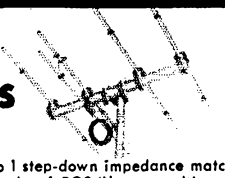

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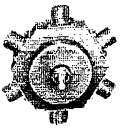

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SOUTHEASTERN DIVISION

ALABAMA — SCM, Joe A. Shannon, W4MI — SEC: TKL. RM: KIX. PAMs: RNX and EBD. Congratulations to the following new appointees: TKL as SEC; AZX, GCV, YDU, and BMM as ECs; ZSQ as OPS. TKL asks that all ECs coöperate by sending in reports promptly. The Coosa Valley Amateur Radio Club's new officers are BAI, pres.; WN4HOW, vice-pres.; A. C. Dennison, secy.-treas. K4AKO now has the new mobile installation working, BRE is working 20 meters mostly these days, while DZF is busy getting a kw. linear final under way. BAI did a good job in the SS. GCI and father, WN4HOW, now have two complete rigs consisting of new receivers and transmitters. HOW is working toward a higher class ticket. ZSQ is doing an excellent job with the new *Section Bulletin* and promises greater issues in the future. K4FDY acted as NCS of the emergency net on 3890 kc. during the search for a lost aircraft Nov. 15–16. DXB gave a talk to Woodlawn students on amateur radio, illustrated with a mobile demonstration. Traffic: (Nov.) K4FDY 762, W4UHA 655, KIX 145, WOG 109, TKL 88, DXB 64, YRO 43, HKK 30, ZSQ 29, TXO 26, ZSP 21, OAO 7, BFM 6, ZSH 5. (Oct.) W4UHA 117, YAI 57, MKV 20, BFM 11, ZSP 10, W5ONL/4 9, W4CAH 4.

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — Traffic from the State Fair at Tampa starts Feb. 5th, so don't forget your skeds! Welcome to the Lake Amateur Radio Assn. Legionnaires eligible for the Florida Highway Patrol Auxiliary will receive training in communications. Contact your Legion Post. AZK is EC for Collier County. Contact IYT if you will help organize the Gator Net on 40 meters. How about another JOCO soon, perhaps in May? Write IM. Ye SCM had a most enjoyable meeting with the Tampa Club. Ft. Lauderdale: PBS is OO Class III. YOX runs 900 watts c.w. but with 35 watts QSOed VO6, T12, G3, PJ2, and G5. IM says the "lost person" hunt went over big. Participants included the AREC, ARC, Scouts, and BEN mobiles. It's a jr. operator for FWA! Gainesville: It's a girl for WEM! TJU and WEM report a lively interest in mobiles including WEM, TJU, EHU, ZJZ, EAS, OWX, TKE, CKB, and W9ONE/4. TJU moved into the new shack, assisted by TKE, EHU, OWX, and SVX. The U. of F. Club is booming since the new Collins gear went into service. Hialeah: PBS says he, UIW, and YCL set up on 4 bands for the PAA 27th annual picnic in a big way to handle messages for the 11,000 persons present. Jacksonville: Club station DU handled messages for the Firemen's annual big time. Helping were DSC, UHY, AGT, WEO, TRN, and UGE. WEO and TRN are doing a good job on traffic nets and DSC is no slouch. Key West: New KWRAC officers are W9EJD. W4s OTP, OPZ, ZBF, and OLA. DRT uses 20-meter ground plane. Lake City: The High School Club now has 5 operators, says YNM. St. Petersburg: Welcome to SPARC-YLS. Officers are TDK and BIL. The ARRL Convention will be held June 11th and 12th. Write GAC for information. The SPARC receiver was donated by LTE. WN4HED (14 years old) has worked 40 states in 5 months of operation. Sarasota: LMT reports plenty of activity on 147.1 Mc. for c.d. work. Traffic: (Nov.) W4DVR 283, BMY 232, WEO 127, LAP 97, AWY 66, DSC 60, WS 47, TRN 41, LMT 38, RWM 35, LAP 33, K4ANJ 32, W4IM 27, FSS 26, DES 24, HED 23, ZIR 23, IYT 21, TJU 18, PBS 5, YOX 4, WEM 1. (Oct.) W4LMT 34, TJU 9.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/W4RE — SEC: PLE. ECs: HIZ and MFY. WKQ had a big time in the SS Contest, working 675 stations in 66 sections for 109,890 points. ZFL has an FB 75-meter antenna. BGG keeps the Ranger going on all bands. UUF still holds the fort on 144 Mc. GMS has his General Class license and keeps the mike hot. The Pensy Club transmitter hunts are stimulating high interest. AIA meets 75-meter nets. CQX operates mobile in Crestview. MS is enjoying s.s.b. on 20 meters. AXP has returned from a trip to W5-Land. KN4AGM keeps week-end skeds. KN4AEP has a new receiver. QK has the 813s going at last. JPD is getting a commercial transmitter. HJA is planning s.s.b. SOQ has completed the shack. PQW has a new car and is moving the mobile gear. PLE is working hard to get the gang interested in emergency work. How about a little help from the gang? WN4HBK is QRL the high school band. TTM/PTK concentrate on 75 meters. NOX is one of the best traffic-movers in the State. CCY keeps the PARC in high gear. EAR finds fiendish locations for hidden transmitters where reflections are greatest. GOR is QRL deer-hunting. How about some reports, gang!

GEORGIA — SCM, George W. Parker, W4NS — SEC: OPE. PAMs: ACH and LXE. RMs: MTS and CCG. Nets: The Georgia Cracker Emergency Net meets on 3995 kc. Sun. at 0830; Tue. and Thurs. at 1830 EST; the Georgia State Net (GSN) on 3590 kc. Mon. Wed., and Fri. at 1900; the Georgia Traffic Net on 3920 kc. daily except Sun. at 0745 EST. New appointments: 5RDP/4 as EC for Houston County, BVE as ORS. New officers, of the Atlanta Club are MV, pres.; ZD, vice-pres.; HYW, secy.; NWK, treas.; KFL and YUM, act. mgrs. Warner Robins has three new K4s, ASP, ANN, and IIF. It's a jr. operator for BEQ in Taccoa. The Warner Robins Radio Club has started code

(*Continued on page 104*)

and theory classes under the guiding hand of ØRV/4. ZD, TJS, and NS are working on new rigs with p.p. 813s. CFJ, SAU, YPM, and others in the Atlanta Area are converting some surplus on 420 Mc. for the purpose of setting up a local net on that frequency. ZUE now is mobile on all bands. IKK is on 144 and 220 Mc. TJS has a pair of 75-ft. antenna masts. IPL has a new pine-paneled shack. Your SCM needs more news with your reports. Traffic: K4WAR 1061, W4CFJ 195, DDY 148, WN4HYV 134, W4FYC 114, IMQ 109, BWD 48, NS 34, MV 32. ZD 27, FZO 6.

CANAL ZONE — SCM, Roger M. Howe, KZ5RM — NM is out of the hospital and convalescing at home and spends most of the time on 15 and 20 meters. DG has worked over 100 countries but still needs a few cards. Grace, DG, also schedules W4YB every Thurs. for civil defense. BR needs Delaware, New Hampshire, and Vermont to complete WAS. Pat, PL, now has a VFO. PP and JJ both have beams under construction and hope to get them up soon. WA entertained W5LUH from Hampstead, Tex. WZ is Stateside on vacation and CF just returned from a quick trip to the States on business. JJ is the latest product of the CZARA's classes in code and theory. The new club station, JW, was dedicated recently and is also a MARS station. The club station also has an interlaced 10-20 beam and rotator which the gang hopes to get on the air soon. Traffic: KZ5DG 61, WA 53, KA 36, LB 30, GD 13.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W6YVJ — GYH is getting in the swing of things again with a B. & W. transmitter on all bands, c.w. and 'phone. USY is in an advanced typing class. K6BWD is recording like mad with a new Pentron tape recorder. K6DQA has taken over the added duties of housewife since his wife is ill, but still handled traffic. AM says that he and FRW QSOed 845 stations in all 73 sections for 183,741 points. He believes this to be a new national high. K6COP has no trouble working ZLs but he says the East Coast doesn't come through any more. A local club, according to K6BEQ, is the L. A. Mobileers, open even to non-mobileers. The frequency is 7264 kc. HOW claims that K6DTA puts out code practice on Tue., Wed., and Thurs. at 2000 on 2 and 11 meters. EBK is using a VFO on 2 meters. Upland College is back in the swing of code practice for future Novices at K6CUX. WT reports in and says he is on 2-meter 'phone, the first time on 'phone since 1925 when he had a loop-modulated 201A. BHG reports that CK had the 27-Mc. MARS gang out at his place in Idyllwild. The Westchester Amateur Radio Assn., Inc., has just been awarded ARRL affiliation. Another bunch to come into the affiliated fold is the Lockheed Amateur Radio Club. Let's all welcome EKM as Director of our Southwestern Division. Hands should go out, too, to YXU as Vice-Director. We must not forget to say "thank you" to our outgoing Director, Johnny Griggs, of KW, for his splendid job. To show our thanks, let's all get in back of Walt, who will carry on in the Griggs tradition. *The Riohon List'ning Post* is the official publication of the Rio Hondo Club and reports the death of KN6IMA, a member of the Club. The Club will attempt to adopt his call for the club station in his honor. The Club is sponsoring two classes in radio code. One, offered in conjunction with the local Scout Council, has some 20 Scoutmasters enrolled. The second class is for the Civil Air Patrol. Some 20 CAP cadets, mostly teen-agers, make up this class. New Novices graduated from the code classes are KN6IJY, Bill Wolf; KN6IJV, Bob Lynch; KN6IKD, Doc Norberg; KN6IMG, Peter Sturgeon; KN6IMF, Gil Beard; KN6IHOR, Bill Thompson; KN6HJR, Mike Slonaker; KN6HPZ, Bob Duquesnay; KN6HMN, John Baldovin; KN6HSN, Jim Hall. KN6GJQ, Jim Eddy; and KN6INM, John Helmbold. Several others have not yet received their calls. Traffic: (Nov.) K6FCZ 645, W6LYG 553, K6FCY 416, W6CMN 387, GYH 384, NCP 167, USY 150, K6BWD 68, W6FMG 44, TRF 44, MBW 39, ORS 38, BHG 29, K6DQA 12, W6YAS 9, AM 6, K6COP 6, BEQ 4, W6CBO 4, CK 4, DWP 1. (Oct.) W6MBW 117.

SAN DIEGO — SCM, Don Stansifer, W6LRU — Asst. SCMs: Tom Wells, 6EWU; Shelley Trotter, 6BAM; Dick Huddleston, 6DLN. SEC: VFT. ECs: BAO, BZC, DEY, DLN, HFQ, HRI, IBS, KSI, KUU, and WYA. RM: ELQ. K6EQL, ex-W2BZO, now is active in the San Diego Area. K6IIZO has been active handling traffic and was NCS for SCN last month on 3 sessions. He is ex-W9MIO. YDK is working on amateur teletype to expedite traffic. The Silvergate Amateur Radio Club is now an ARRL affiliated club. K6CTQ won the Club's recent DX Contest. New officers of the Helix Club are IZS, pres.; MGT, vice-pres.; and FFD, secy.-treas. KN6IIR and ITB are new Novices at Dand Junior High. K6CUZ is building a 100-watt parallel 807 final. We regret the passing of KN6GMP, Convair Club member. EPZ is back in the area and still working DX on 7 and 14 Mc. Rumor says KYG was bitten by the s.s.b. bug. BZE hooked VQ6LQ and HE9LAA to bring him up to 186 countries. Thanks to the many AREC members and groups who coöperated recently in furnishing communications for civic activities throughout the county. K6CQS and EXN have new HQ-140X receivers. ZE has a new car and Elmac

(*Continued on page 106*)

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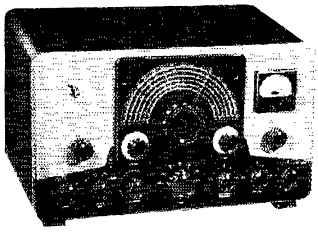

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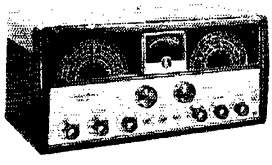

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Viking II kit	279.50	Morrow 5BRF	67.95	Johnson KW	1595.00
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Adventurer	54.95	Gonset Super 6	52.50	National NC125	199.95
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receiver with a TBS transmitter. Our congratulations to VFT, our able SEC, who has been nominated for the Edison Radio Amateur Award for 1954. Our welcome as an amateur to Dave Savage, of La Jolla, who has spent several hours each day since 1931 in an iron lung. LIR, K6DVD, and K6HZO are doing yeoman work in traffic on the SCN. Your SCM again asks that club secretaries let him know who your officers are, and advise of any activities or plans via telephone or mail. If your club never "hits print" in this column it is because no news is received. It's your column, let's make it cover the entire section. Traffic: W6IAB 2837, YDK 1153, BSD 919, ELQ 290, IZG 216, K6HZO 70, DBG 28, W6KVB 23, LRU 11.

SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — From Paso Robles FYW reports that KN6INB received his ticket and AGO is a newcomer to that city. K6NBI came through with his regular traffic report. NKT received his appointment as an Official Observer. Traffic: K6NBI 143, W6FYW 3.

WEST GULF DIVISION

NOTICE TO ARRL MEMBERS OF THE NORTHERN AND SOUTHERN TEXAS SECTIONS: Effective with publication of this notice in QST *(Feb. 1) the Section Boundary Line is revised, to place members in Loving, Winkler, Ward, Ector, Crane, Midland, Upton, Glasscock, Reagan, Sterling, Irion, and Tom Green counties of Texas in the NORTHERN TEXAS SECTION. Monthly activity reports as well as applications for appointment should be sent SCM Craig, W6JQD, at Lubbock. The vote of the full members was 39: 1 in favor of this readjustment of the section boundary.*

NORTHERN TEXAS — SCM, T. Bruce Craig, W5JQD — SEC: RRM. PAMs: IWQ and PAK. RMs PCN and QHI. Tri-City Amateur Radio Club at Borger announces the election of ZKI, pres.; YLG, vice-pres.; and YYO, secy.-treas. YLH is moving to Bartlesville, Okla. BFA soon will be on s.s.b. BFK reports a contact with a station in Fort Lauderdale, Fla., on 75 meters on which he hopes to contact a brother. SNX reports a contact with LGW in Odessa on 2 meters. WNK reports an eight-element array on 2 meters. Activity is picking up toward the organization of a 2-meter net for the Northern Texas section. MQW, at Wichita Falls, has been looking for a contact on 2 meters. The Abilene Amateur Radio Club held its first meeting in its new club house on Dec. 6th. VFH has a new all-band Babcock mobile. WN5CYL has moved to Abilene. The East Texas Amateur Radio Club had a social and barbecue at the home of LJ in Tyler on Nov. 20th. The Plainview Amateur Radio Club held a Christmas party Dec. 9th. The West Gulf Division has been confirmed for June 10, 11 and 12, 1955, in Fort Worth, Tex. WBW uses an 18-ft. trailer for a hamshack and shop. ZWR has moved to Brownsville and NOR to Muleshoe. C.w. operators are needed on the NTX Net for Amarillo, Lubbock, and Plainview (3770 kc., 1900 hrs.). UZM is building a crystal filter sideband exciter. Traffic: W5KPB 279, AHC 254, YPI 205, TFB 193, BKH 174, PAK 137, ACK 57, CF 47, PCN 26, UBW 25, OCV 15, ZWR 12, W4TRY/5 8, W5YIJ 2.

OKLAHOMA — SCM, Dr. Will G. Crandall, W5RST — Asst. SCM: Ewing Canady, 5GIQ. SEC: KY. PAMs: PML, SVR, and ROZ. RM: GVS. KY has been a busy man appointing county ECs and now has about half of the 77 counties covered; he also has a state-wide emergency plan nearly ready with the emergency frequencies 3860 and 3960 kc. registered with the FCC, making it necessary for the local EC only to get authority from local sources and notify FCC of the need for emergency clear channel operation. Congratulations to CF on his election as West Gulf Division Director. We have faith that he will do a good job of representing the West Gulf Division. Novice training is very commendable, as witness GYW's three 10-year-olds, ILO, IOZ, and IQG. BIE gets credit, too. EHJ is working with a crop of younguns. PZW demonstrated for the Boy Scouts. Two-meter activity is increasing around Oklahoma City. The ACARC manual, *C.W. Operating Procedure*, will be available for postage by addressing Aeronautical Center ARC, Oklahoma City. AGM and EHC get credit for presenting a receiver (SW) to Putnam Jr. High. We appreciate the news being sent in. Keep it coming. UJW has gone to Ecuador as radio technical. Traffic: (Nov.) W5GVS 212, MRK 196, FEC 45, QAC 38, MQI 36, PML 33, SVR 28, KY 20, ADC 14, REC 13, RST 12, UCT 12, PNG 11, WSM 11, MFX 9, ITF 8, EHC 3. (Oct.) W5GVS 199.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — FZO is overhauling his 1-kw. emergency power unit. AUO has completed his 60-watt mobile. On Nov. 21st the Rio Grande Valley Amateur Radio Club (Edinburg) staged a transmitter hunt with SZB, pres., hiding his mobile in an out-of-the-way mesquite thicket. AUO won first prize and NZH second prize. Pan American College (Edinburg) purchased two 5-kw. emergency power units. SU is constructing a 15-meter beam. We understand that he couldn't wait to get it set on the pole so he propped it up side of the house and hurriedly put out a CQ and worked an African station; now he is wondering what will happen when he gets it about 60 feet in the air. Mobile 8PKU/5 has finally discovered that he needed another dozen turns on his

(Continued on page 108)

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Hughes Field Engineer H. Heaton Barker (right) discusses operation of fire control system with Royal Canadian Air Force technicians. Avro Canada CF-100 shown at right.

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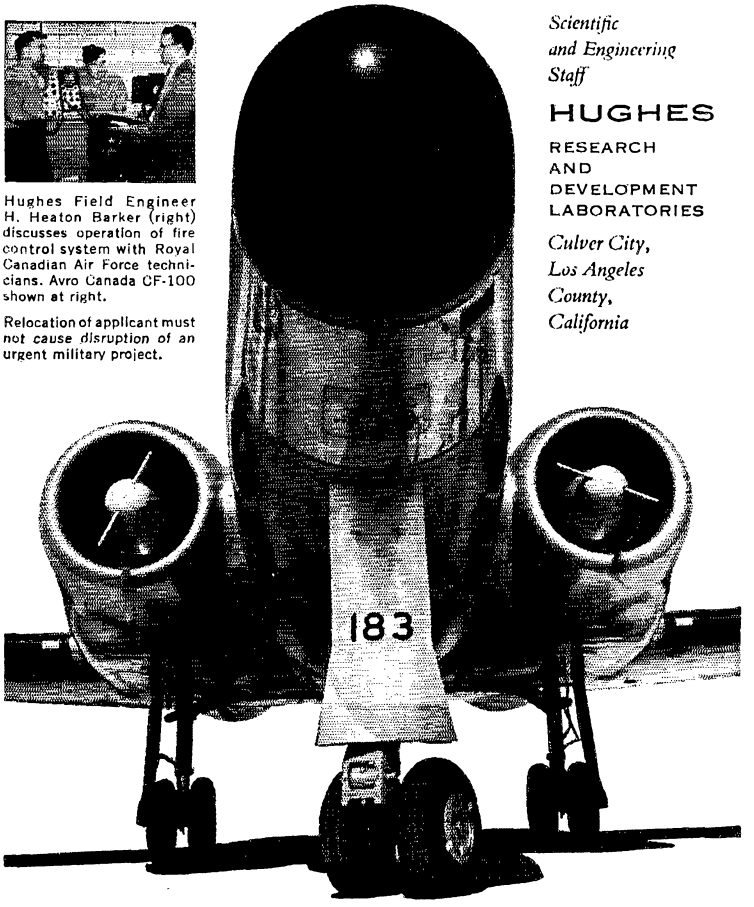

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antenna coil and he is blasting the ether with a real 50-watt signal. AET is installing two dynamotors for his mobile; one for full power rating and a PE-101C for lower power with low-battery drain for hauling traffic over a long period of time. MBU monitors 3860 kc. practically every day while servicing radios at his shop. Mobiles operating in the vicinity can always get a QSO. MBU has been using cathode modulation but he is constructing a 20-watt 6L6 modulator for the 807 r.f. final and he hopes to have heavier modulation in the near future. AJR is attending the University of Texas. TVL finally got his rig on the air; however, we are wondering if he is operating into a dummy antenna. BWT is a new ham and is installing a 50-watt mobile transmitter. Other new hams: WN5HBV, WN5GBC, WN5DTS, and W5BRO. NVQ has moved from Cameron to Hidalgo County. LKJ has been appointed Assistant EC for Hidalgo County. Bud is very active and is vice-president of the Rio Grande Valley Amateur Radio Club. YXH and son, EDC, worked in the SS on 3.5-, 17-, and 14-Mc. c.w. and made 417 contacts. TFZ has been on 20 meters with 65 watts to an 807 and has worked all states and 8 foreign countries. WN5ELN is doing FB with a Heathkit transmitter and has worked half the states and Hawaii. IYE has 500 watts on 75 meters and is going to 20 meters soon. RFG has moved to a new QTH. MN has skeds with KG6FAA, W5AHC, W4OGG, and W0QXO. 7NWB is now at Ft. Hood, Tex., and is interested in c.w. TVN is on 10-meter mobile with 5 watts. VRW, Anahuac EC, reports on emergency activity. KSW soon will be on s.s.b. URU lost two antennas. Someone gave him a 60-ft. tower and soon he will be on 20 meters with a new 813 final. CE is going to town on 75-meter mobile. LSE has a new kw. c.w. rig. RPH is experimenting with s.s.b. FEK is rebuilding his 2-meter rig. Traffic: W5MN 826.

CANADIAN DIVISION

MARITIME — SCM, Douglas C. Johnson, VE1OM — Asst. SCM: Fritz A. Webb, 1DB. SEC: RR. ECs: VE1DQ, VO2G, and VO6U. PAMs: VE1OC, VO2AW, and VO6N. RMs: VE1HJ and VO6X. AAY is Fredericton Area EC. AM has a new Globe Scout perking on 20 and 75 meters. GU is active on 80 meters. Executives of the Dartmouth ARC are VB, pres.; FK, vice-pres.; ZZ, secy.; OC, treas.; HJ, technical. A visitor to Halifax was VE3DDK (ex-GM3FFJ). New Truro hams are TT, QB, and QN. XYLs MY and TK are endorsed for A3 privileges. UT reports the NBARA Net meets Sun. at 10 A.M. AST on 3750 kc. DB, OM, OS, VN, and WL are active on 21-Mc. 'phone. CO is the only active c.w. man from P.E.I. VO1D, Newfoundland Radio Club secy., reports a strong, active membership there. VO1B and W9BIA/VO1 have mobile set-ups. W4WOU/VO1 is sporting new Globe King and speech clipper. New calls in St. John's are IAL, IAR, and 2Y. VE1PB/VO2 is now VO2A. VO2I is ex-VO1I. VOs 1E, 1J, and 1AA have left Newfoundland. VO6N reports VO6Q and VE2YD qualify for Labrador Net certificates. Congrats to VO6N on making BPL each month. *Active amateurs on Prince Edward Island:* VE1GR (all bands, 'phone and c.w.), VE1KZ (all bands, 'phone and c.w.), VE1CO (40- and 80-meter c.w.), VE1ACQ (80-meter c.w.), VE1ZM (80-meter c.w.), VE1ACL (75-meter 'phone), VE1JE (75-meter 'phone), VE1UE (75-meter 'phone), VE1IA (75-meter 'phone). Traffic: (Nov.) VO6N 348, VE1FQ 117, W4WOU/VO1 95, VO6U 91, VO6B 87, VO6S 58, VO6AH 33, VO6AF 25, VE1OM 21, VE1OC 16, VO1D 8, VE1HJ 6. (Oct.) VE1QM 16.

ONTARIO — SCM, G. Eric Farquhar, VE3IA — The Frontier Radio Assn. of Windsor, now reorganized, has an international flavor with VE3BDT, pres.; VE3MY, treas.; and W8TKI, secy. AVS reports regularly into OSN, TRN, and Northern Nets. TM and AJR alternate on EAN and CAN. PH snagged KR6KS on 14 Mc. It seems that a banquet was held recently up London way. How about some information on your doings, gang? ATR reported into nine nets 59 times in November. The Kitchener-Waterloo Radio Club was treated to an excellent lecture on astronomy very ably given by Charlie Baldwin. VZ delivered a blackboard talk to the Hamilton Amateur Radio Club on "Electronic Photo Electric Controlled Timers As Used With Modern X-Ray Equipment." AAS recounted his year's tour of duty in the Arctic to a well-attended meeting of the Quinte Amateur Radio Club. Members of the Gateway Amateur Radio Club of North Bay took part in a hobby night conducted by the Arts and Letters Club at the Harvey Street Public School. BEE and BFE are Class A. In addition to collecting stamps, CAB looks for 2-meter skeds with Toronto and Rochester on Fri at 2100 EST. OSN is in need of a Hamilton outlet. TRN now operates Mon. through Fri. on 3675 kc. at 1945 and 2130 EST, a good outlet for Eastern Canada and Eastern Arctic and Labrador traffic. BUB now is located in Ottawa. Traffic: (Nov.) VE3TM 107, VZ 95, BUR 80, NG 73, NO 72, GI 70, AJR 62, EAB 46, ATR 45, BJV, 42, CP 37, KM 28, DQX 25, AUU 23, AVS 12, PH 4, (Oct.) VE3DNG 5.

ALBERTA — SCM, Sydney T. Jones, VE6MJ — RM: XG. PAM: OD. XG reports that the newly-formed Pipeline Net on 3620 kc. would like to hear from interested amateurs able to copy c.w. Route your traffic via PLN. WC is having

(*Continued on page 110*)

trouble with unstable final amplifier. FF, PS, EM, ON, FQ, EG, and IZ are active on the Civil Defense Net. HM has new vest-pocket beam for 14 Mc. OE is back on the air operating the rig by remote control. The NARC now meets on the 3rd Fri. of each month at the new St. John Ambulance Building. From all accounts the NARC members did fairly well in the recent SS Contest. KX is rebuilding both the c.w. and the 'phone rig and is taking no chances with TVI. YE is planning a higher-powered rig and is hunting the necessary parts. I notice that our section is not the only one where only a few faithful ones report each month. Fellow amateurs, this is your column and if it is to continue your SCM must hear from you. Let's start the new year with a bang and report regularly. All the best to you all for 1955. Traffic: VE6HM 50, OD 36, XG 19, WC 9, MJ 8, IZ 5.

MANITOBA — SCM, Leonard E. Cuff, VE4LC — The Annual General Meeting of the Amateur Radio League of Manitoba, Inc., was held in the club room on Nov. 26th and the following were elected to office: NW, pres.; JY, vice-pres.; PE, secy.; and MO, treas. I would like to take this opportunity to wish the new executives every success for the coming year. JM reports that 75 meters has been very good in the early forenoons lately and he is having quite good success working VE8s. PE is a newcomer to the ranks of ham radio in this district and we all wish her success. However, she should not have too much trouble as I believe that she is a member of the only family in this district where all the members are licensed hams, her mother and father being GE and IF, respectively. I wonder if there are any more families in Canada where all the members are licensed hams. It would be interesting to know, so if anyone has this information would they please pass it on to the SCM? Traffic: VE5DS 22, VE4GE 21, AI 19, QD 18, EF 16, FF 12, NW 5, OB 3, AY 4, VE4JM 2, VE5JK 2.

Control Unit

(*Continued from page 14*)

inside the b.f.o. can and the 6C4 tube mounted on the side of the can. It is suggested that the can be ventilated to keep the drift down. The level of the monitor is set by adjusting the value of the 10-$\mu\mu$f. output capacitor. Small changes may be made conveniently with the receiver audio volume control. A cathode circuit switch, S_3, marked "Aux. Monitor," in the control unit disables the unit when another monitoring method is used.

Much cleaner monitoring will result if this circuit is used in conjunction with the receiver muting circuit to be described in the next section. Otherwise, the transmitter signal will also appear in the receiver output.

Receiver Muting

The muting circuit, tube V_5, operates to clamp the screens of the first r.f. and the last i.f. tubes in the receiver to a negative potential when the key is closed, thus destroying their amplifying action so that the transmitted signal is not heard. The 0.1-megohm potentiometer, R_3, marked "Rcvr Vol," in the cathode of the tube which controls the last i.f. stage, allows the stage to be slightly unclamped so that the actual transmitted signal may be monitored directly in the receiver, if desired. Again, these screens must be fed from dropping resistors or voltage dividers, and not from a fixed voltage source.

This is the only one of the three monitoring methods which actually monitors the output signal. The other two monitor the relay action. However, the difference is negligible at the usual amateur keying speeds.

It may be found that this direct monitoring is not quite as clean as could be desired, due to the

(*Continued on page 112*)

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receiver operating levels being upset by the clamping action. A preliminary check which is useful is to tune in a very strong c.w. signal, ground the r.f. screen directly, and connect a potentiometer from the last i.f. screen to ground. Then adjust the potentiometer and see if a comfortable signal level in the output can be obtained easily. If the control is too critical, try clamping the screens of other r.f. or i.f. stages. If too much output signal is still present with both screens directly grounded, try clamping to a negative voltage instead of ground.

General

If this unit were to be built again, the "Monitone" section would probably be left out. It has been found that it is rarely used when the other two monitoring methods are available.

In building, it should be kept in mind that the bane of this type of circuitry is stray capacitance. In this case, it just means don't make leads longer than necessary. Don't use a 20-foot lead where a 2-foot one will do. Particularly, don't use capacitors across the key lead. Local click reduction measures should be kept to an r.f. choke in series with the key, right at the contacts.

The circuit of the power supply used is also shown in Fig. 1. No circuit is given for the plus 300-volt supply, as it is assumed that a supply of 250 to 350 volts is already available somewhere in most stations. The current requirement is about 25 ma. when the key is open, and 5 ma. when the key is closed.

The 3500-ohm potentiometer, R_4, should be adjusted so that the VR tube is lit under both key-up and key-down conditions. If extra 6BX7 sections are used in the keyer to control heavy-current screens, it may be necessary to have a heavier-duty minus 105-volt power source. About 40 ma. should be allowed for each 6BX7 section used.

144-Mc. Converter

(Continued from page 16)

difference with or without the neutralizing capacitors, C_N. With the 6BQ7A, 2-$\mu\mu$f. fixed ceramic capacitors improved the noise figure appreciably. The builder who wants the ultimate in noise figure may want to put in adjustable trimmers for neutralizing.

With the r.f. circuits peaked near the middle of the band, the response should be fairly uniform across the whole band. If it turns out that it is not flat enough to satisfy you, the mixer and second r.f. plate windings can be stagger-tuned to even it up. There is no ill effect on the converter noise figure if these stages are detuned slightly either way to smooth out the response across the band. Adjustment of the coils is done most readily if an insulated tuning wand is used. Once the proper settings are found, the coils may be coated with coil dope and you are ready for some real 2-meter reception.

The writer wishes to thank W8BGY and W8GYU for their help in the designing of this converter.

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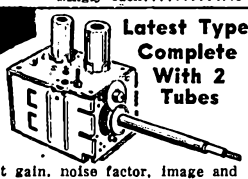

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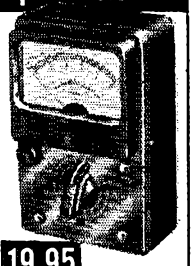

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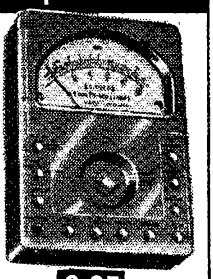

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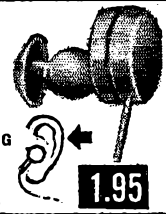

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Variable Bandwidth Filter

(Continued from page 19)

enough to equal the losses in the filters and the receiver functions normally with the usual a.v.c. operating as intended. The input to the variable filter is taken from the output of the first i.f. stage and the output is returned to the input of the second i.f. stage.

Simplification

As described, the variable bandwidth filter operates in such a way that a signal tuned on the nose remains in the center of the filter regardless of the bandwidth setting. If this feature can be dispensed with, considerable simplification of the device is possible. The simplification requires that F_1 be designed for a "center" frequency equal to the i.f. of the receiver. M_1 and the separate VFO can then be eliminated and the signals are moved in and out of F_1 by tuning the receiver itself. M_3 becomes a converter with its oscillator portion capable of being varied and its frequency adjustment determines the bandwidth of the response curve. It must be kept in mind that the steep side of F_1 remains stationary with respect to the signal, while the steep side of F_2 is, in effect, moved back and forth. Under these circumstances, narrowing the filter may cause loss of the signal unless the receiver is also retuned.

Suggestions

Since this article is intended only as the presentation of an idea, no design or construction details are given, although the circuit of Fig. 5 will serve as a starting point for work with the device. Some pointers are in order, however. Shielding of the components and wiring is of the utmost importance and the frequencies involved must be given due consideration. Adequate by-passing is a must. Any kind of coupling around the filters will diminish the effectiveness of the device.

Mechanical filters can be used for F_1 and F_2 but since they are relatively expensive, many amateurs will elect to construct these items. Half-lattice filters are recommended in this case since it is much easier to use only two noncritical surplus crystals than it is to match the pairs of crystals required by the full lattice. Better results are obtained with the full lattice filters but the extra effort is hardly worth the small improvement.

If the filters are properly built to give the sharp slope, and reasonable care is taken in the construction of the device, it will be a real source of pleasure. It will make a top-notch receiver out of even a poor receiver. For ordinary 'phone reception the variable feature is superb, and of course it is a natural for the "duck chatter" boys.

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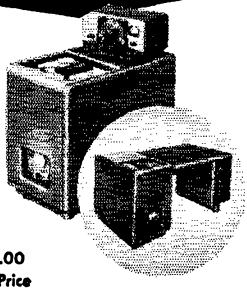

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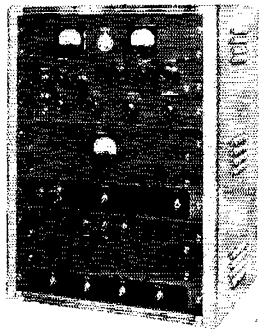

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R.F. Assembly Data

(Continued from page 28)

sary some trimming of the coils. Anyone attempting the conversion should read previous articles [1, 2] on the design of multiband tanks.

One more frequent repeater is the question concerning conversion of the 5763 oscillator for remotely-tuned VFO operation. From the standpoint of circuit modification, this does not present much of a problem and those interested should duplicate the oscillator section of Fig. 6-44 of *The Radio Amateur's Handbook*, 31st edition. This same circuit also appears on page 24 of *QST* for December, 1952. But selecting an oscillator schematic is not the complete problem as is indicated by the following.

The chances are pretty good that the output from the VFO set-up will be appreciably less than from the crystal-controlled arrangement and may not provide adequate drive for the 6146 final. This will most certainly be an important factor in any attempt to operate parallel 6146s.

The multiband tanks are quite sharp and require readjustment whenever the operating frequency is shifted appreciably. Therefore, a remote frequency-control head and a trunk-mounted transmitter would be rather inconvenient. Even though the retuning of the r.f. assembly is a simple job itself — thanks to the ganged multiband tuners — it is advisable to mount the unit so that the tuning controls are within reaching distance of the driver-operator. The original design of this transmitter was based on the assumption that the unit would be so located.

Additional Notes

In closing, we should like to add several bits of information on points that have caused some constructors some concern. Two of these items appeared under the heading "Feed-back" on page 10 of the November, 1954, issue, but will be repeated here for the benefit of those who may have overlooked them.

In the parts list, page 12, October *QST*, L_3 should be B & W Miniductor No. 3012 (not No. 3007 as shown).

In Fig. 2, page 14, October *QST*, the dimension ($1\frac{1}{32}$) shown to the upper right of hole "C" should be changed to 25/32 inch.

To obtain cathode-bias protection for the oscillator (see page 12, October *QST*), the 0.1-megohm oscillator grid leak should be returned to ground rather than to the cathode (Pin 7) of the 5763.

The knobs used on the r.f. circuit controls are E. F. Johnson type 116-222-1. They have a 100-0 scale spread over 180 degrees and have a $1\frac{1}{8}$-inch knob mounted on a $1\frac{1}{2}$-inch skirt. Yes, they are available from some of the mail-order supply houses.

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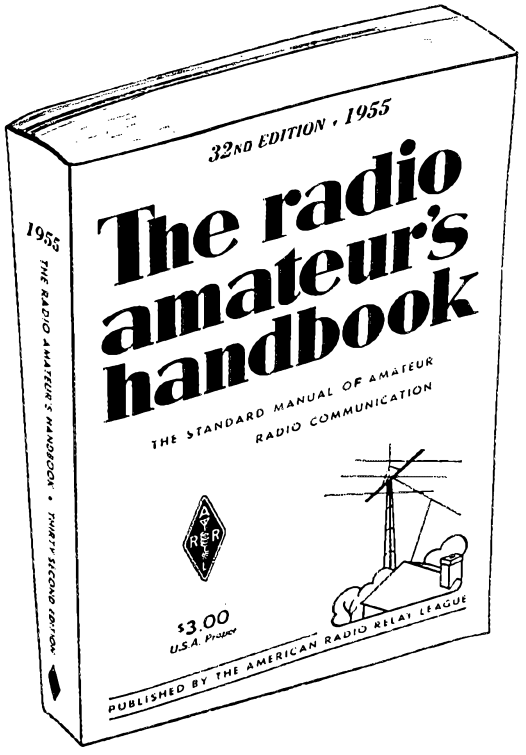
[1] Johnson, "Multiband Tuning Circuits," *QST*, July, 1954.
[2] Chambers, "Single-Ended Multiband Tuners," *QST*, July, 1954.



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Loudspeaker Enclosure

(*Continued from page 27*)

on each side. The spacers are constructed of 1-inch lumber. The side strips are of 3½-inch-wide stock, one edge of which is beveled at 45 degrees. The remainder of the spacers are 1 inch wide.

Care must be taken in assembly to ensure a tight fit between the panels and spacers. This is accomplished through the generous use of a thick casein glue and plenty of wood screws. The front panel is placed face down as the first step in assembly. Each spacer strip is given a coating of glue as is the corresponding edge of the panel. The beveled strips are fitted on each side of the panel so as to produce a continuous 45-degree bevel. Inch-wide strips are placed flush with the bottom of the panel. Strips are also placed in a 16-inch square centered on the circular opening. All strips are secured to the panel with 1½-inch flat-head woodscrews placed 6 inches apart, and countersunk so as to eliminate obstruction when the rear panel is assembled. (See section *A-A*, Fig. 1.) This method of assembly leaves the face of the front panel unmarred by unsightly screw heads or filled holes. The subpanel is given a thick coating of glue where it contacts the spacers. The spacers, as well, are given a generous coating of the glue. The subpanel is secured to the spacers by screws placed at alternate 6-inch intervals.

The panel assembly is allowed to set for at least 24 hours before continuing the construction. It is then filled with very fine and thoroughly-dried sand. The sand can be dried by spreading it on some sort of a canvas or cloth base and placing it in the sun for several hours. Or it can be dried by "cooking" a small quantity at a time in a large frying pan or similar container over the kitchen stove. After the panel assembly is filled to within an inch of the top with the dried sand, the top assembly, consisting of the triangular-shaped plywood panel and the 1 × 1-inch assembly strip is set into place and secured by 1½-inch woodscrews. These screws are inserted from the rear side of the baffle assembly in order to eliminate defacing the front of the cabinet. The speaker is attached to the panel by 6 countersunk screws placed around the periphery of the circular opening.

The front of the cabinet can be decorated to suit — one design feature about which the XYL will have a great deal to say. It was mutually agreed, in this case, to paint the front and top of the enclosure to match the flat-grey walls of the living room, thus camouflaging it to the extent that it is inconspicuous in spite of its rather large size. The decor was completed by placing a green grill cloth over the speaker opening and trimming it with a gilded molding.

Conclusions

The entire assembly, when placed snugly in the corner, stays put without attachments, and has no tendency to vibrate or work loose, even

(*Continued on page 120*)

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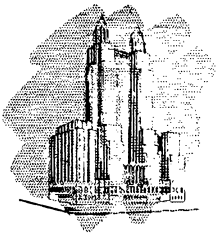

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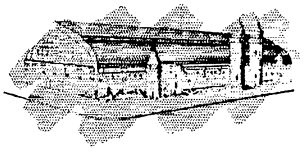

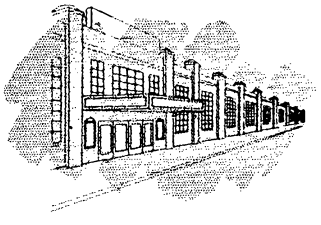

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when the 15-inch coaxial speaker is hit with a full 15 watts. However, I must admit that the windows protested with vigorous rattling and rumbling, as did the neighbors, when the tests were made.

The project has been considered highly successful as is witnessed by the following concluding remarks:

1) The design is such as to fit into any available corner of a modest living room with the facility for "being a part of."

2) The cabinet can be built for less than ten dollars. The components may be prefabricated at your local cabinet shop for a small additional fee.

3) The acoustical qualities, although not measured on meters, are excellent. This is borne out by the fact that many friends who have expensive speaker systems bring their 45 r.p.m.s over for record sessions. They say, "It just sounds better."

4) Last, but not least, I note a slight gleam of pride in the XYL's eye when she displays the functional, decorative and tonal qualities to visitors — a great accomplishment, indeed, when it is considered that the project was almost squelched in the beginning because of the thought of having "an ugly box of sand gracing the living-room wall."

Steerable Array

(Continued from page 30)

action between elements. This interaction was not bad on 20.

Next, the same procedure was repeated on 40 meters without touching the 20-meter adjustments. There was found to be quite a little more interaction on this band.

Finally, both 20- and 40-meter adjustments were gone over several more times, to be sure that everything was "on the nose." All of this tuning should be done with very loose coupling to the final amplifier, to avoid pulling between the antenna tuned circuits and the final tank.

Of course this whole tuning procedure might have been done in reverse; tuning for maximum front-to-back ratio, but we were primarily interested in maximum gain.

Tuning for east and west only leaves out the north and south directions but, as it happens, north and south automatically come up OK. The only difference is that on 20 meters the loading is just a little lighter when the beam is switched north and south, and on 40 the loading is just a little heavier. A final link variable from the front of the panel takes care of the problem.

Results

Now as to results. Very good reports have been received both on domestic and DX contacts. The calculated forward gain is 4.5 to 5 db., except north-south on 40 where it is approximately 3 db. On 20 meters the front-to-back ratio on the

(Continued on page 122)

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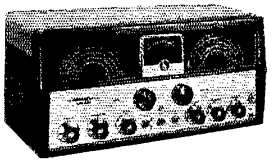

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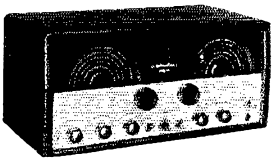

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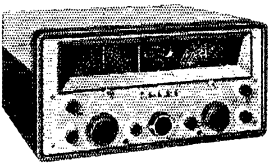

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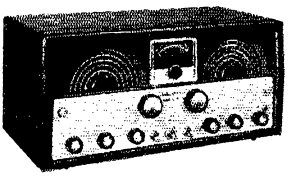

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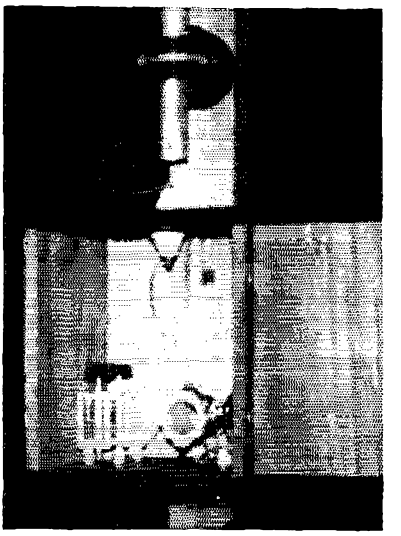
east-west leg is very, very good. The front-to-side ratio of the north-south beam is also exceptionally good on this band. Reports varying from five to seven S points have been received on these various ratios.

On 40 meters the front-to-back ratio in the east and west directions runs four to five S points,



The matching section for one of the elements. No relays are used to switch bands — the circuit takes care of it automatically.

while the front-to-side ratio north and south is not so good. It runs about two S points on the average, but it all helps in digging that weak one out of the fourth layer.

Phased arrays using odd values of phasing have not been used in amateur work to any great extent so this antenna is presented, not as the ultimate in beams, but as a mode of operation that would seem to have distinct possibilities for our purposes.

Wavemeter

(Continued from page 33)

coupled to the coil in the grid-dip meter and the grid-dip meter is tuned until the wavemeter shows a reading. The frequency of the grid-dip meter is read and the wavemeter is marked accordingly. This procedure is followed throughout the frequency range of the wavemeter.

It may be that a grid-dip meter is unobtainable and, if so, there is another simple method of calibrating the wavemeter, by making use of your communications receiver. A short piece of wire, six inches to one foot long, is connected to the antenna terminal of the receiver. The other end is connected directly to one side of the pick-up loop, L_4. A signal at 3.5 Mc. is then tuned in on the receiver, using only this short antenna system. The wavemeter is switched to the lowest frequency range. As the condenser in the wavemeter

(Continued on page 124)

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1. Is your barefoot SSB getting trampled on? Put seven-league boots on your signal with a good Power Amplifier from Harrison! We have the new Gonset 500W for only $339. The new Johnson KW-in-a-desk is a good investment at $1,595, plus $123.50 for the rest of the desk! And, of course, Collins is our middle name! Don't send money (unless you're in a big hurry!); ask for literature, first.

2. Line voltage drops at night? Harrison has regulators for every application! Tapped autoformer type, to give 115 volts from line voltages of 60 to 140. With meter, 150 watt —$14.00. 300 watt — $16.00. 600 watt — $20.00. 1200 watt — $35.00. Superior "Powerstat" for smooth variable control of 115 volt output from line of 95 to 135 volts. Output up to 3 Amps. — $12.50. 7.5 Amps. — $23.00. 15 Amps. — $50.00. 52 Amps. — $98.00. Sola, completely automatic. No matter how the line swings between 95 and 125 volts, or how your load varies, your equipment is fed a stable 115 volts, within 1.2 volts! (Line of 85 to 140 volts gives output of 112 to 118 volts!) 30 watt output capacity — $18.00. 60 watt — $25.00. 120 — $33.00. 150 — $40.00. 250 — $52.00. 500 — $81.00. 1,000 — $135.00. 2,000 — $245.00. 3,000 — $345.00. 4,000 — $435.00. 5KVA — $515.00. 10KVA — $990.00. (230-Volt models at same prices.)

3. Want to get more soup out of your rig? Heating of tubes and transformers is the *major* limitation on power rating. Harrison has a mighty fine, new, quiet blower to raise that rating! 115 Volts, 60 cycle — draws only 40 watts. Delivers 44 CFM at .025" static pressure. 6⅛" x 6" x 5⅛" overall. 4" OD mounting flange. Item RO44, $8.45.

4. Want a complete beam installation at a bargain? You can save a cool $100 if you hurry and get Harrison's sensational beam package of a rugged 30-foot self-supporting tower, heavy duty prop pitch rotator, all accessories and your choice of any Telrex beam! Ask for details, or see our previous *QST* ads.

5. Searching for transistors, and miniaturized parts? Harrison is your most dependable source of all the new, ultra compact components of the leading manufacturers. Just order — Harrison has it!

6. Want to solder heavy chassis, grounds, etc.? No need to tie up money in a single purpose high wattage iron. Get one of the new Wall *LP (Liquid Propane)* Torches. Compact, disposable fuel tank gives up to 30 hours of clean, odorless, instant heat for light or heavy soldering, brazing, paint burning, etc., at less than 6¢ per hour! Harrison gives you the complete $6.95 torch with pencil point burner and fuel tank, PLUS the $3.60 heavy duty burner — all for only $5.88.

7. QRM got you down? Make 'em sit up and listen to *your* sigs! A Telrex "Beamed Power-Perfect Match" beam can make your 100 watts pound through like a full KW! Harrison has the new ones! 40 Meter: Full size 2 element — $275; 3 element — $330; 2 element Mini-Beam — $180; New Super Mini-Beam, broad banded 2-element 20 meter with 4.8 db power gain — $62.50. "Tri-Band" 2 full size elements on 10, 15 and 20, all on one 22-ft. boom! $248. Harrison features and recommends the complete proven line of beams with all the guess-work engineered out — TELREX! Ask for performance charts.

8. Short on cash? A small down payment will bring you your new equipment, right away. Enjoy it while you pay, on Harrison's easy terms at lowest cost.

9. Wearing out your coax plugs, band-changing antenna cables? Let Harrison send you one of the new 5-position coaxial switches. Takes PL-259 connectors (76¢ each). Will handle a full KW at 52 or 72 ohms. Single hole mounted 4" dia. cast aluminum case, $13.65.

10. Want to mount some Telrex beams on your Johnson rotator? Harrison's special heavy-duty adapter bolts right to tapped holes in rotator and takes vertical 2" mast for Telrex beams. Complete with hardware and instructions. Item MX-20 — $30.00. (Only $20.00 if bought with rotator.)

11. Building high power into small space? Harrison has the needed blower — at a low price. See problem 3.

12. Need "AN" or "UG" Connectors? From Harrison's New York warehouse stock you can quickly obtain one, or a quantity, of the more than 1,000 types of new, latest improved production genuine AMPHENOL Connectors, at factory prices! (Please tell the *Purchasing Agent about this!)*

13. Need to solder, far from AC line? Antenna, earthing (that's English for grounding!) connections, etc, are easy! See problem 6.

14. Yearning for a really dependable supply house? With all proper modesty, we shout "Harrison is *the* place for you!" No matter what parts or equipment you need, you can always write, wire, phone, or visit "Ham Headquarters Since 1925" with confidence that you will receive everything promptly, accurately, at guaranteed lowest prices and with complete satisfaction above and beyond the call of duty!

15. Like to go SSB, with the right equipment? You couldn't make a better start than with a Central Electronics exciter! Model 10B, 10 Watt, plug-in coils for band changing. Complete kit $129.50; wired and tested $179.50. Model 20A, 20 Watt, band switching $199.50; wired and tested $249.50. Hook a Signal Slicer to your receiver, and you're in business! Kit $49.50; wired and tested $74.50. *(Of course, Harrison has all the other good makes of SSB equipment, too!)*

16. Looking for a real bargain in a piece of good, USED EQUIPMENT? Come in and look over the large, constantly changing selection at the Harrison-New York and Harrison-Jamaica, Long Island stores.

17. New car has 12-volt system? Here's how Harrison can help with your 6-Volt mobile rig: (a) Carter "Change a Volt" efficiently converts your 12 volts into 6 volts to run the entire rig. Complete with relay, fuses, etc. Delivers up to 45 Amps for intermittent transmitter duty (15 Amps continuous for receiver). $66.72, or, (b) Get a new Carter dynamotor, with a liberal allowance from Harrison for your 6-volt one. (c) Dropping resistor, to operate a 6V DC relay on 12 Volts. Adjustable. $1.12, or (d) Let Harrison furnish you with an entirely new and modern mobile set-up, with top allowance for the old.

18. Wasting valuable time stripping coax cables? Harrison has a professional tool to quickly and neatly prepare cables for connectors. A money-saver for Lab and small production lines. Precision adjustable for long blade life. Model 420, for RG-8, 11, etc. $38.50. Model 300, for RG-58, 59, etc. — $33.50.

19. Afraid to operate while driving? Use a "Third Hand" to hold the mike in front of your lips, put a push-to-talk switch under your left foot, and you can drive safely with both hands on the wheel! "Third Hand" slips around your neck in a jiffy; adjustable gooseneck has standard ⅝–27 thread for mike. $3.00. Normally open, heavy plunger micro switch for under floor board mounting. SW10 — $1.95.

20. Getting a "Glass Arm"? (That's the tired arm old time telegraphers say you can get pounding brass too long with a straight key!) Harrison has genuine Vibroplex keys for immediate relief. Champion — $12.95. Zephyr — $14.95. Lightning Bug — $15.95. DeLuxe — $21.50. Blue Racer — $17.95. DeLuxe — $22.50. Original — $17.95. DeLuxe — $22.50. Presentation Super DeLuxe — $29.95. (DeLuxe models have jewelled bearings and are brightly plated.) Carrying case, with lock and key — $5.75. (*Bring your old key or bug in to either our New York or Jamaica, Long Island, stores for a liberal allowance.*)

21. Left handed, and want a "Bug?" Harrison has 'em! Add $1.00 to $20 prices.

22. Want to go on 6 meters (and help save that band)? Harrison has the sensational Gonset Communicator! Like the 2-meter model, it is a complete receiver, transmitter, and 6V DC/110V AC power pack, all in one compact metal case. DeLuxe model with adjustable squelch — $229.50. (Also for 12 volt cars.)

23. They don't know your new call letters? Wear a neat lapel pin ($1.50), cast aluminum call plates on your car ($3.50 each), and hang a stiched felt pennant on your shack wall ($1.50). All three for only $6.25, postpaid.

24. Want "eyes" for your receiver? To "see" responses to your CQ, open spots in the band, characteristics of received signals (your own, too), net frequency deviations, etc., etc., you should hitch a new PR-1 *Panadaptor to your receiver! A 3" CR tube* gives you constant visual monitoring of up to 200 KC each side of received frequency. $199.75.

25. Can't decide which Hi-Fi system is the best investment? National's "Horizon" line will give you top quality and excellent value for your money. Tuner — $169.95. Preamplifier and control panel — $49.95. 10 Watt Amplifier — $79.95. 20 Watt — $84.95. Harrison has it! — In stock.

26. Not enough room for a *20* meter beam? Then put up one of the new center loaded, condensed element jobs! Physical size of a 10-meter beam, easily turned by heavy-duty TV rotator. The power gain, and F/B ratio make it really worth while! Harrison has all the best: TELREX "Mini-Beam" — $55.50. Radio Specialties "Shortbeam" 3 element — $59.95. Gonset "Bantam" — $59.50. Mosley "V-P" — $55.95. 3 element — $79.95. (If you have enough room for 27' elements, the new broad banded TELREX "Super Mini-Beam" is FB! $62.50.) Heavy-duty TV rotator, with direction indicating control box — $29.47. Cable — 3¢ per foot.

27. Losing too many QSO's in the QRM? A new receiver, with sharper selectivity, selectable sideband, better signal/noise ratio, etc., will boost your batting average. Harrison is *the* place to get the latest and the best. Quick delivery, easy terms, and Harrison guarantees to match or top any trade-in deal — no matter how crazy! Collins 75A3 — $530.00. National HRO-60T — $533.50. NC-183D — $399.50. NC-125 — $199.95. NC-98 — $149.95. NC-88 — $119.95. SW-54 — $49.95. Hallicrafters S38D — $49.95. S85 — $119.95. SX99 — $149.95. SX96 — $249.95. SX88 — $675.00. Hammarlund HQ-140X — $264.50.

28. Not sure your beam and coax match are "on the nose"? With the new Jones Micro-Match you *see* when you have lowest SWR, and best efficiency. 261 Coupler — $22.50. 262 Indicator — $14.50. (Harrison has all M. C. Jones commercial units.)

29. TVI leaking out of your rig? Seal your cabinet door and panel joints with METEX, the Electronic Weather-stripping. 20 ft. package — $3.95.

30. Haven't got $300 for a good rotator? Just ask any of the thousands of happy hams using the Harrison PROP PITCH Rotator! Precision gear box, rugged motor, hall thrust bearings. Cost U. S. over $1,000 for aircraft use. Harrison modifies them for dependable beam service. Weighs only 43 lbs., but will support and turn the largest multi arrays! Complete installation instructions. Item RO-10 — $29.95. Special step-down transformer, TF-30 — $7.95.

31. Got other problems? Drop me a line, and let's see if I can help you.

73,
BILL HARRISON, W2AVA

is slowly tuned through its range, a point will be reached where the 3.5-Mc. signal will practically disappear. The dial setting at this point should be marked. A signal is then located at the other end of the band, 4.0 Mc., and the wavemeter again tuned to "null" the signal. This procedure is followed throughout the condenser range. The a.v.c. of the receiver should be turned off for these tests.

With the coil specifications given in Fig. 1, the lowest frequency range should be approximately 3.0 Mc. to 9 Mc. The second range should run from about 6.8 Mc. to 18 Mc., and the highest range from 14.0 Mc. to 40.0 Mc. The low-frequency portion of each of the three ranges will show considerably more bandspread than the high-frequency end. Good check points for the receiver calibration are the 5-, 10- and 15-Mc. signals of WWV, the U. S. Bureau of Standards station in Washington, D. C.

If you are sure of the output frequency of your transmitter, the transmitter signal can be used as an additional verification of the calibration. The wavemeter can be held near the transmitter output and tuned to the output signal frequency. When making these tests, or for that matter when making any tests not requiring an antenna, use a dummy load in place of the antenna. A light bulb of sufficient wattage to handle the transmitter power makes a good dummy load for testing a rig. Be careful not to couple the wavemeter too closely to the transmitter output as too much signal may burn out the crystal or the meter.

The cost of the parts for the unit described here was slightly less than eight dollars. This figure includes the price of the meter (Shurite). This is a very small amount to pay for an instrument as useful around the shack as an absorption-type wavemeter.

To use the wavemeter to adjust a beam antenna, set up a half-wave antenna at least several wavelengths from the beam to be tuned, preferably broadside to the beam and at the same height. The antenna feed line should be a half wave or a wavelength long. Couple the feed line of the pick-up antenna to L_4 with a 2- or 3-turn coil, and tune the wavemeter for maximum signal with the transmitter "on" and the beam pointed at the pick-up antenna.

The builder will soon wonder how he ever got along before without such an instrument. One last word of caution: the clip lead was put on the wavemeter for a definite purpose. When checking around a transmitter, clip the lead to the transmitter chassis. Then, if you accidentally brush against a "live" circuit with the wavemeter there will be a lot less danger of getting a nasty shock. When working around "live" circuits, it is better to be safe than sorry.

Bonus Features in the B&W model 5100 Transmitter

Only B&W Offers all these Features at this Low Price

$442.50 Amateur Net

Factory wired & tested; complete with tubes

Built-In VFO—Accurately calibrated for 80, 40, 20, 15, 11, & 10 meter bands. Over 7" of dial space.

Optional crystal control using 80 meter crystals. Separate circuitry assures clean, clear keying at all speeds on both VFO or crystal operation.

Built-In Low Pass Filter—Pi-network final followed by low-pass filter (75 ohm unbalanced output), plus functional cabinet design and thorough bypassing of all critical leads, keeps TVI to a minimum.

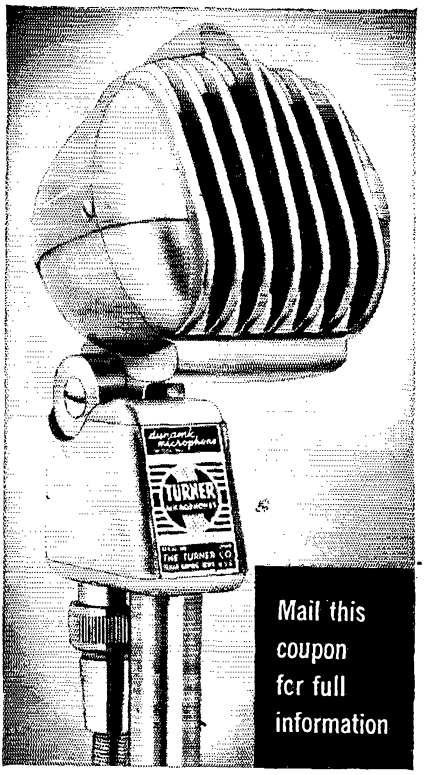
Unitized Construction—Any major section (oscillator, multiplier, etc.) is quickly un-plugged and easily removed for servicing. *Found only in the B&W Model 5100.*

NEW! Single Sideband Conversion Feature

For $25.00 extra you can now buy a Model 5100 Transmitter fully converted for SSB operation with the B&W Model 51SB Single Sideband Generator, or have one you already own converted by the factory. Cost of the 51SB is additional. If you prefer, you can make this conversion yourself with the kit provided with the 51SB.

BARKER & WILLIAMSON, Inc.
237 Fairfield Ave., Upper Darby, Pa.

Input Pwr—150 watts CW
135 watts Phone
Size—22"w., 11½"h., 14¾"d.
Weight—95 pounds.



Quality low cost ham mikes
TURNER 33D and 33X

Hams appreciate the wide, flat response characteristics of Turner Model 33, dynamic or crystal. 33D and 33X give clear, crisp speech reproduction smoothly . . . over the whole, peak-free response range. The frequency response of Model 33D is 100 to 9000 c.p.s.; output level is —52 db. Model 33X has response of 60 to 9000 c.p.s.; level of —52db. And hams appreciate the rugged dependability of Turner Model 33.

Model 33X and Model 33D both have the same modern, satin-chrome plated good looks, 90° tilting head for semi- or non-directional operation, standard ⅝"—27 thread mount. Both are complete with 20-ft. removable cable sets. And both are modestly priced.

TURNER MODEL 33X CRYSTAL, List Price $26.95
MODEL 33D DYNAMIC, List Price $31.90

Mail this coupon for full information

The TURNER Company, 917 17th Street, NE, Cedar Rapids, Iowa
Gentlemen: Please send me complete information on Model 33.

Name.....
Address.....
City.....State.....

IN CANADA: Canadian Marconi Co., Toronto, Ont. and Branches
EXPORT: Ad. Auriema, Inc., 89 Broad Street, New York 4, N. Y.

25 Years Ago this month

February 1930

. . . The editorial points out that most of the fellows griping about QRM and poor conditions are the ones still using 1928 equipment. Open-scale tuners and peaked amplifiers in the receiver and "high-C" circuits in the transmitter will make the band seem much wider, the editor states.

. . . "Revolutionizing High-Frequency Tuner Design," by Hoffman and Mix, describes a highly selective receiver which tunes continuously from 3000 to 16,000 kc.

. . . Herbert Jones, W9DUH, reports on a compact and flexible tube and set tester readily adaptable to the checking of new tube types.

. . . A power supply for UX-210 tube transmitters, using a 1100-volt transformer and two UX-281s in a full-wave rectifier, is described by George Grammer.

. . . Another article by Grammer deals with winding data for the tube-base coil, including tables for quick reference.

. . . A toy transformer can be used to increase voltage to the primary of the transmitter plate power transformer when the commercial a.c. line voltage falls below rating, according to an article by C. Warren, W2BVA.

. . . Rufus P. Turner, W9FZN, describes improvements in the superhet receiver, including the addition of an untuned r.f. stage to eliminate radiation of the first detector regardless of the use of different antennas.

. . . Applications of dynatron circuits are discussed by W. H. Newbold, together with a little of the theory of operation.

. . . "A Three-Phase High Voltage Rectifier" by F. O. Tribbey, W5KX, "High-Frequency Inductances" by M. A. Ausman, and "Notes on the Monitor" by Grammer, round out the technical articles. "Passing the Government Examinations," "W1KH" (station of the month), and the usual departments complete the issue.

NEW BOOKS

How To Use Meters, by John F. Rider. Published by John F. Rider Publisher, Inc. 156 pages, including index. 5⅜ by 8¼, paper cover. Illustrations. Price, $2.40.

D.c., a.c. and r.f. meters and methods of using them in making measurements. Volt-ohm-milliammeters and vacuum-tube voltmeters are included.

Fundamentals of Transistors, by Leonard Krugman. Published by John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y. 144 pages, including index, 5½ by 8½ inches, paper cover. Price, $2.70.

This book appears to fit into the gap between the scientific, highly technical publications on transistors and the "sugar-coated" nontechnical material that has appeared from time to time. It presumes some knowledge of electrical circuit theory on the part of the reader, although advanced mathematics is not required. Treatment of transistor circuits is on a par with treatment of v.t. circuits in design handbooks; i.e., the reader capable of using tube curves for design purposes will find himself in the analogous transistor field.

Picture Book of TV Troubles; Vol. 1, Horizontal AFC-Oscillator Circuits, by John F. Rider Laboratories Staff. Published by John F. Rider Publisher, Inc., New York. 80 pages, 5½ by 8½, paper cover. Price, $1.35.

Pictorial trouble-shooting for the popular horizontal sync circuits of television receivers.

Hints & Kinks

(Continued from page 38)

HOLD-DOWN CLAMP FOR MOBILE WHIP ANTENNAS

A SIMPLE, handy and inexpensive clamp for holding a whip down against the car body whenever desirable can be made by modifying a spring-action binding post and then mounting it on the rain gutter of the car.

An EBY type 7834 (old type 61) is best for the job. Compress the post in a vise and then file or saw a slot through the side of the barrel. The slot must be wide enough to clear the end of the whip and must travel straight through to the D-shaped hole at the center of the assembly. Reduce the length of the threaded 6-32 mounting stem at the center of the post to a length of approximately ¼ inch. Drill and tap a 6-32 hole in the rain gutter of the car and then mount the post with the whip slot facing toward the center of the roof.

To insert the whip, the movable portion of the binding post is depressed, and the whip inserted in the notch. When the pressure is removed from the post, it will grip the whip tightly. If it is desired to release the whip while driving, it is only necessary to depress the post top, and the whip springs up, ready for action. Since the binding posts are made of plated brass, there need be no fear of rusting.

— Ralph H. Kalb, W9ZGI

COTTER-PIN ADAPTER FOR SURPLUS TYPE CR-1A CRYSTALS

SURPLUS crystal holders, Type CR-1A, have a pin diameter and pin spacing of 0.125 and ½ inch, respectively. These holders can be quickly and inexpensively adapted to fit a standard crystal socket such as accommodates the popular FT-243 type of holder by slipping a pair of 1-inch (length) cotter pins over the 0.125-inch pins. Orientate the cotter pins with the free ends facing away from one of the wide flat surfaces of the CR-1A assembly and then force them up against the bottom of the holder. This particular arrangement of crystal and cotter pins permits the crystal to be inserted in either a standard or a CR-1A holder. The length of the cotter pins may be reduced somewhat if that proves to be desirable and the heads of the pins may be spot-soldered to the crystal-holder mounting posts if extra rigidity is required. Most hardware and auto stores carry pins of the correct size. Take a holder along when you go shopping so that pins providing a good force fit may be selected.

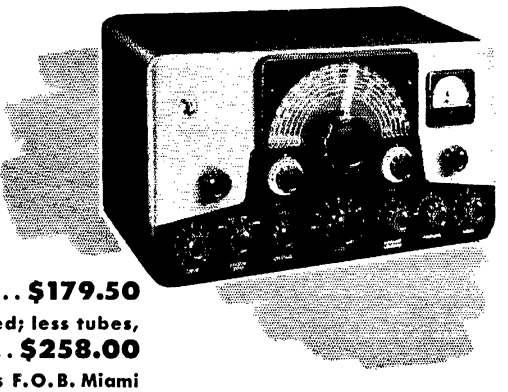
— Lee Rogers, W5HGII

Strays

Bill Barnes, W5YAT, and Bill Barnes, W5SZM, both live in Las Cruces, New Mexico.

HAM SPECIAL

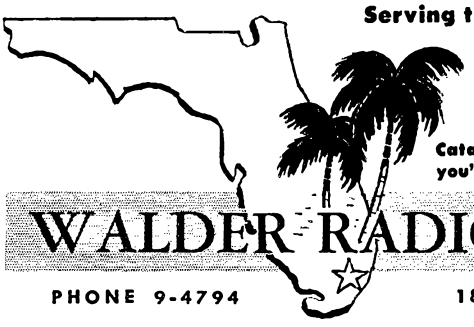
The Viking Ranger . . . desk-top beauty in a self-contained rig. Serves both as a transmitter or as an RF-audio exciter for high power equipment. Phone input 65 watts . . . CW input 75 watts—covers all amateur band from 10 to 160 meters.



No. 240-161 Kit; less tubes, crystals, key and mike . . . $179.50

No. 240-161-2 Assembled, wired and tested; less tubes, crystals, key and mike . . . $258.00

All prices F.O.B. Miami



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ORIGINAL VAARO MOBILE PRODUCTS NOW MADE BY DAVIS ELECTRONICS

ORIGINAL VARIABLE SINGLE UNIT COIL

For 75-40-20-15-11 and 10 METER BANDS. NOW IN THE 1955 DESIGN with the NEW, IMPROVED "DUAL CONTACT" between the coil windings to provide a greater, more positive, more efficient contact. Coil can be INSTANTLY TUNED to ANY DESIRED BAND or FREQUENCY by ingenious locking device. Factory pretuned. Continuous coverage from 3750 kcs. to 30,000 kcs. Highest "Q" available in an all-band coil. Fits all whips and bases.

MODEL V-102B—for 0 to 500 watts input

$14.95

MODEL V-103B—for 0 to 1000 watts input

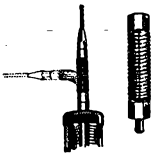
$16.95

Vaaro Electronic Engineering Co., Long Beach, California has been purchased by Davis Electronics, Burbank, California. Throughout the television years, DAVIS ELECTRONICS has been known for their integrity and the high quality of the DAVIS "SUPER-VISION" TV ANTENNA LINE. Now, in addition to VAARO excellence of design facilities, DAVIS ELECTRONICS is providing top manufacturing facilities so you are assured of top quality performance, prompt delivery and fair pricing.

VAARO BUMPER MOUNT Eliminates cutting holes in your car. Fits any antenna and car bumper. BUMPER CURVATURE INSERT exactly fits your make and model of car. Socket dimensions: Standard ⅜" x 24 thread. Has .500 thick fibreglas disc of top dielectric material. MODEL V-105. Cast aluminum. Hammertone baked enamel, **$13.95**

MODEL V-105V. Guaranteed 5 years against corrosion and flaking. Cast bronze. Heavy chrome and copper underplating, **$25.95**

VAARO "WHIP FLEXOR" keeps whip perpendicular at high speeds—thus no change in loading or impairment of reception. Cuts down bad "QSB" action on receiving end. Whip can be brought into horizontal plane for car storage, etc. Has strong cadmium-plated square steel wire spring. Only **$3.95**



The DAVIS-VAARO Line also includes: FIBREGLAS WHIPS—6' $8.50, 7' $8.75, and 8' $8.95. Also BASE SECTIONS (Solid Hex); 12" $3.75. 24" $3.95. 36" $4.95.

VAARO "WHIP CLAMP" —. Securely fastens to roof water-drain of any car without damage to finish. Fastens whip securely down to car roof level for storage, low wooded areas, etc. Solid brass, chrome plated—with Allen Wrench, **$1.79**

DAVIS ELECTRONICS

VAARO ELECTRONICS DIVISION

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VAARO DIV., DAVIS ELECTRONICS **Q-1**
BOX 1247, Burbank, California
SIRS: RUSH INFORMATION TO ME AS CHECKED:
☐ Send **CATALOG INFORMATION** and **DATA** on **VAARO MOBILE ANTENNA EQUIPMENT.**
☐ Send Address of **NEAREST AMATEUR JOBBER.**

Name_____

Street_____

City_____ State_____

YL News & Views

(*Continued from page 60*)

JA YL Hams

JA1FM and JA1AEQ are the first and second YLs, respectively, to receive amateur licenses in JA-land. The country's other two YLs are JA2JX and JA3LB.

JA1FM, Miss Shizuyo Tomihira of Tokyo, is on forty 'phone, running 80 watts to the final stage with suppressor

« JA1FM «

» JA1AEQ »

modulation, and using a homebuilt double-conversion superheterodyne receiver and half-wave antenna.

JA1AEQ, Fumi Abe of Musashine City, is the XYL of JA1PK. She operates on either 3.5, 7, 50 or 144 Mc. daily, with her chief interest being v.h.f. activity. Her low-frequency rig runs 60 watts input to an 814 in the final, plate-modulated. The receiver is a homebuilt superhet.

Thanks to OM K6DV for this report. Bob was the first non-Japanese station to get the AJD award for working all Japanese districts.

Technical Correspondence

(*Continued from page 48*)

high or low, as the case may be, from the WWV carrier. I'm fully aware of that.

So, we follow the usual method of tuning to very near zero beat while WWV is not modulating, and very near the end of their unmodulated minute. Then we simply hold still until the tone comes on again. Now tune, very slightly, for the flutter. Remember that if your receiver has fairly good low-frequency response, you are already within 50 cycles or so. When you hear the flutter, tune for slowest flutter. The rate of flutter is the difference in frequency between your marker harmonic and WWV's carrier. All the instructions given refer to tuning the marker generator. There's nothing else to tune as WWV is fixed, and your receiver has no effect whatever.

Again, as to the danger of tuning to one of the sidebands: It is utterly impossible to tune far enough to come

(*Continued on page 132*)

within miles of zero-beating a sideband without hearing a loud tone falling out of zero beat; that is, starting at or near the low-frequency limit of your receiver's audio response and rising in pitch as you go away from carrier zero beat (approximate). As soon as you hear that note appear at a very low pitch and start rising, reverse your direction of tuning the marker. That will bring you back to where you will soon hear the flutter. It's foolproof, with a very little practice, and a knowledge of three things. These three things are: zero beat, low pitch, and high pitch. Anyone who has worked much c.w. doesn't have to be a musician to know these simple things. This is a method of zero-beating WWV's carrier that is just as accurate as the best methods with the most expensive equipment, up to within a quarter of a cycle, at least. What more does an amateur operator want? And why be satisfied with being within 50 cycles or even 25, when it is so easy to be within less than one cycle?

— *Paul E. Smay, W9TZN*

IMAGE RATIO AND NOISE FIGURE

331 Forest Drive, S.E.
Cedar Rapids, Iowa

Technical Editor, *QST*:

Have you heard the 2-meter man say, "Yeah, I built up one of those noise generators with a 24G (or 5722). It works swell for tuning up my receiver but I get ridiculously low noise figures. When I check my converter I get 3 db.; now you know that can't be right."

Can it be these fellows are using low intermediate frequencies and consequently their receiver front ends accept almost as much image signal as the desired signal? A receiver having equal sensitivity to signal and image gives twice the output for a given noise-generator plate current that the receiver having good image rejection gives. The measured noise figure must then be corrected by this factor of two by adding 3 db. to give the corrected noise figure. Applying this correction, the example above would yield a noise figure of 6 db., a reasonable figure for a good front end.

As given by Beringer, Montgomery, Howard and Katz[1] the measured noise figure F' must be multiplied by the factor

$$\frac{G_s + G_i + (\text{gains to other spurious responses})}{G_s}$$

which is always equal to or greater than 1, where G_s is the over-all gain at the signal frequency and G_i is the over-all gain at the corresponding image frequency. This assumes the noise signal comes from the same source and that the receiver has the same bandwidth at both frequencies. These conditions are generally satisfied in a communication-type superhet noise test.

As a further example, if the first spurious response is down 8 times below the desired signal response (9 db. down)

$$G_i = G_s/8$$

$$F = F' \frac{G_s + G_s/8}{G_s}$$

$$F/F' = 1.125 \text{ or an error of } 0.5 \text{ db.}$$

This error in db. must be added to the measured figure in db. In reviewing the *QST* articles on noise generators,[2] I do not find this caution. Perhaps this has been pointed out elsewhere in the v.h.f. columns, but I have not seen it.

— *R. Ray Weeks, W9VTO/Ø*

[1] Montgomery, *Technique of Microwave Measurements*, Radiation Laboratory Series, 11, p. 226.

[2] Tilton, "Noise Generators — Their Uses and Limitations," *QST*, July, 1953, p. 10; and the two *QST* articles referred to therein.

MEMBERSHIP CHANGES OF ADDRESS

Four weeks' notice is required to effect change of address. When notifying, please give old as well as new address. Advise promptly so that you will receive every issue of *QST* without interruption.

World Above 50 Mc.

(Continued from page 61)

W6ORS, Alhambra, Calif. — Completed 220-Mc. crystal-controlled converter and heard first signal (K6CGA) one minute after firing up. Band seems good for work over rough terrain with low power; sigs heard well by K6GTG, Arlington.

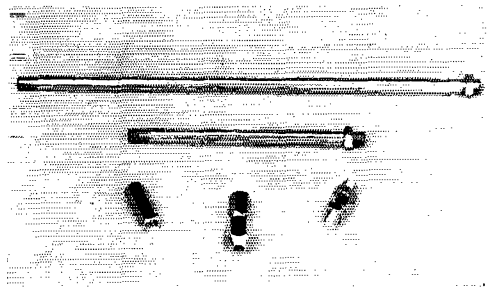
W8UZ, Columbus, Ohio — New WNs appearing on 2-meter band regularly, congregating on 145.08 Mc. Talk going on regarding formation of v.h.f. club.

VO6U, Goose Bay, Labrador — 829-B rig and 4-element array for 50 Mc. to be ready about Jan. 10th. Will run automatically keyed for observation down Atlantic Seaboard. Would like to hear from anyone interested in making tests or keeping schedules.

New Apparatus

Sectionalized Mobile Antenna

A new sectionalized mobile antenna that permits a great variety of adjustments to suit almost any condition has recently been announced by K-W Engineering Works, 3145-A North 48th St., Milwaukee 16, Wisc. (W9SNK).



Various mobile-antenna components produced by K-W Engineering Works. Above are 6- and 12-inch antenna sections. Below, is the chuck, with female and male couplings on either side.

The sections are of ⅜-inch steel tubing, threaded standard male ⅜-24 S.A.W. at both ends. Sections are available in any length from 6 inches to 36 inches in steps of 6 inches. Thus, a loading coil may be inserted at any point desired along the length of the antenna, depending on clearance or the operator's preference. Each section includes one lock nut.

Also included in the line are useful hardware accessories, such as a coupling with female threads for joining the sections together, another coupling with female threads where such a coupling may be found necessary, and a chuck with female threads to fit the antenna sections. This chuck is designed to take plain-end 3/16-inch-diameter rod as an adjustable top section. Since the antenna sections are hollow, the top section can be adjusted by telescoping it and locking it fast with the chuck.

All parts are chrome plated against corrosion, and all nuts and couplings are hexagonal to fit standard wrenches.

— *D.M.*

U. S. N. R.

Rear Adm. W. B. Ammon, USN, director, Naval Communications, presented the Hooper trophy to Naval Reserve Electronics Division 8-12 in colorful ceremonies at Paris, Texas.

"Electronics is the spark of modern warfare," Admiral Ammon told the Reservists. "In less than 20 years, we have come from radio and sonar to the many marvels of the electronic age.

"It was not until 1940 that the first radars were installed in a handful of Navy vessels. When the fleet arose from the ashes of Pearl Harbor, guns — formerly silenced by fog and darkness — could be laid at their maximum range of an enemy 'seen' only through electronics. Soon, electronics went along as part of the bullet — in the form of the proximity fuse.

"Today, guns — historically symbols of armed might — are becoming secondary to swift, electronically-controlled missiles.

"You of Naval Reserve Electronics Division 8-12 have demonstrated by winning the Hooper trophy that you fully realize the increasing magnitude of electronics in war," Admiral Ammon said. "In northeast Texas — here and at Tyler — the Naval Reserve has set an example which, if followed throughout the nation, would assure the Navy of a war-ready electronics team."

The Eighth Naval District trophy was presented to the Paris division by the commandant, Rear Adm. John M. Higgins, USN.

The Paris division is commanded by Cmdr. Paul H. Daniels, USNR. Other officers attached to the division are Lt. Cmdr. James D. McLaughlin, USNR, executive officer; Maj. W. J. Houston, USMCR; Lt. Randall S. Morphew, USNR; Lt. Cmdr. T. J. Scott, USNR; Lt. Cmdr. Floyd C. Burnett, USNR; Lt. Eugene M. Belew, USNR; Lt. John L. Jack, USNR; Lt. Louis B. Williams, USNR; and Lt. P. Burtner, USNR.

—•••—

Operators of Naval Reserve Electronics Battalion 12-3, Modesto, Calif., operating Naval Reserve drill circuit. *L. to r.*: H. L. Blankenship, RMSA, USNR; C. DeVore, RMSA, USNR; J. E. Keys, RMSA, USNR; and J. I. Matthews, SR, USNR.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.
(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters he used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns.
(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.
(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.
(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.
(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature, and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.
(7) Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred.
(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS. Radio publications. Latest Call Books, $3.50. Mrs. Earl Mead, Huntley, Montana.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YIY, Troy, Ill.

WANTED: All types of aircraft radios, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

WANTED: Early wireless gear, books, magazines and catalogs. Send description and prices. W6GH, 1010 Monte Drive, Santa Barbara, Calif.

CODE slow? Try new method. Free particulars. Donald H. Rogers, Ivyland, Penna.

URGENTLY need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

DON'T Fail! Check yourself with a time-tested Surecheck Test. Novice, $1.50; General, $1.75; Amateur Extra, $2. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

MICHIGAN HAMS! Amateur supplies, standard brands. Store hours 0800 to 1800 Monday through Saturday. Roy J. Purchase, W8RI, Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Tel. 8-8696, No. 8-8262.

WANTED: Bargains in transmitters, receivers, laboratory and test equipment, also miscellaneous and unusual gear, etc. What have you? Please state price desired. Especially interested in husky power supplies, large filter chokes and condensers, etc. Also need plate transformers putting out about 4,000 V or more each side center. Harold Schonwald, W5ZZ, 718 North Broadway, Oklahoma City 2, Oklahoma.

HANDIEST gadget the c.w. man ever had. Variable speeds for your bug key. Whether QSO or traffic, you can change speeds instantly to suit the receiving operator. Chrome plated. Send $1.98 with make and model of key to J. A. Hills, 8165 Inwood Ave., Dayton 5, Ohio. W8FVO.

FABULOUS K2CBO/20M "Short" Beam puts low power man on map, ask any Brooklyn ham. 10M dimensions, seven pounds, 1:1 SWR, front-back 28 db! Only $39.95. Specifications write Gellman, K2CBO, 1268 East 12, Brooklyn 30, N. Y.

SURPLUS: RG-8/U cable 100 ft. $5.95; 250 ft., $13.25; 500 ft. $25.00. New connectors, PL-259 and SO-239, 5 for $2.00; new oil-filled condensers, 600 WVDC, 2 mid, 69¢, 4 mfd, 90¢, 7 mfd, 95¢, dual 8 mfd, $1.95; 1000 WVDC, 1 mfd, 69¢, 2 mfd, 90¢, 4 mfd, $1.59; 8 mfd, $3.25. AN/APS-13 420 MC transceiver with 17 tubes, $15.50. Postage extra. Request new bargain bulletin. Visit new store for thousands of unadvertised bargains. Wanted to purchase: Surplus radio equipment, Navy synchros. Lectronic Research Laboratories, 715-19 Arch St., Philadelphia 6, Penna.

COLLECTING War Dept. Technical Manuals, etc., in communications and electronics. What have you got? Write to: Bob Briody, 140 West 57th St. (1 RE), New York 19, N. Y.

FOR Sale: 2 BC-611F Handie-Talkies, in excellent condition. W4MFW, Robert J. Moore, 402 Edgewood Avenue, Rome, Georgia.

WANTED: A U.H.F. Resonator 3-element or Telrex 5-element 20-meter beam. Also, a 66 ft. whip. John Wilson, W8ZWX, Lawyer St. Club, Ann Arbor, Michigan.

WANTED: ART-13 transmitters. Write James S. Spivey, Inc., 4908 Hampden Lane, Washington 14, D. C.

QSLS? SWLS? Get America's finest and the largest variety super-gloss samples, 25¢ (refunded). One-day service! "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Mich.

QSL's-SWL's Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSLS-SWLS. 100, $2.85 and up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS, SWLS. America's Finest!!! Samples 10¢. C. Fritz, 1213 Briargate, Joliet, Ill.

QSL's, SWL's. Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 423 Barker Bldg., Omaha, Nebraska.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSL-SWLS. Samples, free. Bartinoski, Houlton, Me.

QSLS. Samples free. Albertson, W4HUD, Box 322, High Point, N. C.

QSLS! Two colors, $2.00 hundred. Samples for stamp. Rosedale Press, Box 164, Asher Station, Little Rock, Ark.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSLS! Taprint, Union, Mississippi.

QSL-SWL cards, Sensational offer. Bristol stock 500 1 color $3.95. 2 color $4.95, 3 color $5.95. Super gloss $1.25 extra. Rainbow cards. Samples. QSL Press, Box 71, Passaic, N. J.

QSL samples. Dime, refunded. Roy Gale, WIBD, Waterford, Conn.

QSLS. Postcard brings samples. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

QSLS-SWLS, as low as $1.50 per color. Samples dime. Stronberg, P.O. Box 151. Highland Station, Springfield, Mass.

QSLS-SWLS, Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSLS: Nice designs. Samples. Besesparis, W3QCC, 207 S. Balliet St., Frackville. Pa.

QSLS! Only the very best! Oscar Craig, P.O. Box 157, Newark, Arkansas.

W6HTN, Riesland, prints QSLS. $1.00 for 100.

QSLS-SWLS. Rainbows, Cartoons, Others. Reasonable. Samples 10¢ (refunded). Joe Harms, W2JME, 225 Maple, North Plainfield, N. J.

QSLS distinctively different. Postpaid. Samples free. Roland J. Dauphinee, W1KMP/6, Box 78374, Los Angeles 16, Calif.

QSLS! Modern. Better quality designs. Samples, 10¢. Tooker Press, Lakehurst, New Jersey.

QSLS — Noteheads. 200 QSLs and 100 noteheads, all in 2 colors or more, postpaid $5.00. 2 days service. Stock up and save. Satisfaction guaranteed. This offer may be withdrawn on moment's notice. Better hurry. CPS, Bladensburg, Md.

BEAUTIFUL QSL cards from World Printing. Samples free. 166 Barclay Ave., Clifton, N. J.

QSLS, personalized. 150, $2.00. Samples, 10¢. Bob Garra, Lehighton, Penna.

QSLS-SWLS, samples free. Backus, 5318 Walker Ave., Richmond, Va.

QSLS. New! Different! Samples, 10¢. Graphic Crafts, Route 12, Ft. Wayne, Ind.

QSLS. Samples, dime. Printer, Corwith, Iowa.

FLUORESCENT QSL-SWL cards. Samples 10¢. Kimball, 1545 Vine, Denver, Colorado.

QSLS. Same day service. Samples. Besesparis, W3QCC Box 66, Frackville, Penna.

WESTERN Hams! QSLs in the west. Save time, money. Personal Prints, Box 64553, Los Angeles 64, Calif.

QSLS "Eventually, why not now?" Ham's "Super-speed specials" will please your contacts and your wallet. Dozen samples, 10¢. Robinson, W9AYH, Dept.-V, 12811 Sacramento, Blue Island, Ill.

TRY Vern's QSLs! Samples, 10¢. Vern's Print, 729 Juul, Hutchinson, Minn.

COMMUNICATIONS Engineers and Technicians! Excellent salaries, minimum requirements. Engineer: Graduate with 3 years experience. Technician: 2 years school in communications and 5 years experience. Require installation, adjustment, and maintenance experience with communication receivers and associate terminal equipment. Also, men with similar experience with high-powered transmitters, antennas, transmission lines. Must be willing to travel in United States and overseas. Write: Page Communications Engineers, Inc., 710 Fourteenth St., N.W., Washington 5, D. C.

FOR Sale: Lysco Model 600, 35 watt VFO/xtal TVI suppressed transmitter. Never used. Clamp modulator can easily be added. Have gone VHF. Price: $100. Les Murray, W8BKA, 19723 Frazier Dr., Cleveland 16, Ohio.

LATE Hallicrafters S-76, $125.00. TV set suitable monitor, $30. W4APJ, 1420 South Randolph, Arlington, Va.

RECEIVERS repaired and aligned by competent engineers, using factory standard instruments. Prompt service, at low cost. Our nineteenth year. Douglas Instrument Laboratory, 176 Norfolk Avenue, Boston 19, Mass.

RADIO Diagrams $1.00 Television, $2.00. Give make, model. Diagram Service, 672-St. Hartford 1, Conn.

QSTS for sale — only 7 volumes left: 1934 through 1937 (Vols. 18 through 21), 1939 and 1940 (Vols. 23 and 24), 1944 (Vol. 28). Each year is bound in black buckram with gold letters. Low price per volume — special price on all eight. L. A. Morrow, W1VG, 99 Bentwood Rd., West Hartford 7, Conn.

TOP Dollar paid for ART-13s, dynamotors, parts, racks and all other component parts. Write to Harjo Sales Co., 4109 Burbank Boulevard, Burbank, Calif.

HOTTEST Ham List in the nation! trade-ins and closeouts of all leading Amateur brands including Collins, National, Johnson, Hallicrafters, Gonset, Elmac, Morrow, Harvey-Wells, RME, Millen, Meissner, Sonar. We trade and offer our own time payments tailor-made for you. All leading brands of new equipment in stock. Write for latest bulletin. Stan Burghardt, WØBJV, Burghardt Radio Supply, Inc., Box 41, Watertown, South Dakota.

REAL bargains: New and reconditioned Collins, National, Hallicrafters, Hammarlund, Johnson, Elmac, Barker & Williamson, Gonset, Morrow, Babcock, RME, Harvey-Wells, Millen, Meissner, Lysco, Sonar, Central Electronics, all others. Reconditioned S40A, $69.00; S40B, $79.00; S76, $129.00; SX71, $159.00; NC57, $59.00; NC98, $119.00; NC125, $129.00; HRO50T, $269.00; HRO60, $389.00; SP400X, $259.00; HT-20, $299.00; 32V1, $345.00; 32V2, $445.00; 75A2, 75A3, Viking I, Viking II, HT9, NC183D, many others cheap. Shipped on approval. Easy terms. Satisfaction guaranteed. Write for free list. Henry Radio, Butler, Mo.

FOR sale, QSTS 1920–1932. Make offer stating month and year wanted. G. S. Watson, RFD No. Grosvenor Dale, Conn.

SELL or trade: — 2 compactly rebuilt BC-457 mobile phone xmitters for 160 and 75, VFO controlled, mike, dual vibrapack, built-in speech and mod., $60 each. 5 new 14 lb. spools #25 en. wire, $10 each. 400v.-80ma. vibrapack, $7. All components for following supplies: — 600v.-740v.-1000v.-750v.-800v. — all 300 ma. 2 tube novice xmitter, $15. 100 watt modulator, $30. 40 watt modulator, $20. Kilowatt final condenser. 110v. DC generator, $10. Need: — Grid-dipper, S-38 or BC-348 receiver, Offr. W8QKU, 2748 Meade St., Detroit 12, Mich.

BARGAINS: With new guarantee: R-9-er, $14.95; Gonset Triband, $29.95; S-72, $59.50; S-38C, $35.00; S-40, $65.00; NC-57, $65.00; RME-45, $99.00; Lysco 600, $109.00; S-27, $99.00; SX-43, $129.00; S-76, $149.00; SX-71, $169.00; SX-42, $189.00; HRO-50, $275.00; HT-17, $32.50; EX Shifter, $19.00; Globe Trotter, $49.50; Harvey Wells Sr., $69.00; DeLuxe, $79.00; Viking I, $209.50; New SS-75, $189.00; early HT-9, $139.00; Globe King, $275.00; 32V1, $395.00; 32V2, $475.00; 32V3, $575.00. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

WANTED: APR-4, APR-1, APR-5, ART-13, ARN-7, BC-610 BC-614, BC-939, BC-348, BC-342, BC-312, ARC-1, TCS, RTA-1B, ARC-3, BC-221, LM, TS Test Equipment, CU-25 TDQ, TAJ Teletype, Boehme, DY-12, RA-34, TS-174, TS-173, 32V, 75A. Will take any surplus or amateur equipment in trade for new Johnson Viking, Ranger, Barker & Williamson, Hallicrafters, Hammarlund, National, Gonset, Elmac, Central Electronics, Telrex, Fisher, Pentron, etc. Write to Alltronics, Box 19, Boston 1, Mass. Richmond 2-0048. Store: 44 Canal St., Boston, and 60 Spring St., Newport, R. I.

FOR sale: S-53A receiver and TR75TV transmitter; $65 and $40. F.o.b. Enon Valley, Glenn H. Kennedy, WN3AMH, R.D. #2, Enon Valley, Penna.

Need your used equipment. Best trade-in allowance. Write me. Uncle Dave, W2APF, Fort Orange Radio Distrib. Co., Inc., 904 Broadway, Albany 4, N. Y.

SELL: Globe King 400B, all coils 10-80. Like new condition. $375 or best offer. W9PZN/Ø, 121 E. Rose St., Owatonna, Minn.

ELECTRONICS engineer, with ham exp., to design transmitters and accessories. Spare time work. Metropolitan New York. Cromwell Advertising Agency, 300 West 43rd, N. Y. 36, N. Y.

SELL: Viking II, VFO, A-1 shape: $295.00. W2PSG, Edward MacFaul, Route #1, Lewiston, N. Y.

FACTORY-built Viking II, Viking VFO, D-104 mike, ten months old in perfect condx. Going back to c.w. Hi-power DX. $300. W9SHO, D. F. Christopherson, 1725 St. Lawrence Ave., Beloit, Wisconsin.

FOR Sale: SX-71 with R-42 speaker and Lysco 600. In good condition. $150 each. Roger Kalkis, 2233 E. 4th St., Waterloo, Iowa.

NC-101XA Rcvr, spkr, $75;- RCA AR-77E rcvr, $85; DB-22A Preselector, $45; Wilcox CW3 Rcvr, $20; BC-1031A Panadaptor (3"), $100; BC-614E speech amplifier, $60; 1-192A audio generator, $50; 80M-B signal generator, 8–330 Mcs. needs some repairs, $125.00; DM-65 dynamotor 12/440 @ 400 Ma., $15.00; CF-7 carrier repeater, $10; Geo. H. Goldstone, W8MGQ, 25416 Parkwood, Huntington Woods, Mich.

COLLINS 30K-1, complete, new condition, $900; Motorola FMT 30 DMS and 75, two complete units, two channel operation 20, 75 meters; factory modified; antennas included, tuned to transmitters, $300. F.o.b. W1THM.

FOR Sale: 1500V @ 300 Ma. power supply 19" x 10½" grey panel, $45; BC-459, brand new, $18.00; XE10 Sonar FM exciter, $15; 3 ft. blk rack cabinet, $13; G.I. 78 rpm record cutter and playback, $15.00. Local sale preferred. W2VZQ, Andy Cola, 168 McKinley Ave., Brooklyn, N. Y.

BC-211-AN frequency meter; like-new, with original calibration charts and manual TM 11–300. Range 125–20,000 Kc with xtal check points in all ranges. Panel mounting. Complete with xtal and tubes. Tropicalized. $115. F.o.b. Brooklyn, N. Y. S. V. Marlowe, 2145 Ocean Avenue, Bklyn 29, N. Y.

WANTED: Lear 12 volt T-30-AB transmitter, RCBB receiver, G30AB power unit. Advise lowest price and condition. Don Neal, Box 1002, Douglas, Alaska.

WANT: SX-28. Must be reasonable and in gud condx. Send details. Sell Q5'er Navy R23, new, $20. Eico batt. eliminator, $20; Heath tube tester TC1P, $25; PE101C new, modified, $395. All plus shipping. M. J. Marshall, 455 Washington Ave., Dumont, N. J.

SELLING Out! HRO60, NFM and xtal calib., matching speaker, A,B,C,D coils; 400B Globe King (80–40–20–10 coils), TVI'd, push to talk, D104 mike, Mod. 120 Viking VFO, coax ant. relay, speech filter, complete unit factory built, no home wiring, 6-ei. 10 over 20 Hy-Lite beam, complete with prop-pitch motor, selsyns, indicators and all connectors, cables and controls. Complete mobile station: 50W, 10m, VFO, AM xmittr complete with PE103, all meters, cables, 10M whip and Gonset converter. Best offer over $1000 takes all. Box 828, Eldorado, Kansas.

NEED ART-13. R. Ritter, 4908 Hampden Lane, Bethesda, Maryland.

RECEIVERS repaired, aligned. Collins modifications by competent engineers, using factory-standard instruments. Prompt service. Our nineteenth year. Douglas Instrument Laboratory, 176 Norfolk Avenue, Boston 19, Mass.

JOHNSON Viking II (TVI), $210.00; Johnson VFO, $22.50; Johnson low pass filter, $9.00; Balun coils (2), $4.00; Vibroplex Bug, $8.00; Paul Gaynor, 400 East 52nd St., New York 22, N. Y. Tel. PLaza 9–2900 after 6 PM.

FOR Sale: National One Ten receiver with power supply and speaker, Eldico Antennascope, 2-in. MM-2 oscilloscope. Best offer takes them. L. Ingalls, WØVOY, Tracy, Minn.

TRANSMITTER: Kilowatt c. w., 800 phone, remodeled Federal, composite 805 modulators, power supplies, broadcast components, relays — 'scope. Write for details. Box 84, Blauvelt, N. Y.

WANTED: Collins KW-1 transmitter. Missionary Communications Service, Houghton, New York.

SELL: Lysco B-129; National S-O-J; Philmore Novice transmitter; Gardiner tape machine; Hallicrafters S-29; Bliley 100 Kc xtal; complete set of parts including tubes and drilled chassis for 2-meter rig in the April 1954 QST, p. 11. Do not have time to finish building same. Please state price in first letter. Will ship F.o.b. Philly. Wally Moyer, W3VZI at 7249 Lawndale St., Phila. 11, Penna.

NEW twenty-meter groundplane sturdy telescoping aluminum mast. Complete with mounting, guy and radial wire, insulators, instructions and all necessary hardware. Assemble and erect. Just $19.95 F.o.b. New Hyde Park, N. Y. Specify shipping. M. Pollack, K2DNL, 1517 Falmouth Ave., New Hyde Park, N. Y.

SELL: Sonar CFC VFO/xtal exciter: $30.00. BC459A, $10.00. W2GKK.

HAMS! Pay cash and save on the new Johnson Kilowatt and on all popular ham gear. No trades. Write or call "Olde Rex", Electronic Heights, Wellesley @ Natick, Mass., OLympic 3–2130.

COMMERCIALLY designed custom amateur equipment. Write to Arnold K. Beauchemin, Electronic Engineer, Member IRE, ARRL, W2CTB, 11-A Wayne Gardens, Collingswood, N. J.

FOR Sale: Perfect BC459, 7–9 Mc. Beautiful c.w. note, $15.00; Link 25 watt police xmittr, 10M, 807, 2–6A6 Mod., complete with enclosed relays and dynamotor, $60; Gonset Sup. 6, $39; 10M whip and heavy Ward base, ex., $10; 6v. -300V. 100 mil Mallory Vibrapack, $10. New RCA813, $5. Dave Morse, W1TBW, 35 Nichols Rd., Needham, Mass.

ANTIQUE tubes, QST's, antique radio magazines, technical books, etc. Mrs. Conrad Beardsley, 103 Wythburn Rd., South Portland 7, Maine.

SELL: National 183 receiver and Select-O-Ject in excellent condition, and three Aircraft transmitters, one each — 3–4 Mc., 5.3–7 Mc., 7–9.1 Mc. These are brand new, never had time to convert and use. $200 takes all. F.o.b. this address: William Duncan, Western College, Oxford, Ohio.

TRADE: 3" Philco 'scope, Mod. 7020, originally cost $139. Want small receiver, transmitter, etc. David Craycraft, WN8TWB, 128 Progress Ave., Hamilton, Ohio.

COLLINS 32V3. New, less than one hour's use. First check for $565. No trades, sorry. F.o.b. Omaha. WØWQE, 5236 Ames, Omaha, Nebr.

SX-42 R-42 excellent, first $165 takes both. L. K. Hussar, Box 143, Oak Hill, W. Va.

QSTS 1919 to 1937 Make offer, stating month and year wanted. Gepapa, North Grosvenordale, Conn.

VAN SICKLE has "Multiphase" SSB in stock. Bargain hunters ask for stock reduction specials. W9KJF, Gene, 1320 Calhoun, Ft. Wayne, Ind.

MOBILES: Sell complete rig, 20 watts VFO on 75 and 40; 2E26 final, separate modulator w/cabies, 400V, 250M 6V. dynamotor, relays, $50.00. F.o.b. Charleston, S.C. Lt. Ed Wheeler, 22 ATS, Charleston AFB, South Carolina. K4ADD.

TRADE: Latest Bessa II, Ikoflex IA cameras, 4 x 5 enlarger, darkroom equipment for ham transmitting gear, beams, hi-fi gear, etc. Marcel L. Valois, W5CII, Box 488, Covington, La.

SELL: Two Triplet Model 3441 oscilloscopes. Both are new. Each $169.50. Wayne L. Faith, Montpelier, Ohio.

WANTED: Used communication receiver. Drop a card giving full specs to Gery Steinke, WØPVR, 320 17 Ave. S.E., Minneapolis 14, Minn.

FAIR Eimac 4–250A, new, $30 each; Dow-Key 6 v.a.c. coax relay, $5.00; Eldico antennascope, $20; BC–610 500w. modulation transformer, $12; B & W CX-95 v. condenser with coils and plug-in mount for 20–40–80 meter kw final. W8EWS, Box 6121, Flint 6, Michigan.

WANTED: 25 Watt modulator, also 2 meter transceiver described in April 1954 QST. K2GKK, Don MacDonald, Rt. 1, Lakewood, New York.

USED commercial FM communications equipment bought and sold. W2FOU. Allan M. Klein, 95–33 225th St., Bellerose, L. I., N. Y.

FOR Sale or swap one new National HFS and 110 V.A.C. power supply for RME VHF 2-11 rec. or Hallicrafters SX-25 rec. T. Johnston, 1919 Whitehall Rd., Muskegon, Mich.

FOR Sale: Viking I and Viking VFO coax relay, extra brand new 4D32 JT30 mike, $175. W2VP.

SWAP Jewlers chromed cross-slide lathe compound, PDQ direct positive camera complete, two Briggs 1 Hp engines, Maytag 2 cyl. engine, Doodlebug motor-scooter. Any or all for good transmitter and/or receiver or other ham gear. W. G. Horn, W5GSF, Bay Springs, Miss. Tel. 4–6260.

BC669-C excellent, $150.00; BC654-A, $25.00; BC659B with 6 volt supply, $30.00; ARC4, $20; new Johnson mobile wired tested with tubes, $100; new cartoned S53-A, $65; BC1068-A, $25; 24 volt D.C. 100 amp. power supply, $30; NC-101 National, $30; BC-457, $10; FL8 filters, 50¢, prop pitch motor $10; army antenna kit, $40; one new 1032 Pandadapter, $60. What have you to swap? W7HCJ. Farano, 308 Locust, Dishman, Spokane, Wash.

HALLICRAFTERS HT-20 transmitter (new) with Johnson VFO and Matchbox, $375; Globe-King deluxe 400B transmitter, with all coils (160 thru 10) GD-104 mike and low pass filter, $425; single sideband exciter (factory wired and new) Model 10A with VFO and mike, $120; Elmac receiver with power supply, six months old, $110; two (2) Handie-Talkies, in excellent shape complete with batteries and xtals, $180. Adleta Co., Cedar Springs at No. Akard, Dallas 1, Texas.

FOR Sale: Half interest in radio service shop. Well established, large area, no competitors. Television in March. $4000.00 will handle. Write for particulars. John Scoville, Box 696, Lakeview, Oregon.

COLLINS twins, excellent, 32V-3, $595; 75A-2A, $425; both for $1100. F.o.b. Cincinnati, with extras worth $135. Write Mel, W8LLX, Terrace Park, Ohio.

QST, Radio, broken files 1930–1943; 130 numbers at 20¢. F.o.b. Write for list. D. P. Keily, R.R. No. 1, Box 90, Concord, Mass.

FOR Sale: GO-9 transmitter, 250 watts cw, bandswitching 15 thru 80, VFO, 115V. power supply. Gud condx. $125. Also ARC-4, 2-meter transceiver, converted with power supply. $50. Prefer personal pickup. R. Phoenix, W9HFN, 432 S. Madison St., Macomb, Illinois.

For Sale: A used SX-71 in very good condition, $175. Am in college now. WØABS, West Plains, Missouri.

FOR Sale: BC-348-0 110V A.C., shock mount, in good condition, $55.00. W. M. Jackson, W4ILZ, Box 51, Savannah, Tenn.

WANTED: Wilcox CW3 or F3 with 3 Mc. coils. Spera, 37-10 33 Street, Long Island City, N. Y.

WANTED: One 1913 Government Amateur Call Book published by Department of Commerce, Radio Division. Will pay $10.00. R. S. Egolf, W2WX, 90 Eighth Avenue, Brooklyn 15, N. Y.

GOING Mobile? Have Vibrapacks 6VDC input 400V 100 Ma. output, $12.50, ant. switches ceramic with heavy duty contacts, perfect for ant. couplers 11PST, $1.35; 6VDC motor with gears and keying points for sending SOS-SSS, $3.50. 500 Kc xmittr 5W (less power supply), parts alone worth $2.25. Gallagher's Service, John, W2VAQ, Boiceville, N. Y.

SALE: HRO60, with coils, like new, $410.00. R. E. Ridenour, 839 Wildwood Parkway, Balto 29, Md.

GOING SSB: Complete mobile rig. TBS 50-D w. VFO, wired relay push-to-talk, $110; heavy-duty surplus 6v. dynamotor w. relay, filter, wired for TBS 50, 400v 250 Ma. $35.00; Elmac PMR 6A mobile recvr, $95; VHF 152A, $40; Millen 90810 VHF xmttr, $60; Gonset 2 meter converter $28.50; Gonset 2-meter pre-amp, $15. W6JYA, 215-32nd Ave., San Francisco 21, Calif.

ELMAC PMR-6A recvr, 115 Vac ps. 6V dc ps., $125; Gonset Cdr with VFO, $100; PE-103 w. base (in ex. condx), $25; complete with ant. relay, contr. box and cables, $225; conv. ARW-34 (PP4E27's @ 400w. & ps), $50; PP 5514 mod. & ps, $50; 6v 400v 150 Ma., Vibr. PS, $8; 12v 425v 225 Ma. Dyn., $5; new Gonset noise clipper, $3. All F.o.b. Chincoteague, Va. and all inq. ansd. W. J. D. Bradford, GMU-3, NAAS, Chincoteague, Va. W4FPJ.

FOR Sale: DeLuxe 1 KW plus. Two complete finals for 4-125's or 4-250's covering 80–40–20–10 including antenna tuner. Modulated Class B pair of 810's with clipper. Commercial speech amp. Separate heavy-duty power supplies for final, modulator, grid and screen. *All contained in two 7 foot cabinets with some room to spare. Good* high-grade parts, over $1200 worth. Will sell for $500. James C. Bailey, W9CLP, 10 Westview Dr., Macomb, Illinois.

RECORDING Fans! Swap tapes everywhere. Details free. Box 1404, San Francisco 1, Calif.

PRINTED circuit kit, complete with laminate, chemicals for etching, etc., only $2.00 postaid. Springfield Enterprises, Box 54-G2, Springfield Gardens 13, New York.

COMPLETE 60-watt phone transmitter: 807 final, mod. with pair 6L6's, AB2. Xtal osc. with 2 doubler stages; 40-meter xtal and coils for 10 meter output furnished. RF and audio on one chassis, pwr supply (600v., 300 Ma. 6.3v, 6A) constructed on separate chassis. All well built and used very little. Excellent condx., no junk. Also new Astatic JT-30 mike, new Heathkit AO-1 audio oscillator, new Bud CPO-128A Codemaster. Also two used power transformers; 1000v-750v-0-750V-1000v., 200 Ma and 1200V-0-1200V, 300 Ma. First $100 takes entire lot. No trades. All inq. ansd. W5LFB, W. L. Cook, 1614 Morson Rd., Jackson 9, Miss.

W9ERU still cleaning out the shack. SX-28, $99; 75A1, $250; 3" Panadapter, $54; condensers, transformers, selsyns, rotator, decade box. WE line amplifier, many more. Send stamp for list to 2511 Burrmont Road, Rockford, Illinois.

LVSCO 600, perfect, $90; National MB-150, excellent, $13; BC-457A, good, $6; shipping is extra! K. Conrad, Akron, N. Y.

ANTENNA for bandswitching transmitters up to 300 watts input, approx. 120 feet long, centerfed with 75-ohm line, 70 feet included, low SWR, tunes 80–40–20–10 meter bands. U. S. Patent 2,535,298. Each one tested for resonance on all bands. Send stamp for details. $18.95 each. Lattin Radio Laboratories, 1431 Sweeney St., Owensboro, Ky.

300 Watt transmitter, $140. Mobile transmitter with dynamotor, $30; 350 watt Katolight generator, $65; SX-71, $160; BC453, $15; 420 Mc. gear, 80m. VFO, GDO, antenna and other misc. gear, priced very cheap. Send for list. D. P. Tracy, 2233 Michael Dr., Youngstown 11, Ohio.

SELL for best offer: *QST*'s 1926 through 1953, only 8 issues missing; PE103A generator complete with base and cables, also one PE103A generator head, both never used. Parts for power supply and modulator for 200 to 300 watt transmitter, including meters and tubes, most never used; miscellaneous parts and sections of SCR522, including tubes; also many spare parts such as tubes, transformers, meters and capacitors. Will send list on request. E. Kirdahy, W2BCF, 211 Smith St., Brooklyn 1, N. Y.

WANTED: Old-fashioned "side-swiper" key (not a bug). WØLPB, Hamilton, 900 So. Fairview Ave., St. Paul, Minn.

URGENTLY need internal schematic of Workshop antenna rotator motor and rotor indicator wiring. D. L. Marks, W2APF, 904 Broadway, Albany 4, N. Y.

FOR Sale: Viking II transmitter, $240; Heathkit VFO, $20; SX-25 Hallicrafters receiver, no speaker, $45; Astatic push-to-talk mike, $10; new mod. 425K "Eico" 5-in. oscilloscope, $35. Will consider trade on TV test equipment. J. R. Driver, W4ZRS, 6419 Fitzhugh Ave., Richmond, Va.

SELL: BC625A transmitter, $15; Mallory VP554 Vibrapack, $12; Mallory 6A3Vs Vibrapack, $10; Millen R9'er, 10 and 20 meter coils, $16; Jones MM1 MicroMatch, $19.50; pair "Syncro-Transmitter" selsyns, $12; TR4 transmitter modified for 220 Mc., $12; Gonset Triband converter, $27.50; Gonset clipper, $5. W3BS, 1012 Wilde Ave., Drexel Hill, Penna.

FOR Sale: New Gordon 1 KW antenna changeover relay, $10; new sealed 250TH's pair $22, each $12; Stancor cased fil. xfrmr 10v. @ 10 amp., $4; new pair 810's, $11, each $6; 750 watt mod. xfrmr (comml.) impedance ration 2.7:1 70 lbs. $25; Browning hi-gain 5-band preselector 1.7 to 39 Mcs $15; Mallory Vibrapack 12v. to 300v. @ 100 Ma., $12; Weston AF output voltmeter Mod. 687, new, $20; Weston model 301 Db and Mw meter (100% mod. @ minus 5 db-600 ohm-slow action type) brand new, $10. First check buys. All postpaid except mod. xfrmr. S. Tucker, W2HLT, 51–10 Little Neck Pkwy, Little Neck 62, N. Y.

SELL: RMR-45 Cal-O-Matic model, good condition, $85. H. Ellison, W3QXZ, 294 Clermont Ave., Pittsburgh 27, Penna.

WANTED: A complete CREI Radio-Television or television engineering correspondence course. Standard 5–6 foot enclosed steel rack. Complete commercial 10-meter mobile rig for sale. Arden Ebert, WØWTE, 101 No. Garth Ave., Columbia, Missouri.

GLOBE SCOUT 40A Bandswitching transmitter, factory-wired. Converted to 60 watts c.w., 50 watts on fone. New condition. A real buy. $75. Fred Claus, 608 Wible Rd., Pittsburgh 9, Pa.

BAPTIST preacher-hams list being revised again. Send name, pastorate, operating habits; be included; get copy free. Rev. Wes Miller W5QNK, First Baptist Church, Chelsea, Okla.

2-METER beams; 6-element, horizontal or vertical; all seamless aluminum. $6.95 prepaid. Wholesale Supply Co., Lunenberg, Mass.

WANTED: 1-right angle drive National 85-ACD-2, 1–300$\mu\mu$f Bud MC-910, 1–100$\mu\mu$f Bud CE-2004, 1–30$\mu\mu$f Cardwell ET-30-ASP, also 4–50$\mu\mu$f and 3–100$\mu\mu$f. Midget padders. Hammarlund APC. W8VLB.

FOR Sale: Sylvania modulation meter model X-7018, $15; UTC modulation transormer S-20, $6; UTC power transformer S-46, $8; 2" round Weston 0–1 Ma. $2; 4½ inches square Marion 0–1ma, $4; Weston 0–100 current squared thero-milliameter model 425, $10. Johnson Neut. condenser $3; pair EB8B field phones, $15, and black cabinet, 12¼" panel space, $5. A. W. Speyers, W2CZA, 39 Lowell Ave., Summit, New Jersey.

FOR Sale: Geloso VFO unit using 6J5, 6AU6, 6V6. Described by W6SAI in article in the October '54 CQ. New, less tubes, $30. Vic Crawford, W1TYQ, RFD #5, Danbury, Conn.

NC-57 $45. Meissner FX Signal Shifter, $40. Both for $80. W2MNI, 83 Seacord Rd., New Rochelle, N. Y.

WANTED: NC-183D, Chicago area. Frank Joseph, W9AOI, 354 Osage, Park Forest, Ill.

FOR Sale: Heathkit AT-1 transmitter (35W.) and AC-1 antenna coupler. In A-1 condition: $40. Dave Lifton, 140 B. 135 St., Rockaway Beach, L. I., N. Y.

SELL 60-watt modulator/speech amplifier and Multi-Match modulation transformer, $40; modulation transformer 811's to 813, Thordarson T21M59, new, $12; 1550 VDC @ 200 Ma., $15. Two 350 Ma. Triplett meters, $3.00 each; new B&W 150-watt all-band turrett, $10. Money back guarantee on all parts. W5HMZ, 323 Main, Pine Bluff, Arkansas.

CALL Signs, reflectorized aluminum. Regular $1.50; Jumbo, $2.00. Lawn sign, $2.75. One day service. Whitley, W2LPG, 133 Airsdale Ave., Long Branch, N. J.

COLLINS 32V1 converted, in excellent condition. Filter, $350. John Strubank, W8FXA, 4417 Bedford, Detroit 24, Mich.

SELL: Prop pitch rotor; transformer and two selsyns, $30 f.o.b. Radio Club, Central High School, Sioux City, Iowa.

TRADE: Brand new Zeiss Ikoflex camera, 3.5 Tessar lens, with case, $100 or Trade for HQ129X. Also Zeiss Super Ikonta, built-in exposure meter, range finder, used twice. Worth $350 new. Trade for Viking II. W. O. Eden, 479th Comm. Sq. George AFB, California.

FOR Sale: Teletypewriter Model 26. Has been completely reconditioned and is like new. With metal typewriter stand. $150. F.o.b. Los Angeles. Would consider trade for good receiver. W6OQB, 230 West Camino Real St., Arcadia, Calif.

TRADE: 2¼ x 3¼ Bausch Pressman f4.5 Velostigmat lens Kalart rangefinder, Master automatic flash gun. Six cut film holders, film pack adaptor, four wratten filters and lens shade. Equipment in good condition including fair carrying case. Need HQ140-X. Would consider a 129. J. T. Robinson, 1621 West Oklahoma, Enid, Okla.

GLOBE-KING 400B with 80, 40, 20, 10M coils, spare V70d's, 5514's, 300 ohm low pass filter, in excellent condx, $375; Heathkit GDO model GD-1B, never used, $20; Simpson tube-checker, model 305, checks latest tubes, like-new, $35; Superior VTVM, Mod. 400, good condx, $35; both $65. Bryson Lowman, W4TTH, 1009 Northwood St., Columbia 2, S. C.

QSTS 1924 to 1954 inclusive. Best cash offer acceptable to me. W2ATJ, 133 High Street, Mount Holly, N. J.

SELL: Complete 35 watt transmitter including VFO, antenna coupler, and relays. *This is a new Heathkit set, ready for operation.* Will take best offer. Write or call Maurice Bernhard, W3ZZD, 406 W. Penna. Ave., Towson 4, Maryland. Tel: Valley 3–4792.

FOR Sale: 4000 watt 110volt 60 cy. power plant 4 cyl. air cooled Onan. Used 30 hours. Push button or manual start. Needs 12 volt battery. In excellent cond. $500. F.o.b. Millinocket, Me. "Doc" Leavitt, W1MXT, Whalen Bldg., Millinocket, Me.

SALE: Eldico TR75TV, in excellent condx, with three sets of coils. Best offer over $60. Write for details. Al Brogdon, W4UWA, 326 So. Walnut, Cookeville, Tenn.

SELL cheap or swap: components of 4 transmitters from KW down. Want good receiver. K2KGU, 519 West 139th St., N. Y.

WANTED: Tech Manual for Bendix T-12-C transmitter. Also desire to exchange conversion ideas on same. W8YGV, Kihm, 3598 West Boulevard, Cleveland 11, Ohio.

CALL-SIGNS: Mobile, Shack, Lawn-stake, $1.00 and up. Free literature. Kallsigns, 2029-A Bradley, Chicago 18, Illinois.

PRINTED Circuits: Make your own printed circuits. Kit includes materials and instructions. $2.95. Felix Dutko, 2078 Vyse Ave., Bronx 60, N. Y.

VS Baby mobile antenna. Satisfied XYL mobile antenna problem. Beautifully chromed, only 4 ft. high. High Q, weatherproof plug-in loading coils. Changes bands instantly. Top section resonates antenna to operating frequency. Becomes regular car whip when coil is removed. Perfect for Gonset, Elmac, Viking, etc. Bandswitching transmitters. Tiny but effective on all bands. Replaces regular cowl or fender broadcast whip. Easily installed in a few minutes. Coils available 75 thru 10 meters. With all mounting hardware and onecoil, $12.95 eac. Specify band. Other coils $2.75 each. W6VS Bill Davis, 225 Cambridge Ave., Berkeley 8, Calif.

FOR Sale: L kw fone and cw transmitter; band shift covers 4 bands, pair 813's, final 810's modulators; commercially built, $300. 1 Kw oil filled modulation transformer, $100. 5 Kw oil filled plate transformer, 3000 each side, $100. Will deliver 300 miles in Seattle area. W7KV

SELL: NC-183-R and speaker, $185; NC-2 40D, speaker, $165; NC-101X, $85; HT-9, $95; 32V-1, $375; 32V3, $575. Want: ARC-1, BC-610, ART-13, 75A-1, Dy-12, ARN-7, TDQ. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

SELL: National 183D, spotless, guaranteed, like-new, in original packing, $285. WØATP, Thelemann, 9412 East Gregory Blvd., Hickman Mills, Mo.

FOR Sale: Phone/c.w. xmitter: 6146 final completely TVI-proofed, commercial looking; RME-69 receiver; vertical ground plane 14 Mc. antenna (110 ft. coax cable). All for $110. Prefer locals. H. Weintraub, W2KRB, 1475 Walton Ave., Bronx, N. Y. Call JE 6-8114 after 6.

NATIONAL NC-98 for sale. Used only 3 weeks, absolutely like-new, with matching speaker and case, $125. J. Klein, 235 Lyons Ave., Newark, N. J. phone WA. 3-3025.

NEW Lysco Transmaster 600; TVI-free, 35 watts and Model 50 antenna coupler, both $99; 25-watt Stromberg-Carlson audio amplifier modulating above, $25. W5JIZ, Pully, 4031 Clover Lane, Dallas 20, Texas.

CASH Paid for *BC-610-E xmitters*; BC-614-E, Sp. amplifier, BC-939 or 729 ant. tuning units, also BC-221 freq. meters, TCS and others. Technical manuels wanted. We need Sig. Corp, Navy and Air Force stock catalogs; maintenance and instruction TM's for war surplus equipment. Amber Co., 393 Greenwich St., New York 13, N. Y.

FOR Sale: Like-nu, Bogen DB-10 hi-fi amplifier with case and Garrard RC-80 changer: $50. Louis G. Barrett, Ex 1NP., 26 So. Main St., Hanover, N. H.

NEW ham desires to purchase entire station or separate components. Interested in Hammarlund rcvr; Collins xmitter. State price and condx of equipment. A. Paleogos, 144-64 Sanford Ave., Flushing 54, L. I., N. Y.

MOBILE station for sale: Babcock MT-5B transmitter, Gonset Super-Six converter, PE-103 dynamotor and complete Master Mobile all-band mobile antenna system. Complete with all cables, relays, mike, connectors, coax, noise-filters, etc. All in perfectly new condx. $250. WØOMH, Grothen, RFD #2, Hastings, Nebraska

ENGRAVED laminated plastic call-signs, 1¾" × 7", $2.00. Postpaid. Box 426, Jamaica, L. I., N. Y.

SELL: Bendix automatic band-switching 100 watt fone/c.w. transmitter 540 to 9050 Kc. or swap for NC-183; new BC459. Hoffman, W8ET, 366 Canterbury Rd., Bay Village, Ohio

VIKING II, VFO, in excellent condition. Best offer, cash and carry. W2ZDQ, Fenning, 8 Tessen St., Teaneck, N. J.

30 FT. triangular galvanized steel tower complete with 3-element plumbers delight, 20-meter beam with gamma match, rotator and two selsyns. Used less than one year. $250.00. Can be seen at 36 Van Schaik Rd., Wyckoff, N. J. or contact Gene Yost, W2FMN, 163 West Prospect St., Waldwick, N. J.

SELL: S-53, $49; Viking VFO, $45; 3E29, $5; Stancor 750-0-750 No. P6334, $5; 500 watt B&W coils; $1.00 each; Millen 2-meter plug-in coils; carbon desk mike $2. W3VIM, Droke, 4113 Slater Ave., Baltimore 6, Md.

WANT fractional power mobile station using auto receiver power. Leiber, 130 Langston, Hot Springs, Ark.

TRADE *unused Minneapolis-Honeywell Y229A2 furnace heat* regulator complete with thermostat, etc. Want mobile equipment or what have you? W3VEP, 1 Virginia Terrace, Pittsburgh 29, Penna.

BC-610 complete with 614 speech amplifier, antenna tuner, TVI 100%, B&W final coils, 807 w. $500. Will consider B&W, Viking or Collins in trade. W. M. Fryer, W4HKT, 225 N. Green, Henderson, Ky.

FOR Sale: Collins 310-B. George Kravitz, 7919 20th Ave., Brooklyn 14, N. Y.

FOR Sale or trade: Viking Model 122 VFO for cash or c.w. xmittr or other ham gear. W9HSK, *Eldon*, Box 84, *Bloomfield*, Indiana.

FOR Sale: Complete mobile rig, $100. Heath AT-1, $30. All in vy fb condx. W5ZWM.

WANTED: S-40 Hallicrafters receiver. Send full details and lowest price to Kenneth Warner, KN2JSS, 64-11 99th St., Forest Hills, L. I., N. Y.

SELL or swap: Late Hallicrafters HT9 transmitter, in perfect condx, with VFO, for higher powered rig or include excellent Hallicrafters SX28A with speaker for Collins 75A2 or HRO60. 100% QSL. W3WCW, 30 B Glenwood Road, Baltimore 21, Md.

REPAIR calibration all types of meters. For estimate send to Martin Vyenielo, P.O. Box 741, San Bruno, Calif.

SELL: NC125 receiver and matching speaker, $135; Johnson VFO, $40; TBS5OD Bandmaster Deluxe with pwr supply, $100. Entire outfit, $250. Almost new equipment. Roger Burnham, W1SIM, 73 Shelter Cove Dr., Milford, Conn.

BANDMASTER Senior and APS 50 AC supply, 1 year old, $85; Panadapter SP44, $55. Both now in use. W2HWH, 152 Garfield Pl., Maplewood, N. J.

FOR Sale: Collins 32V3, like new, $590; also 500 watt modulator, using 810's; 1 KW modulation xfrmr, $45; 2500 VDC at 500 mils pwr supp., $70; 3000 VDC at 500 mils supp, $90; push-pull 4-125A's all-band final, completely encased with 7 meters and integral grid and screen voltage supplies, beautiful, $225; also high power triodes and other equipment. Write for list. Tom E. Davis, Box 5, Willmar, Minn. WØSW.

FOR Sale: 1 Delco 100 amp. generator, practically new, $100; 1 Leece Neville 80 amp. generator, practically new, $100. Contact: Jack Babkes, 2227 East 65th St., Brooklyn, N. Y.

COLLINS Exciter 310B-1, coils, book, original carton, $200. H. Bergmann, W2WDT, 1028 Jefferson Ave., Brooklyn 21, N. Y.

WANTED to buy: small used or surplus Marine Radar unit for 110v. or 220v. AC or 12 V o.c. supply current. Must be complete, with power supply, all plugs and cables, antenna, etc. In operating condx and includes service and operating manual. Send full particulars and price to P. H. Hodges, K6CQV, P. O. Box 675, San Mateo, Calif.

FOR Sale: Collins 70E 8A osc., *National M-B 150 Multi-band tank* circuit, modulation transformers from ART-13 (driver and output). M. Katz, W2KPE, 147-11 76th Ave., Flushing 67, L. I., N. Y.

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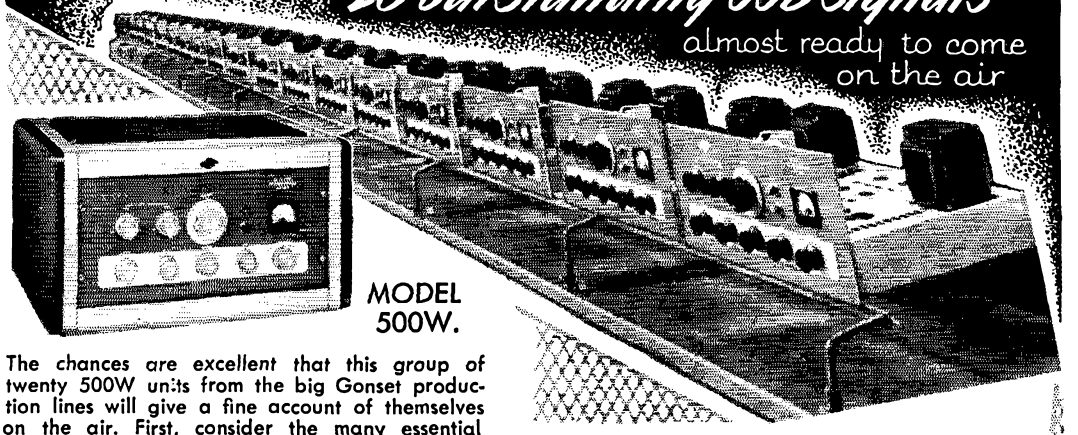
20 outstanding SSB signals
almost ready to come on the air



MODEL 500W.

The chances are excellent that this group of twenty 500W units from the big Gonset production lines will give a fine account of themselves on the air. First, consider the many essential elements that make up any good linear . . . then . . . check the 500W. You'll find them ALL there, built-in, inherent ! For example:

Excellent linearity on SSB or AM.

Complete stability, a freedom from oscillation, parisitic or otherwise . . .

Loadability . . . to any practical degree with pi network output into 35 to 300 ohms. (A big assist in tuning is provided by full switchable metering including . . . grid drive and an output RF voltmeter.)

Insurance against inadequate loading . . . a special, relay-actuated screen cutout circuit, interrupts screen voltage, protects tubes, continues to flash a panel light until improper underloaded condition is corrected.

Grid circuit is adequately pre-swamped.

Excitation control . . . permits precise excitation adjustment for AB_1 or AB_2 operation.

80 mfd., capacity . . . in filter of heavy-duty, (bridge) power supply gives excellent dynamic regulation.

Add . . . as highly desirable features . . . single knob bandswitching for 10-11-15-20-40-75-80 . . . (provision for extra band, as 160) . . . low replacement cost tubes, (4-807's) . . . very low grid drive requirements on SSB, C.W., AM . . . precision parts and workmanship inside . . . and outside . . .

SSB – 250 Watts Peak envelope power.
AM – 80-100 Watts Carrier
CW – 220-240 Watts Output

Net.... 339.00

"Look for me on your frequency"

. . a statement any Communicator owner can now make without sifting through his crystal stock.

GONSET 2 meter VFO brings complete diversification to your operation . . . brings added enjoyment in the form of more . . . better . . . QRM-free contacts . . . DX . . . C-D, CAP, nets or just friendly "Zeroing-in".

Does something else too. A built-in stage of audio pre-amplification provides extra audio gain for Communicators, permits "sit-back" operation of lower-level xtal mikes. Panel gain control also.

No installation problems . . . no soldering . . . no wiring changes needed. Plugs into Communicator like a crystal . . . flexible mating rear plugs link the two units . . . in seconds.

VFO output at 24 mcs., (can be used with other 2 meter equipment). Switch permits "zeroing" without carrier.

Calibrated dial tunable over same frequency range as Communicator . . . also usable as VFO for C.W. reception.

High stability. "Stays put" when received at stations using crystal converter front-ends into communications receivers.

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EVERYTHING IN ELECTRONICS

KEEP IT HANDY

Become an honorary National Engineer!

LAST CHANCE TO WIN A $1,000 HAM SHACK!

or an NC-88 Receiver

National's big Honorary Engineers Contest closes this month — on February 28! All entries must be postmarked no later than midnight on this date. So hurry, pick up your entry blank at your National distributor.*

Just write down your idea (or ideas) for the ideal amateur receiver. You can be as technical or as non-technical as you like. National's sole purpose is to find out what the majority of you want or don't want in a receiver. (Acceptance of your entry does not mean it will be included in future receivers and submission of an idea doesn't obligate National to use it.)

Whether you win or not, you will receive a certificate as an "Honorary National Engineer."

National NC

NATIONAL COMPANY, INC.
61 SHERMAN ST., MALDEN 48, MASS.

*If there is no National distributor near you, write direct to the company, attention Contest Department, for your entry blank.

OFFICIAL RULES

1. Describe the features you would like in your "dream receiver." Suggestions can be as technical or non-technical as you like — anything from a circuit design to the style of a knob. Drawings or diagrams may be used. Please write legibly. Enclose your suggestions with a signed entry blank and mail to: Contest Department, National Company, Inc., 61 Sherman Street, Malden 48, Massachusetts.

2. You can mail as many suggestions with an entry blank as you wish. Be sure that a separate entry blank accompanies suggestions mailed at different times. You may file as many entry blanks as you wish.

3. An NC-88 will be awarded to the winner of each monthly contest. A grand prize of a $1,000 value ham shack will be awarded for the entry judged best from all winning monthly entries. A certificate will be awarded to each entrant, making such entrant an honorary National Company, Inc. engineer. The contest will continue through midnight February 28, 1955.

4. Anybody is eligible to enter the contest except employees of National Company, Inc., its advertising agency, and their immediate families. To be eligible an entrant must send a signed entry blank with his suggestions. To be eligible for any particular month's contest, entries must be postmarked no later than midnight on the last day of the specific month. Winners will be notified by mail.

5. Entries will be judged by a three-man panel composed of competent technically qualified personnel of National Company, Inc., each exercising independent personal judgment. All decisions of the judges will be final and will be decided by majority vote.

6. All suggestions submitted in this contest, whether awarded prizes or not, become the exclusive property of National Company, Inc., and are not subject to being returned. Entrants grant to National Company, Inc. all rights to suggestions, including the right to patent and/or copyright the suggestion. National Company, Inc. has no obligation to entrants other than to award prizes in accordance herewith.

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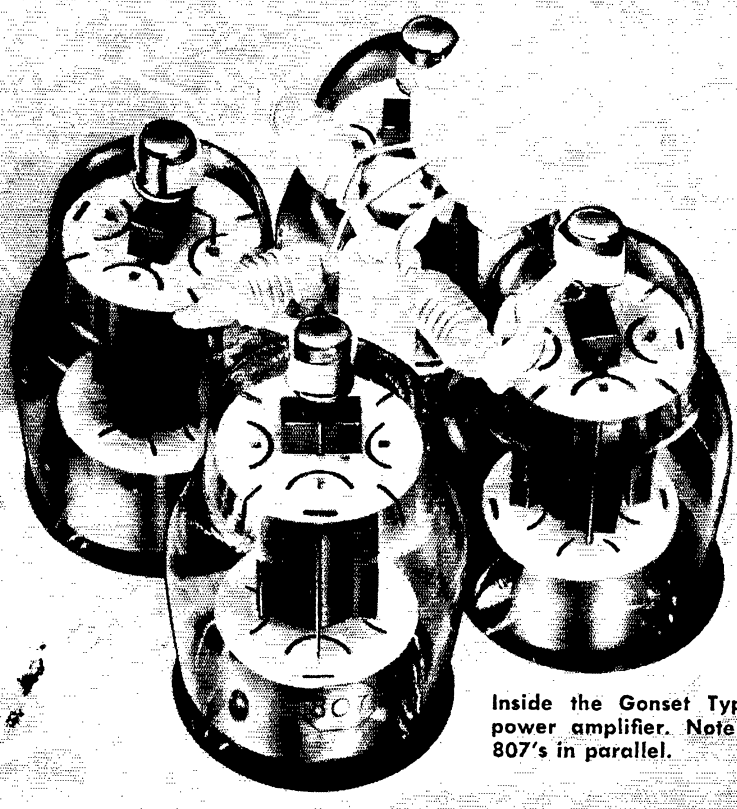

Inside the Gonset Type 500-W rf power amplifier. Note the 4 RCA-807's in parallel.

LEADING AMATEUR DESIGN

...Use RCA Power Tubes

Take Gonset's Model 500-W power amplifier, for example.

Solidly designed to meet the present and the future transmitter needs of progressive amateurs, this multi-purpose rf power amplifier is built to "deliver the goods"—*using four RCA-807's in parallel.*

Why is RCA the choice of both the commercial transmitter designer AND the amateur?

RCA power tubes are built to "take it." They are conservatively rated and reliable. They have great reserve of emission. They have "high perveance" design—deliver high power output at lower plate volt ages. RCA power tubes ar ECONOMICAL.

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RCA-807 Beam Power Tube. Famous for it circuit versatility and popular price. In CW service, handles 75 watts input (ICAS) up t 60 Mc; 60 watts on phone—can be operate with reduced input to 125 Mc.

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