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November 1953
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In This Issue — TELEVISION CAMERAS FOR THE AMATEUR

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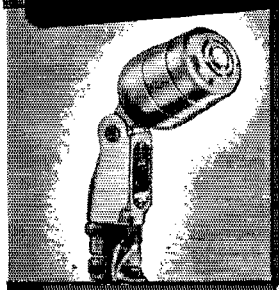

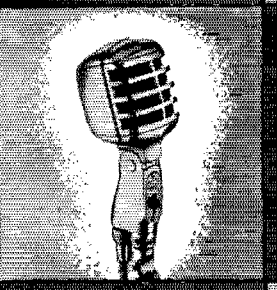

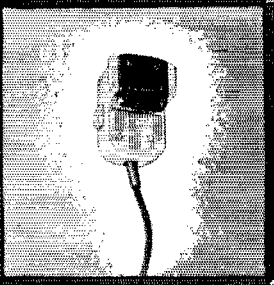

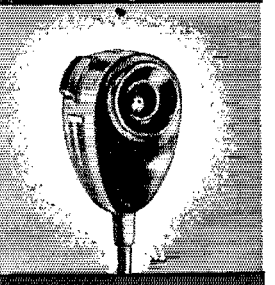

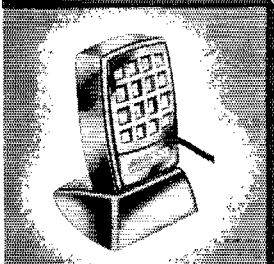

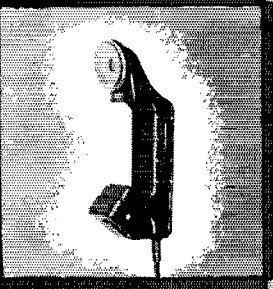

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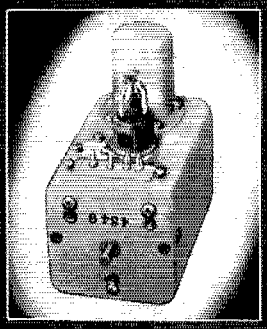
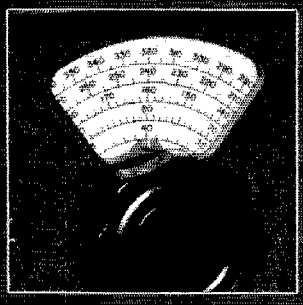


Pick your frequency with the built-in 70E-8 VFO



You can count the kilocycles on the 32V-3 dial

- With this popular transmitter you QSY from the high end of 10 to the low end of 80 in a few seconds; just pick your band and set the built-in VFO to the desired spot. The 32V-3 will stay there — its frequency is controlled by the highly stable, built-in 70E-8 VFO.
- Have you ever wondered why the 32V-3 sounds so powerful on phone? It's because the audio circuits are Collins-designed and Collins-built for peak performance at speech frequencies.
- And, of course, spurious radiation has been reduced to an absolute minimum.
- The Collins 32V-3 runs 160 watts on cw and 140 watts on phone.

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NOVEMBER 1953

VOLUME XXXVII • NUMBER 11

PUBLISHED, MONTHLY, AS ITS OFFICIAL ORGAN, BY THE AMERICAN RADIO RELAY LEAGUE, INC., AT WEST HARTFORD, CONN., U. S. A.; OFFICIAL ORGAN OF THE INTERNATIONAL AMATEUR RADIO UNION

OFFICES

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Subscription rate in United States and Possessions, $4.00 per year, postpaid; $4.25 in the Dominion of Canada, $5.00 in all other countries. Single copies, 40 cents. Foreign remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

Entered as second-class matter May 29, 1919, at the post office at Hartford, Connecticut, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1102, Act of October 3, 1917, authorized September 9, 1922. Additional entry at Concord, N. H., authorized February 21, 1929, under the Act of February 28, 1925.

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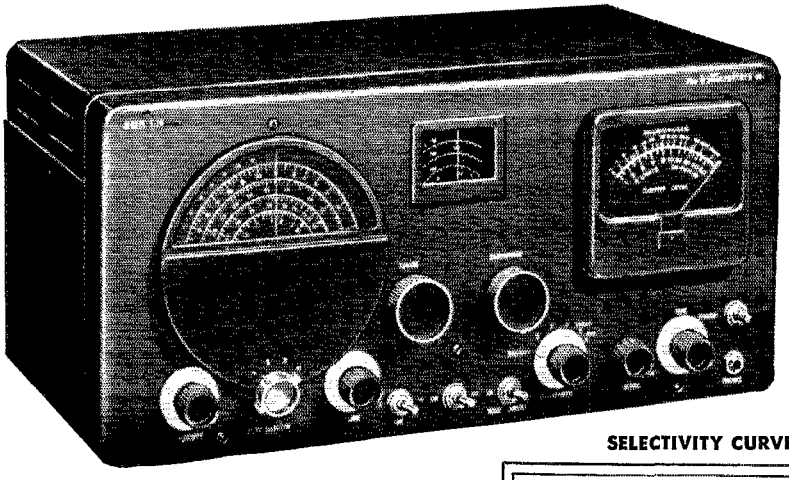
Check the specs...
Check the performance...

AND YOU'LL CHOOSE

Do you know any better way, any other way, to judge SW equipment than to check the specifications and the performance? Frankly that's the only valid way we can think of to make sure you get your money's worth. Check these specs. Take a look at the selectivity curve for the S-76. It is typical of the outstanding value Hallicrafters offers in every price class.



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For 105/125V. 50/60 cycle AC
Use R-46 speaker **$199.95**

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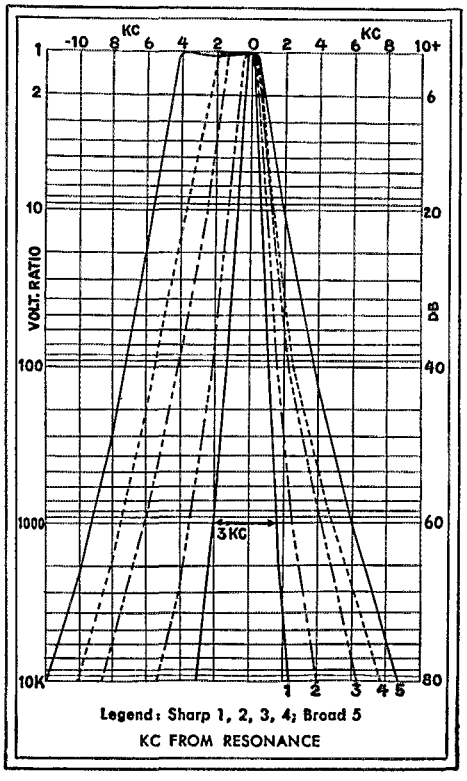

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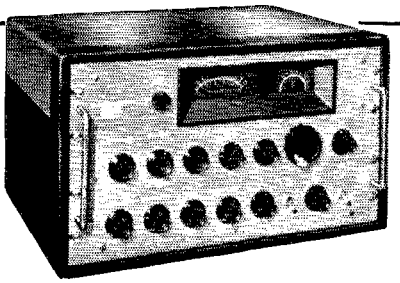

Model HT-20. T.V.I. suppressed 100 watt AM-CW transmitter with all spurious outputs above 40 Mc at least 90 db. below full rated output.

All stages metered; single meter with eight position meter switch; output tuning indication. Frequency range of 1.7 Mc to 31 Mc continuous on front panel control. Seven tubes plus five rectifiers.

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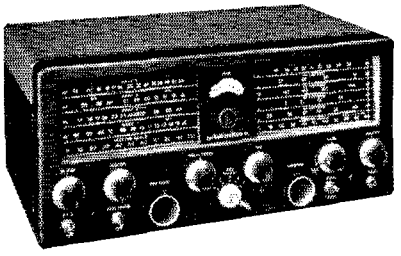

Models S-40B, S-77A. Covers Broadcast Band 540-1680 kc plus three short-wave bands covering 1680 kc-44 Mc.

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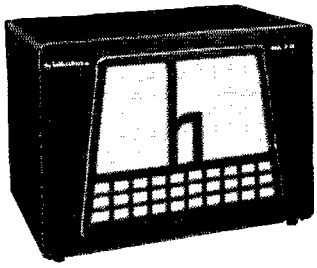

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **All ARRL Field Organization appointments** are now available to qualified League members. These include ORS, OES, OPS, OO and OBS. Also, where vacancies exist SCMs desire applications for SEC, EC, RM, and PAM. In addition to station and leadership appointments for Members, *all amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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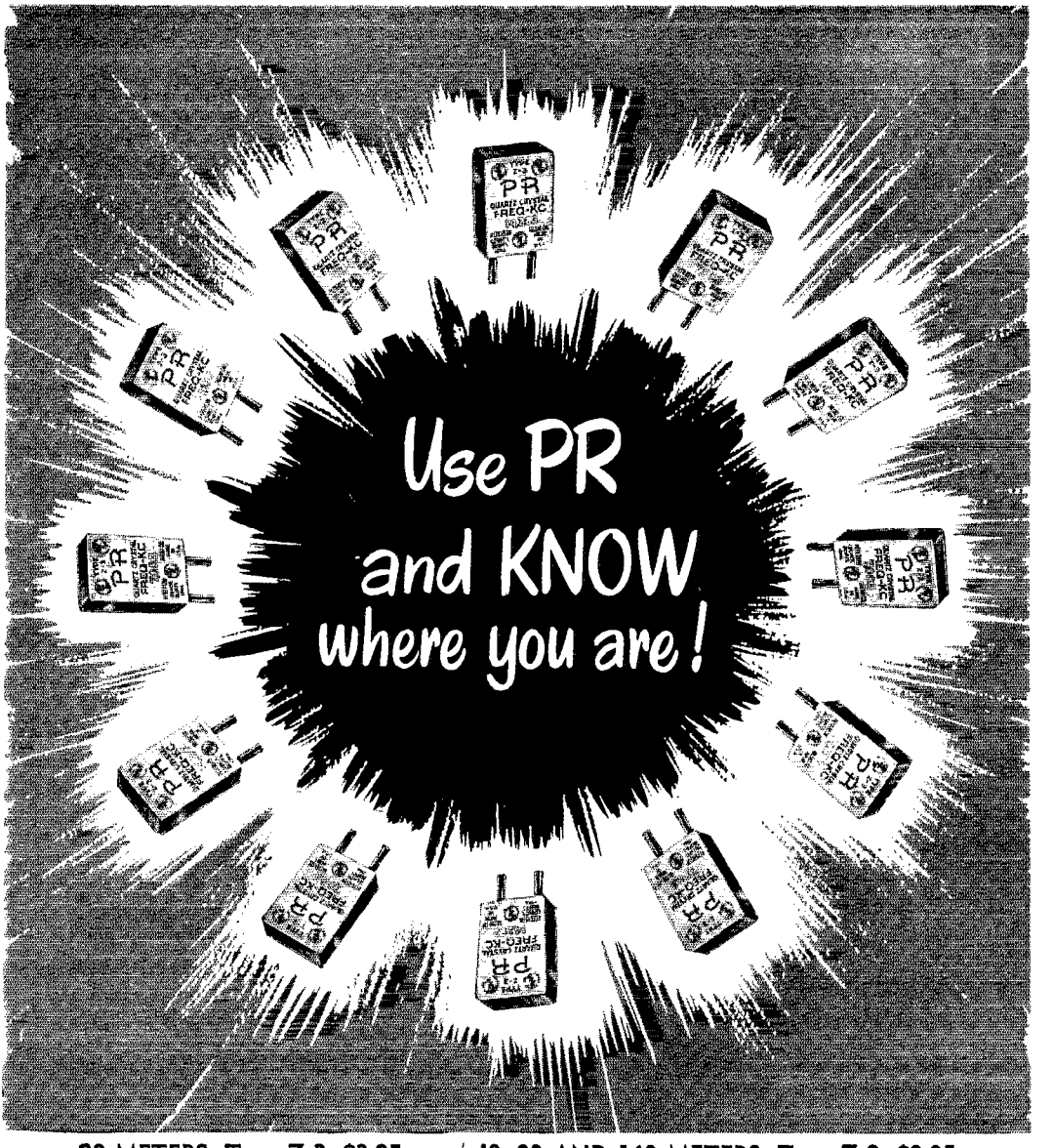

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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

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.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.

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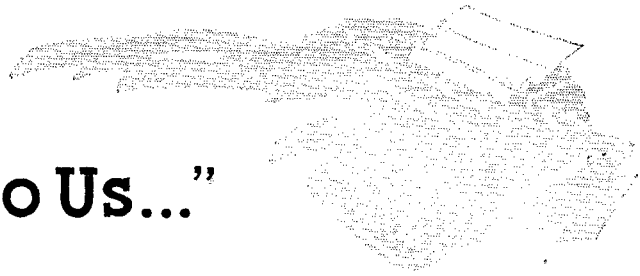


"It Seems to Us..."

TVI — COLOR . . .

We want to direct the attention of every reader of this issue of *QST* to the article on color television interference potentialities beginning on page 31.

The story is about a complex subject; it can't be told in a few paragraphs. Before we could write it, it also cost thousands of the dollars we members put into the League and that, additionally, we garner in the course of our normal business operations. But we can't think of a better example of why we need a League — the experience that inevitably goes with it, and the ability and contacts to do something about it. It is a story that vitally affects every active amateur.

Now to it:

The machinery which over the past few years has been set up to combat TVI problems, through the joint efforts of amateur radio and FCC, with industry coöperation, has been running pretty well of late, with only an occasional shot of oil needed now and then. But in a field as fast-moving as electronics, nothing is truer than the old adage: You have to run to stand still. And so it is that this year we have come face to face with some new problems of TVI — whose exact potentialities remain unknown but may be formidable.

One is color TV. In the compatible electronic color system certain to be approved by FCC, obviously a TV signal has to be more complex — in addition to the sound channel and basic monochrome information, the carrier has to include also "instructions" to the picture tube as to what colors to produce in what portions of the screen at what intensity and at what hue. The modulation processes therefore become extremely intricate, requiring the use of subcarriers to convey additional information. What gave us no little concern earlier this year is that one frequency involved is approximately 3580 kc. There are good and sufficient engineering reasons why this spot is the logical one; and we want to make it plain that no *transmission* on 3580 kc. is contemplated — the frequency is only one of many which will be running around in the receiver innards. But two serious questions arose — what are the potentialities of amateur 80-meter operation ruining a near-by color picture, and what are the expectations for interference to amateurs from receiver radiation?

Early this year the League addressed the industry group which was setting up proposed standards for color TV, the National Television Systems Committee, warning of possible complications and asking that the matter be given full consideration before proposed standards were finally determined. The response, through NTSC Chairman W. R. G. Baker, was immediate and heart-warmingly coöperative — a special committee was appointed with the sole job of examining the problem as we set it forth. This group held a series of meetings and conducted a number of tests at several cities in the Northeast; for its part, ARRL Hq. designed and built special gear and bought a station wagon to cart it around (there are only a few color receivers in existence, and we had to go where *they* were). For ARRL it was an effort representing both considerable money and time; we had to take several of our people from their usual jobs and put them to work for months on this particular problem, virtually to the exclusion of *QST*, the *Handbook* and other activities. The results of the committee study, now embodied in NTSC's documents filed with FCC, are encouraging, saying principally: "the real solution to the bilateral . . . problem lies in suitable receiver design."

The tests have been extremely useful not only in furnishing technical data, but in bringing forcibly to the attention of manufacturers, *before* designs are finalized, of the need for adequate consideration of the potential interference problem. They are also a shining example of how an advance coöperative endeavor can save us all a lot of headaches later on.

. . . AND STRIPS

The second problem is a newer one, showing up in some of the u.h.f. channels and being peculiar to receivers converted for those frequencies by means of inserted channel strips. These gadgets use a dual-conversion system (instead of the single conversion recommended by FCC) and the trouble is that many of the new first intermediate frequencies thus set up fall close enough to the 144-Mc. band so that amateur 2-meter operation can completely disrupt the picture; the makeshift design simply doesn't provide any protection for signals riding in on the i.f.

The League has therefore requested FCC, in instances of such interference, to make it

(Continued on page 64)

• If you've been digging into television circuits with the idea of building your own TV transmitter, here's practical information on the construction of a camera, together with the essential amplifiers, sync and blanking circuits. It uses the same line and frame repetition frequencies as in commercial television, so puts out a signal that can be reproduced by an ordinary TV receiver. The camera tube is the modern version of the 2-inch iconoscope brought out some years ago for amateur use.

An Amateur Television Camera

BY JOHN W. KELLER, JR.,* W3NDB

THE usual drawbacks to the building and operation of a television camera are the expense of the pick-up tube, the complicated and complex magnetic deflection and focusing circuits, and the need for keystone and shading correction in the case of an iconoscope tube. These drawbacks can be eliminated in the construction of an amateur television camera by the use of the RCA type 5527 iconoscope tube.

The 5527 is a two-inch iconoscope with a definition capability of 250 lines. It uses electrostatic deflection and electrostatic focus, and the need for keystone and shading correction is eliminated by a type of mosaic construction that permits the use of a straight-sided tube. An inexpensive short focal-length lens can be used.

While some may feel that the 250-line definition is not sufficient, let me point out that the pictures are excellent and that only by using a monitor receiver with a picture tube of the 16-inch size or larger does the line structure become noticeable. Although the pictures are not interlaced, they can be received on a conventional television receiver which will lock in on the blanking pulses.

The amateur camera system described here consists of the following units: camera chassis, synchronizing and blanking chassis, and power-supply chassis.

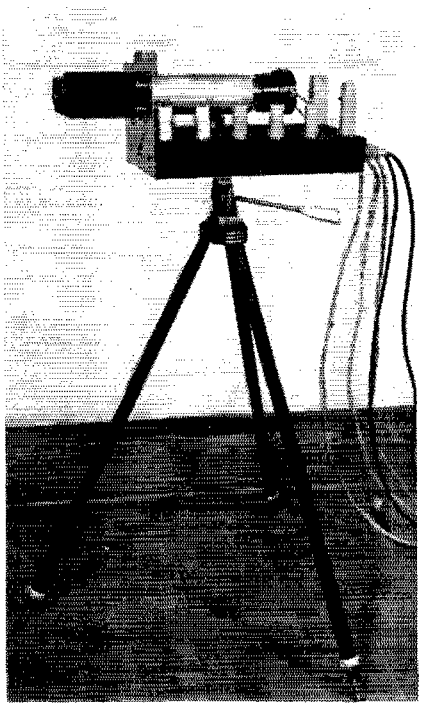
The Camera Unit

As the heart of any television system is the camera, special care should be given to its construction. The camera chassis shown in the photographs contains the iconoscope tube and its lens system, the video preamplifier stages, and the high-frequency peaker stage. The video amplifier stages and the high-frequency peaker stage, Fig. 1, use Type 6AG5 tubes. No noticeable increase of gain or signal-to-noise ratio was realized by using 6AK5s in place of 6AG5s. Since the signal output from the iconoscope tube is very low, it is necessary to use four video preamplifier stages to increase the level to a value sufficient to feed through coax cable to the video line amplifier, which is located on the synchronizing and blanking chassis.

The output capacity of the iconoscope is shunted across the input of the video preamplifier, so it is necessary to compensate the preamplifier for the loss of high frequencies. This is accomplished by operating the video high-frequency peaker stage and the third video preamplifier stage in series. The 100-$\mu\mu$fd. capacitor from the cathode of the third video amplifier stage by-passes the high frequencies, causing the stage to have more gain for the high than for the low frequencies. This type of high-peaker stage is very stable and quite free from microphonics. The amount of high-frequency compensation is set by adjusting the 50,000-ohm potentiometer in the plate circuit of the 6AG5 high-peaker stage. This adjustment is best made by adjusting the control to eliminate a black streak following a black bar on a white background. The control should be set so that the streak is just eliminated, and not moved far enough to cause overcompensation.

As the cathode of the 5527 iconoscope tube is operated at a high negative voltage above ground, it is necessary to use a separate filament transformer for this tube. This transformer is located on the synchronizing and blanking chassis to reduce the possibility of

The camera unit mounted on a tripod ready for use. This chassis-mounted unit contains the 5527 "amateur" iconoscope, lens, and video preamplifier.



*135 No. 11th St., Sunbury, Penna.

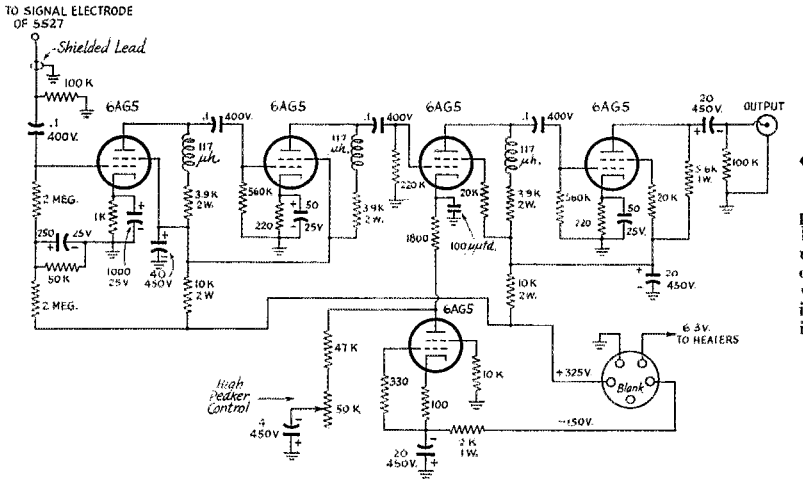


Fig. 1 — Camera preamplifier circuit. Resistors are ½ watt unless otherwise indicated. Capacitance values in μf. except as indicated. Socket is for incoming power.

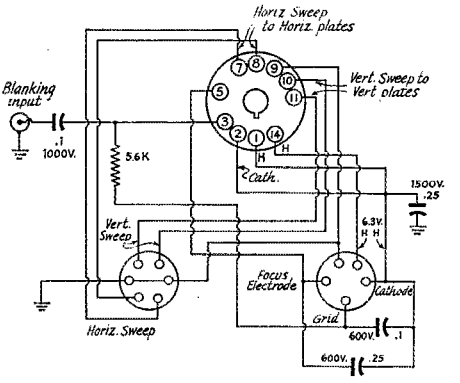


Fig. 2 — Socket connections on camera chassis for iconoscope. Six-prong socket at left is for incoming sweep voltages, 5-prong socket at right for iconoscope power supply. The blanking input connector is a coax fitting.

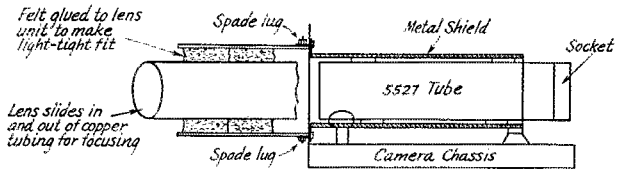
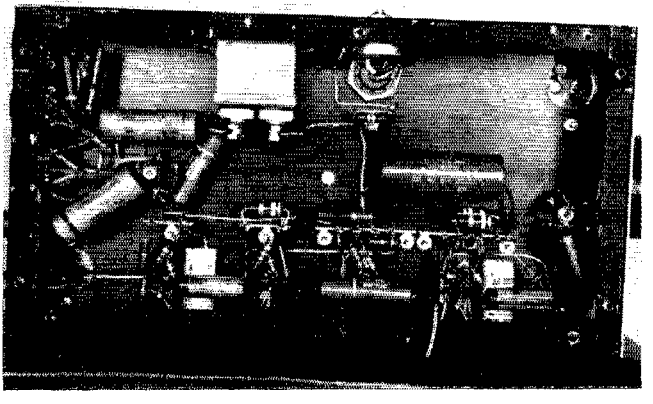


Fig. 3 — Detail of the iconoscope and lens mounting.



Bottom of the camera-unit chassis. The principal constructional point to watch out for is to keep stray capacities low in the "hot" video circuits to prevent loss of high-frequency response.

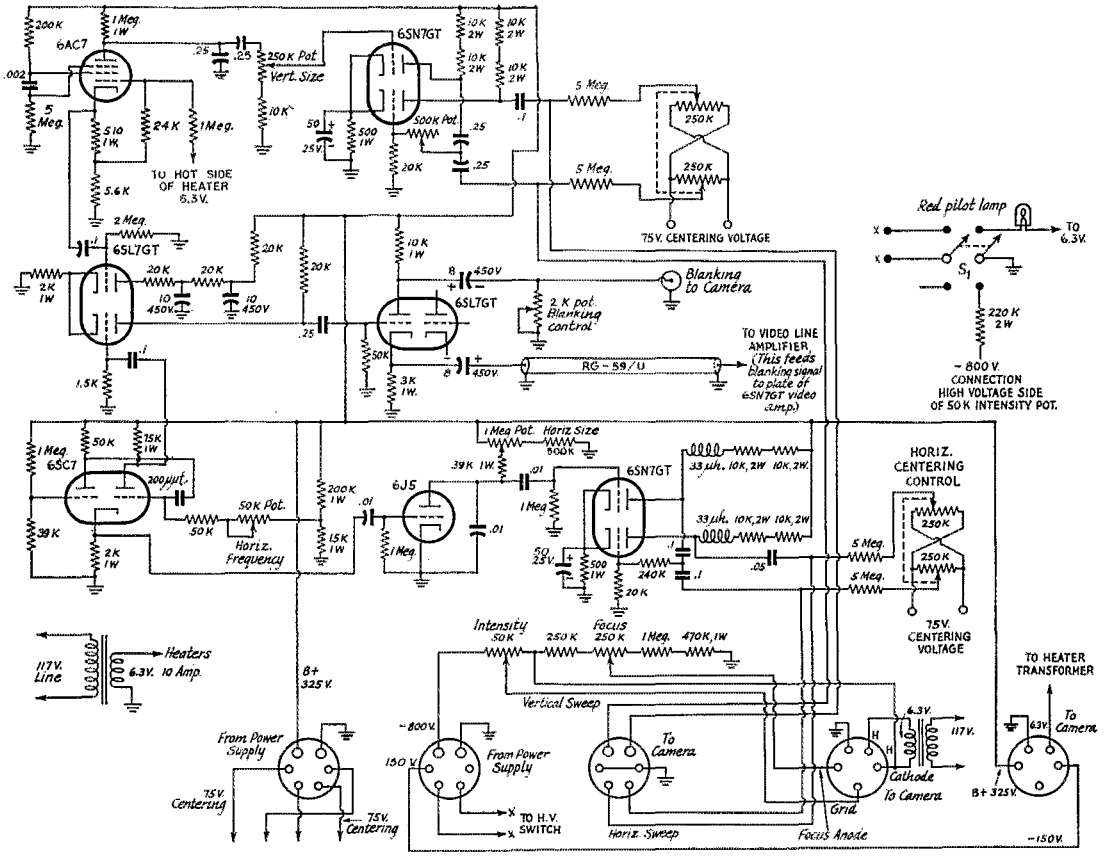


Fig. 4 — Blanking and sync generator circuit. Top section, vertical oscillator and sweep amplifier; middle section, blanking mixer, clipper and amplifier; lower section, horizontal oscillator, shaper, and amplifier. Fixed resistors ½ watt, capacitance values in μf., unless otherwise indicated. The inset diagram at the upper right is the high-voltage switching arrangement; when in the off position, the high-voltage filter is discharged through the 220K resistor.

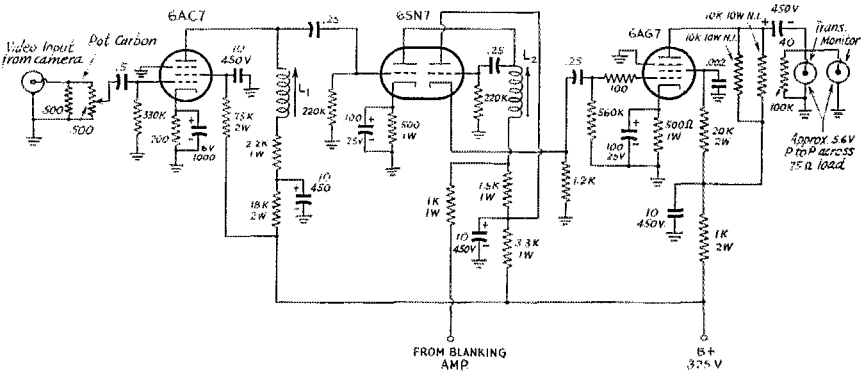


Fig. 5 — Video line amplifier diagram. The frequency response of this circuit is substantially flat from 60 cycles to 2.5 Mc. L_1 and L_2 are adjustable peaking coils, 44–68 μh. Noninductive resistors should be used in the plate circuit of the 6AG7. A later modification, which improves the shape of the vertical blanking pulse, is to substitute a 10-μf. 25-volt electrolytic condenser for the 0.25-μf. condenser between the 6SN7 cathode and 6AG7 grid. It should be mounted well away from the chassis to prevent loss of high-frequency video.

its magnetic field affecting the iconoscope tube.

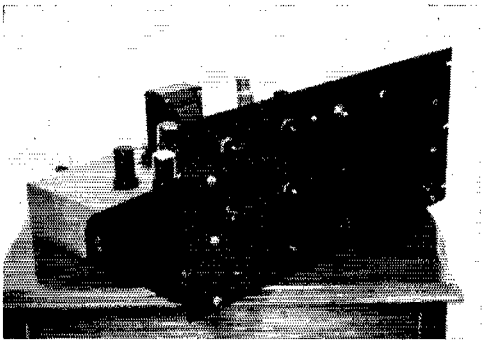
The camera is built on a 7 × 13 × 2-inch chassis with a bottom plate. The bottom plate is very necessary for shielding — without it, the wiring picks up a strong signal from the local broadcast station, thereby causing interference in the picture. Two five-prong sockets are used to connect the necessary voltages to the camera unit, and the sweep voltages are fed in through a six-prong socket. Regular coax cable connectors are used for the blanking signal input and the video output of the camera.

The interconnecting cables between the camera and the synchronizing and blanking chassis are made up as follows: For the 325-volt B+, the 150-volt negative voltage, and the heater supply, a cable of five wires is used; for the control voltages and heater voltage of the iconoscope tube, a five-wire cable; for the vertical and horizontal sweep voltages, a five-wire cable. The cable-socket connections are given in Figs. 1 and 2.

It may be wondered why shielded cable was not used for the sweep voltages; this was tried, but because of the capacitive effect of the shielded cable, the 15,750-cycle horizontal sawtooth voltage was distorted. This resulted in a nonlinear picture. As the sweep voltages are relatively high the unshielded cable worked well, and if the length is not excessive there is no need to worry about using shielded cable.

The first video amplifier stage is connected to the signal electrode of the 5527 iconoscope tube by a low-capacity shielded lead, made up by using a small-diameter lead shielded by braid having a rather large inside diameter.

The peaking coils used by the author were standard 117-microhenry units used in Motorola television sets. The new adjustable-type video peaking coils can be used if desired. These can be adjusted to the correct value needed for best frequency response of the video amplifiers.



The sync and blanking generator. This unit also contains a video line amplifier. Controls are as follows: top row, left to right — intensity, focus, high-voltage switch; second row — vertical centering, horizontal centering, blanking; bottom row — vertical size, horizontal frequency, horizontal size. The control at the extreme lower right is the video gain control.

The heater leads for the 6AG5s should be run along the edge of the chassis to reduce the field around these leads. The 0.1-μf. coupling capacitors should be placed well away from the chassis as should the peaking coils. The Type 5527 tube is mounted in a shielded housing to protect it from stray fields.

The lens system is shown in Fig. 3. The lens used was a surplus one originally made for the sniperscope unit. It is a Bausch & Lomb *f*2.1, focal length 3.5 inches. With this fast lens very good pictures can be obtained by using one or two No. 1 photoflood lamps to supply the necessary light.

A piece of 2⅞-inch copper tubing 4⅛ inches long is mounted to the front of the camera by

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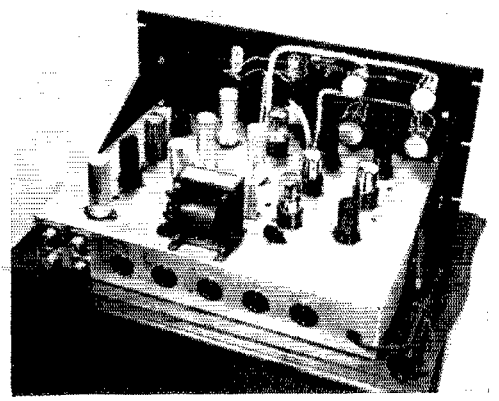
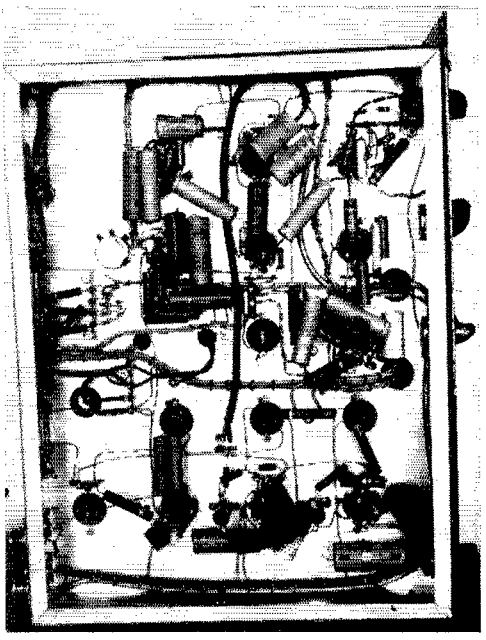
Top and bottom views of the sync, blanking, and video line amplifier chassis. The video line amplifier is along the left-hand edge of the chassis in the top view, and along the lower edge in the bottom view.





using spade lugs. The lens is fitted to slide in and out of the copper tubing for focusing. It is adjusted to the correct diameter for a light-tight fit by gluing felt around it. The inside and the outside of the copper tubing is painted a flat black to eliminate reflections.

Sync and Blanking Chassis

The synchronizing and blanking generator is built on a 13 × 17 × 3-inch chassis. An 8¾ × 19-inch panel is used to mount the necessary controls for the camera unit. The circuit of the synchronizing and blanking generator is shown in Fig. 4. In the unit built by the writer standard-size tubes were used, but miniature types may be used if desired. The photographs show several views of this unit.

The vertical synchronizing and sweep pulses are generated by a Type 6AC7 tube. The grid of this tube is coupled to the 6.3-volt heater voltage, thus locking the vertical synchronizing and sweep voltage directly to the power-line frequency. A Type 6SN7 tube is used as an amplifier to provide sufficient sweep voltage for the iconoscope tube. The 0.5-megohm control located in the grid of the second section of the 6SN7 should be adjusted for equal output voltages to the deflection plates of the 5527 iconoscope.

The horizontal synchronizing and sweep pulses are generated by a free-running multivibrator using a Type 6SC7 tube. The horizontal frequency can be set by a front-panel control. The 6J5 is used as a horizontal discharge tube, and the horizontal sawtooth is amplified by a 6SN7 to an amplitude sufficient to sweep the 5527 tube.

The straight-sided pulse that is developed in

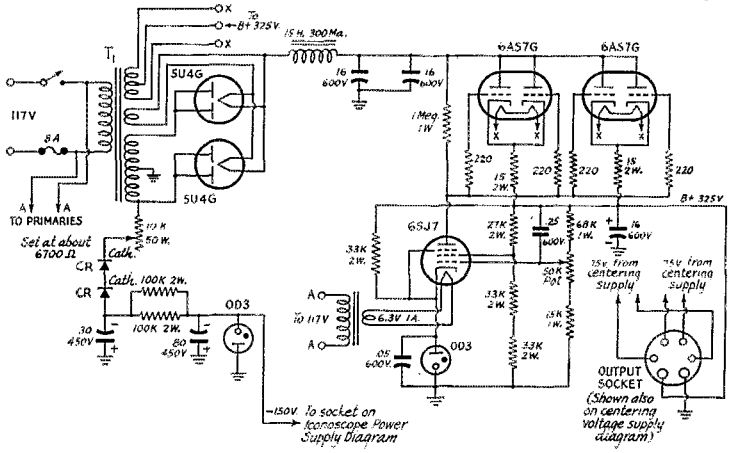


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Fig. 6 — Regulated plate supply for sync and blanking tubes and video amplifiers. T_1 — 525 v. each side c.t., 300 ma.; 5 v. at 6 amp.; 6.3 v. at 6 amp. *CR* — Selenium rectifier, 65 ma.

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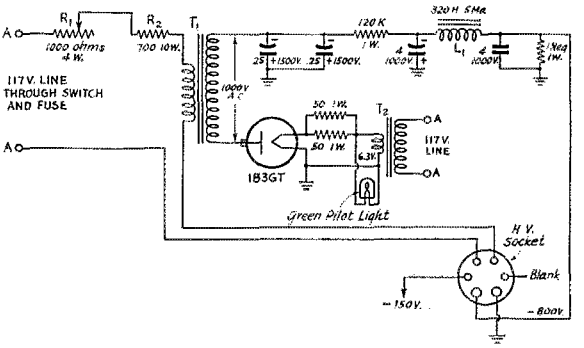
Fig. 7 — High-voltage supply for iconoscope. L_1—Thordarson T20C50. T_1 — Neon-sign transformer (see text). Thordarson T22R40 or equivalent may be used, but it may be necessary to change the values of R_1 and R_2. R_1 should be of proper value to permit varying the output voltage from — 700 to — 900 volts. T_2 — Filament transformer, 6.3 volts, 1 amp.



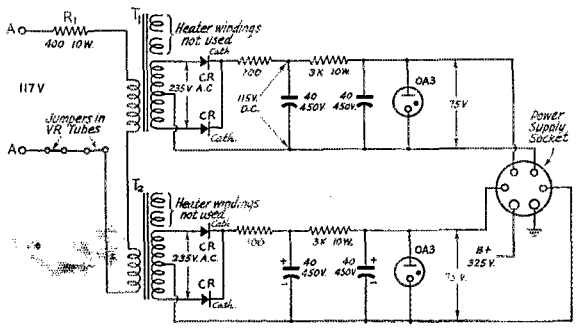


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Fig. 8 — Centering-voltage power supply diagram. T_1 and T_2 are replacement-type power transformers rated at 600 volts, center-tapped, at 40 ma. With different transformers, R_1 should be chosen to give the transformer secondary voltages indicated. *CR* — Selenium rectifier, 65 ma.

This power supply chassis contains the three supplies shown in Figs. 6, 7 and 8. *Right* — bottom view of the power supply chassis.

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the cathode circuit of the 6AC7 vertical oscillator and the straight-sided pulse that is developed in the plate circuit of the 6SC7 horizontal oscillator are fed into a 6SL7, which mixes and clips them to develop square waves that are used for blanking. These blanking signals are amplified in one half of another 6SL7 where pulses of proper polarity to blank the 5527 iconoscope are taken from the plate. A like pulse but of opposite polarity is taken from the cathode of the same tube and used for blanking the video line amplifier. (A monitor television receiver also can be locked in on these pulses.)

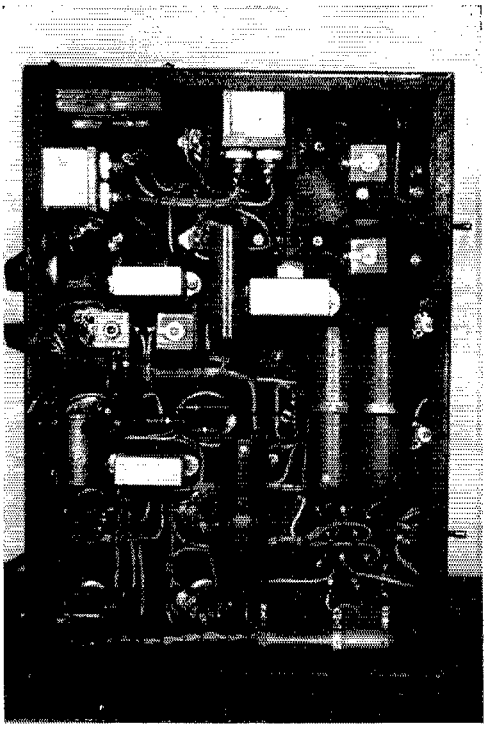
The video line amplifier, the circuit of which is given in Fig. 5, is built along the right edge of the chassis. As in the construction of the camera preamplifier, all leads should be kept as short as possible and the coupling capacitors should be dressed away from the chassis to prevent any loss of high frequencies. The blanking pulses are fed into the plate circuit of the second video amplifier stage. The 1000-ohm resistor in series with the blanking lead is used to prevent loss of video signal.

The filament transformer for the tubes in the synchronizing, blanking video line amplifier, as well as for the camera preamplifier stages, is located on this chassis.

Power Supplies

The power supplies for the operation of the camera unit are built on a 13 × 17 × 3-inch chassis. For the operation of the camera preamplifiers, video line amplifier, and necessary synchronizing and blanking stages, a 325-volt regulated supply is used. A 150-volt negative supply is used for the video high-peaker stage. Two 75-volt supplies are used to furnish centering voltages for the iconoscope tube. An 800-volt supply is also included on this chassis to provide the necessary negative high voltage for the iconoscope tube.

The 325-volt regulated supply uses two 5U4Gs for rectifiers, two Type 6AS7 tubes as series



regulator tubes, a 6SJ7 as control tube, and a VR-150 as reference tube. The 150-volt negative supply uses two selenium rectifiers in series to supply the necessary voltage. This voltage is regulated by a VR-150. The two 75-volt centering supplies each use two selenium rectifiers in a full-wave circuit, with the output voltages regulated by VR-75s.

In the author's unit a neon-sign transformer was used to supply the negative 800 volts necessary for the operation of the iconoscope tube, the voltage being rectified by a 1B3G. The use of this 60-cycle supply requires rather elaborate filtering. A radio-frequency type power supply would require a lot less filtering, and since the total drain is very small this type of supply should work very satisfactorily.

Acknowledgment

I would like to thank Mr. R. R. Barrett and Mr. M. M. Goodman, Tube Department, Radio Corporation of America, and the McGraw-Hill Publishing Company, Inc., for permission to use some of the circuits from the article, "Simplified Television for Industry," that appeared in *Electronics*, June, 1947. Thanks also are due to Ken Neidig, W3MXT, who took all photographs [including cover shot — Ed.] of the equipment.

OUR COVER

John Keller, author of the TV camera article presented in these pages, puts his equipment through its paces in the W3NDB shack. Other cameras, built by W4ATO and W4HER, are shown on page 63.

Tube-Keyed Grid-Block Keying

BY A. R. WILLIAMS,* VE3BSH

TUBE KEYERS are usually used in the cathode circuit of a keyed stage, but the principle can be applied to grid-block keying of a low-level stage with little or no difficulty. The keyer to be described has been in use at VE3BSH for over a year, and it has been so satisfactory that it is certain to be included in any future transmitter installations.

As can be seen from the diagram in Fig. 1, it consists of a 6SJ7 keyer tube and a low-powered negative-voltage supply. The power supply can be anything that will furnish about 5 ma. at around 250 volts; using material around the shack I found an old audio output transformer, T_1, and a 6X5 half-wave-connected rectifier to be satisfactory. The 6.3 volts for the voice-coil winding can be borrowed from the transmitter heater circuit, of course.

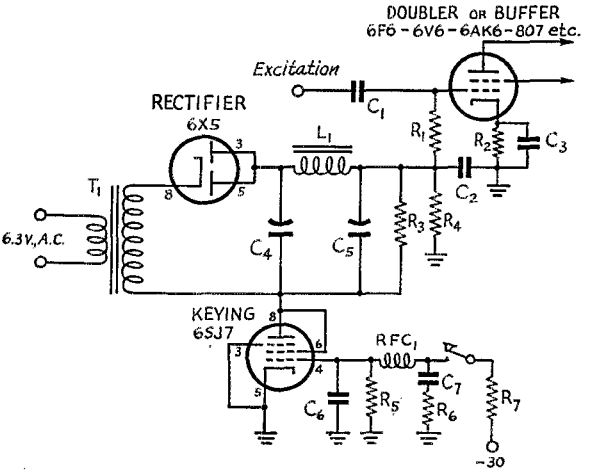


Fig. 1 — Circuit diagram of the grid-block tube keyer.
C_1 — 100 $\mu\mu$fd.
C_2 — 0.02 μfd.
C_3 — Normal cathode condenser, if used.
C_4, C_5 — 8-μfd. 350-volt electrolytic.
C_6 — 0.001-μfd. mica.
C_7 — 0.1-μfd. paper.
R_1 — 4700 ohms, or 2.5-mh. r.f. choke.
R_2 — Normal cathode resistor, if used.
R_3 — 0.1 megohm.
R_4, R_5 — 47,000 ohms.
R_6 — 470 ohms.
R_7 — 15,000 ohms.
All resistors ½ watt.
L_1 — Small filter choke.
RFC_1 — 2.5-mh. r.f. choke.
T_1 — Small audio output transformer.

When the key is "up," the 6SJ7 grid is at cathode potential, the 6SJ7 conducts, and the negative voltage from the small supply is connected to the grid of the keyed stage. When the key is closed, −30 volts is applied to the grid of the 6SJ7, cutting it off and disconnecting the small negative supply from the keyed stage. The "make" characteristic is controlled by the value of C_2 and R_4, and to a lesser degree by R_7, C_6 and C_7 in the 6SJ7 grid circuit. Making any of these values larger will "soften" the keying on make — C_2 is probably the best one to operate on to get a desired characteristic. On "break" the keying can be softened most readily by increasing the size of C_7.

C_7, R_6, R_7 and RFC_1 also constitute an r.f. filter for eliminating any local b.c.-receiver click caused by minute sparking at the key, but no trouble has been encountered along these lines. The key current is a maximum of ½ ma., and the sparking at the key is imperceptible.

In the transmitter at VE3BSH, two 6F6 isolation stages following a 6AK6 Clapp oscillator are keyed with this arrangement, and the keying is very clean and pleasing to listen to. A resistor is used at R_1 instead of the r.f. choke used there originally, to eliminate a tendency toward a parasitic oscillation, but this had nothing to do with the keying system, of course.

If one has an oscillator that is stable enough to key without chirp, it may be keyed by this circuit by lifting the "cold" end of its grid resistor and connecting it to the junction of C_2, R_3 and R_4. Several stages can be keyed simultaneously by returning their grid resistors or r.f. chokes to this same point. In any event, it should be used with stages running little or no grid current, because any flow of current will develop additional grid bias across R_4.

* Sioux Lookout, Ont.

QuistQuiz

The new 20-meter beam that A built will require a 200-foot feed line into the shack. Finding that the loss in 200 feet of RG-8/U coaxial cable would be 1.25 db. for the matched condition, A has been considering the use of an open-wire line. His friend B advises him against it, saying that although the theoretical loss in 200 feet of open-wire line would be only 0.15 db., the actual loss through radiation from the line would equal or exceed the loss in the coaxial line. Which feed line is better, and why?

(Please turn to page 54 for the answer)

A front view of the v.h.f. transmitter shows the crystal mounted above the meter switch to the left of the amplifier grid-tuning control. The tuning knob for the oscillator is at the lower left-hand side of the output switch, S_1. Control knobs for the output and the amplifier plate circuits are at the upper and lower edges, respectively, at the right end of the chassis.

Compact R. F. Assembly for 50- and 144-Mc. Mobile

Using the Multicircuit Tuner at V.H.F.

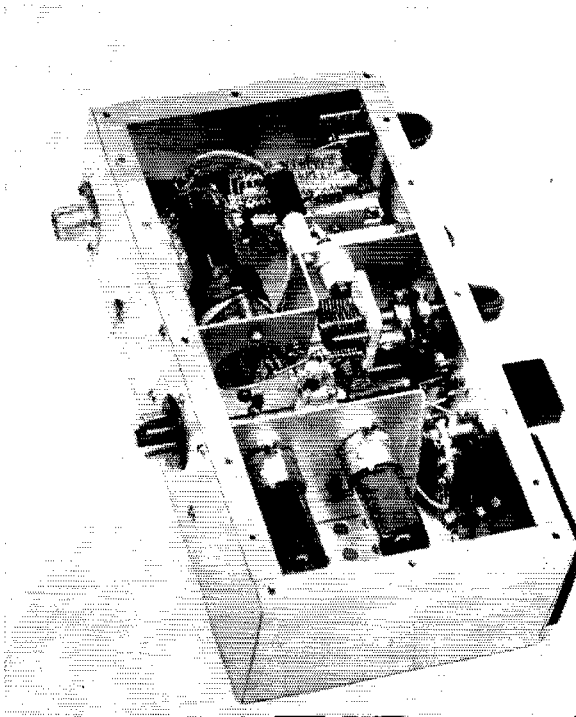
BY C. VERNON CHAMBERS,* W1JEQ

WHILE the objectives in the design of mobile equipment for v.h.f. are, of course, the same as in low-frequency gear, some of them are not so readily attained in units operating at 6 and 2 meters. Many of the liberties taken in achieving compactness and simplicity at the lower frequencies would be fatal to the performance of a rig operating at v.h.f. Nevertheless, with proper attention to the essential factors, it has been possible to arrive at a simple unit of small dimensions that requires no compromise in efficiency, while maintaining operating conveniences usually found only in lower-frequency gear. The transmitter described is ideally suited for under-the-dash mounting — it is only 3 inches high — or it may be lashed to the fire or side walls of the cab.

Aside from a very desirable form factor, the transmitter has several other features which should interest the mobile fan. One of these is the ease with which the rig can be hopped back and forth between bands. For instance, to get from 50 to 144 Mc., only change the crystal, flip the s.p.d.t. output-coupling switch — the only r.f. switch in the layout — and retune three stages. Plug-in coils and complicated r.f. switching circuits have been eliminated completely by utilizing wide-range tanks in the exciter stages and by employing a multicircuit tuner in the plate side of the amplifier. Incidentally, this tuner not only shows efficiency comparable with the more commonly used series-tuned circuit at 144 Mc., but also features construction that is rather novel. A single length of B & W Miniductor, with minor modification, provides a rugged one-piece assembly containing the amplifier-plate and the output-coupling inductances for both bands of operation.

A wide range of crystal frequencies — 8 through 25 Mc. — may be used with the transmitter. In addition, the entire rig may be operated from a 300-volt supply capable of delivering 100 ma. This means that a standard 300-volt 200-ma. supply could be used to power the r.f.

*Technical Assistant, *QST*.



In this view the perforated top cover has been removed to show the complete transmitter. The input and output connectors are on the rear chassis wall and the 5763 subassembly is inside directly to the left of the meter switch. The Z-shaped partition supports C_{12}, RFC_4 and the 2E26. Notice that C_{12} is mounted on an insulated feed-through bushing. The oscillator tuning capacitor, C_5, is panel-mounted directly below C_{12}. The output switch, S_1, is partially hidden by the Z-shaped plate. The multicircuit tuner is at the upper end of the chassis, just below the link tuning condenser, C_{18}.

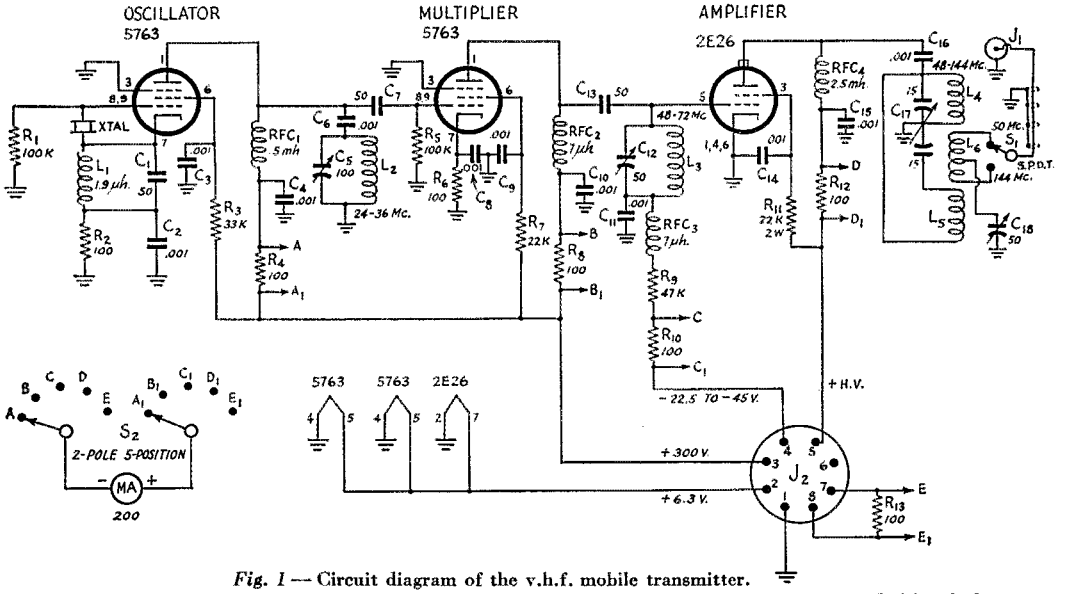


Fig. 1 — Circuit diagram of the v.h.f. mobile transmitter.

(NOTE: All resistance values in ohms. K = 1000. Resistors ½ watt, unless otherwise noted.)

C_5 — 100-$\mu\mu$f. variable (Hammarlund HF-100).
C_{12}, C_{18} — 50-$\mu\mu$f. variable (Hammarlund HF-50).
C_{17} — 15-$\mu\mu$f.-per-section variable (Hammarlund HFD-15-X).
L_1 — 1.9 μh., 34 turns No. 22 enam., ¼-inch diam., close-wound.
L_2 — 0.44 μh., 6 turns No. 20 tinned, ½-inch diam., ⅜ inch long (B & W 3003).
L_3 — 0.155 μh., 3 turns No. 18 tinned, ½-inch diam., ⅜ inch long (B & W 3002).
L_4 — 0.36 μh. (see text).
L_5 — 0.2 μh. (see text).
L_6 — See text.
J_1 — Amphenol coaxial connector.
J_2 — 8-prong male connector.
RFC_1 — National type R-50 r.f. choke.
RFC_2, RFC_3 — Ohmite type Z-50 r.f. choke.
RFC_4 — National type R-100S r.f. choke.
S_1, S_2 — 2-pole 6-position miniature selector switch. S_1 used as s.p.d.t. (Centralab PA-2003).

section as well as an external modulator. However, provision is made for the application of higher voltage (above 300) to the amplifier from a separate supply if this proves desirable. The transmitter also includes a meter-switching circuit that provides for the metering of an external modulator.

Although the transmitter is referred to as a 2-band mobile rig, it may be used as the exciter for a 50- or 144-Mc. amplifier, or as a source of 48-Mc. excitation for a v.h.f. tripler.

Circuits

As shown by Fig. 1, the Tri-tet oscillator employs a Type 5763 tube, as does the multiplier or driver stage of the transmitter. The oscillator has a fixed-tuned cathode circuit that is resonant at approximately 15 Mc., a frequency that was determined experimentally as being optimum for the range of crystal frequencies usable with the transmitter. Cathode bias developed across R_2 holds the input to the tube to a safe value in the event of crystal failure. The plate tank for the oscillator uses C_5 to resonate L_2 at 24 through 36 Mc.

This plate tank is tuned to 25 Mc. for 50-Mc. output of the transmitter, and may be tuned to either 24 or 36 Mc. for amplifier output at 144 Mc. Capacity coupling is used between the oscillator and the driver stages.

The multiplier is straightforward, employs protective cathode bias and is capacity-coupled to the amplifier grid circuit, $C_{12}L_3$. The multiplier operates as a doubler to 50 Mc. when the transmitter is set up for that frequency of operation, and as either a doubler or tripler (depending upon the tuning of the oscillator) to 72 Mc. when the rig is fired up for 144-Mc. work.

The Type 2E26 in the final operates straight through at 50 Mc. and as a doubler for output at 144 Mc. A combination of fixed and grid-leak bias is used. The value of fixed bias is not especially critical (either 22.5 or 45 volts) and is recommended mainly as a protective measure against damage to the amplifier tube in the event of excitation failure. Screen voltage is taken from the plate supply through R_{11}. A value of 22K for R_{11} gives the proper voltage drop for the screen over a supply-output range of 300 to 400 volts.

The plate tuner for the amplifier consists of capacitor C_{17} and inductors L_4 and L_5. Output from the amplifier is transferred to J_1 by a series-tuned circuit consisting of C_{18}, L_6 and S_1. As seen in Fig. 1, L_6 is electrically subdivided by a tap which connects to C_{18}. The portion of L_6 above the tap provides output coupling at 50 Mc. and the lower section of the coil couples to L_5 when S_1 is set for 144-Mc. operation.

The metering circuit uses S_2, a 200-ma. d.c. milliammeter, and resistors R_4, R_8, R_{10}, R_{12} and R_{13}. R_{13} is connected to Terminals E and E_1 of the switch and, in turn, to Pins 7 and 8 of the power-input connector, J_2. This last set of con-

nections allows the plate current of an external modulator to be checked by the meter.

Provision for connecting either a single or a pair of supplies to the transmitter are provided for at J_2. If a single 300-volt pack is used for the entire r.f. section, it is necessary to connect a jumper between Pins 3 and 5 of J_2. With separate supplies, connect the 300-volt job to Pin 3 and the amplifier supply to Pin 5. If a modulator is to be connected to the transmitter, connect the secondary of the modulation transformer between Pins 5 and 7 of J_2, connect B-plus for the r.f. amplifier to Pin 7 and then return the B-plus lead of the modulation-transformer primary to Pin 8.

• This 25-watt mobile rig covers two popular v.h.f. bands with a simple 3-tube line-up. Power-supply requirements are quite flexible, and band-changing is accomplished without plug-in coils or complicated switching circuits. The design keeps driver-compartment mounting in mind.

Construction

An aluminum chassis, measuring 3 by 5 by 10 inches, is used as the housing for the transmitter. Most of the actual construction is made easy by the use of subassemblies, as indicated by the accompanying photographs.

A view of the oscillator-multiplier section along with Fig. 2 identifies the components for this assembly. The plate that supports the components has ⅜-inch lips at the right and the bottom edges for bolting to the chassis, and also has a narrow flange at the front (as seen from the inside view of the transmitter) to give additional mechanical strength. The tinned-wire leader which connects to C_5 (at a later stage of the construction) should be about 3 inches long and the five leads which will be joined to J_2 and S_2 can be 5 inches long.

The interior view of the transmitter shows a Z-shaped partition fastened to the front, bottom and rear surfaces of the chassis. To simplify construction, this partition is actually fabricated from two pieces of aluminum. The rear section has ⅜-inch lips for fastening to the rear and bottom of the chassis, a 2½ inch span to support the 2E26, a 1⅛-inch member that runs parallel with the length of the chassis and still another lip that bolts to the forward partition. The forward section is 2½ inches wide and has ⅜-inch mounting lips front and bottom.

The socket for the 2E26 is mounted above deck to permit a short plate return. The socket should be mounted by means of bolts, nuts and ⅝-inch metal posts directly above a 1¼-inch hole that has been punched in the mounting plate. Prongs 1, 2, 4, 6 and 8, and the screen by-pass capacitor, C_9, should all be returned directly to ground on the *socket side* of the mounting plate. A 2-terminal tie-point strip to the rear of the socket is used to support the heater lead and the h.v. end of the screen resistor R_{11}.

The bracket that fastens to the front wall of the chassis should be fitted with a feed-through bushing (we used a Millen type 32100) which will, in turn, support the amplifier grid-tuning capacitor, C_{12}. Place the bushing at a point that will provide adequate clearance between C_{12} and the rear partition. C_{12} may now be bolted in place with the bushing hardware.

Next, mount the meter shunts across the terminals of S_2. Now, join Contacts A_1 and B_1 (Fig. 1) together, and then connect 8-inch wire leaders to the rotor-arm contacts and to Contacts C_1, D_1, E and E_1. A leader about a foot or so long should be soldered to Contact D.

Construction of the multicircuit tuner constitutes the last subassembly operation. The tuner will be a compact and rugged affair if instructions are followed. First, reduce a Type 3006 B & W Miniductor to a total of 14¼ turns. Now, without breaking the support bars, clip the winding at points which will leave 5 full turns at one end and 3¼ turns at the opposite end. The 6 turns that are left intact between end windings are used as the output coupling inductance. Short tinned leads (2-inch lengths of No. 16 will do) should now be soldered to the free ends of the three windings.

Also, solder a short lead at 1¼ turns in from the 144-Mc. end (the end closest to the small outside coil) of the output inductor. This should place the tap at the top of the coil, as shown in the inside view of the transmitter.

To assemble the tuner, turn C_{17} with the insulated support bar facing toward the left, as viewed from the shaft end of the condenser. Now, place the 3-section inductor about ⅜ inch

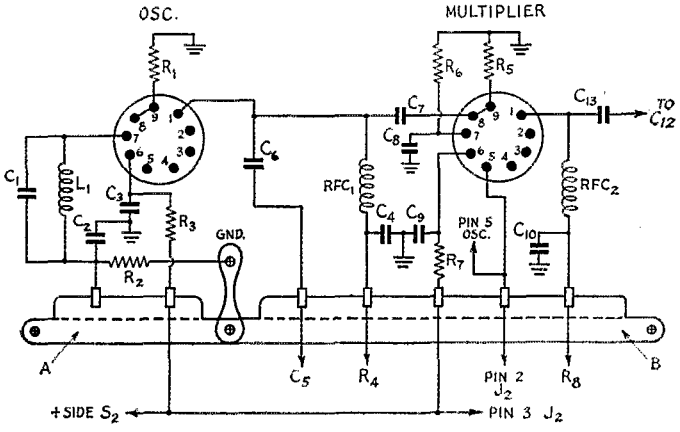


Fig. 2 — Drawing of the parts layout for the exciter subassembly. A and B are 2- and 5-terminal tie-point strips.

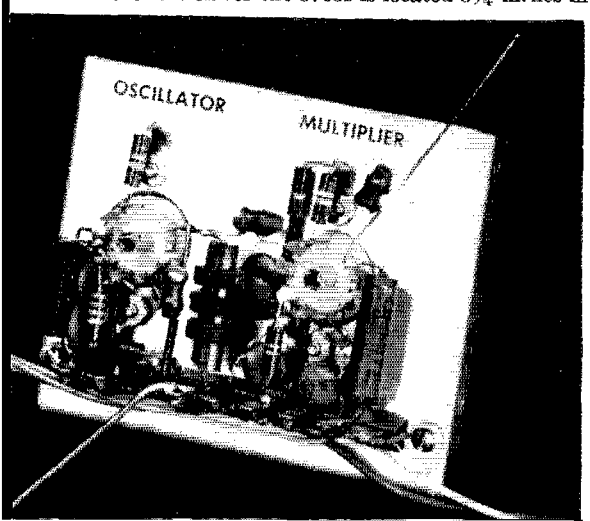
Voltage and Current Chart for the V.H.F. Mobile Transmitter

Oscillator				*Multiplier*				*Amplifier*				
Crystal Freq., Mc.	E_s	I_p, *Ma.*	*Plate Freq., Mc.*	E_g	E_s	I_p, *Ma.*	*Plate Freq., Mc.*	E_g	I_g, *Ma.*	E_s	I_p, *Ma.*	*Plate Freq., Mc.*
8.3	210	20	25	−80	240	25	50	−190	4	135	45	50
12.5	235	15	"	−120	245	27	"	−210	4.5	120	"	"
25.0	210	20	"	−60	240	25	"	−185	4	145	"	"
8.0	210	20	24	−85	250	25	72	−155	3.2	170	50	144
12.0	220	16	24	−140	255	27	"	−190	4	155	47	"
"	225	18	36	−115	245	"	"	−215	4.5	150	"	"
24.0	210	21	24	−65	250	"	"	−140	3	180	50	"

above and parallel to the condenser, and then bend the four leads from L_4 and L_5 into place. Make certain that the outside ends of the two plate coils go directly to the stator terminal at the rear of C_{17} and that the inside lead of L_5 (the one next to the coupling link) goes to the stator terminal at the front. The cold end of L_4 (the one next to the output link) may be returned to a soldering lug at the rear of the condenser. The lug can be held in place by one of the machine screws that pass through the isolantite base plate to the rotor frame of the capacitor.

It is now time to start mounting parts on the main chassis. Center J_2 on the rear wall at a point located 4¼ inches in from the right end (rear view) of the chassis and mount J_1 at the lower left-hand corner. Holes for the panel-mounted parts should now be marked and drilled. The shafts for C_{17} and C_{18} are each located 1 inch in from the right end of the unit. S_1 is centered 1⅞ inches to the left of C_{17}, and the oscillator capacitor, C_5, is still another 1⅞ inches to left of S_1. A panel-bearing assembly for C_{12} must be set in the front wall just above C_5. Spacing between the meter switch, S_2, and the tuning capacitors is also 1⅞ inches. The meter mounts at the extreme left end of the panel.

The subassemblies may now be positioned in the chassis while mounting holes are marked. As seen from the inside view of the transmitter, the section for the 5763s is located 3¼ inches in from the bottom of the chassis. The Z-shaped plate which crosses the chassis has the lower section (the one that supports the 2E26) fastened to the rear wall at a point 5⅛ inches in from the bottom of the unit.



This subassembly measures 2 15/16 by 3½ inches and supports most of the components for the exciter stages. C_{13}, with one end floating free, is at the upper right-hand corner. The wire leaders at the bottom of the plate connect to the oscillator tank, meter switch and power connector, as shown by Fig. 2.

After the necessary holes have been marked and drilled, set the subchassis aside and proceed with the wiring. Connect S_1 to the tuner and to J_1; solder the tap on L_6 to C_{18}; mount L_2 on the terminals of C_5; connect the rotor arms of S_2 to the meter.

Now, mount the exciter assembly and, using the leaders already provided, wire it to C_5, J_2 and S_2. Mount a 1-terminal tie point at the right end (front view) of the crystal socket and mount R_9 between the terminal and Contact C of S_2. Run leads to the crystal socket, and then mount the partition carrying C_{12}, RFC_4 and the 2E26. Be sure to use an insulated shaft coupling between C_{12} and the panel bearing. The remaining wiring can now be finished off in a few minutes.

Testing

A conventional a.c. power supply that will deliver 6.3 volts at 2.3 amp. and 300 volts at 100 ma. may be used during testing of the transmitter. Do not connect the output of the supply to the amplifier input terminals (Pin 5 of J_2) at this time. Bias for the amplifier may be obtained from a small B battery. A 10-watt lamp bulb, that will be used as a dummy load, should be plugged into J_1 and a crystal must be placed in the crystal socket. For 50-Mc. operation, the

(Continued on page 114)

A Simple Heterodyne Exciter for 10 Meters

Stabilizing the VFO for Higher Frequencies

BY CHARLES FAULKNER,* W6FPV

PREVIOUS articles in *QST* and elsewhere have pointed out the advantages of the heterodyne type of VFO. However, most of the units described have been designed for either 3.5- or 7-Mc. output, making it necessary to multiply frequency (and any drift or other instability along with it) to get to the higher-frequency bands. It is, however, possible to avoid this multiplication by heterodyning directly to the higher frequencies. (See Fig. 1.) While there may be certain complications in attempting multiband operation on this principle, the system

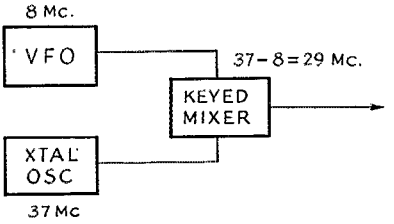


Fig. 1 — Block diagram of a simple heterodyne VFO. Signals from an 8-Mc. VFO and a 37-Mc. crystal oscillator are combined in a mixer. The difference between these two frequencies appears in the output.

can be quite simple if only one band, such as the 10-meter band, is involved. In doing this, the VFO can still operate at a frequency low enough to assure good stability. Since there is no frequency multiplication involved, the stability at 28 Mc., in terms of cycles, will be essentially the same as at the VFO's fundamental.

Choice of Frequencies

So far as arriving at the desired output frequency is concerned, the only requirement is that either the sum of the two oscillator frequencies, or their difference, equal the desired output frequency. However, there are other considerations.

In the process of mixing, spurious frequencies are unavoidably generated and it is desirable to select oscillator frequencies that will place these spurious frequencies as far removed from the desired output frequency as possible so that they may be more easily rejected by the tuned circuit in the output of the mixer.

Also, from the consideration of frequency drift (and chirp in c.w. operation) it is desirable to allow both oscillators to run continuously without causing interference in the receiver. This can be done, provided the oscillator fundamentals and their harmonics fall outside the band of operation, since the desired output frequency appears only when the mixer stage is operating. The mixer can be keyed for break-in c.w., or switched on and off for push-to-talk 'phone.

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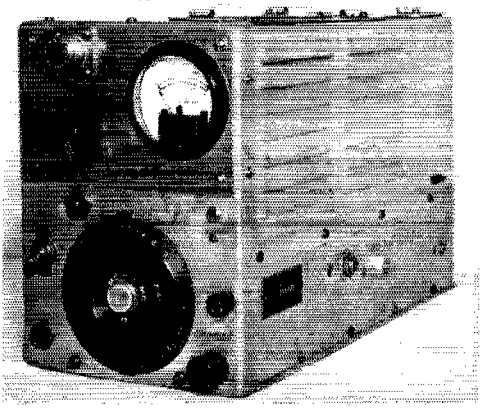
Using the BC-459

Although other combinations might have been considered, I had a surplus BC-459 covering 7000 to 9100 kc., and a crystal I had been using for 6 meters. A little figuring showed that these could be used to produce output in the 10-meter band. The crystal is a 3rd-overtone unit marked 12,535 kc., whose fundamental is about 4178.3 kc. By using the 9th overtone at about 37,600 kc., and the difference frequency, it is possible to cover the output range of 28.5 to 29.7 Mc., while tuning the BC-459 from 9.1 to 7.9 Mc.

By adjusting the slug and padder, or perhaps pruning the oscillator coil, in the BC-459, so that the VFO tunes up to 9600 kc., the entire band down to 28,000 kc. could be covered. However, as the output frequency goes from 28,000 to 28,267 kc., the third harmonic of the VFO will go from 28,800 to 28,000 kc., putting a signal in the band over this range. Some may not consider this to be too serious, since only at 28,200 kc. will this harmonic fall directly on the operating frequency. However, if the harmonic is pronounced, the selectivity of the following circuits may not be sufficient to keep it from reaching the antenna.

If this is to be avoided, the most convenient combination, assuming that the BC-459 is to be used, would be to retrim the VFO slightly so that it goes to 9200 kc., and use a crystal-oscillator frequency of 37,200 kc. (The crystal would be an overtone type nominally close to 12,400 kc.)



This BC-459 has been revamped to provide a heterodyne-type exciter for the 10-meter band. The upper portion of the panel is new. Original holes in the lower portion are used for the key jack, VFO-set switch and a panel lamp. The grid-current jack, buffer tuning slug, C_6 and C_8 adjustment holes, are along the side.

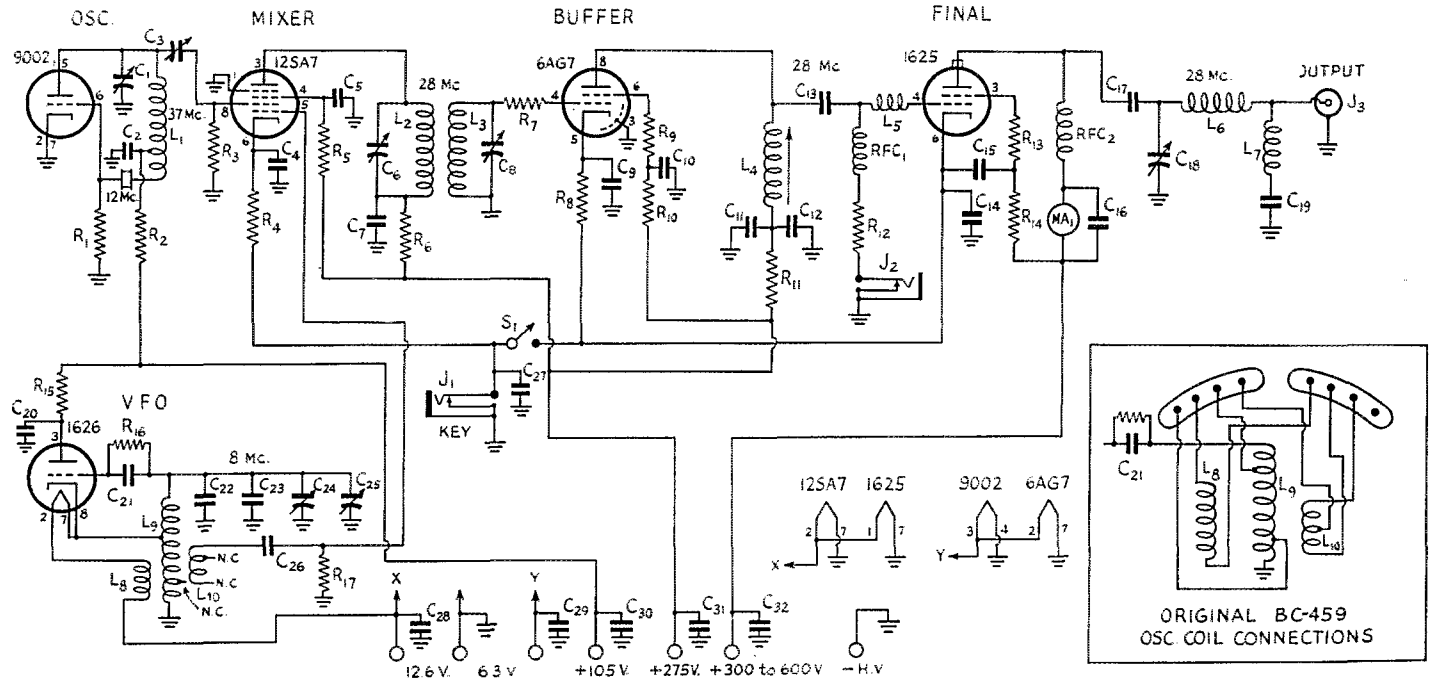


Fig. 2 — Circuit of the 10-meter heterodyne exciter.

C_1 — 15-$\mu\mu$fd. variable.
C_2, C_4, C_5, C_7, C_9, C_{10}, C_{11}, C_{15}, C_{20}, C_{28}, C_{29}, C_{30}, C_{31} — 0.001-μfd. disk ceramic.
C_3, C_6, C_8 — 30-$\mu\mu$fd. mica trimmer.
C_{12}, C_{14}, C_{27} — 0.01-μfd. mica.
C_{13} — 47-$\mu\mu$fd. mica.
C_{16} — 0.0047-μfd. mica.
C_{17}, C_{32} — 0.002-μfd. 1200-volt mica.
C_{18} — 50-$\mu\mu$fd. 1000-volt variable.
C_{19} — 100-$\mu\mu$fd. 1200-volt mica.
C_{21}, C_{22}, C_{23}, C_{24}, C_{25}, C_{26} — As originally in BC-459.
R_1, R_{17} — 3900 ohms, ½ watt.
R_2, R_6, R_{11}, R_{15} — 270 ohms, ½ watt.
R_3 — 22,000 ohms, ½ watt.
R_4 — 330 ohms, ½ watt.
R_5, R_{10} — 22,000 ohms, 1 watt.
R_7, R_9, R_{13} — 47 ohms, ½ watt.
R_8 — 330 ohms, 1 watt.
R_{12} — 15,000 ohms, ½ watt.
R_{14} — 10-watt resistor, resistance value depends on supply voltage — adjust for 250 volts at screen with amplifier loaded.
R_{16} — As originally in BC-459.
L_1 — 13 turns No. 20 enam., ½-inch diam., 1 inch long, tapped at 4th turn from grid end (see text).
L_2 — 11 turns No. 20 enam., ½-inch diam., ½ inch long.
L_3 — 7 turns No. 20 enam., ½-inch diam., ⅜ inch long.
L_4 — 8 turns No. 22 enam. on ½-inch slug-tuned form (e.g., Millen 69046).
L_5 — 10 turns No. 24 enam., ¼-inch diam., ⅝ inch long.
L_6 — 6 turns No. 14 enam., 1-inch diam., ¾ inch long.
L_7 — 3 turns No. 22 bare, ¼-inch diam., as per text.
L_8, L_9, L_{10} — As originally in BC-459.
J_1, J_2 — Closed-circuit 'phone jack.
J_3 — Coax connector.
MA_1 — 200-ma. d.c. milliammeter.
RFC_1, RFC_2 — 2.5-mh. r.f. choke.
S_1 — S.p.s.t. toggle.

With this combination, no VFO harmonic will fall inside the band. The second harmonic of the crystal oscillator will fall in the gap between TV Channels 4 and 5, and its third harmonic between the high and low v.h.f. TV bands. The first VFO harmonic to fall in the TV bands is the seventh. Harmonics of the 28-Mc. output frequency must be treated as usual with any other type of circuit, of course.

• VFO stability at the higher frequencies can be improved considerably by using the heterodyne principle, rather than multiplying frequency from a low-frequency VFO of the conventional type. Although W6FPV has used a BC-459 here as his guinea pig, the circuit can easily be adapted to new construction.

The Circuit

The circuit of the rig is shown in Fig. 2. The crystal-oscillator is of the regenerative type, operating at the 9th overtone of the crystal, as discussed previously. A 9002 was used in this instance, but almost any of the small triodes should work equally well. Don't let this circuit scare you, since it is not difficult to get output on overtones much higher than the ninth. A little care is necessary in finding the best position for the tap on L_1 but, once set, no further adjustment should be necessary.

As stated earlier, the VFO is the original in the BC-459 although, of course, any good stable VFO covering the required frequency range could be substituted. The two oscillators are fed into a 12SA7 mixer whose output is tuned to the 28-Mc. band. A slug-tuned coil is used in the output circuit of the 6AG7 buffer stage.

If you have been bothered with TVI and have not yet tried the pi-network output circuit, let me recommend it to you. This exciter was first built with a conventional plate tank for the 1625 final. Although there was no TVI without the antenna, Channel 2 was taken out completely as soon as the antenna was connected. After reading the article on pi networks in *QST*,[1] this circuit was tried out. Then, with the antenna connected, only a slight herringbone pattern was visible in Channel 2 and this could be eliminated with a low-pass filter. The output condenser, C_{19}, should be resonated with L_7 to the local band where TVI is worst. The circuit is designed to work into coax to an antenna tuner, and thence into any type of antenna or feed system. L_5, R_7, R_9 and R_{13} are necessary to suppress v.h.f. parasitic oscillations.

All stages, except the two oscillators, are keyed simultaneously in the common cathode lead.

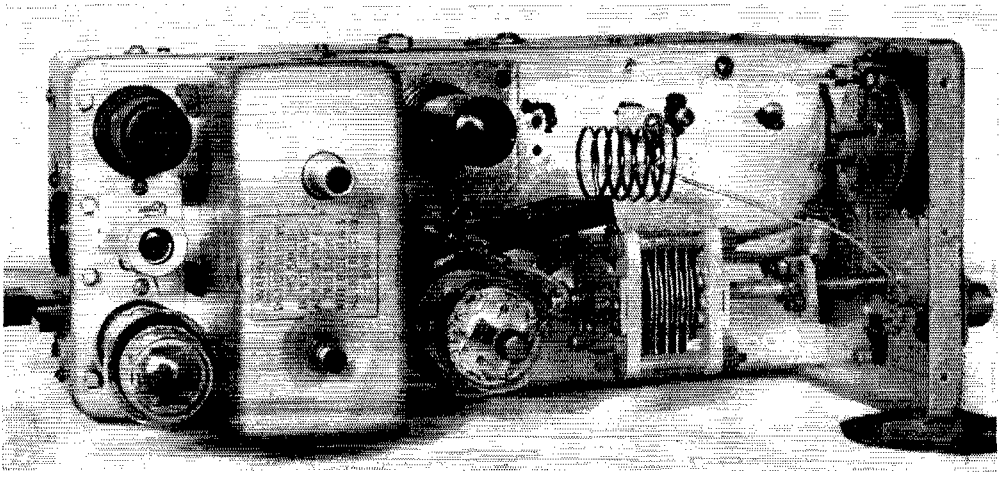
Construction

The BC-459 chassis is stripped of everything but the oscillator tube and associated circuits. The original amplifier tuning condenser is left in so as not to disrupt the tuning cable, but otherwise is not used. One of the 1625 sockets is removed and the hole covered with a piece of aluminum. The aluminum is then punched for the 6AG7 socket. The socket for the calibrating crystal at the center of the rear of the chassis is similarly replaced with a socket for the 9002 (or other crystal-oscillator tube). The socket formerly used for the "magic eye" is used for the 12SA7.

The components associated with the two oscillator tubes and the mixer tubes are mounted underneath at the rear of the chassis, close to the tube sockets. C_1, C_6 and C_8 are mounted so that they may be adjusted through holes in the sides of the chassis. L_4 is mounted near the 6AG7 socket so that the slug can be adjusted from the side. The output-circuit tuning condenser, C_{18}, and the coil, L_6, are mounted on top of the chassis, as shown in the top-view photograph.

[1] Grammer, "Practical Application of Pi-Network Tank Circuits for TVI Reduction," *QST*, Jan., 1952, p. 10.

Top view of the 28-Mc. heterodyne exciter. At the left, from bottom to top, are the 1629, the 9002 and the 12SA7. To the right of the original oscillator unit are the 6AG7 buffer and the 1625 final with its pi-section output circuit. The crystal socket has since been moved inside to eliminate the last traces of key-up signal.



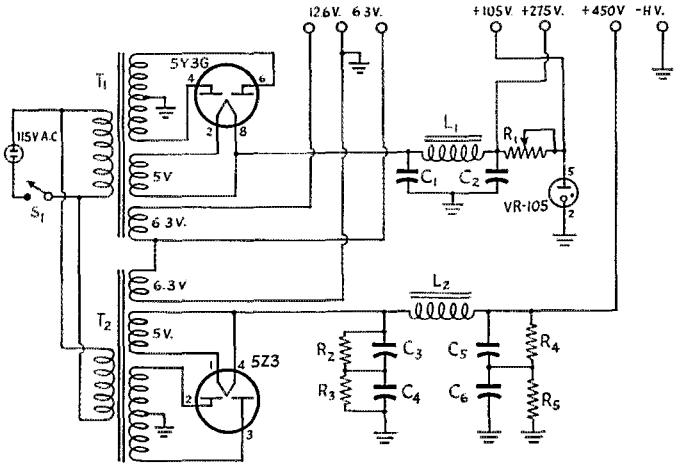


Fig. 3 — Circuit of a suitable power supply for the heterodyne exciter.

C_1, C_2, C_3, C_4, C_5, C_6 — 16-μfd. 450-volt electrolytic.
R_1 — 5000 ohms, 25 watts, adjustable.
R_2, R_3 — 0.1 megohm, 1 watt.
R_4, R_5 — 20,000 ohms, 10 watts.
L_1 — 10-hy. 70-ma. filter choke.
L_2 — 10-hy. 125-ma. filter choke.
S_1 — S.p.s.t. toggle.
T_1 — Power transformer — 350-0-350 volts r.m.s., 70 ma.; 5 volts, 2 amp.; 6.3 volts, 3.5 amp.
T_2 — Power transformer — 400 to 500 volts r.m.s. each side of center; 5 volts, 3 amp.; 6.3 volts, 3.5 amp.

♦

An aluminum patch was cut to cover the top of the panel, and the meter, output-stage tuning control, and coax connector were mounted on it. Existing holes in the lower portion of the panel were used for the key jack, the switch S_1, and a pilot lamp. The amplifier grid-current jack, J_2, was mounted on the side of the chassis.

Adjustment

Fig. 3 shows the circuit of a suitable power supply. Oscillation in the crystal circuit can be determined by connecting a low-range milliammeter in series with the 105-volt terminal and watching for the dip in plate current as C_1 is tuned through its range. The 1626 should be removed temporarily. If you do not have a calibrated wavemeter or g.d.o. covering 37 Mc., it should be possible to check to make sure that you are on the correct overtone by listening with the receiver. Place a wire close to the crystal oscillator and run it to the antenna terminal of the receiver. Add your receiver i.f. to the crystal-oscillator frequency, divide by 2, and subtract the i.f. You should hear the crystal-oscillator signal close to this calculated frequency, making use of the 2nd harmonic of the receiver's high-frequency oscillator. As an example, if your crystal-oscillator frequency is 37,200 kc., and your i.f. 465 kc., then

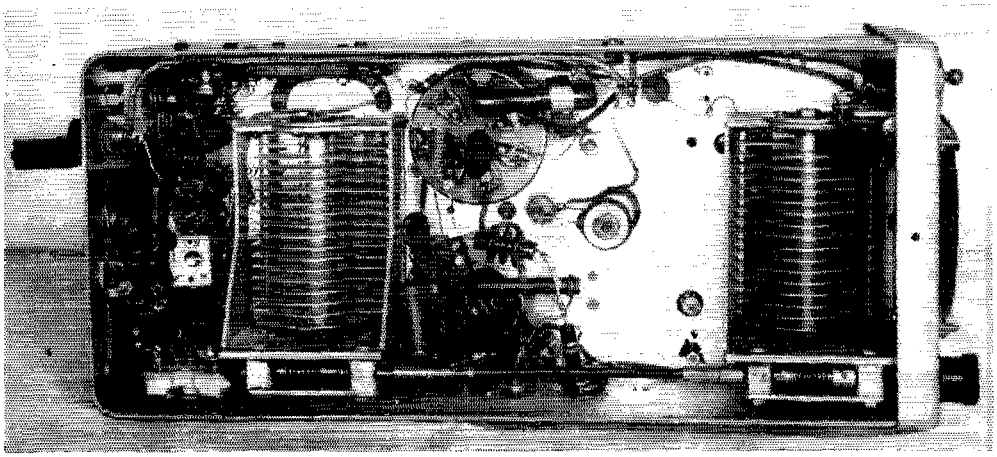
$$37{,}200 + 465 = 37{,}665$$
$$37{,}665/2 = 18{,}832.5$$
$$18{,}832.5 - 465 = 18{,}367.5 \text{ kc.}$$

When you have located the signal on the receiver, wave your hand around L_1 to make sure that the crystal is controlling. If it is not, the frequency will change with the motions of your hand. The tap on L_1 should be set as far toward the grid end of the coil as possible, still maintaining oscillation. If you cannot find the signal at the right frequency, see if you can find another dip in plate current by resetting C_1.

After the 1626 has been replaced and the range of the VFO checked, it should be possible to hear the resultant signal in the 10-meter band. Then C_6 and C_8 can be adjusted for maximum deflection on the receiver S-meter. The slug of L_4 is

(Continued on page 116)

Bottom view of the 10-meter heterodyne exciter. The amplifier tuning condenser at the right is not used in the circuit. C_1 is in the upper left-hand corner, adjustable from the rear. L_2 and L_3 are in the lower left-hand corner, with the trimmers C_6 and C_8 adjustable from the lower side.



The Single Side-Saddle Linear

A 75-Meter 807 Linear Amplifier for S.S.B.

BY CARL W. ECKHARDT,* W7BBK

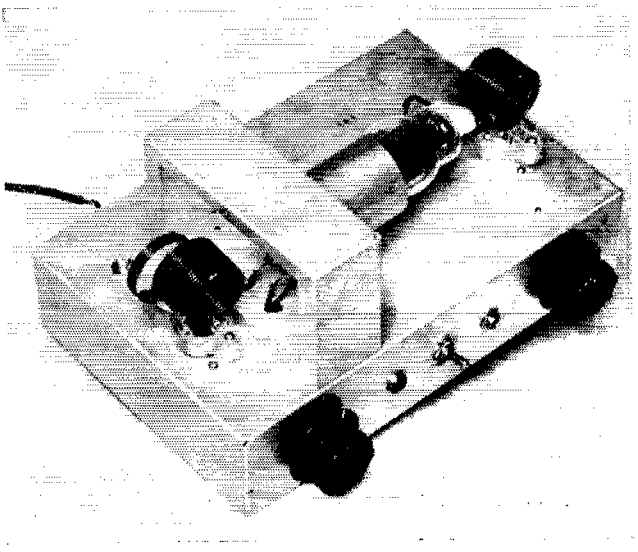
• This is a good example of how an amateur can dig into the literature for a few ideas, kick them around a bit, and end up with something tailor-made to his requirements. In this case the end result happens to be something that will fill the requirements of a lot of the s.s.b. gang: a 75-watt linear amplifier to follow one of the basic exciters.

HERE is a low-power Class B linear for one of the new, popular, simplified s.s.b. exciters designed by Rust,[1] Edmonds,[2] and Norgaard.[3] There have been several excellent linears designed in the medium- and high-power class, such as the Lazy Linear,[4] and Two-Stage Linear Amplifier,[5] and the Power-Peaker.[6] The Side-Saddle Linear is designed for the low-power station and will operate from existing 50-watt 600-volt power supplies. The 807, in the Side-Saddle Linear, performs efficiently as a Class B linear and will deliver approximately 50 watts of peak s.s.b. output at 75 watts peak input. Fifty watts of s.s.b. output should be properly evaluated, considering that s.s.b. gives an effective gain of at least 9 db. over a.m., equivalent to increasing the transmitter power 8 times.[7] Furthermore, the 807 is literally loafing at 600 volts plate voltage.[8]

Every effort was made to "de-bug" the amplifier before construction by referring to the excellent articles on linear design by Reque[9] and Long,[10] and using straightforward mechanical and electrical layout. The resulting amplifier is stable and behaves properly, just as the experts say it should.

The receiver has been connected directly to the antenna coax transmission line through an electronic "TR" switch,[11] and although the 807 is not biased to cut-off during receive periods (the exciter is), the linear is perfectly quiet, with no trace of thermal noise.[12]

The drive requirement is approximately 2 watts. As Fig. 1 shows, the grid is series-fed, and 35 volts of bias is supplied by batteries. Since approximately 1 ma. of grid current will flow on peaks, batteries provide the cheapest and most



The "Side-Saddle" linear amplifier uses a single 807 mounted horizontally.

*Ritzville, Wash.

[1] Rust, "Single Sideband for the Average Ham," *QST*, August, 1949.

[2] Edmonds, "A Crystal Filter S.S.B. Exciter," *QST*, November, 1950.

[3] Norgaard, "S.S.B., Jr.," *G. E. Ham News*, Nov.-Dec., 1950.

[4] Norgaard, "Lazy Linear," *G. E. Ham News*, July-Aug., 1949.

[5] Goodman, "A Two-Stage Linear R.F. Amplifier," *QST*, March, 1951.

[6] Norgaard, "Power Peaker," *G. E. Ham News*, Sept.-Oct., 1952.

[7] ARRL *Handbook*.

[8] Norgaard, "What About Single Sideband?" *QST*, May, 1948.

[9] Reque, "Linear R.F. Amplifiers," *QST*, May, 1949.

[10] Long, "Sugar-Coated Linear-Amplifier Theory," *QST*, October, 1951.

[11] Cronin, "An Improved Break-In System," *QST*, June, 1952.

[12] This may not hold true in all cases where the final runs idling current and an electronic TR switch is used. — ED.

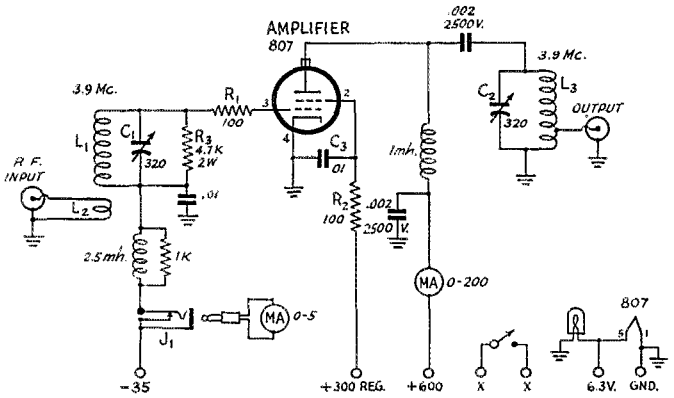


Fig. 1 — Circuit diagram of the "Side-Saddle" linear amplifier.

C_1, C_2 — Hammarlund MC-325-M or equivalent.

L_1, L_2 — 8-μh. Bud OES-40 with 3 turns removed from grid end of L_1.

L_3 — 8-μh. Bud OES-40 with 3 turns and end link removed.

Resistors are 1-watt composition unless otherwise specified.

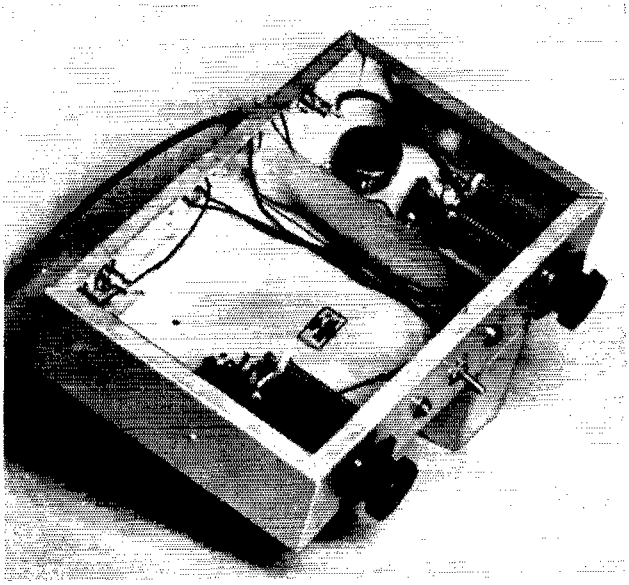
convenient method of supplying the required well-regulated bias voltage.

The plate is shunt-fed, and 300 volts regulated is provided for the screen. Instability cannot be tolerated in a linear amplifier.[10] To insure a stable-operating 807, the physical layout of the Torpedo Twins[13] was used. The grid and plate circuits are effectively isolated above the chassis as illustrated, and by a 3-inch aluminum shield running the depth of the sub-chassis, near its center, thereby isolating C_1 from C_2. Further to guard against instability, small 1-watt noninductive resistors R_1 and R_2 are placed in the grid and screen leads directly at the socket. The cathode is grounded to the tube-support chassis with a short lead at the socket. The screen by-pass condenser C_3, a disk ceramic, is wired directly across the tube socket, keeping leads as short as possible. Noninductive resistor R_3 provides the proper amount of swamping.

The values given for the grid and plate tank circuits should be followed if proper circuit Q is to be maintained.[6, 10] The Bud coils specified must be pruned to get the desired L/C ratio. Three turns are carefully removed from both L_1 and L_3. The end link of L_3 did not provide sufficient coupling and was cut from its supporting leads at the coil. One of the remaining link support leads is used as the antenna tap to L_3. Scrape a small section of the enamel covering from the 3rd, 4th, 5th and 6th turns from the ground end of L_3 and carefully solder the antenna tap to the proper turn during the tune-up procedure.

The amplifier is constructed on an 8 × 12 × 3-inch aluminum chassis. A 4 × 6 × 2-inch aluminum chassis provides the tube support as shown. The 807 is provided with a base shield. Grid and plate tank circuits are near the left- and right-hand ends of the chassis as illustrated. You will note that J_1 and the rotor of C_1 are at −35 volts bias potential and must be insulated from the chassis. This is done by slightly enlarging the mounting holes for C_1 and J_1, and insulating each of the bushings with a couple of fiber washers. The terminal strip and input and output

[13] Owens, "Torpedo Twins in 150-Watt Final," *RCA Ham Tips*, May-June, 1947.



A bottom view of the linear amplifier. The potentiometer is not used.

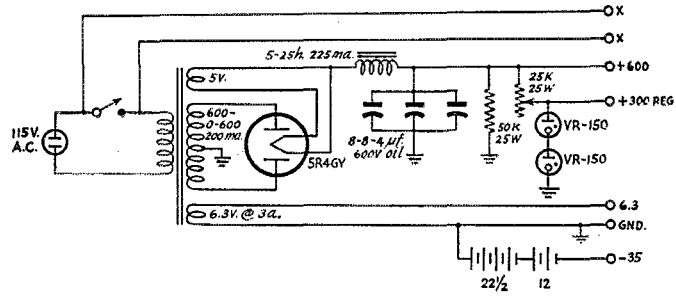


Fig. 2 — The power supply for the linear amplifier.

coaxial sockets are on the rear of the chassis. An aluminum subchassis shield 7½ inches long by 2¾ inches high, with a ½-inch lip, should be placed as mentioned earlier.

A pilot light, a power switch, and J_3 are mounted on the front center of the chassis as shown. (The potentiometer below the chassis is not being used and should be ignored.)

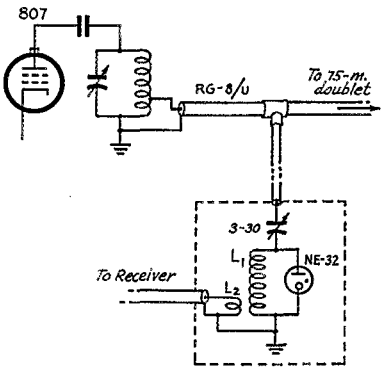


Fig. 3 — The TR switch allows the same antenna to be used for transmit and receive.
L_1 — 76 turns No. 30 d.c.c., 1¼-inch diam.
L_2 — 4 turns No. 20 flexible hook-up wire.

The power supply shown in the schematic of Fig. 2 delivers approximately 600 volts at 150 ma. to the plate of the 807, and 300 volts regulated to the screen.

Tune-Up Procedure

Before applying power to the 807, check the bias and screen voltages. Without excitation to the linear, and applying power, the grid current should be 0 and plate current 10–15 ma. The amplifier should be perfectly stable without a trace of self-oscillation or parasitics.

In applying grid drive and antenna loading, adjust for the following goals:

	Grid Current	*Plate Current*	*Relative Ant. R.F. Current*
Idling (no voice)	0	10–15	0
Maximum peak, tone or whistle	1 ma. max.	140	max.
Normal speech peaks		100	high
Normal voice		10–15 to 60–70	0 to high

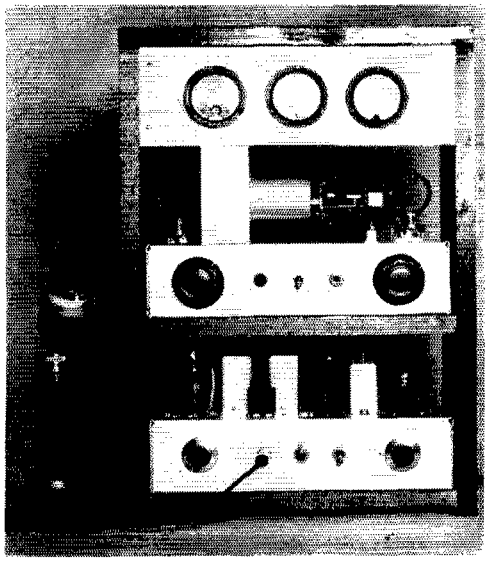
Relative readings are suggested for output r.f. current, as this will depend on the impedance of the line and the s.w.r.

Tap up from the ground end of L_3 with the antenna tap until the above maximum peaks are reached. Provide just enough excitation to the linear by adjustment of L_2 and gain control of the exciter so that the above maximum peaks are achieved. If additional gain or coupling of L_2 will not give the peak readings desired, additional coupling to the antenna will be required. If you are overdriving, reduce the drive to the point where the peak conditions of plate current just begin to drop off.

Of course, in time you will wish to give your linear the acid test, the two-tone adjustment as described by Ehrlich, "How To Test and Align Your Linear Amplifier," May, 1952, *QST*.

TR Switch

The TR switch in use is shown in Fig. 3, and in a modification of Cronin's system. It shows about 1 S-point loss on 75 meters over a direct connection, and it protects the receiver to the point where a maximum of 4 volts reaches the receiver input terminals.



In use, the linear amplifier is mounted in a wooden rack above the Edmonds crystal-filter exciter. The meters measure antenna current, grid current and plate current.

Novice 80- and 40-Meter One-Tube Rig

Simple Construction for the Beginner

BY LEWIS G. McCOY,* W1ICP

• The *first* transmitter the Novice builds should be as simple as possible so that the builder has only a minimum of problems. Here is a transmitter that goes far toward being the ultimate in simplicity of construction.

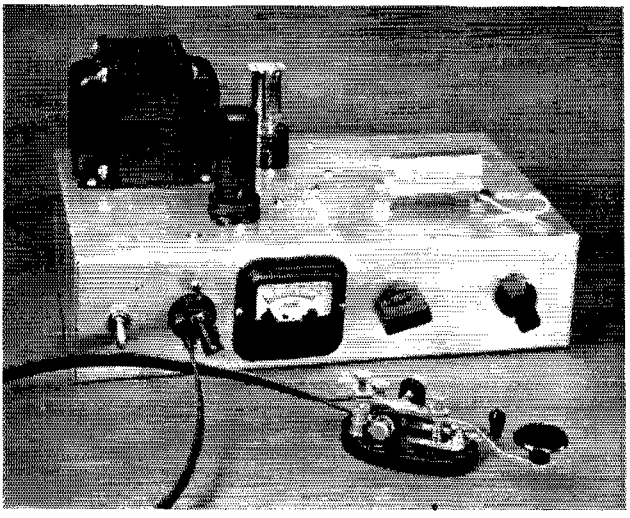
WHEN designing a Novice's first rig, cost, simplicity, and TVI precautions most often are the prime considerations. The transmitter described in this article tries to fulfill these requisites. It is low in cost — approximately $14.00 for the parts at amateur prices. It is simple in design, utilizing a minimum of components. And the use of an aluminum chassis helps keep harmful TVI harmonic radiation down considerably.

The transmitter is a 6AG7 crystal-controlled oscillator, running at approximately 10 watts input. The output circuit can be tuned to 80 or 40 meters. The output circuit is the type known as a "pi-section tank" and is explained in Chapter 6 of the ARRL *Handbook*. It is a type that furnishes a fairly easy method of feeding random lengths of wire for antennas. The author strung up 30 feet of wire indoors to use as an antenna to test the rig described here. The first CQ brought a reply from Maryland, over 200 miles from northern Connecticut. It is worth mentioning that the received report of the contact was RST 589, so don't be afraid to try indoor antennas.

Construction

After you've purchased all the parts for the rig (or raided your amateur friend's junk box), you are then ready to go to work. Before cutting holes in the chassis, beg, borrow or steal a February, 1952, copy of *QST*. On page 30 is an article entitled "How To Wire a Transmitter."[1] A study of this article, and the one on the use of tools in the May, 1952, issue,[2] will save the builder a world of headaches and serve to point the way to neat workmanship. In the "layout" (placement of parts) of the transmitter, the power-supply section is kept in a line at the back of the chassis. The r.f. components are mounted toward the front of the chassis. As can be seen in the photographs, there are three octal sockets — one for the 5Y3 rectifier, one for the 6AG7 oscillator, and a third which is used as a crystal socket and key jack. The use of an octal socket for crystal and key terminals saves the cost of a crystal holder and a key jack.

With the exception of the three sockets and the meter, all the mounting holes can be made with an ordinary hand drill. For the socket holes, one can purchase, or borrow, a socket punch. The meter hole can be started with the socket punch and then enlarged with a half-round or rattail file. When drilling the mounting holes for the variable condensers be sure the condensers are placed so that their shafts extend far enough out from the front of the chassis to accommodate the tuning knobs. Incidentally, you will note from the circuit diagram, Fig. 1, that the rotors of the



Top view of the transmitter. L_1 at the top right-hand side is shown in the 80-meter position. The shorting clip is clipped to the feed-through bushing. The lead to the key is a short piece of 300-ohm Twin-Lead which is terminated in a Millen 300-ohm plug. This type of plug is the correct size for octal socket Pins 2 and 4.

* Technical Assistant, *QST*.

[1] Goodman, "How To Wire a Transmitter," *QST*, Feb., 1952.

[2] Mix, "Tools and Tricks," *QST*, May, 1952.

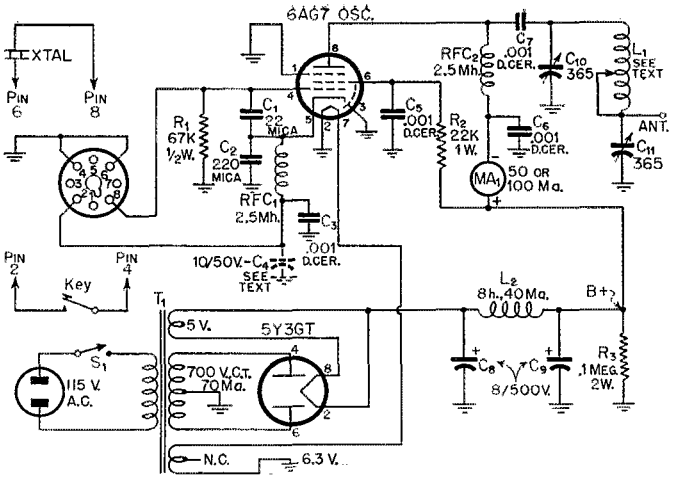


Fig. 1 — Circuit diagram of the beginner's transmitter.

condensers are grounded to the chassis, so there is no need to worry about insulation. These condensers are of the broadcast-receiver replacement type, and can be purchased locally, or from one of the large mail-order houses. They are usually listed in the catalogs as single-gang midget t.r.f. condensers and have a maximum capacitance of more than 300 $\mu\mu$f. So long as those you buy have more than 300-$\mu\mu$f. maximum capacitance, you'll be safe. They cost about one dollar each.

The power transformer is mounted in such a manner that the high-voltage leads and the 5-volt rectifier leads are brought out at a point close to the 5Y3 rectifier socket. A three-terminal tie point is mounted close to the transformer 115-volt leads to furnish terminals for the power switch and transformer leads. After the sockets, a.c. switch, meter, and feed-through bushings for holding L_1 are all mounted in place, we are ready to wire the rig.

The soldering iron to be used should have a clean tip so we'll be sure to transfer enough heat to the point being soldered. Also, we use *rosin-core* solder, not acid-core.

Wiring

Connect the two 115-volt transformer primary leads (black), each to one of the tie-points. Then also connect one of the power-cord wires to one of these tie-points, and one terminal of the power switch, S_1, to the other. Connect the remaining side of S_1, and the remaining power-cord wire to the third tie-point. Fasten one of the 6.3-volt transformer leads (green) to a solder lug under the tie-point mounting screw. The remaining 6.3-volt transformer wire (green) is connected to Pin 7 on the 6AG7 socket.

For the high-voltage wiring, the center-tap wire of the high-voltage secondary (red and yellow) is connected to ground, one of the high-voltage leads (red) is connected to Pin 4 of the 5Y3 socket, while the other red lead goes to Pin 6. One of the 5-volt rectifier-filament leads (yellow) is connected to Pin 8 of the 5Y3 socket, and the other yellow lead is run to Pin 2. Also connected to Pin 2 of the 5Y3 socket is a lead from the choke, L_2, and the lead marked + from C_8. The other side of C_8, or the *negative* side, is grounded. The remaining lead of L_2, the *plus* side of C_9, and a lead from R_3, are all run to a terminal on a tie point. The *negative* side of C_9 and the other lead from R_3 are grounded. This completes the power-supply wiring. We are now ready to wire the r.f. section.

Pins 1, 2 and 3 of the 6AG7 socket are connected together with a bare wire and the wire run to ground. Also, one side of C_2 must be grounded, so it can be connected to one of these pins. The other side of C_2 is run to Pin 5. A lead to RFC_1 is also connected to Pin 5. One side of C_1, one side of R_1, and a lead to Pin 8 of the crystal socket are all soldered to Pin 4 of the 6AG7 socket. The other side of R_1 is grounded, while the remaining side of C_1 goes to Pin 5. Pins 4 and 6 of the crystal socket are also grounded. The remaining side of RFC_1 is connected to Pin 2 of the crystal socket. Also connected to Pin 2 is one side of C_3. The other side of C_3 is grounded. Although we call it the crystal socket, Pin 2 is the cathode side of the key jack while Pin 4 is the ground side. In other words, your key is connected between Pins 2 and 4 of this socket.

The screen resistor, R_2, is connected between the B+ (+ terminal of C_9) terminal and Pin 6 of the 6AG7 socket. Also connected to Pin 6 is one side of C_5. The other side of C_5 is grounded. A lead is connected between the B+ terminal and the + side of the meter. The other terminal of the meter is connected to one side of RFC_2. Also connected to this point on RFC_2 is one side of C_6, the other side of C_6 being grounded. The remaining side of RFC_2 is connected to Pin 8 of the 6AG7 socket and C_7 is connected between this side of RFC_2, and the stator section of C_{10} is also connected to the nearest of the two feed-through bushings holding L_1. The stator of C_{11} is connected to the other feed-through bushing, and a lead is run from this bushing to the transmitter output terminal mounted on the rear

side of the chassis. This should complete all wiring below the chassis.

Coil

As shown in the parts list, L_1 is a Barker & Williamson stock No. 3016 coil with 13 turns removed from each end. For 40-meter operation, it is necessary to short out a large part of the coil. This is accomplished by use of a short clip lead. One end of the lead is connected, along with one end of L_1, to the output bushing (the one connected to C_{11}). The other end of L_1 is soldered to the input bushing. To operate on 40 meters it is necessary to attach the clip to the 30th turn of L_1, from the input side. In order not to short out the 29th and 31st turns, they should be bent toward the axis of the coil. This will not affect the operation of the coil and will provide the necessary clearance.

Testing

You should now be ready to test the transmitter. You'll need an 80-meter crystal between 3700 and 3750 kc. for 80-meter operation. For 40-meter work, you need one between 3588 and 3598 kc. Incidentally, don't make the mistake of leaving your 40-meter crystal in the rig when you tune up on 80. You'll find that you will be getting out, but not in the 80-meter Novice band — you'll be operating on the crystal frequency which, in this case, would be lower than 3700 kc.

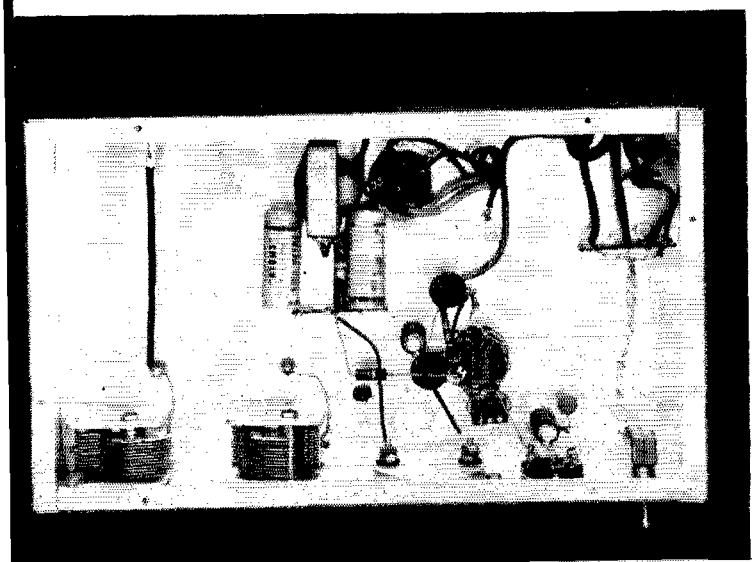
Let's assume you are tuning up on 80 meters. You insert the crystal in Pins 6 and 8 of the octal socket. Your key leads are inserted in Pins 2 and 4. Most keys have a built-in switch for opening or closing the key. In this case, we leave the switch open. We are going to need a dummy load to test the rig and a 115-volt, 10- or 15-watt light bulb will serve the purpose. To make it easy to connect the bulb to the output terminal of the rig we can solder a piece of wire to the center terminal in the base of the bulb, and one to the screw shell portion. One of the wires is then connected to the output terminal of the transmitter and the other to the chassis. The 115-volt a.c. switch is turned on and the tubes allowed a minute or so to warm up. After the rig has been on for a minute, you can then close the key. Tune your receiver to the crystal frequency and you should be able to hear the transmitter's signal. The input condenser, C_{10}, is slowly tuned through its range. Two things should happen — the dummy load lamp should light and your meter should show a dip, or lower reading, at the point where the bulb lights. Also, the signal should be louder at this point. Now tune the output condenser, C_{11}, across its range and the bulb should brighten at one point, and the signal get louder in the receiver. A look at your meter will show that you are getting a greater reading than you had with the setting of C_{10} by itself. You can experiment by switching back and forth between the two condensers, always tuning for maximum brilliance in the bulb.

If you cannot hear the signal in the receiver, or the bulb doesn't light, carefully check over

(Continued on page 116)

Shopping List for Novice Transmitter

22-$\mu\mu$f. mica condenser.
220-$\mu\mu$f. mica condenser.
4 0.001-μf. disk ceramic condensers.
2 8-μf. 500-volt midget electrolytic condensers.
67,000-ohm resistor, ½ watt.
22,000-ohm resistor, 1 watt.
0.1-megohm resistor, 2 watts.
2 2½-mh. r.f. chokes (National R100S or Millen 34102).
2 variable condensers (midget type t.r.f. one-gang broadcast receiver replacement).
70 turns of No. 24 wire, 1-inch diam., 2¼ inches long (B & W 3016 with 13 turns removed from each end).
8-hy. 40-ma. filter choke (Thordarson T20C52).
Power transformer: 350–0–350 volts r.m.s., 70 ma.; 5 v., 2 amp.; 6.3 v., 2½ amp. (Thordarson TS-24R02).
3 octal sockets.
Single-pole single-throw toggle switch.
2 feed-through insulators (National TPB).
Tip jack (Amphenol type 781S).
2 three-point terminal strips.
0–50 or 0–100 d.c. milliammeter (Shurite).
Aluminum chassis 3 by 7 by 12 inches.
6 feet of hook-up wire.
6AG7 tube.
5Y3 tube.
6 solder lugs.
18 6-32 × ½-inch nuts, bolts, and washers.
Two tuning knobs to fit ¼-inch shaft.
Crystal.



Bottom view of the Novice rig showing the wiring of parts. The power supply components are mounted along the rear side while the r.f. section runs along the front. The output lead from the feed-through bushing is clearly visible on the right-hand side. The only openings at the back are the output terminal and the 115-volt a.c. leads.

Color Television and the Amateur

TVI and ITV Potentialities in the New Color TV System

BY GEORGE GRAMMER,* W1DF

• This article is the story of a coöperative undertaking on the part of the League and the radio profession to assess the interference potentialities of color television before they became realities, and to find ways to avoid mutual interference between the amateur and television broadcasting services.

To amateurs who have wondered what color TV means in terms of TVI, it is also "must" reading.

THE addition of color to a television picture introduces new elements into the TVI situation. From somewhat limited experience so far, it does not appear that the technical problem of getting rid of TVI will be intrinsically more difficult, but it may not be possible to get by with the minimum measures that sufficed, in certain cases, with monochrome television.

At the present writing it appears a practical certainty that FCC will scrap its current standards for color TV and adopt instead the standards worked out by the National Television System Committee. The NTSC, with membership drawn from all segments of radio engineering and industry, has been working intensively on standards for a "compatible" system ever since FCC, after the now-famous controversy over color systems some three years ago, decided to go along with the frame-sequential system. It was not a popular decision, since it meant that the millions of TV receivers in existence could not receive a color signal, even as a black-and-white picture, without considerable modification. The system on which the NTSC standards are based is a compatible one — meaning that any monochrome receiver will reproduce a color signal as an ordinary black-and-white picture without requiring any circuit or other changes.

This is simply a bit of background, of little direct interest to amateurs since it is an internal matter in another service. What is of interest is the effect of the choice of system and standards for color TV on our TVI problems, and on the associated question of ITV. It is possible that by the time this issue of *QST* is distributed there will be regularly-scheduled color transmission on the air, so color TVI is not just something to anticipate in the dim future. To understand what may be in store, it is necessary to know something about the system.

The Proposed Color TV System

Probably most amateurs are familiar with the essential features of the black-and-white or monochrome television system as it is used in this country. The total channel width assigned for the complete signal, including both picture and sound, is 6 megacycles. The picture signal is amplitude-modulated on one carrier (but with most of the lower sideband removed) and the picture modulation components extend out to about 4 Mc. in the upper sideband. The sound signal is transmitted by frequency modulating a second carrier, which is placed 4.5 Mc. higher in the channel than the picture carrier. The picture carrier is placed 1.25 Mc. above the low-frequency edge of the channel.

This same arrangement is retained in the proposed color system — it has to be, of course, for compatibility. In fact, the *detail* in a color transmission actually is sent in monochrome, so an ordinary monochrome receiver handles a color signal just as it does a straight monochrome signal, and hardly sees any difference between the two.

At least, the viewer doesn't see any particular difference, and this represents a rather remarkable technical achievement. Because in order to send a color picture it is necessary to send all the information about where and when dabs of which color should appear in the picture, and this additional information has to be sent in the same channel that already is used for plain black-and-white information. It not only has to be sent in a form that can be utilized by a color receiver, but which also will not interfere with the picture in either a color or monochrome receiver.

The technical details are complicated, but to put it briefly, it can be said that the transmission of color requires sending a minimum of three separate sets of information. In the system on

* Technical Editor, *QST*.

♦

Taking notes during the preliminary color TVI tests at the David Sarnoff Research Center, Princeton, N. J. No ham could see this ideally flat expanse of field behind the Princeton laboratory without having visions of whole families of rhombics! (*Photo by W2LV*)

WIJEQ at the "operating position" in the station-wagon set-up used for color TVI tests. The installation was such that the equipment could be bedded down for damage-free transportation, but could be assembled ready for going on the air within a few minutes.

♦

which the NTSC standards are based, one such set is "brightness," or the relative intensity of light without respect to color. This is the same as the ordinary monochrome signal that appears as amplitude modulation on the picture carrier in a black-and-white transmission. The other two sets of information give the receiver all it needs to know about the colors in the picture. Although it might be expected that two additional carriers would be needed to convey the necessary modulations, only one carrier is used — and it is actually not transmitted at all, being suppressed at the transmitter. Only the color sidebands are transmitted. One set of sidebands, the red signal, is confined to a bandwidth of approximately 600 kc. and is produced by amplitude modulation of the "color subcarrier." The other set, the blue signal, is amplitude-modulated on a part of the color subcarrier that has been shifted in phase by 90 degrees, and has a bandwidth of about 1.5 Mc. The composite signal from these two sets of sidebands is modulated in both amplitude and phase, the amplitude variations corresponding to color saturation, or the amount by which the color is diluted by white, and the phase variations to hue.

Since the carrier is not transmitted, it has to be supplied in the receiver for proper detection, just as receiving an amateur single-sideband signal requires a locally-supplied carrier. In this case, however, the locally-supplied carrier has to be exactly right both in frequency and phase, since double sidebands are transmitted. To keep the receiver local oscillator in line, a "burst" of the color subcarrier frequency is transmitted during the blanking period at the end of each line.

The requirement that the color information must not cause interference in the monochrome or brightness channel and thus be invisible in the picture puts definite restrictions on the frequencies that can be used for the color subcarrier. First, it should be as far as possible from the regular picture carrier — in the upper reaches of the picture part of the channel where interference effects are relatively small. On the other hand, it cannot be put too close to the sound channel because of the possibilities of mutual interference there. Second, beat patterns are most noticeable when the frequency of the interfering signal is at or close to an integral multiple of the line frequency (giving vertical or nearly vertical bars) and tend to become invisible when the frequency is halfway between. Hence the subcarrier frequency must be an odd multiple of half the line frequency. The color sidebands will then tend to invisibility also, since these sidebands are discrete frequencies spaced at multiples of the line frequency away from the subcarrier (the sidebands in a regular monochrome signal are likewise discrete frequencies spaced at line-frequency intervals from the picture carrier).

For these and other reasons the carrier frequency has to be placed in a region roughly 3 to 4 Mc. above the regular picture carrier. The frequency eventually decided on, after detailed consideration of the four or five possible frequencies lying within this region, was approximately 3.58 Mc. (3579.545 kc.). The layout of a television channel for color transmission is therefore as shown in Fig. 1. The difference between Fig. 1 and the ordinary monochrome layout is in the addition of the color sidebands at the upper end of the channel.

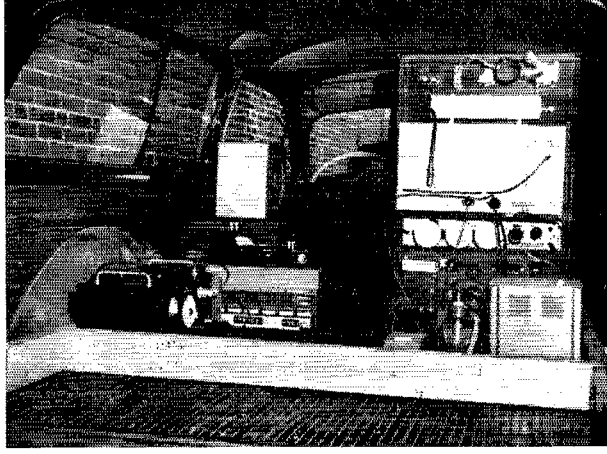
In-Channel Interference

Now what does this new element mean in terms of TVI, particularly the type of interference caused by harmonics from an amateur transmitter? This part of the TV channel has been one in which a relatively strong interfering signal can be tolerated, as compared with interference from frequencies near the regular picture carrier.[1] It has been possible to take advantage of it in, for instance, 28-Mc. 'phone operation by working on a frequency that throws either the Channel 2 or Channel 6 harmonic in the region 4 to 5 Mc. above the low edge of the channel. But that is just where all the color information lies, in a color transmission.

To date, opportunities to make a field check on this point have been nonexistent, but the question has been investigated on a laboratory basis.[2] From past experience, there is every reason to believe that the laboratory results will be valid in actual practice. They show that in the frequency region where a beat pattern becomes less

[1] See *The Radio Amateur's Handbook*, chapter on BCI and TVI; also TVI Tips, *QST*, June, 1949.

[2] "A Comparison of Monochrome and Color Television with Reference to Susceptibility to Various Types of Interference," Exhibit 8, Petition of the Radio Corporation of America and the National Broadcasting Company, Inc., before the Federal Communications Commission for Approval of Color Standards for the RCA Color Television System.



A view inside the station wagon showing the equipment set up for operation. The transmitter was arranged for either VFO or crystal operation, with Variac control of the plate input. A considerable amount of accessory and test gear also was carried. A 100-foot length of heavy-duty power cable was used for connection to either 220- or 110-volt source of power.

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bothersome with a monochrome signal, interference to the color circuits begins to increase. Near the color subcarrier frequency the interference caused by a signal of given intensity will be approximately the same as the interference caused by a signal of equal intensity near the picture carrier. In other words, the upper part of the channel will become just as "sensitive," for color, as the lower part now is, and the middle reaches of the channel will not be much better.

Thus it is to be expected that color TVI of the harmonic variety will not be appreciably alleviated by care in choosing an operating frequency. If you now get into trouble when you operate on a frequency that puts a harmonic near the picture carrier but can "get by" by staying on a higher frequency, you can look forward to having to do a bit better job of harmonic suppression before being in the clear with color. But if you are clean on all frequencies with black-and-white, you can expect to be equally free from trouble with color.

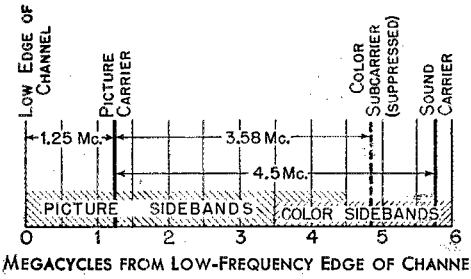


Fig. 1 — Frequency relationships in a color television channel. The sideband regions are only approximate; no attempt is made in this drawing to show the amplitude characteristics of the standard signal.

That is the situation with a color receiver receiving a color transmission. There are two other cases: a color receiver receiving a monochrome transmission, and a monochrome receiver receiving a color transmission. The first of these is no different from present TV so far as interference is concerned; no color sidebands are transmitted so the interference situation is the same as with a conventional receiver. In the second case, it is probable that the interference potentialities in the color-sideband region of the channel will be less than in color reception. Although an interfering harmonic can cause low-frequency beats with certain sidebands, and thereby put broad bars in the monochrome picture, the interference will be intermittent because the color information transmitted will be changing as the picture changes. Also, the intensity will depend on the characteristics of the receiver; many of them cut off fairly sharply in this frequency region.

Again it should be emphasized that by and large the problem is no more acute than it has always been; it is just the same old one spread over more of the TV channel. The same considerations also apply to the front-end deficiencies of TV receivers.

Video Interference

That 3.58-Mc. separation between the picture carrier and color subcarrier frequencies opens up new TVI possibilities in another direction. When the color signal is detected in the receiver, the locally-inserted carrier is actually on 3.58 Mc. and the color sidebands likewise have been converted down to lie in the 3- to 4-Mc. region. If there is an 80-meter transmitter nearby, it is distinctly possible that enough energy could be picked up directly on the receiver's color circuits, or fed through by stray coupling from the antenna, to cause interference.

Actually, such pick-up is nothing new. It occurs on many present-day monochrome receivers, but is seldom bothersome to the viewer because even the low edge of the 80-meter band is so far up in the video range that the beat pattern is extremely fine. In fact, close inspection of the picture is usually necessary in order to see it at all.

However, with the introduction of a subcarrier in the color circuits of the receiver at 3.58 Mc., together with its sidebands, an 80-meter signal no longer would be in the "invisible" region but in an excellent position to give all kinds of picture trouble, by causing low-frequency beats with the subcarrier and its sidebands. Television receivers, as a class, have not been distinguished for their ability to keep out near-by amateur signals.

Interference of this type is of course no fault of the transmitter. Getting rid of it is purely and simply a question of receiver design and construction. Unfortunately, there is no way to find out whether or not its proportions would be serious short of actual testing under conditions typical of amateur-transmitter and TV-receiver home installation. During the period of working out the NTSC standards there was no possibility of doing such testing, since there was no color transmission and less than a handful of laboratory color receivers.

About the first of this year NTSC adopted its final standards and announced plans for field-testing the system in the Spring. Concerned with the possibilities described above, and also the question of radiation from the 3.58-Mc. oscillator in the color receiver, ARRL Headquarters immediately addressed a letter to Dr. W. R. G. Baker, NTSC chairman, outlining the problem as we visualized it and offering to coöperate in field tests with a view to determining the actual facts. In the event that the interference situation proved to be a difficult one, it was suggested that the solution might be to move the subcarrier frequency. The time to decide such a question, of course, was before the standards became a part of the FCC regulations.

Dr. Baker's response was immediate, and took the concrete form of appointing a special committee to study the question and report to the main body of NTSC.

The NTSC Ad Hoc Committee on Amateur-Color TV Interference

The rather formidable title above was the official designation of the group. Its instructions were, first, to study the interference possibilities both ways — interference to picture reception, and interference to amateur operations caused by radiation from the color circuits in the receiver. Second, to recommend to NTSC any tests that might be required to obtain needed information. Third, to submit to NTSC, as a result of the study and tests, a report on the degree of interference, together with any recommendations the committee might have to alleviate it.

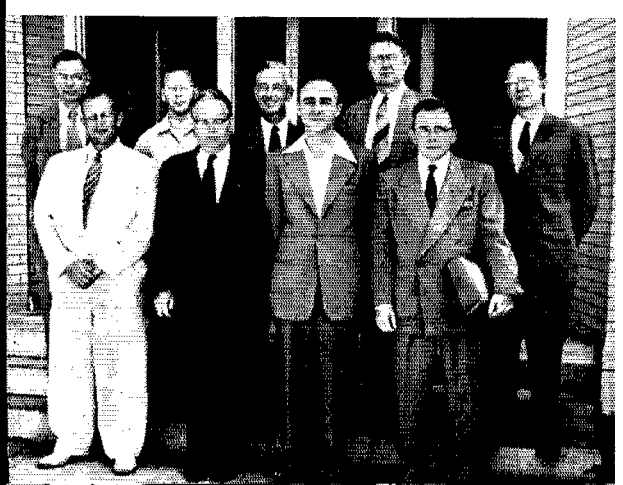
The success of any committee depends principally on its chairman, who has to spark-plug its activities. This committee was particularly fortunate in that Dr. Baker appointed Earl I. Anderson, W2UE, of the RCA Laboratories Division, to the job. Earl in turn appointed committee members representing principal segments of radio engineering and industry, nearly all of them also active amateurs. The committee membership included K. A. Chittick, RCA Home Instrument Dept.; Larry G. Cumming, W1FB/W2YP, IRE; Donald G. Fink, W3TVI (yes, that's the right call!), Philco Corp.; W. E. Good, W2CVI, G. E. Co.; Leopold Kay, W2GHA, CBS; W. W. MacDonald, W2TY, *Electronics;* Robert M. Morris, W2LV, ABC; Wendell Morrison, W2YCE, RCA Laboratories Division; Phil Rand, W1DBM, Remington Rand (and ARRL consultant); Ben F. Tyson, W2PLR, Sylvania; and the writer. Even the one non-licensed member did not escape being tinted by the amateur brush, having been a ham in pre-World War I days. In other words, the committee membership was thoroughly familiar with the amateur viewpoint.

At its first meeting, the committee concluded that the only practical way to get started was to conduct some tests in advance of the formal NTSC field tests, the purpose being, as the chairman expressed it, to "get the feel of the problem." The obstacles in the way of such testing were considerable. Practically every color receiver in existence was being worked on to get it in satisfactory shape for the coming field tests, so borrowing one for any period of time was out of the question. Even if that had been possible, there still remained the problem of getting a color broadcast signal on which to use it, and of finding a ham transmitter that would be useful for the testing — i.e., one that did not have harmonic output which would confuse the issue, that had at least moderately high power, and that was so situated that it, the receiver, and the signal could be brought together.

It was immediately obvious that, under the existing conditions, any test set-up would require bringing a complete ham station to the spot. This the League undertook to do. Through W2YCE, arrangements were made with the RCA Laboratories to make a color receiver available at Princeton, N. J., where broadcasting conditions could be simulated by putting the r.f. output of a modulated signal generator on an antenna.

The dates set for these preliminary tests, April 1st and 2nd, allowed us just a bit over two weeks to get a portable 80-meter ham station in shape. Thanks to earlier work in checking TV receiver performance, we had a high-power transmitter at Headquarters that gave us no worries on the harmonic score, but innumerable accessories were needed for completing an operating set-up that would permit assembly and testing with a minimum of wasted time and motion. Also, we could not be sure that there would be space available for installing such a station at all of the possible test sites. This, together with the fact that transportation time was an important element, posed so many difficulties that the solution was easy, although not cheap: a station wagon that became literally that — a station on

(*Continued on page 118*)



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At the final meeting of the Amateur-Color TV Interference Committee, June 23, 1953, the members present were cajoled into lining up for this picture. Front row, in the usual order: Phil Rand, W1DBM; Earl Anderson, W2UE (Chairman); Ben Tyson, W2PLR; Bill Good, W2CVI; rear row, George Grammer, W1DF; Wendell Morrison, W2YCE; "Mac" MacDonald, W2TY (Secretary); Bob Morris, W2LV; K. A. Chittick, no call now but a pre-World War I ham. The location is the Sylvania Physics Laboratory, Bayside, L. I., where the NTSC field tests in which the Committee participated were conducted.

A 220-Mc. Station for the Beginner

Part II—The Transmitter

BY EDWARD P. TILTON,* W1HDQ, AND MASON P. SOUTHWORTH,** W1VLH

Just about all the rigs for 220 Mc. described in amateur publications in recent years have been complex crystal-controlled jobs. This is fine for the fellow with some experience in transmitter design and construction, but the cost and complexity of such gear have tended to keep the beginner out of the 220-Mc. picture. The prospect of having to build a multistage transmitter has been particularly frightening to many of the newcomers who need help the most: the Technician licensees who must, by nature of their tickets, make their start in amateur radio on 220 Mc. or higher bands.

The crystal-controlled transmitter and its logical companions in the receiving field, a crystal-controlled converter and a communications receiver, are ideal devices with which to exploit the possibilities of the 220-Mc. band. We want to make this clear at the outset. But they represent a tough technical problem for the fellow who is about to build his first ham gear, and they can run into considerable expense. The beginner's 220-Mc. station may well employ a less formidable approach.

The three principal components of our station are shown in the photograph on this page. At the right is the two-tube receiver described in detail last month. The little one-tube gadget at the left is the r.f. portion of the transmitter, a simple oscillator. The unit in the middle is the modulator. This is not the sort of equipment that will make you the 220-Mc. DX champ of your section, but it will do a creditable job. More important, it is of elementary design. *You* can build it. Anybody can.

* V.H.F. Editor, *QST*.
** Laboratory Assistant, *QST*.

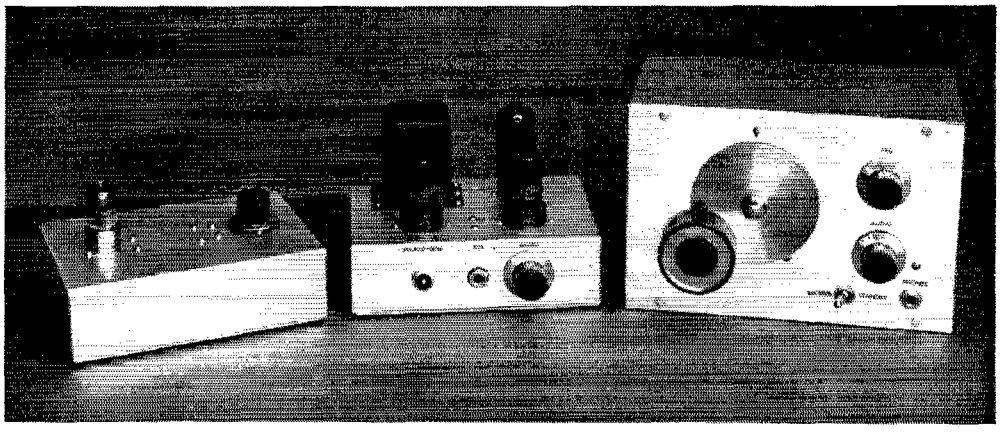
Taming the Modulated Oscillator

V.h.f. beginners of a generation ago knew the modulated oscillator well. It was the means by which both the 5- and 2½-meter bands were populated, and you can find many greybeards today who think it served the purpose pretty well, all things considered. Its principal drawback, and one we cannot entirely overcome even today, is its tendency to shift frequency when the plate voltage is varied. As modulation is nothing more than varying the plate voltage at an audio-frequency rate, it is obvious that a simple oscillator such as this is going to suffer from severe frequency modulation if it is not designed and operated with care.

This frequency modulation need not be too troublesome, however. It's hardly noticeable, in fact, if you are listening with a receiver like the one described last month. It is only when we try to listen to the simple transmitter with a selective communications receiver that the effect of the f.m. is likely to be harmful. And even then, if the oscillator is well designed and the power supply and speech equipment are free from hum, the signal from our little rig can be made to sound very much like the narrow-band f.m. you hear on lower ham bands. It can be copied on all types of receivers in the same way, by controlling the level of the modulation (and consequent frequency deviation) to suit the selectivity of the receiver at the other end.

Thanks to today's vacuum tubes and specially-designed components we can build oscillators for 220 Mc. that are more stable than those we used on 56 and 112 Mc. in the early days of activity on those bands. Many of the tubes we can buy at low

Principal components of the 220-Mc. beginner's station are, *right*, the receiver previously described; *left*, the oscillator treated in this issue; and the modulator, *center*, to be described in a subsequent article.



cost today were designed especially for v.h.f. applications, whereas the bottles used in the '30s were made principally for service in the broadcast band! If the reader is a veteran of those days, we feel sure that he will be pleasantly surprised at the quality of the signal radiated by this modulated oscillator, 1954 model.

There are a few simple precautions we must follow, if we are to put out a good signal with a v.h.f. oscillator. First, as already mentioned, the power supply and speech equipment must be free from hum. That means plenty of filtering in the power supply, and good shielding and proper arrangement of parts in the modulator. Filament-type tubes are out for use in the transmitter, as a.c. applied to the filament would cause hum modulation of the signal. Second, the r.f. portion of the transmitter must be solidly built, so that there can be no vibration in the parts of the circuit that affect the frequency. No haywire is permissible here! Third, we must hold down the level of the modulation if we want the signal to be readable on a selective receiver. More than about 10 or 15 kilocycles frequency shift under modulation will make the signal sound pretty awful. You can use more audio when the fellow you're working is using any form of broad-band receiver, but if you want to keep from sounding like a buzz saw to the fellow with a communications receiver, you've got to keep that audio gain control turned *away down!*

One other thought to keep constantly in mind: the frequency of the transmitter can be shifted by all sorts of mishaps. It should be checked frequently, to be sure that it is within the amateur band. The Lecher wire device described later is the most reliable means of accomplishing this. There are commercial services operating on either side of the amateur band. Don't risk interfering with any of them!

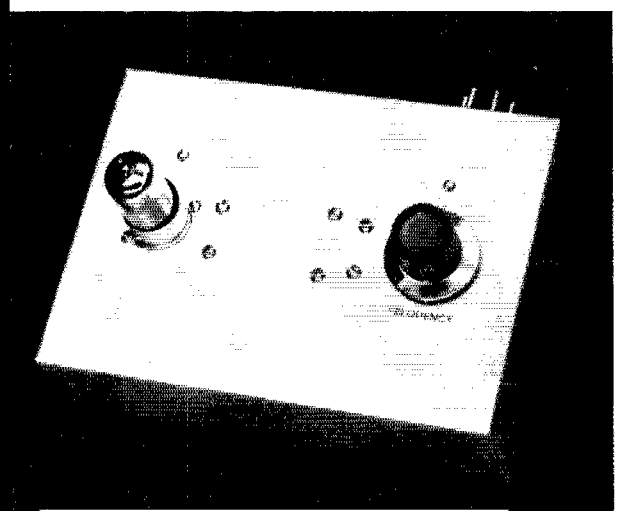
Construction

The transmitter r.f. section (Fig. 3) uses a 12AT7 dual triode connected as a push-pull oscillator. Frequency is controlled by the length of the plate line, and by the setting of the tuning condenser, C_1. The transmitter is built inside a $5 \times 7 \times 2$-inch aluminum chassis (Bud AC-402), to which a bottom plate is affixed with self-tapping screws. The tube socket is mounted $1\frac{1}{4}$ inches from one end of the chassis and oriented so that Pins 1 and 6, the plate connections, are toward the back and front of the chassis, respectively. The tuning condenser, C_1, is mounted $1\frac{1}{2}$ inches from the opposite end. The quarter-wave plate line, L_2, is made from No. 12 wire as described in the parts list, and supported by four 1-inch high ceramic stand-off insulators (National GS-1 with hardware removed) mounted $2\frac{1}{8}$ inches and $4\frac{3}{8}$ inches from the tube end of the chassis. If these insulators are mounted $\frac{3}{4}$ of an inch apart, and the wires are soldered to lugs mounted on the insulators, the line spacing will be correct. The inner stator terminals of C_1 are connected to the proper points on the line by short wire leads. The shorting bar may be a piece of wire wrapped around each side of the line. This should be crimped in place, but not soldered permanently until after the frequency of the oscillator has been adjusted. The antenna coupling link (L_1) is supported by two more ceramic pillars. These are mounted 1 inch apart and $3\frac{7}{8}$ inches from the tube end of the chassis. A short piece of 300-ohm line is used to connect the link to the antenna terminal, a crystal socket on the rear wall.

The grid coil (not visible in the photograph) is mounted between Pins 2 and 7, and R_1 is supported between the coil center-tap and a ground lug under a socket mounting nut. The cathode and heater center-tap connections (3, 8, and 9) are connected together and grounded through a self-supporting r.f. choke (RFC_3). The heater pins (4 and 5) are connected to the tie-point in back of the tube socket through RFC_2. RFC_1 is supported between the end of the plate line and a tie-point near the tuning condenser. Heater and high-voltage leads are brought to a power connector on the rear of the chassis.

Adjustment and Operation

A power source capable of supplying 6.3 volts a.c. or d.c. at 0.3 amp. and 200 to 300 volts d.c. at about 40 ma. is required for testing the oscillator. Allow the heater to warm up and connect a 6.3-volt 250-ma. (blue bead) pilot lamp across the antenna terminals before applying the plate voltage. Solder two short pieces of No. 12 or 14 bare wire to the bulb base and center contact, and bend these wires so that they will fit into the crystal-socket antenna terminal. Apply plate voltage, with a 100- or 50-ma. meter connected in series with the plate supply, and check the plate current. It should be about 25 ma. at 200 volts or 38 ma. at 300 volts. The pilot lamp should glow if the transmitter is oscillating. Another check for



The r.f. portion of the transmitter uses a single 12AT7 oscillator. The knob at the right is attached to the tuning condenser shaft.

oscillation, in case no light is seen in the pilot lamp, is to touch a pencil lead to the tube end of the plate line. If the tube is oscillating there will be a fluctuation in the plate current as this is done.

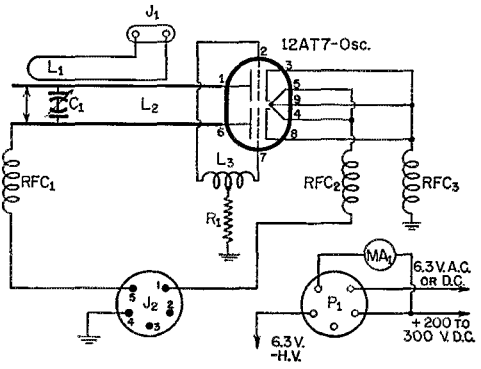


Fig. 3 — Schematic diagram and parts list for the 220-Mc. oscillator.

C_1 — 10-$\mu\mu$f.-per-section butterfly variable (Hammarlund BFC12).
R_1 — 4700 ohms, ½ watt.
L_1 — Hairpin loop, made from 3½-inch length of No. 14 wire covered with spaghetti and bent at center around ⅜-inch diam. form.
L_2 — Plate line made from two 6-inch lengths No. 12 tinned wire with 1 inch bent down at tube end. C_1 is connected to lines 3½ inches from bend and shorting bar is about 1 inch from C_1. Wires spaced ½ inch center-to-center.
L_3 — 3 turns No. 18 enam., ⅜-inch diam., and ⅜ inch long, center-tapped.
J_1 — Antenna terminal; standard crystal socket (Millen 33102).
J_2 — 5-pin chassis fitting (Amphenol 86-CP5).
P_1 — 5-pin matching cable fitting for J_2 (Amphenol 78-PF5).
RFC_1, RFC_2, RFC_3 — 10 turns No. 18 enam., ¼-inch diam., close-spaced.

Next, the frequency must be checked by some fairly accurate means. This can be a trusted wavemeter, a grid-dip meter with an accurate frequency calibration, or a Lecher-wire device such as that shown on page 38. The position of the shorting bar on the plate line should be such that the condenser will tune the oscillator over at least the full band, 220 to 225 Mc. Actually, the tuning range will probably be about 7 or 8 megacycles, so there should be some leeway at each end. When the position of the shorting bar has been set so that this tuning range is achieved, it may be soldered in place on the plate line.

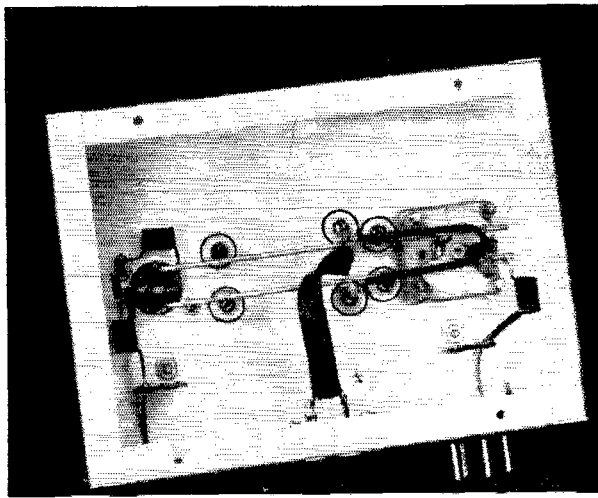
Next, the spacing of the turns in the grid coil, L_3, should be adjusted so that the transmitter efficiency is highest; that is, the highest output with the least plate current. The transmitter may now be tested on an antenna system, but the frequency should be checked immediately when the antenna is connected, as there is likely to be some change in frequency as the antenna is substituted for the dummy load. A listening check with the receiver is good enough for this purpose, as a transmitter of this type should not be operated close to the band edges. It is suggested that the frequency be kept between 221 and 224 Mc. as a precaution against accidental out-of-band operation. Keeping above 221 Mc. is particularly desirable, as most operation with crystal-controlled transmitters and selective receivers is in the first megacycle of the band. If we keep our oscillator rig above 221 there will be little likelihood that it will interfere with DX activity that may be taking place in that segment of the band.

Final adjustment of both the antenna coupling and the frequency should be made with the bottom plate fastened in place. The position of the coupling loop can be varied with a fiber rod or crochet hook, reaching through a hole drilled for this purpose in the bottom plate. The coupling should be the least that will transfer power to the antenna satisfactorily.

Making and Using Lecher Wires

The Lecher-wire device shown in the photograph and Fig. 4 on the next page is a convenient means for measuring actual wavelength by observing standing waves along a section of transmission line. The physical distance between two points of maximum current is measured on a metric scale, the length indicated being a half wavelength. A meter is 39.37 inches, or one centimeter is 0.3937 inch.

The two wires held taut by turnbuckles comprise the transmission line, and the block of wood with the metal plates attached is a carrier for the shorting blade mounted on the front of the block. The purpose of the metal plates on the side of the block, and extending down over the track along which the block slides, is to hold the carrier in alignment. They could be made of wood equally well. The top surface of the track is marked off in tenths of meters, beginning at a point directly under the coupling end of the line. A transparent scale marked in the metric system (graduated in centimeters) is mounted on the bottom of the carrier, as shown in the sketch. This type of scale can be found at any stationery counter. It should



Under-chassis view of the 220-Mc. transmitter, with the bottom plate removed. The grid coil, L_3, not visible in the photograph, is connected directly to the two grid contacts on the socket, at the left.

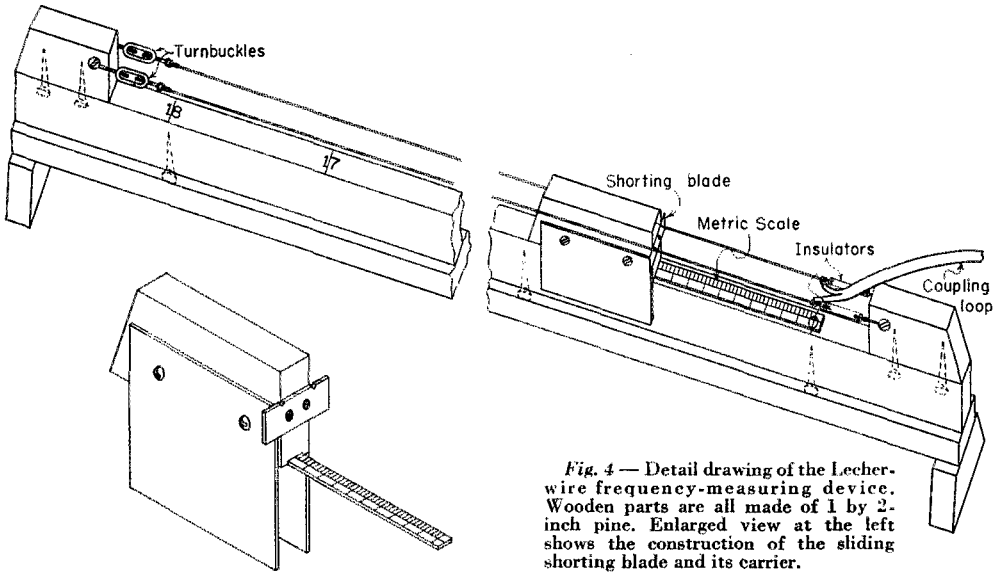


Fig. 4 — Detail drawing of the Lecher-wire frequency-measuring device. Wooden parts are all made of 1 by 2-inch pine. Enlarged view at the left shows the construction of the sliding shorting blade and its carrier.

be about 12 centimeters long, so that about 2 cm. can be fastened to the underside of the carrier.

Mechanical details should be obvious from the drawing. The material used for the track and block is 1 × 2-inch pine, called "furring" in lumberyards. Two pieces are screwed together to form a stiff 7-section base, as shown in the drawing.

Checking the frequency of the transmitter may be done with the Lecher wires in several ways. If the rig is being tested on a lamp load the lamp may be connected at the end of a piece of 300-ohm Twin-Lead that is plugged into the antenna socket. The Lecher wires should also have a short length of Twin-Lead connected to the insulated end. The far end of this piece of line is shorted so that it can be used as a coupling loop. This coupling line and the section of line to which the lamp is connected are then taped together at a convenient point, as was shown in our cover picture last month.

Now we are ready to measure frequency. With the transmitter running, slide the shorting block along the carrier slowly, watching for a change in the brilliance of the lamp. When the light dims, note the reading on the scale. We'll say, for example, that it is 0.255 meter. Now move the carrier along until the lamp dips again, and note the scale reading. Suppose it is 0.937. Subtract the first reading from the second, giving 0.6818 meter as the length of a half-wave. To convert this to megacycles, we divide 150 by the length of the half-wave just measured, and we find that our transmitter frequency is 220 Mc.

Best measuring accuracy is achieved with the least coupling between the Lecher wires and the lamp load that will give a flicker in lamp brilliance. Measurement may also be done using the oscillator plate current as an indication, and this method is recommended when the antenna is connected to the rig. Couple the Lecher wires to the antenna transmission line, as for the lamp load check, and measure the distance between the points at which a flicker is seen on the plate milliammeter.

The Lecher-wire measuring gadget is a very handy thing to have around. If the assembly is made 7 feet long it can be used for checking in the 144-Mc. band, and it is sufficiently accurate to be used well up into the microwave region. It's the quickest and surest way to measure frequency on any amateur band from 144 Mc. up. It may be used to measure the frequency to which a superregenerative detector is tuned by listening for a dip in the background noise, with the Lecher-wire loop coupled to the detector tuned circuit.

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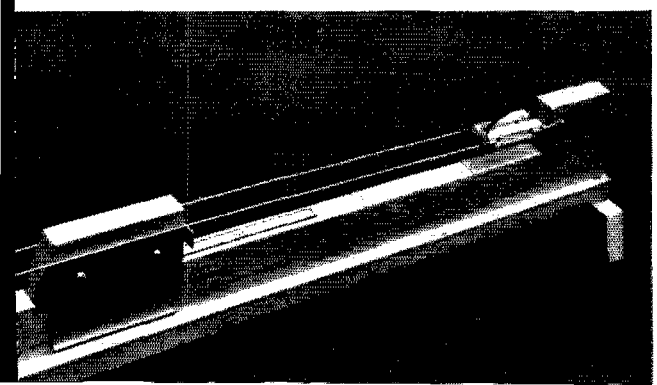
Part II of a series. Details of the modulator, power supply and suitable antenna systems and control circuits will be discussed in a subsequent issue. A crystal-controlled transmitter for the fellow who wants to step up from the modulated oscillator is also scheduled for early appearance.



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Close-up view of the coupling end of the Lecher-wire assembly. Details are shown above.

• Technical Correspondence —

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New York, N. Y.

Technical Editor, *QST:*

In connection with the current interest in pi-network output couplers, I feel that you should point out the need for (1) elimination of the "sub-harmonic" components before the grid of the final tube, (2) regard for lower-than-output-frequency response of the antenna tuner and antenna, and (3) a careful check on the air to insure no troubles with "sub-harmonic" radiation, just as with harmonics.

At, say, half frequency, the pi network may present even less impedance to the tube than a parallel-tuned tank of equivalent *Q*, but if the load resistance is placed directly across the output condenser of the pi (coax-fed dipole, for example), there is a fair amount of sub-harmonic fed to the load under many conditions. For example, I'm at present having difficulties with a near-by 1-kw c.d. station on 3.5 Mc. whose harmonics are S9 right through 21 Mc. On the other hand, they find me 100 per cent readable (although weak) on 3.5 Mc. when my rig is on 21 Mc.! High attenuation in the buildings notwithstanding, we here in the city are so close to one another that we need more rejection than is obtained by the pi network working directly into the antenna.

— *Eugene Black, jr., W2ESO*

[The condition is worst when one arrives at a set of adjustments that makes the tank *Q* too low. With the wrong combination the thing will act like a low-pass filter and will have almost no discrimination against low-frequency spurious signals. It is particularly easy to do this when trying to work into a random wire. The selectivity of the network is not bad if it runs the same operating *Q* as in a normal tank circuit. When a continuously-variable inductance is used, it is fairly easy to get a poor set of adjustments, and W2ESO's point is one well worth watching out for. — Ed.]

TORNADO TRACKING

P.O. Box 21
Henderson, Tenn.

Technical Editor, *QST:*

Tornadoes are tracked by radar and by conventional direction-finding equipment, but I have been using a third method that seems to offer some advantages, and it can be done by amateurs with little extra equipment. Radar tracking is based primarily on the water-vapor content of the cloud and so does not distinguish well between tornadoes and large cloud formations. The d.f. method is based on electrical discharges within the tornado and therefore other types of clouds are not indicated. My method is somewhat similar, in that it uses a TV receiver to track the electrical discharges.

For equipment, one requires an old-model TV receiver, preferably an RCA 630, with means for controlling the a.g.c. sensitivity or a switch for disabling the a.g.c., a rotatable Yagi antenna for the TV channel to be used, and a signal generator capable of introducing a signal in the TV channel. An a.m. broadcast or communications receiver is also necessary.

First, it is necessary to learn, by listening to any a.m. receiver on any frequency range, whether or not a tornado exists. This is done by noting the type of QRN that is present. If the QRN is heavy and comes in isolated crashes of varying intensity, then you are listening to a group of widely-scattered thunderstorms. If there is no QRN, there can be no tornado or thunderstorm. Tornado static sounds like someone strewing a shovelful of gravel on a metal roof, or like pebbles rolling down a metal drainpipe. One must learn to distinguish between this and the isolated crashes of thunderstorm static.

Once you hear the tornado-type static, you are ready to try to find its bearing. With the TV receiver tuned to an (in your vicinity) unused channel and the a.g.c. disabled or reduced, introduce a signal (dummy carrier) from the signal generator to produce an almost-black screen. As the antenna is rotated, a bearing will be found where each "shovelful of gravel" heard in the a.m. receiver will produce bright silver streaks across the TV screen. (The new "black-and-white" picture tubes produce only black disks or streaks.) When the antenna is at right angles to the storm bearing, no streaks will be seen. To sharpen the bearing on the tornado, gradually increase the level of the dummy carrier until the streaks on the screen can be seen over only about 5 or 10 degrees of antenna bearing. If simultaneous bearings are taken by two or more stations, the intersection of the bearings gives a "fix" and the location of the storm. Consecutive fixes will give the course and speed of the storm. Bearing accuracy of 10 degrees is quite sufficient for locating storms at distances up to 100 miles, but greater accuracy is desired as the distances are increased. I have confirmed bearings with 5-degree accuracy up to 350 miles, and I have "heard" tornado activity as far away as Minnesota and West Texas. This system is not something that "may work" — it does work.

One thing that should be recognized at the start is that a tornado cloud *without a tail*, and causing no damage on the ground, is still a tornado and will slip by posing as an ordinary thunderstorm. At any moment, however, it may swoop down and destroy life and property. With my system, the tailless tornado can be detected just as well as those that wrecked Waco, Flint, Warner-Robbins, Henderson, Judsonia and other places. With a network of stations taking bearings on these things, it should be possible to warn whole areas of the impending danger hours in advance. In other words, a tornado cloud may have a base 5000 feet in the air and still be just as dangerous as one at a lower altitude; yet it would hardly be noticed from the ground. Within the past few months I had the good fortune to track one that passed 8 miles to the north of me, and as I took bearings with the TV lash-up, I was also able to check by visual bearings. I tracked this particular storm from a few miles east of Memphis until it passed northeast of Henderson. Three communities along the path were all that reported damage, to a total of six dwellings. As this specimen passed within sight it was noted that the visible base was more than 5000 feet above the ground.

With trained amateurs and properly-equipped stations, a network could be established for tracking tornadoes and supplementing the other amateur emergency services. Right now one of our bottlenecks is suitable rotators for the necessary Yagi antennas.

— *James Milliken, W4AGC*

Strays

Nine-year-olds Peter and Michael Blumenfeld, WN1YZZ and WN1ZAA, are most probably the youngest licensed-amateur twins in the world. Proud father W1TFT (ex-W2CVQ), who has had his own ticket for 23 years, finds it difficult to reconcile the boys' early bedtime with W1AW code-practice hours.

A Coaxial Antenna for Ten Meters

A Self-Supporting Vertical Antenna for Restricted Space

BY HARRY M. NEBEN,* W9YVZ

• The vertical antenna, especially when self-supporting, is always attractive when space is at a premium. Here is a way to build a ten-meter coaxial antenna without resorting to special fittings. It's especially good for "ground-wave work" and for contacting mobiles.

THE ham who has an antenna space problem and yet desires efficient operation on the ten-meter band may well want to consider a vertical antenna. A suitable vertical antenna can be made self-supporting, and is nondirectional. For fixed-station-to-mobile operation, the vertical antenna gives consistently better results than a horizontal antenna.

The antenna at W9YVZ is of the coaxial type, and not only works well but is very inconspicuous. When constructed as described, it is scarcely noticeable in the yard and thus dispels any objections from the landlord or XYL. In fact, at W9YVZ the antenna doubles as a support for the Monday wash line.

The Vertical Antenna

The common type of end-fed vertical antenna has a tendency to have serious feed-line radiation when fed with an open line. The use of coaxial feed may materially reduce line radiation provided the antenna is properly decoupled from the outside of the coax. A concentric J antenna for wide frequency band operation or a coaxial antenna for narrow frequency band operation will provide this decoupling and also will provide a suitable match to the coaxial cable. The coaxial antenna has enjoyed great popularity in the past in narrow-band commercial v.h.f. stations where a nondirectional vertical radiator is required, and a low radiation angle is desired. The concentric J antenna, a rather recent development, has proved its superiority where maximum transfer of energy to the antenna over a wide frequency range is essential. However, for ham applications, the coaxial antenna performs adequately and is easy to construct in the home workshop.

In the coaxial antenna, the center conductor of a 70-ohm coaxial transmission line or cable is extended one-quarter wavelength beyond the end of the cable and acts as the upper half of a half-wave antenna. The other half of the antenna is provided by a quarter-wave sleeve, the upper end being connected to the outer braid of the coaxial cable, as shown in Fig. 1. The coaxial feed is run through the sleeve and very little current is induced on the outside of the line by the antenna field. The feed line of the coaxial cable is practically nonresonant since its characteristic impedance is quite close to the center impedance of a half-wave antenna.

*% American Phenolic Corporation, 1830 S. 54th Ave., Chicago 50, Illinois.

Antenna Construction

The coaxial antenna consists of an upper metal radiator, a metal sleeve section, and support mast. The components of this antenna were obtained from a surplus store, the tinsmith shop, and the local plumbing shop.

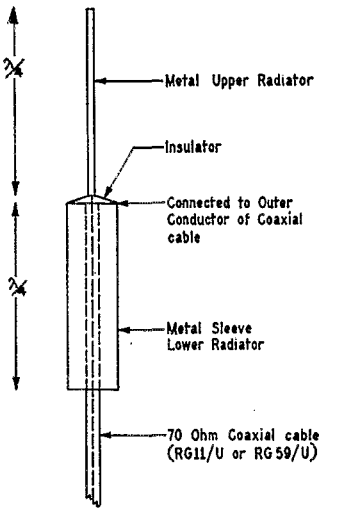


Fig. 1 — Basic construction of the coaxial antenna. Lengths are electrical, including allowance for length/diameter ratio.

The upper radiator is a surplus whip antenna still available in most surplus stores. However, a mobile whip antenna may be used in place of the surplus antenna and with its insulator may even simplify the construction. The mounting insulator for the whip section is a surplus porcelain feed-through insulator with a feed-through hole which just permits the end of the whip to pass through. The paint was removed from the end of the whip, a washer soldered to the whip about 3 inches from the end, and the end of the antenna whip threaded as shown in Fig. 2. This permits the antenna and insulator to be secured to the sleeve cap much as one would tighten the feed-through insulator to a panel, and provides a lug for connecting the center conductor of the coaxial cable to the antenna whip section.

The sleeve section of the antenna consists of an 8-foot length of 3-inch galvanized iron air duct, and was obtained at the local tinsmith shop. The sleeve section is 2 inches shorter than the whip section of the antenna in order to compensate for the difference in diameters of the whip and sleeve sections. Originally, both the whip and sleeve radiators were made the same length; however, when an effort was made to reduce the standing-wave ratio on the line, it was found it was necessary to shorten the sleeve section. This substantially reduced the standing-wave ratio.

The cap of the sleeve is a pipe cap which just slips into the antenna sleeve and was obtained from the plumber's shop. The hole for the upper radiator feed-through insulator was cut with an ordinary fly cutter. The pipe caps are usually cast iron and cutting the hole was fairly easy.

A hole is drilled off center to permit making the connection between the coaxial cable and the upper whip section and the sleeve section. The galvanized iron sleeve section is fastened to the pipe-cap skirt by means of self-tapping sheet metal screws.

The mast consists of a 20-foot length of 1-inch galvanized iron pipe. A half-inch hole is drilled in the pipe about three inches from the top and another 14 feet from this end; these are for entrance and exit of the coaxial cable. The holes were slightly elongated by "wobbling" the drill to permit easy passage of the coaxial cable. However, these holes are not really necessary as the coaxial cable may be run outside the mast if desired.

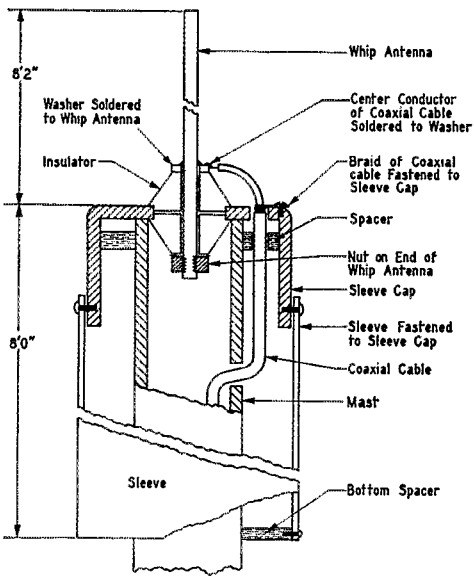
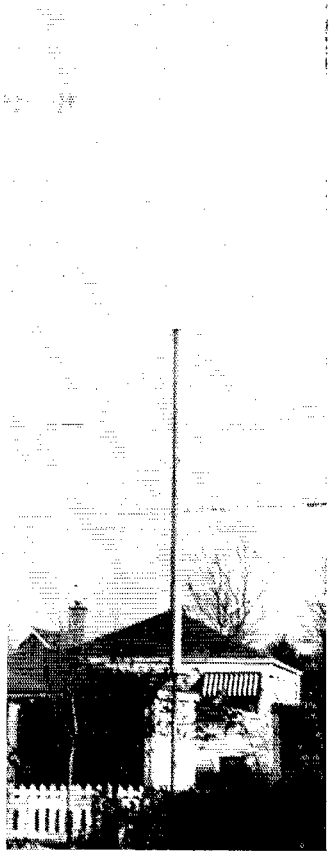


Fig. 2 — Constructional details of the antenna at W9YVZ. Dimensions of whip and sleeve are for a resonant frequency of 28.6 Mc. The antenna operates with a low s.w.r. from 28.2 to 29.0 Mc.; above 29 Mc. the s.w.r. rises but for all practical purposes the system covers the entire 28-Mc. band satisfactorily.



The construction used in the coaxial antenna at W9YVZ overcomes objections based on appearance — it is no more noticeable than an ordinary clothesline pole. It even serves as one when necessary!

Two blocks of wood are next whittled to serve as centering devices for the sleeve section of the antenna. Both are of pine, varnished before installation, and lend no support to the antenna. One piece serves to center the mast on the sleeve cap. This piece in some cases may not be necessary as the mast may center itself on the feed-through insulator in the sleeve cap. The other, or lower, block is mounted at the base of the sleeve and maintains the sleeve in alignment with the mast. It was found that without this lower block the wind blowing across the open end of the sleeve section caused a low-pitched whistle to be set up by the sleeve hollow. Until the cause of the noise was discovered the neighbors asked if the ghosts formerly on their TV sets were now haunting the ham bands!

The antenna is fed by 70-ohm coaxial cable. For low-power work RG-59/U may be used, but for higher power RG-11/U should be used. The RG-11/U has lower loss than the RG-59/U and is recommended. The coaxial cable is fed through the lower hole in the mast and is "fished" through the upper hole and through the hole in the sleeve cap. About three inches of outer jacket is removed from the cable and the braid fanned out from the cable and soldered to a lug on the sleeve cap. The center conductor is

(*Continued on page 126*)

ZS2GA and ZS6WG can lay claim to the first ZS two-way s.s.b. QSO. Although ZS6KD and ZS2GA were the first two on the air (and in that order) they were never able to get together on the same band and at the same time. ZS2GA reports his best two-way DX a 45-minute QSO with KA4MC on 14 Mc. The KA uses a 3-element beam and a kw. on peaks, which helped to make him "living-room copy" in Port Elizabeth. ZS2GA is writing a series of s.s.b. articles for *Radio ZS*, the official magazine of the SARL — the first article (and a good one) appeared in the August issue. . . . The West Coast had a s.s.b. dinner and get-together in San Francisco during August, with many of the Los Angeles gang in attendance: W3GZQ, W6s LWD GEG NCK PGY OVM JPU PSQ EDD LZE EPX GGM UHM FAQ CIN PYH US and HLY (ex-W3MBY).

A VFO for the 10-A Exciter

A VFO is not yet available for the popular Central Electronics 10-A exciter, and Wayne Cooper, YN1WC, sends along the circuit (Fig. 1) he is using for the purpose. ". . . the Clapp oscillator tuned circuit is external, and plugs into the 'VFO Socket' in the back of the 10-A. It is similar in construction to those external units that have appeared in past *QST*s. I don't recall any mention of it before, but a crystal can be inserted in place of the tuned circuit, and I use it that way for crystal-controlled operation. . . . The selection of tube and voltages was carefully made. A 6V6 gives too little drive, and a 6AG7 gives too much with 75 volts on the screen. This regulated power supply is 'built in' by installing a socket between the final tube and the power transformer, where there is plenty of room both above and below. R_{29} and R_{30} are then connected to the VR tube as shown. For 40 meters, along with changing the exciter coils, it is necessary to change the VR tube to an 0D3, to give 150 volts on the screen and proper excitation. Along with changing from 20/80 to 40 meters, it is necessary to switch the coils in the VFO plate circuit. The d.p.d.t. switch was mounted on the front panel in place of the old crystal socket, as I use the VFO-XTAL switch to switch in and out a built-in 1300-cycle test oscillator. The wiring to it is open and in the clear. The 'VFO Socket' is an octal socket mounted behind L_7. L_7 is not needed as a harmonic trap, so it serves nicely for the 5-Mc. plate tank. I use high-C here to reduce the harmonic output for 20-meter operation and also, to help a little more, the 15-Mc. tank is left in series with the plate. This 15-Mc. tank is a few turns of No. 16 wire, air-supported, with its condenser between L_7 and Pin 8."

Correction of W6HLY Peak-Control Circuit

Dave Mann, W6HLY, points out that his circuit for peak-control in a linear amplifier (Fig. 2, page 49, *QST*, March, 1953) is in error. The 0.01-μfd. condenser C_1 should be connected from cathode to ground instead of as shown. As is, it makes the recovery time too long.

Moving I.F. Crystal Frequencies

As anyone who has been following the literature on crystal-lattice filters and the Edmunds exciter knows, there are times when it is convenient to be able to shift the frequency slightly or to match up a pair or more of the surplus i.f. crystals. The mail this month brings several slightly different approaches to it — they're being passed along with the thought that one or more of the ideas will come in handy some day.

W3USX tried the copper-plating techniques mentioned in the April column, and found out the hard way that the strength of the solution wasn't nearly as important as the strength of the current. His experiments indicate that 1 ma. is about the top current that should be run, and he controls this readily by the depth to which he inserts the copper-wire electrode in the solution. He says, "I used a small copper wire and inserted just enough wire to bring the current to 1 ma. Very shortly, the current will drop, but do not attempt to bring the current back up. Any motion of the crystal being plated will bring the current back without disturbing the opposite electrode, and if more wire has been inserted the current will rise too high if something should disturb the solution or the crystal in it."

W7CJB finds that he can *increase* the frequency of the FT-241 crystals by the copper-sulphate method described in April, by reversing the battery polarity. He has moved them as much as 500 cycles higher without losing any activity. The method apparently removes some of the original silver plating — if the frequency goes too high you can reverse the battery and copper plate the crystals to decrease the frequency. One crystal was moved 1800 cycles lower after having first been raised 400 cycles.

W4ORB has found that he can move the crystal frequencies as much as 2 kc. lower by lightly rubbing cold soft solder on the plated faces. Small changes can be made by making marks with a No. 2 pencil on the plated faces or on the solder already rubbed on. Don finds it convenient to use solder first, and then "zero in" on the last 100 cycles or so with pencil. A small eraser will remove the pencil marks if you go too far. Small moves of only a few cycles can be made with a fine pencil point. The crystal should be steadied while undergoing treatment by holding the two opposite edges lightly between the fingers and taking care not to flex or stress the mounting more than necessary.

Voice-Controlled Break-In with a Loudspeaker and No Relays

Ray Brandt, W9LIJ, Janesville, Wis., uses the circuit shown in Fig. 2 to give him smooth break-in with a loudspeaker, and it has the additional attraction that no relays are required. The unit delivers −90 volts blocking bias for

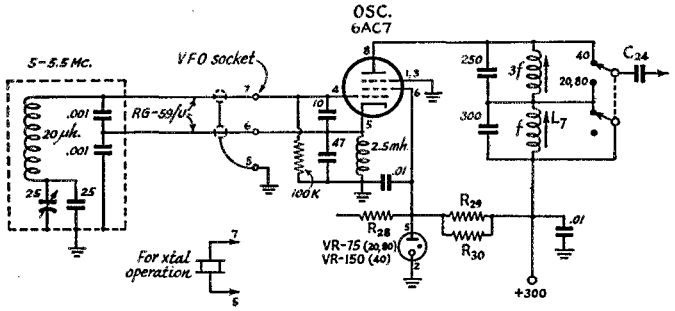


Fig. 1 — YN1WC added a VFO to his 10-A exciter by using this circuit. Crystal-control or VFO is available, and the VFO tuned circuit can be located some distance from the exciter. Resistor designations correspond to those in the original.

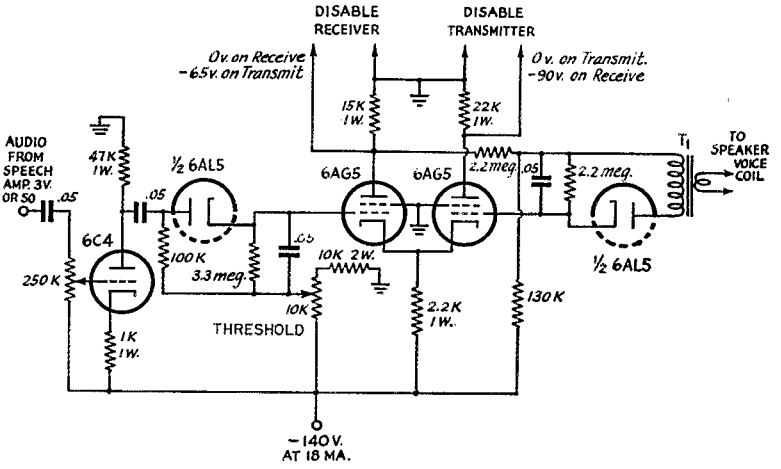


Fig. 2 — This voice-control circuit requires no relays and permits loudspeaker reception. T_1 is a midget a.c.-d.c. output transformer with the low-impedance winding connected to the 'speaker voice coil.

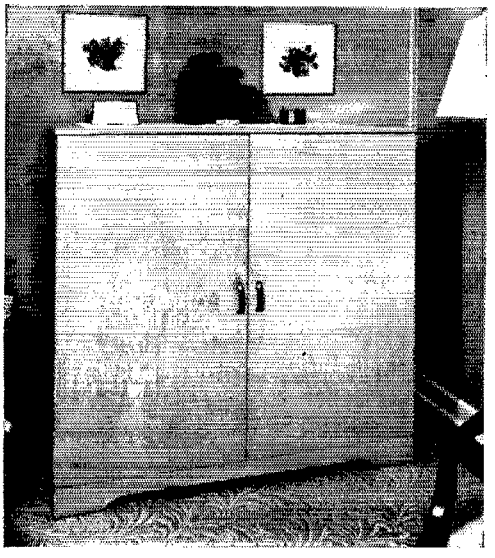
the transmitter and −65 volts blocking bias for the receiver. These biases exist at either full value or not at all, so the action is positive.

In the "receive" condition, audio from the receiver ('speaker) is rectified by the right-hand diode and holds the right-hand 6AG5 conducting. The left-hand diode is also rectifying audio picked up from the 'speaker and passed through the speech amplifier, but the setting of the "Threshold" control holds the left-hand 6AG5 just below cut-off. Talking into the microphone unbalances this condition but causes no output in the receiver until the circuit is tripped, because the transmitter is off. Once the circuit is tripped, the receiver no longer delivers audio, and the bias developed by the right-hand diode decays. The transmitter is held on until the rectified output of the audio from the speech amplifier decays below the threshold value.

W9LIJ adds that if the receiver is to be disabled by applying the −65 volts to the a.v.c. bus, it is recommended that the bias be applied through a diode, the plate to the a.v.c. bus and the cathode to the "disable receiver" lead. This also requires that there be some resistance left between ground and the a.v.c. bus, of course, when the a.v.c. is switched off for s.s.b. reception.

The time constants of the diode circuits can be made variable, but the values shown have proven quite satisfactory at W9LIJ. Mica condensers are to be preferred, to stabilize the time constants under various conditions of temperature and humidity. — *B. G.*

W9MQK — Compact . . . Convenient . . . Compatible



W9MQK's "Sheraton half-kilowatt" is a beautiful example of parlor-station design. Assembled of ¾-inch plywood with blonde mahogany finish, the cabinet conceals a 14-Mc. 'phone-c.w. transmitter using p.p. 813s modulated by 811As, plus VFO, receiver, and other operating essentials and accessories. The beam indicator, not enclosed, is decorative enough to pass the XYL's inspection. W9MQK is close to DXCC with this installation.

Happenings of the Month

DIRECTOR ELECTIONS

In four of the eight ARRL divisions currently holding elections, incumbent directors have been returned to office without valid opposition, remaining on the job for another two-year term beginning January 1st. They are Canadian Division Director **Alex Reid, VE2BE;** Dakota Division Director **Alfred M. Gowan, WØPHR;** Great Lakes Division Director **John H. Brabb, W8SPF;** and Midwest Division Director **William J. Schmidt, WØOZN.** Paul M. Bossoletti, WØGZD, was named a candidate for the Dakota post, but was found ineligible because of insufficient continuity of membership. Robert W. Denniston, WØNWX, and Albert J. Ploog, WØSCA, were named candidates for the Midwest directorship, but also were found ineligible because of membership lapses.

Charles O. Badgett, W3LVF, continues as Vice-Director of the Atlantic Division for two years; John W. Gore, W3PRL, was named a candidate but ruled ineligible because of a membership lapse. **George S. Acton, W5BMM,** retains the Vice-Director post in the Delta Division, and **James E. McKim, WØMVG,** in the Midwest Division, both with no opposition.

Forrest Bryant, WØFDS, has been declared elected as Vice-Director of the Dakota Division, taking office next January for a two-year term. Charles G. Compton, WØBUO, was named a candidate but ruled ineligible because of his occupation in radio manufacturing. OM Bryant was first licensed in 1919, and has been particularly active in the Minneapolis Radio Club, holding various offices therein.

Robert L. Davis, W8EYE, becomes the new Vice-Director, Great Lakes Division, without opposition. Factory representative for a pump manufacturer, OM Davis was licensed in 1923; he has served as assistant director, and has been active in Ohio club affairs, serving not only as president of the Columbus Amateur Radio Assn., but also as chairman and currently vice-chairman of the Ohio Council of Amateur Radio Clubs.

The remaining offices are contested, and balloting is now in progress.

NEW SOUTHEASTERN DIRECTOR

Upon the resignation of Lamar Hill, W4BOL, for reasons of business pressure, and pursuant to provisions in the Articles of Association, **Ernest W. Barr, W4GOR,** on September 14th took over the post of Director, Southeastern Division, for the remainder of the term ending this year.

4TH QUARTER EXAM SCHEDULE

FCC has now released its schedule of examinations to be conducted by traveling engineers during the last part of 1953. The usual arrangements continue at the district offices. Below we list cities, and dates where known, on the November-December itineraries:

Birmingham, Alabama: Dec. 3
Charleston, W. Va.: Sometime in December
Cincinnati, Ohio: Sometime in November
Cleveland, Ohio: Sometime in December
Corpus Christi, Tex.: Dec. 10
Ft. Wayne, Ind.: Sometime in November
Fresno, Calif.: Dec. 16
Indianapolis, Ind.: Sometime in November
Jackson, Miss.: Dec. 9
Knoxville, Tenn.: Dec. 17
Louisville, Ky.: Sometime in November
Nashville, Tenn.: Nov. 5
Pittsburgh: Sometime in November
St. Louis, Mo.: Sometime in November
Salt Lake City, Utah: Dec. 18
San Antonio, Tex.: Nov. 5
Schenectady, N. Y.: Dec. 2-3, 9 A.M. and 1 P.M.
Sioux Falls, S. D.: Dec. 9, Novice and Technician at 10 A.M.; *others at 1* P.M.
Williamsport, Penna.: Sometime in December
Wilmington, N. C.: Dec. 5
Winston-Salem, N. C.: Nov. 7

MERIT AWARD TO RAND

The first ARRL Merit Award, to be given annually to an amateur "chosen for his outstanding technical contributions to the art of amateur radio communication," has been made to Philip S. Rand, W1DBM, for his excellent work in the field of television interference elimination. Actual presentation of the award, an engraved wall plaque, was made at the National Convention by President Dosland.

PHILIP S. RAND, W1DBM

No one will disagree with the view of the award committee that interference to television reception has been the most complex problem facing amateur radio in recent years. There is similarly no question that Phil Rand has been the out-

Six new Novices at Hq. look to the future with an after-hours discussion of the General Class written exam. *Left to right*: Lillian M. Salter, WN1ZJE, communications aide; Anne Welsh, WN1ZID, secretary to the Communications Manager; Ann Furr, WN1ZIB, production assistant; Miriam Knapp, WN1ZIM, secretary to the Technical Director; Jeannine Parent, WN1ZIK, secretary, Technical Information Service; Marie Page, WN1ZCS (also Technician), secretary to the General Manager. *Absent*: Phyllis Wilson, WN1ZCR (also Technician), former contest checker.

standing pioneer in tackling the problem, not only coming up with technical solutions in many cases but, and even more important, inspiring amateurs throughout the country to lay aside defeatist attitudes and get busy with soldering iron, filtering and shielding materials to follow his lead. In fact, his work is so well known that it makes unnecessary the recapitulation of accomplishments which would normally accompany a report on the Merit Award. Suffice it to say that amateur radio is in a much healthier and stronger position now for having had as enthusiastic and aggressive and indefatigable a member of the fraternity as Phil Rand. The plaque itself is only a symbol of the sincere appreciation which every amateur would like to express.

NEW HAMS AT HQ.

The noon hour at 38 La Salle Road acquired a new look starting a few months back — small groups of the office gals poring over the *License Manual*, or eating a sandwich from one hand while using a code practice oscillator with the other, or intently watching a volunteer instructor (also sandwich in hand) drawing diagrams on a makeshift blackboard and explaining some of the simpler workings of basic radio circuits. The embryo of curiosity about ham radio, which in the past had developed spasmodic but half-hearted attempts to obtain a ticket, had finally blossomed into a deadly serious intent. And of seven starters, seven finished and passed the Novice exam with flying colors; two have since become Technicians, while the remaining five continue their noon-hour theory and code sessions. Most of the gals have already been on the air with borrowed gear; right now there's an assembly line in the Lab during noon and after hours, where they are building transmitter kits they purchased. Much of the guidance has been furnished by Ellen White, W1YYM, Asst. Comm. Manager, 'Phone.

Another flurry of interest like this among the remaining gals, which might happen in self-defense, and the OMs at Hq. will almost be outnumbered!

F.C.C. PROPOSES NOVICE, TECHNICIAN EXAMS BY MAIL

In early October FCC released a notice of proposed rule-making to:

1) make Novice and Technician examinations available by mail only;

2) reduce to 50 miles the present 125-mile limit determining eligibility for a Conditional Class license.

These proposals are considered least disadvantageous to the amateur service among the numerous methods available to FCC to cut down the expense of its field examinations as required by the economy-minded administration. Under the proposal, all aspirants for Novice or Technician licenses, no matter where they lived, would take their examinations by mail according to procedures already specified in the regulations for Conditional Class licenses. Further, aspirants for the General Class privileges who live more than 50 miles from a quarterly examining point (instead of the present 125 miles) would be eligible to take the exam by mail, of course getting a Conditional Class ticket with the same privileges.

Comment must be filed by December 31st.

CHANNEL STRIP TVI

As discussed on our editorial page this month, there is a newly-discovered potential source of TVI from amateur 2-meter operation — again, through no fault of the transmitter. The League has requested the continued coöperation of the FCC in handling complaints which may come from this source, by means of the following letter filed in late August:

(Continued on page 180)

Announcing the 20th ARRL Sweepstakes

Certificates to C.W. and 'Phone Winners in Each Section and to Top Club Scorers; Special Novice Awards

CONTEST PERIODS

Time	*Start*	*End*
	Nov. 14th & 21st	Nov. 16th & 23rd
EST	6:00 P.M.	3:01 A.M.
CST	5:00 P.M.	2:01 A.M.
MST	4:00 P.M.	1:01 A.M.
PST	3:00 P.M.	12:01 A.M.

TIME for the Sweepstakes again! This popular annual activity affords you an opportunity to pit your operating skill against the best men in your ARRL section, and fill in the states you need for WAS. Every licensed amateur in every League section is urged to participate. Whether or not you're an ARRL member, you are cordially invited to get into the SS and submit an entry. All scores reported in accordance with the rules will be listed in a *QST* tabulation of final results.

The rules are the same as those of last year with one exception: For the first time, a special c.w. certificate will be awarded to the highest scoring Novice or Technician in each ARRL section where at least three such licensees submit c.w. logs; similarly, a 'phone certificate will be awarded in each section. These special awards are *in addition to* the customary certificates to 'phone and c.w. section winners and to top club scorers. *Novices and Technicians will find fun galore in the SS* — and at the same time build up code speed and familiarity with traffic-handling procedure.

The contest will run over two consecutive week ends, as in the past, with a maximum allowable total operating time of 40 hours out of the possible 66 for each entry ('phone or c.w.). You may operate both 'phone and c.w., but separate logs must be filed for each mode.

The Sweepstakes, like Field Day, puts a premium on operating skill rather than on power, since the score multiplier (1.25 on c.w., 1.5 on 'phone) for stations operating with 100 watts or less insures that much of the operation will be in this category. The low-power man can really go to town in the SS!

If you're new to the SS, it won't take you long to catch on. During the contest period, call "CQ SS" or answer such a call, exchange preambles in the form shown elsewhere in this announcement, and keep your log properly. ARRL will gladly send you contest forms upon request, or you can draft your entry in accordance with the sample. Although it is not required by the rules, more operators each year are using the 24-hour time system in their SS exchanges. Under this system, midnight is 0000, 12 noon is 1200, 6:30 P.M. is 1830, and 11:59 P.M. is 2359.

For the purposes of this contest let us clarify the status of stations in certain areas even beyond the listing of ARRL sections on Page 6. All VE8s in N.W.T. may be considered attached to the Yukon section; likewise Swan Island (KS4) is part of West Indies, and Newfoundland (VO) and Labrador (VO6) count as Maritime.

Entries by multiple-operator stations are encouraged and will be listed, but only single-operator stations will be eligible for the certificates offered to the top 'phone scorer and the top c.w. scorer in each section. Multiple-operator scores can be grouped with single-operator scores in club competition, however, and a handsome gavel is offered to the club with the highest aggregate score. Within a club, single-operator entries can compete for the "club-certificate" awards given to the top c.w. and 'phone scorers.

Whether you prefer 'phone or c.w. work, there will be plenty of stations eager to exchange SS information with you. 'Phone activity will be lively with 7 and 21 Mc. available to the A3 contingent for the first time in an SS, and Santa Barbara will provide a new section multiplier. So ready your equipment for action now, read over the rules to acquaint yourself with the details, and then stand by for two week ends of operating you'll *really* enjoy.

Rules

1) *Eligibility:* The contest is open to all radio amateurs in (or officially attached to) sections listed on Page 6 of this issue of *QST*.

2) *Time:* All contacts must be made during the contest periods indicated elsewhere in this announcement. Time may be divided between week ends as desired, but a total of 40 hours must not be exceeded for each entry. Time spent in listening counts as operating time.

3) *QSOs:* Contacts must include certain information sent in the form of a standard message preamble, as shown in the example. C.w. stations work only c.w. stations and 'phone stations only other 'phones. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your preamble and/or receipt of a preamble.

HOW TO SCORE

Each preamble sent and acknowledged counts one point.

Each preamble received counts one point.

Only two points can be earned by contacting any one station, regardless of the frequency band used.

For final score: Multiply totaled points by the number of *different* ARRL sections worked; that is, the number in which at least one bona fide SS point has been made. Multiply c.w. scores by 1.25 and 'phones scores by 1.5 if you used 100-watts-or-less transmitter input *at all times* during the contest.

EXPLANATION OF "SS" CONTEST EXCHANGES

Send Like a Standard Msg. Preamble, the	*NR*	*Call*	*CK*	*Place*	*Time*	*Date*
Exchanges	Contest info. numbers, 1, 2, 3, etc., for each station worked	Send your own call	CK (RST report of station worked)	Your ARRL section	Send time of transmitting this NR	Send date of QSO
Sample	NR 1	W1AW	589	CONN	1812	NOV 14

4) *Scoring:* Each preamble sent and acknowledged counts one point. Each preamble received counts one point. Only two points can be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see p. 6) worked during the contest is the "sections multiplier." It is not necessary for preambles to be sent both ways before a contact may count, but one must be received, or sent and acknowledged, before credit is claimed for either point(s) or multiplier. Apply a "power multiplier" of 1.25 to c.w. entries and 1.5 to 'phone entries if the input power to the transmitter output stage is 100 watts or less at all times during contest operation.

The final score equals the total "points" multiplied by the "sections multiplier" multiplied by the "power multiplier."

5) *Reporting:* Contest work must be reported as shown in the sample form. Lithographed contest forms will be sent gratis upon receipt of radiogram or postcard request. Indicate starting and ending times for each period on the air. All Sweepstakes reports become the property of ARRL. No contest reports can be returned.

There are no objections to one's obtaining assistance from logging, "spotting" or relief operators, but their use places the entrant in the multiple-operator class, and it must be so reported.

A single-operator station is one manned by an individual amateur who receives no assistance from other persons during the contest periods. He may not have assistance in any manner in keeping the station log and records, or in spotting stations during a contest period. The operation of two or more transmitters simultaneously at single-operator stations is not allowed. Contest reports must be postmarked no later than December 9, 1953, to be eligible for *QST*

(Continued on page 128)

Sample of report form that must be used by contestants

STATION W. . . .—SUMMARY OF EXCHANGES, TWENTIETH A.R.R.L. ALL-SECTION SWEEPSTAKES

Freq. Band (Mc.)	*Time On or Off Air*	*Sent (1 point)*				*Time*	*Date (Nov.)*	*Received (1 point)*				*Time*	*Date (Nov.)*	*Number of Each Different New Section as Worked*	*Points*
		NR	*Stn.*	*CK-RST*	*Section*			*NR*	*Stn.*	*CK-RST*	*Section*				
3.5	On 1810	1	W1AW	589	Conn.	1812	14	7	W8JIN	589	Ohio	1814	14	1	2
"	"	2	"	589	"	1815	"	6	W1BFT	599	N. H.	1817	"	2	2
"	"	3	"	579	"	1820	"	6	W1ZDP	579	Conn.	1821	"	3	2
7	"							24	W5KIP	479	Ark.	2005	"	4	1
"	"	4	"	479	"	2115	"	38	W5HJF	579	N. Mex.	1915	"	5	2
"	"	5	"	579	"	2128	"	45	W6BIP	479	S. F.	1820	"	6	2
"	"	6	"	589	"	2133	"	59	W8RSP	589	Ohio	2134	"	..	2
"	Off 2135 Time: 3 hrs. 25 min. On 1845														
14	"	7	"	569	"	1915	15	94	KL7PI	569	Alaska	1418	15	7	2
"	"	8	"	569	"	1925	"	127	W7ZN	569	Idaho	1728	"	8	2
"	"	9	"	469	"	1935	"	114	W7HRM	569	Wyo.	1730	"	9	2
3.5	"	10	"	579	"	2110	"	130	WØLHS	579	N. D.	2005	"	10	2
"	"	11	"	589	"	2112	"		W5KIP		Ark.				1
"	Off 2115 Time: 2 hrs. 30 min.														

Total Operating Time: 5 hrs. 55 min. 3.5, 7 and 14 Mc. used. 10 Sec., 22 Pts. 85 Watts Input Power

Assisting person(s): name(s) or call(s):.....

Claimed score: 22 points × 10 sections = 220 × 1 25 (85 watts input) = 275

I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is correct and true to the best of my knowledge.

Signafure.....

Address.....

Tube Line-Up.....

Number Different Stations Worked.....

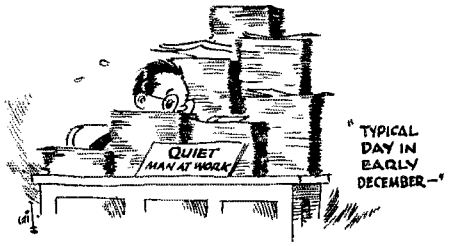
"I Have Observed All the Rules . . ."

BY CHARLES L. WOOD,* W2VMX

SIGN it on the dotted line . . . and mail your winning entry in another ARRL contest activity. Feels good, doesn't it? Nothing to do now but sit back and wait for *QST* to bring the good news, followed shortly thereafter by a smiling letter carrier with another winner's certificate for the Lower Podunk section. Wonder if anybody looks at these logs, anyway?

Old man, it might surprise you to know just how thoroughly your log *is* checked, whether a simple post card confirming a single contact with a friend or a thirty-page Sweepstakes entry. ARRL employs a full-time amateur for the specific purpose of seeing that all of our contest activities are fairly won and honestly scored. This person is responsible for almost everything that happens in the handling of contest logs and results except matters of policy, such as rules changes and disqualifications. These are handled by a special committee. Would you be interested in watching the contest checker at work for a while? Look over his shoulder — *if* you can see over the pile of logs. . . .

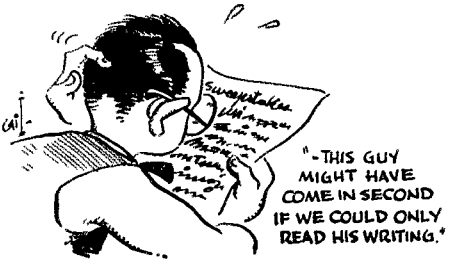
It is a day early in February, and the time has come to wind up the Sweepstakes contest which



took place back in November. For many weeks the checker has been sorting and verifying, correcting where necessary. About 1200 logs are piled neatly on the desk, together with a myriad of letters, radiograms and club correspondence, all of which refer to the contest in one way or another. The day's mail is in a side basket; a glance shows that it contains assorted reports from the Novice Round-up, the January CD Parties, both 'phone and c.w., cards for the February LO-Party, some OO reports for the DX contest file, and a few late logs for the V.H.F. Sweepstakes which may be added to the results if space permits.

Today the checker is looking through the Sweepstakes for the last time before typing these results for publication in *QST*. He must see that every log has been classified correctly as a 'phone or c.w. entry, single or multiple operator, and that the logs are arranged according to ARRL divisions and sections in order of descending score. Multiple-operator entries are at the bottom of the pile, together with a few non-competing logs.

At the fourth or fifth log from the top he stops and shakes his head sadly. "This guy probably would have come in second, if we could only read the stuff." And he displays something which



would pass for a light carbon copy of an Egyptian papyrus of the second century B.C. "No station can receive credit for a contact when we cannot see the call of the station he worked," the checker explains. Sounds fair enough, doesn't it? Elsewhere on this log we note small red check marks where this entry has been compared with others to confirm contacts claimed.

Now the checker smiles broadly as he pulls from another section a log of many pages. "Here," he explains, "is another man who might have won. He has done something never before accomplished in a Sweepstakes — worked 89 sections! Guess he never did look at Page 6 in a copy of *QST*, did he?" Quite a feat, indeed, considering that there are only 73 ARRL sections. He worked perhaps 65 or 66 of them. . . . Not content with working Virginia and West Virginia, he has worked Eastern Virginia and Southern Virginia. He has counted Delaware, Maryland and the District of Columbia separately, although they are all one section. Then, too, he has worked a couple of really rare sections, such as Western Montana and Central Texas. Well, his disappointment will serve to arouse his curiosity about such things, and may save him grief the next time.

Sensing your interest in the grading of these papers, the checker explains that almost 50 per cent of all incoming logs must be changed in some respect. Perhaps one in ten undergoes a major change in score. Some go up, some go down.

Chief reasons for upgrading are omissions made by beginners in the contest game. These include such errors as failing to count full QSO points, or multiplying contact points times states or divisions instead of sections. Few complaints, of course, will come from this group. Some, however, will write Hq. to find why their scores were increased.

Most of the major changes are downgraded

(*Continued on page 128*)

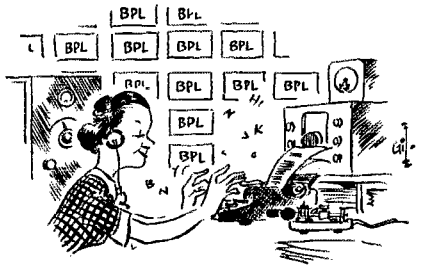
* 17 South Surrey Ventnor, N. J.; formerly of ARRL Staff.

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

A glance at the Brass Pounders League tabulation each month for the past nine issues of *QST* (January through September, 1953) has revealed some interesting facts. Each month at least three YLs have been listed, and in four of the months, *five* YLs have "made it." W2RUF and W3CUL placed high on the list for six of the nine months, and W2BTB made it seven times and topped everyone (OMs too) with the highest score in the last month analyzed, September.

The survey period was arbitrarily chosen — the past nine months simply because of recent reference value. We all know that W3CUL has consistently placed high, often first, for a number of years (she has made BPL more than *sixty*



times); and numerous other YLs have been listed at various times. Also, a number of YLs handle enough traffic each month to warrant places in BPL, but for one reason or another their calls do not appear.

This is all realized, but it is not our purpose at this time to go into these aspects. In singling out the seven YLs who have made BPL more than three times in the past nine months, we have tried to uncover *why* these girls handle so much traffic and *how* they manage to do it consistently. Each has her own story.

W9JUJ, Peggy — "I like to handle traffic because of the thrill I get on delivering it. I could handle traffic all day and never get tired. Each message I handle I know will make someone happy. I don't find it hard to manage the house, OM, and two harmonics while handling traffic. The family seems to understand the enjoyment I get, and I try not to operate too much when they are around. And with a dishwasher, automatic washing machine and dryer, there isn't too much of a housework problem."

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

Mae Burke, W3CUL, an outstanding "traffic YL."

W7ONM, Marion — "I like to handle so much traffic because you meet so many nice people and you feel you are really doing your own small part in helping out. It is something that just gets you and you can't leave it alone. I find it no harder to take care of house, husband and children. In fact, it is easier, because I find myself home all of the time."

W8ZGT, Lillian — "I get satisfaction out of seeing how quickly I can get a message from here to there. Ham radio is one of the few hobbies that can be useful to others, and I feel that by sending messages for other people I am having fun and being useful at the same time. And my belief is firm that handling traffic *well* can do a great deal for amateur radio."

W2RUF, Clara — W2RUF feels that she "is being of value to the community. Appreciation is so profound that it more than pays for my time and trouble. I never neglect my home. My OM

W8ZGT, Lillian (left) and W2BTB, Jeanne, are perfectly at home behind stacks of fast-moving traffic. (*Photo by W1APK*)

(unlicensed) is very happy with my hobby because he enjoys his home and is satisfied that I am there with him most of the time."

W4TAV, Marty — W4TAV considers the question "Why do you like to handle so much traffic?" comparable to asking a DX man why he chases DX. Traffic handling is simply the phase of amateur radio that she enjoys most. Marty is not married and consequently doesn't have to take care of a house and family. Just fifteen, and a high school sophomore, she takes books into the shack and studies "between nets, or in dull periods within a net."

W3CUL, Mae — We didn't hear from Mae herself regarding "why" and "how" she does it, but her OM, W3VR, told us that handling traffic is vital to his wife. He said that she tries never to let down those who depend on her for relay and delivery, and that so long as she can handle service traffic she'll continue to devote most of her time to the work. Mae's staggering record speaks for itself.

W2BTB, Jeanne — "If you could see some of the many letters in my bulging file, if you could hear the parents of service men on the telephone calling from local and long distances, so grateful, you would understand my handling so much traffic. My real purpose is just to help the GI and his family — maybe it's because I have a son of my own. Knowing the operators and bases, knowing they depend on me for an outlet, I do not, if I am able, want to let them down."

And anyone who is acquainted with Jeanne knows how much she accomplishes in her home and community. She does manage and very capably, too.

Hats off to a remarkable group of girls!

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The YLRL Chairman of the Fourth District is probably better known by her old call, W8TAY, than by her new one, W4JCR. Anita was YLRL President and *Harmonics* Editor in 1942 and '43, was 4th D. C. in '47 and '48, and Publicity Chairman for six terms. She organized the first local YLRL chapter in Cleveland and initiated QRV as the Club's motto. Currently, in addition to D.C. duties, she is chairman of the committee appointed to revise the YLRL constitution. Nita and her OM W4JCS now reside in Asheville, N. C., where she is employed as a writer for radio and TV.

Keeping Up with the Girls

Three YL Century Certificates have been issued to date. Recipients are OMs W1BFT and W2QHH, and W3JSH, Dottie (now K2DYO), in that order. This info from certificate custodian W7GLK, Dot. . . NCS, W7SFR, Lorraine, of the newly-formed NYLON (Northwest YL Operators Net) announces a change in net time from 0830 to 0900 PST (Wed. A.M. 3820 kc.). VE7 YLs are invited to call in. . . . When W6PJF, Rosemary, calls roll for the 75-meter 'phone net Wed. mornings, W6EKX, Beth (at work as a librarian) is checked in by her OM, W6VNI, who plays a tape with her message to the net. Russ then makes a tape of the net and plays it back to Beth when she returns home. . . . W5LGY, Helen, has built a 6-tube receiver (535 kc. to 35 Mc.), which she claims is really "hot". . . WØIRD now has her Conditional License and has been enjoying 75 'phone. Lil's doctor has said that her hobby is "better than all the medicine he could ever give." . . . YLs of the Los Angeles area have formed a two-meter net which meets Wed. at 7:00 P.M. on 146.1 Mc. W6LBO, Marie, is NCS. . . Because of other commitments, W8HWX and W8HUX, Lillian and Marvel, will soon have to forego their *Ham Shack Gossip* monthly news bulletins which they have edited for the past four years. . . . W7QYX, Doris, maintains daily skeds with her OM, W7QYZ, who operates a commercial salmon trawler in Alaska . . . W6YRL and W6UHA appeared as guests on one of W6NAZ's (Lenore) recent TV shows. Sandy and Maxine talked about traffic handling and DXing respectively. W6NZP, Evelyn, and W6LMQ, Eleanor, were guests another day and discussed their part in the 1953 All Women's Transcontinental Air Race. Audience response was enthusiastic, and Lenore urges YLs throughout the country to appear on radio and TV programs in behalf of amateur radio. . . . The YLs who attended the South Hills Brass Pounders and Modulators Hamfest at South Park, Penna., were W3s QPJ QPQ TTR TYC UTR UUG and W9MLE. . . . And W1s OAK UET UNF VZD WJA YYU and W2MLT had fun at the Vermont c.w./'phone picnic on Sept. 23rd. . . . W1FTJ, Dot, is proudly displaying her new OT certificate. . . . W4UDQ, "DB" and W1VYH, Betty, are happy about receiving their General Class licenses. . . YLRL Third District Chairman, W3SVY, is sorry to report that W3QPJ has been quite ill again. Loreli says that notes and cards for Kay would be appreciated. . . . Twenty-five YLs were present at the season's first meeting of the Los Angeles YLRC. Special guests were W3VNN, Shirley, and W5RFK, Delores. The membership was pleased with the new club pin (blue lettering on silver ovals, suspended on blue ribbons). W6WRT, Ruby, and W6FKH, Ben, were the first YL and OM to win the club's Lad 'N Lassie Certificate. . . . We believe newly-licensed Sharon Pakinas of Bothell, Washington, still takes honors for being the youngest YL licensed. Sharon, you know, was just seven years old.

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The following contribution to the discussion of YL-XYL terminology was received entitled *Hamsey Report:*

YL — Young lady (under 18)

LH — Lady ham (over 18)

HLH — Hitched lady ham

MH — Mother ham

HLH — Followed by / and number indicates number of times married

MH — Followed by / and number indicates number o children

If Eleanor Wilson had letters after her name, we would know whether to use Miss or Mrs. when writing to her.

[This treatise was volunteered by OM K6DV (R. W. McCormack, San Jose) and appears unedited — *W1QON, MH/1.*]

Important Dates.

Set aside Dec. 5th ('phone section) and Dec. 12th (c.w. section) for participation in the YLRL 14th Anniversary Party! The contest is open to *all* YLs, whether or not they are members of YLRL. Full details next issue.

Hints and Kinks For the Experimenter

HOMEMADE TURNS COUNTER

A SIMPLE and inexpensive turns counter that may be used with roller-type inductors is shown in Fig. 1. The assembly counts tenths of turns as well as full revolutions and can be put together for less than two dollars.

The heart of the unit is a mileage reel salvaged from an automobile speedometer. The reel is

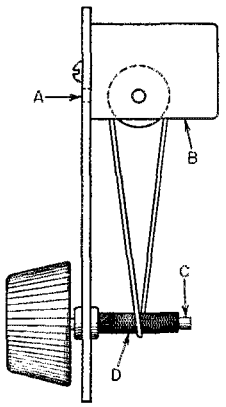


Fig. 1 — Drawing of the homemade turns counter. *A*, *B*, *C* and *D* are the viewing slot, mileage reel, panel-bearing assembly and tape "build-up," respectively.

bolted to the control panel just to the rear of a rectangular viewing slot. A panel-bearing assembly, mounted below the reel, is used as a direct drive for the roller inductor and as the drive shaft for the counter. The drive shaft is coupled to the reel pulley by means of a dial belt (the type used in b.c. receivers). Tape is wound around the drive shaft to build it up to the diameter of the reel pulley. Naturally, this "build-up" is essential if the counter is to register an exact number of turns. However, the unit will give an arbitrary scale for logging purposes regardless of the drive ratio. — *Raymond C. Cotton, W1BTY*

RECTIFIER TUBE-SOCKET KINK

IF your next power supply is to use a 5-volt rectifier tube, it will be advantageous to wire the rectifier socket with jumpers between Prongs 2 and 7, 3 and 4, and 5 and 6, respectively. Filament leads from the transformer should be connected to Prongs 2 and 8. One plate lead goes to either Prong 3 or 4 and the other plate lead goes to either 5 or 6. With these connections, it is possible to utilize without wiring changes any of the following rectifiers: 5AZ4, 5RG4Y, 5T4, 5U4G, 5V4G, 5W4, 5X4G, 5Y3G, 5Y4G, and 5Z4. — *Montague R. Morley, W4YIR*

METAL BEAMS AS RADIALS FOR GROUND-PLANE ANTENNAS

THOSE who already have a relatively wide-spaced all-metal 14-Mc. beam may also enjoy the efficient benefits of a 21-Mc. ground-plane simply by adding a 21-Mc. vertical (quarter-wave) to the system. The vertical must be insulated from the beam so that the latter may serve as the ground radials for the system.

In my case a 12-foot length of aluminum tubing is fed with a length of RG-8/U having the shield connected to the metal beam. The set-up is 45 feet above ground and has a measured s.w.r. of 1.1 to 1. — *T. J. Peery, W5MIS*

ILLUMINATED CALL LIGHT

CERTAIN substances possess a high degree of internal refraction for light, thus transmitting light from edge to edge without illuminating the major surface. However, wherever there is a surface discontinuity, light is allowed to leak out or become visible. Thus, by deliberately scratching or engraving the surface, it is possible to develop a unique *soft* illumination.

Fig. 2 shows a call sign that employs the light refraction property of Lucite. Engraving of the call plate is accomplished most easily by placing the plastic sheet over the lettering desired (letters cut from a magazine serve the purpose) and then carefully etching with a Vibro-tool or similar gadget. An electric drill may also be used as a router, but is more difficult to control.

To illuminate the sign, it is only necessary to mount a pair of pilot lamps, *F* and *G* of Fig. 2, in holes drilled at the bottom of the Lucite sheet.

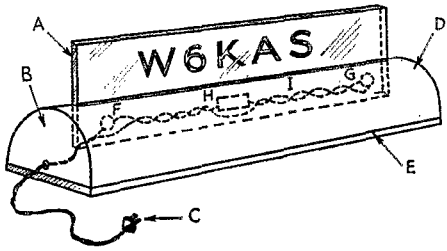


Fig. 2 — Drawing of the illuminated call sign. Members marked *A*, *B*, *C*, *D* and *E* are the Lucite sheet, wooden end (2 required), line cord, metal shield and wooden base, respectively. *F* and *G* are the lamps, *H* is the dropping resistor, and *I* is internal wiring.

The lamps should be held in place with either glue or tape, and require a suitable dropping resistor if they are to be connected directly to the a.c. power line. Naturally, it would be possible to substitute a small filament transformer, mounted within the assembly, as a means of lighting the lamps.

Colored lighting may be obtained by tinting either the lamps or the edges of the engraving Nail polish, dial-light coloring or dyes are suitable for this purpose. The etching will appear more

brilliant if the edges of the sign are treated with aluminum paint to prevent spill light around the edges of the Lucite. — *John W. Sherman, W6KAS*

PERMANENT IDENTIFICATION FOR COMPONENTS

SOME manufacturers of chokes, transformers, etc., are continually changing part numbers and, after several years, it is possible to end up with a stock of usable parts that can no longer be identified. However, if the ratings of a component are etched on the metal case with a scribe at the time of purchase, the fact that the manufacturer changes numbers or discontinues production of that part is of no consequence. — *C. Deane Kent, W2JFA*

CONVERTING THE GONSET TRI-BAND TO 40 METERS

YOUR Tri-band converter need not be made obsolete by the opening of the 40-meter 'phone band if you are willing to invest a few hours in minor modifications.

The high-frequency oscillator covers two ranges: 5000 to 5450 kc. for 75 meters and 7300 to 9200 kc. for 20 and 10 meters. The second and third harmonics of the 7.3- to 9.2-Mc. range are used to provide the 1440-kc. i.f. frequency at 20 and 10 meters, respectively. This range can also be used on its fundamental frequency to provide an i.f. for 40-meter operation. The only change necessary, therefore, is to tune the grid circuit of the r.f. amplifier to 40 instead of 20 meters.

Various methods have been considered but the simplest appears to be the addition of an inductance in series with the 20-meter r.f. amplifier coil. For normal 20-meter operation, the added inductance is shorted out with a low-capacity switch. With this system the antenna is overcoupled at 40 meters. However, operation is satisfactory and only a very simple switching circuit is necessary. The modifications are shown in Fig. 3. The steps involved in the modification may be enumerated as follows:

1) Remove the high-frequency oscillator trimmer capacitor from its front mounting bracket. This position will be used for the 20-40 bandswitch. Drill a ¼-inch hole on the rear panel, topside and midway between the 6BH6 and 6C4 tubes and about 1 inch above the chassis. The trimmer is mounted in this hole and heavy solid copper wire soldered between its stator terminal and the stator of the main oscillator tuning capacitor.

2) The hole in the bracket where the oscillator trimmer was located is enlarged to ⅜ inch. A low-capacity s.p.s.t. switch, S_1 of Fig. 3, is installed in this position. I used a filed-down version of a tone control switch to fit into the limited space.

3) The ground on the 20-meter r.f. coil must be lifted. This is most easily accomplished by removing the screw through the grounding bracket nearest the center of the chassis, bending the bracket up, and replacing the screw to hold the components in place under the chassis. Insulating material or paper may be used to keep the bracket isolated from ground. The 20-meter coil will be held rigidly in position with the one remaining grounding bracket.

4) The new coil, L_1 in Fig. 3, consists of approximately 25 turns of No. 26 enameled wire wound on a ⅝ by ¾-inch powdered iron coil form. An adjustment of the number of turns will be necessary if an air core is employed or because of variations in permeabilities of iron cores. Don't forget to have the antenna connected when resonating the circuit. L_1 is soldered between the grounded and floating brackets of the 20-meter r.f. coil.

5) One contact of S_1 is wired to the floating bracket on the 20-meter coil while the pole of the switch is soldered to ground via a ground lug installed near the switch bracket.

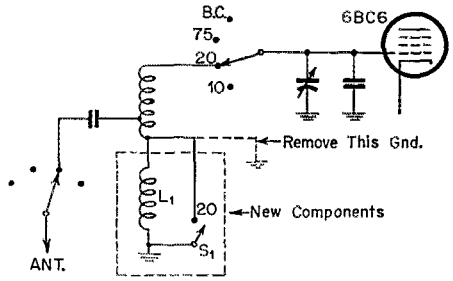


Fig. 3 — Circuit diagram showing the modification which permits 40-meter operation with the Tri-band converter. W3HTF describes the conversion and the new components in the accompanying text.

With the bandswitch set to 20 meters and S_1 in the open position, the 40-meter band will appear between 60 and 90 on the white scale when the pointer is close to vertical. — *H. Lukoff, W3HTF*

—···—

THE Gonset Tri-band converter used here at W4DND was quickly modified for 40-meter 'phone operation by inserting a coil in series with the 20-meter r.f. amplifier coil. The new inductor consists of 36 turns of No. 24 enameled wire wound on a 1½-inch diameter polystyrene form. A s.p.s.t. switch is used to cut the new coil in and out of the circuit. — *Elder T. Holbrook, W4DND-W4VYN*

EDITOR'S NOTE: When installing the coil recommended by W4DND, remember to lift the ground referred to in the description of W3HTF's modification.

—···—

THE Gonset Tri-band can be easily converted for 40-meter 'phone operation by adding a d.p.d.t. switch and a 100-$\mu\mu$fd. variable padder to the original circuit. One section of the switch is used to disconnect the 180-$\mu\mu$fd. padder that is normally tied across the 75-meter r.f. coil and the other half of the switch is used to connect the 100-$\mu\mu$fd. capacitor across the oscillator coil. The new components may be mounted on the back plate of the converter.

After modification, the Tri-band is set up for 40 meters by rotating the regular bandswitch to the 75-meter position and by throwing the d.p.d.t. switch to the position which does the jobs outlined above. Of course, the 100-$\mu\mu$fd. oscillator padder must be adjusted for maximum converter output at the proper i.f. frequency.

When the converter is operated at 40 meters, it draws more plate current than it does when tuned to any of the bands for which it was originally intended and it is therefore advisable to check the plate voltage after the conversion has been made. Make certain that at least 100 volts is applied to the unit. — *Grover Hunsicker, W5BDE*

S-METER CIRCUIT FOR BOTH A.M. AND S.S.B. SIGNALS

FEW amateur-type receivers provide for use of the S-meter when the set is tuned to an s.s.b. signal. Fortunately, this deficiency can usually be easily overcome by switching the indicator over to the audio circuit during s.s.b. reception.

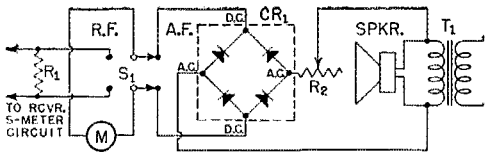


Fig. 4 — **Circuit diagram for the a.m.-s.s.b. S-meter.**
R_1 — 1000 to 2000 ohms; see text.
R_2 — 2500-ohm potentiometer.
CR_1 — Instrument rectifier.
M — Original S-meter.
S_1 — D.p.d.t. toggle switch.
T_1 — Receiver transformer.

Fig. 4 shows how the arrangement has been applied to a National type NC-183D receiver.

In the modified circuit, the S-meter terminals are connected to the center arms of a d.p.d.t. toggle switch, S_1. When this new control is set at the "r.f." position, it ties the meter back into the original indicator circuit. When the switch is flipped to the "a.f." position, it connects the meter to the output terminals of an instrument-type full-wave copper-oxide rectifier. The input side of the rectifier is connected in series with a calibration potentiometer, R_2, and the secondary of the output transformer, T_1. Naturally, the 'speaker-transformer connections do not have to be disturbed when the modification is being made.

If the receiver on hand does not employ a shunt across the S-meter, it will be necessary to add R_1 of Fig. 4 to the original indicator circuit. This resistor prevents the a.m.-indicator circuit from opening up whenever the meter is switched over to the s.s.b. position.

A calibration for the s.s.b. S-meter can be made most easily by comparing its readings with those obtained on a general-purpose test meter. Most of the latter have scales that are directly calibrated in terms of decibels. — *Wayne W. Cooper, YN1WC/W6EWC*

MOBILE C.W. RECEPTION WITH THREE COMPONENTS

THE usual method of adding a b.f.o. to the second detector of an auto receiver ordinarily involves quite a bit of effort and requires an additional tube. In most cases the receiver is so compact that the b.f.o. must be outrigged.

One method of obtaining b.f.o. action is to allow an i.f. stage to oscillate and beat with the i.f. signal. Usual means of introducing oscillation include adding capacitive coupling between plate and grid of the i.f. tube, or providing another winding on the i.f. transformer for feed-back. Either scheme is messy and usually results in considerable detuning and critical wiring.

A simple modification avoiding most of the difficulties and using only three components is shown in Fig. 5.

The screen lead is opened and a 2.5-mh. choke inserted. The screen is thus part of the oscillating circuit. Regeneration is controlled by the 0.25-megohm potentiometer which effectively determines the amount of by-passing at the screen. The values of the components are not critical, and will work with any i.f. frequency. In this particular case, 265 kc. was the i.f. frequency. The components were installed about 5 inches from the tube socket without noticeable effects. Normal 'phone operation is permitted by turning the potentiometer to zero resistance. At this point the i.f. stage acts exactly as it did prior to the conversion. C.w. is received by turning the potentiometer to a point somewhat after a "plop" is heard.

Grounding the a.v.c. line with a switch is absolutely essential. This had already been installed in the receiver when it was found that it resulted in considerable improvement in 'phone reception.

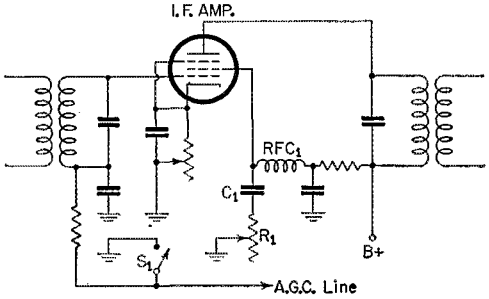


Fig. 5 — **I.f. amplifier circuit that permits c.w. reception with a converter-broadcast receiver combination.**
C_1 — 0.05 μfd.
R_1 — 0.25-megohm potentiometer.
RFC_1 — 2.5-mh. r.f. choke.
S_1 — See text.
NOTE: All other components are original circuit parts.

The a.v.c. voltage had apparently reduced the receiver sensitivity by responding to the high average noise level, rather than the weak signal. The a.v.c. is normally grounded on all but the strongest 'phone signals. I use a 3-position switch with the following positions: Off, noise limiter on, noise limiter on and a.v.c. grounded. As an alternative, the a.v.c. ground switch could, of course, be mounted on the regeneration control. The beat frequency is fairly stable, and therefore voltage regulation is not necessary. Only a slightly noticeable change of frequency occurs as the engine progresses from idle to race.

Quite a number of auto radios have gain controls that can be manipulated to advantage. In my case (1951 Ford) the cathode resistor of the i.f. amplifier is a small screwdriver adjustable potentiometer to which I added a shaft and knob. The extra gain achieved by turning the potentiometer up is very noticeable with weak signals. If the gain control potentiometer is turned too far down, the i.f. amplifier may refuse to oscillate and function as a b.f.o. — *H. Lukoff, W3HTF*

(Continued on page 136)

He Makes What We Hams Use

A. M. PICHITINO, WØEDX
Chief Engineer
E. F. Johnson Co.

QST's feature article for October of 1948 was by A. M. Pichitino, W3NJE, on his 10/20 meter beam. The November issue listed W3NJE as E. Penna. 'phone section winner in the DX contest that year — Al's ham radio ideas are the kind that work. Now WØEDX, Al is keeping right on with his operating activities. He won the Minnesota section on 'phone in last year's DX contest and rolled up the nationally high 'phone score in the Sweepstakes, besides. He likes DX but is always happy to rag-chew either from home or car on any of the 'phone bands. A long-time ARRL member, Al received his first call, W8KML, just 20 years ago. He was still in the Navy when ham radio started again after World War II but managed to be on hand for each band opening. In addition to being the recipient of a Public Service Award for his work in the Louisville flood of 1937, he has qualified for WAC, WAS and DXCC. Contributor to *QST* of articles on such diversified subjects as a low-pass filter, a speech amplifier and a mobile antenna, Al Pichitino is a successful combination of a radio engineer and an active radio amateur.

"Seems to Us . . ."

(Continued from page 9)

perfectly plain where the fault lies. A copy of the letter is published in our "Happenings" column this month; additional letters were also addressed some 40 individual equipment manufacturers. While only a few manufacturers employ the channel strip conversion system, some of them are among the industry's largest producers.

We expect to have more data on this problem in future issues of *QST*, as soon as current lab and field tests are completed.

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. For a list of overseas bureaus see p. 59, June, 1953, *QST*. (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, Wis.
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, 1330 Mitchell 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.

Answer to QUIST QUIZ on page 16

B is wrong about the radiation loss from open-wire line — it is an insignificant factor except when the line spacing is an appreciable fraction of the wavelength. Even the line unbalance introduced by running around corners or not maintaining symmetry with respect to ground does not result in any greatly increased radiation from the line. On a strict attenuation basis, therefore, the open-wire is better, and would show about 1 db. less loss than the coaxial line. For mechanical reasons, however, the coaxial line might be preferable.

The entire feed line (open-wire or coaxial) may radiate if it is unsymmetrically coupled to an antenna and is of such a length that it becomes a part of the radiating system. Typical examples of this are the Zepp, center-fed antennas in which the feed line does not come away at right angles, and the off-center-fed-with-300-ohm-line antenna.

Strays

Reader Joseph Sapienza finds tubular Twin-Lead just the thing for antenna-to-shack intercommunication. No auxiliary gear necessary — just talk into it.

—•••—

W9AOD thinks many constructors may be overlooking a source of simple chassis in the tremendous assortments of inexpensive aluminum metalware available at most department stores.

—•••—

Lloyd Roberts, WØANI, of Minneapolis, in the first such amateur instance brought to our attention, is now catching up on the twenty-seven months of *QST* he missed while being held as a prisoner of war in Korea.

—•••—

Possible menu musts for next Field Day: WØMVJ sends in the label from a can of "Sea-Q" salmon and W4NZY calls our attention to the recent "Ham Cook Book" issue of *Good Housekeeping* magazine.

—•••—

W8HDF had successive QSOs with W7HDF/3 and W3HDF on September 3rd. Noting that the names of both operators were identical, W8HDF ascertained that W7HDF/3 had received his new W3HDF ticket between contacts.

—•••—

Society Radio Operators of Chicago, to celebrate acquisition of new quarters in the Billy Caldwell Post No. 806, American Legion, 6038 N. Cicero Ave., announces an Open House to be held on the night of November 11th. A talk on binaural "3-D" sound will be featured.

—•••—

Twenty-eight amateurs serve on the staff of Allied Radio Corporation, Chicago. With an area equivalent to 1½ midwestern city blocks, Allied's new quarters have 1500 feet of five-layer conveyor belts, 7200 feet of pneumatic tubes, a cafeteria, 150-car parking space and a telephone system equal to that of a fair-sized town.

—•••—

Relatively little information now exists as to ionospheric phenomena on frequencies below one megacycle. Until recently, propagation research on these frequencies lagged far behind that performed on higher ranges. Since 1950, however, when the National Bureau of Standards successfully obtained vertical-incidence reflections at 37 kc., NBS has engaged in a program further to evaluate low-frequency phenomena. Records obtained so far in this work show a diurnal variation with reflections from the ionospheric *E* region apparent at about 100 kilometers above the test transmitter.

From the Fitchburg, Mass., *Sentinel* via W1BNO, concerning audiometer hearing tests given 3000 local school children: "[The audiometer] is an electrical device with headset connections. Decibels, units used for measuring loudness of sound, are transmitted through the 'phones."

—•••—

The Sixth Annual Conference on Electronics and Nucleonics in Medicine, to be held at the Hotel New Yorker, New York City, November 19th–20th, will feature symposiums on such subjects as diagnostic devices, X-ray techniques, cinefluorography and uses of the analogue computer in biological research. This year's session is jointly sponsored by the American Institute of Electrical Engineers, the Institute of Radio Engineers and the American Instrument Society.

—•••—

The many friends and on-the-air acquaintances of Earl Mead, W7LCM, who won wide acclaim for his wit and courage as "Da Mayor" of Huntley, Montana, will be saddened to learn of his sudden passing in late September. W7LCM had been an invalid for the past 16 years as the result of an automobile accident. Earl's silent key will leave a void on his favorite amateur bands, for his log contained an estimated 18,000 QSOs. W7LCM's business as a magazine subscription representative will be carried on by his wife.

—•••—

The Edison Radio Amateur Award Trophy, displayed at the 1953 ARRL National Convention in Houston, is inspected by (l. to r.) FCC Commissioner George E. Sterling, W3DF, one of the four judges for the Award; General Electric Co. official G. A. Bradford; and ARRL President Goodwin L. Dosland, WØTSN, also an Award judge. Awarded annually for outstanding public service, its 1953 winner will be announced on Feb. 11, 1954.

Correspondence From Members-

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

S.S.B.

1214 Greenfield Dr.
Clarksville, Tenn.

Editor, *QST*:

. . . *QST* is aware of the fact that many do not know or will not admit that s.s.b. is 'phone. They are aware that many do not realize that s.s.b. is only one half as wide in spectrum as old-fashioned d.s.b., that it is far more efficient, much less expensive and (get this) simple.

The only thing I have ever noticed *QST* trying to "jam down the throats" of us ordinary citizens is to be more democratic sort of fellers. Should the editors ever stop this sort of "jamming" it would cause *QST* to become the organ of the ever-decreasing number of amateurs who think because they have an old-fashioned 'phone rig that is powerful enough to make them "the king of the roost" and little 50-watt s.s.b. stations are outdating them, that the entire art should stop all forward motion so they can sit back, push a button and say into the mike, "I'm a BIG man." . . .

— *Conway L. "Slim" Wilson, W4WQT*

QRM CUTTER

1205 West Main
Dothan, Ala.

Editor, *QST*:

Just thought I would drop a note of appreciation for the fine work done on the articles in the 1953 *Handbook*. I just got my ticket a few weeks ago, and have been having trouble (like most everyone else) fighting the QRM on the 80-meter Novice band; however, since I had the parts listed stored in one junk box or another, I decided to build the clipper/filter on Page 112. After about three hours' work, I took it over and plugged it into the output of my BC-454. I was expecting some improvement, but nothing like this! It sure cut the QRM and static crashes like a knife. It has doubled the pleasure of operating, when I was about to give up in disgust until I could get a new receiver; now, I am burning a hole in 3735 and 3727 with my QSOs.

Also, I would like to echo what has been said over and over about the W1AW code practice. It was one of the big factors in helping me get my ticket; however, why is it that so many operate zero-beat with W1AW during the sessions? When one is trying to learn code, that looks like the most crowded part of the band.

Again, my thanks for a fine job well done.

— *Douglas Lurie, WN4ARE/W4ARE*

SEE?

756 Francis Drive
Wantagh, L. I., N. Y.

Editor, *QST*:

I don't think you realize the valuable service of your pictures of the tremendous antenna arrays some hams manage to get up. I doubt if there are many of us who miss the chance to show them to the XYL and remark, "So you think *my* antenna is big!"

— *C. J. Herzer, jr., W2CEP*

PULLING POWER

527 Fifth Ave.
New York 17, N. Y.

Editor, *QST*:

In the July *QST* I ran a small classified ad offering a Harvey Wells TBS50-D for sale — the first ad I had ever run in some 23 years of reading your good magazine.

Frankly, I was amazed at the response. Ten fellows either wrote or called me with definite offers to buy it, and I heard from several old friends I used to know back in the early '30s when I was a W2.

Just thought you'd like to know again that *QST* classified ads really pull their weight. The response was particularly interesting to me as one who has spent some 15 years in the advertising and selling business.

— *Stuart D. Cowan, jr., W1RST*

"BLIND TRANSMISSIONS"

Box 374
Hugo, Colorado

Editor, *QST*:

This letter represents my first effort to publicize my views on a pet peeve — hams who send "blind" without listening on the frequency before each transmission. I am continually hearing gripes about QRM on the bands, but so few seem to realize that this is caused to a considerable extent by the above-mentioned trouble. It is thoroughly disgusting to have a DX QSO fouled up with a local CQ right on top of your signals. I don't like to be pessimistic but I think it is high time that every self-respecting amateur got rid of this ungentlemanly habit.

— *Dennie Johnson, WNØNLD*

1420 Elder Ave.
Boulder, Colo.

Editor, *QST*:

On a Sunday afternoon last month, I was trying out a new rig and new antenna coupler on twenty meters. Following my usual custom in testing, I checked with receiver and panoramic adapter, and chose a spot of minimum activity within 20 or 30 kc. of the frequency on which I intended to operate. I found the antenna difficult to load, and had a carrier on for a couple of minutes, then signed my call as is customary, and as required by the FCC. Immediately a station on the frequency called me, without signing his own call, and launched into a tirade about not listening before testing. He evidently lacked the intestinal fortitude to let me know who he was. I informed him that I did listen, that I knew of no way to load an antenna without feeding power to it, and further that he had no exclusive right to the use of any frequency. He did not return, so I listened on the frequency for a minute or so. Presently a W6 with a three letter call, all letters late in the alphabet, resumed a "rag chew" with a W9.

This surely reaches a new high point in unmitigated gall — "I am on the air — everybody else get off my exclusive frequency — how dare anyone interfere with my conversation?"

Ham radio is the wrong hobby for this individual. If he can't take the QRM along with the rest of us, without rudely trying to berate someone for *daring* to interfere with his important rag-chewing, he should take up stamp collecting. It would be easier on his nerves and temper. . . .

— *Eugene M. Link, WØIA*

GHOSTS

18 County Way
Greenbush, Mass.

Editor, *QST*:

. . . I am employed by the New England Tel. & Tel. Co. at their ship-to-shore radiotelephone station WOU, Green Harbor, Mass. One of our receiving frequencies is 2110 kc., and you would expect that we never would hear an amateur on it. Unfortunately we do. This results from 160 and a VFO, and happens when someone is just getting on the band. As near as I can figure it out, it results from the receiver picking up a so-called ghost signal.

As an example, suppose that little Willie fires his receiver up on a frequency of 1882.5 kc. and zero-beats the VFO in

there, so he thinks. The following has happened several times while I have been on watch. WOU hears him calling CQ or test on 2110 kc.

Dial on Willie's rcvr. reads	1882.5 kc.	VFO actually on	2110
The receiver i.f. is	455.0		× 2
The h.f. oscillator is	2337.5 × 2	2nd harmonic	4220
The 2nd harmonic of receiver oscillator is	4675		
Subtract VFO 2nd harmonic	4220		
Ghost signal of the i.f. results —	455		

As the FCC monitors the ship telephone frequencies due to our complaints of other QRM, a nice pink ticket can result. When I can identify the station and can find his call in the *Call Book*, and if the ham has a telephone, I attempt to call him and advise him of the trouble.

— *George W. Brooks, W1JNO*

CODE COPYING

14 Gerdes Ave.
West Orange, N. J.

Editor, *QST:*

. . . Harvey Fletcher's book on sound mentions briefly that pitch can be recognized by the human ear only if the sound has a duration of 0.05 to 0.09 second or more. This corresponds to a code speed of approximately 30 w.p.m. At 60–70 w.p.m. a single dash would lose pitch, but several consecutive dashes would probably make the pitch recognizable. The aural threshold for a dot will be somewhere below 0.05 second, but I haven't been able to find a textbook on sound or psychology that establishes that threshold. Measurements must have been taken to find human end-points for dots, dashes, spaces, and word groups — probably during the time preceding high-speed commercial recording. Have you run into some of those references? What level of random noise effects intelligibility in c.w. reception? I think you have mentioned in one of your articles that as code speed is reduced, the signal-to-noise ratio for the threshold of usefulness will decrease.

With International Morse near 100 w.p.m., the spaces between the words are lost to me. Increasing the gap between words might make recognition of the word groups possible at higher character speeds, but an end-point in word-gap-speed ratios would also be reached. There must be a region, also, where the ear integrates the square-wave c.w. signal into a modulated sine response.

There are several interesting relationships here.

— *Mack Scybold, W2RYI*

OKAY, OM

Syracuse, Indiana

Editor, *QST:*

It is beginning to be a little silly. What's in a name, anyway? This has happened at least a dozen times on the start of a QSO on c.w. — "RRR [meaning solid, of course] but missed your name."

Brother, you didn't miss anything — I didn't give it! Let's use OM once more!

— *M. K. Meredith, W9QVH*

WHAT'LL IT BE?

Tinker Hill Rd.
Pine Plains, N. Y.

Editor, *QST:*

If there were anything that could induce me to side with advocates of a reduction of power permitted on the ham bands, it would be those high-power gentlemen (and I can name names and calls) who long ago got WAC and DXCC and who now, nightly, settle down in the first 10 kc. of the 80- and 40-meter bands to rag-chew (usually about the QRM!), while hundreds of other guys and gals strain and sweat and swear, trying to complete a QSO with a crystal-controlled 50-watter in Denmark or Australia.

Just last night I heard W2—— tell W1—— that "hr we running about 800 watts." Those two stations were less than 150 miles apart and they were on 7008 kc. They could have communicated perfectly with 30 watts — or even 10. The FCC regulations say they should have been using exactly that power — the minimum necessary.

My own feeling is that we could all live and let live — the fortunate few who own a kilowatt should be allowed to enjoy them. But, by the same standard, the big boys ought to allow me and my 50 watts also to live. If they don't, I think the FCC ought to suspend the licenses of a few of them for violating the rule about minimum power.

— *Fred Myers, W2IHI*

1408 Cherokee St.
Marietta, Georgia

Editor, *QST:*

The desire of certain individuals and groups to place additional restrictions upon amateur radio by means of government agencies is a dangerous one. Those restrictions most often desired appear to be a reduction in maximum power input and the exclusive use of a single type of emission on a particular band. . . .

That whipping boy, the kw. input, has too long taken an undeserved beating from persons lacking in communication experience. Actually, a kw. input is a modest power but to judge from the fearful complaints being voiced it is responsible for every lost contact and missed dot in amateur communication. Reducing power input to some lesser value will in no way remedy the two main causes of poor contacts and interference complaints: copying c.w. on a speaker; a low level of operating ability. The use of headphones will often permit solid copy on a signal which would be difficult to read on a speaker. Operating ability requires practice only and unfortunately cannot be bought as are so many of the items required in a station. . . .

A good station running a moderate kw. input is truly enjoyable and permits consistent DX talks, day after day, in contrast to the short exchange of signal strengths characteristic of low-powered operation. My operation in recent years has been on a low-power basis because of finances and not because of a lack of appreciation of higher power.

— *C. W. Stebbins, W6PTQ/4*

HAM RIGHTS

1507 Central Avenue
Kansas City 2, Kans.

Editor, *QST:*

. . . There may be times when net operators may be too quick and eager to ask non-net amateurs to QSY, or even to "tell" them to do so. However, there is much more to be said on the other side of the question.

A net is a *group* of stations. The very nature of a net requires that it meet at a certain time on a certain frequency, and those dependent on factors such as the convenience and availability of all members, propagation conditions, and connecting net schedules. Unlike the casual operator, a net cannot easily QSY, QRX or QRT.

The members spend the biggest part of their time standing by and listening; therefore, a net takes up less frequency space than if the members paired off for individual QSOs. If for no other reason — the non-netter should respect net operation because it reduces over-all band QRM.

If there is a question of "manners" involved, what of the manners of an individual who considers his individual "rights" above that of a large group. In most cases if the offending amateur had had the good manners to listen on the net frequency before he "opened up" with his CQ, "dog whistling," or sending test signals with his left foot, he would have known that he would be interfering with the rights of others.

Amateurs need to "mind *their* manners" and also to use some good old fashioned common sense and realize that when one gets "rights" that one also assumes responsibilities.

— *Merton T. Meade, WØKXL*

CE3AG deftly handles a king-sized pile-up at the CEØAA operating position. Among equipment used: a Collins 32V-2, 75A-2, a 500-watt gasoline generator and an off-center-fed multiband antenna. Luis brought his favorite junk box along, too, and it came in handy!

CEØAA

CE3AG's DXpedition De Luxe

THE on-the-air appearance of CEØAA, installed and operated on Easter Island during the month of August by Luis M. Desmaras, CE3AG, must be recorded as one of the year's outstanding amateur radio events. CEØAA's ham-band signals were the first such to shatter the normal tranquility of the ether surrounding *Rapa Nui*, as Easter's several hundred natives call the island. Here, indeed, was a golden opportunity to cross an enigmatic blank off one's DXCC Countries List!

CE3AG's trials and tribulations in preparing and consummating this operation can easily be understood. The sea voyage in itself, a round trip of over 4000 miles, was an undertaking of no mean magnitude. Transport *Angamos*, bearing Luis and his gear, encountered such storms en route that lists of up to 38 degrees were recorded. The ship left Valparaiso July 24th, touched at Juan Fernandez Isle on the 26th and reached its destination on August 7th.

Surmounting another series of obstacles in debarkation, CEØAA at last was readied for action on the 7th in time to start the ball rolling with CE3AB on 14-Mc. 'phone — a "first" among firsts to come. A contact with CE3AG (CE3DG operating) followed, during which Luis chatted with his anxious family. Then the fireworks really began, for word of CEØAA's availability had spread like a chain reaction and each passing moment brought more and more stations on the air in pursuit of Easter Island.

W6GDJ was the first U. S. amateur to enter the CEØAA log (c.w.) and W1FH was the first lucky W 'phone. Eight days later, when Luis closed down after 73½ hours of on-the-air time, CEØAA had recorded 1538 QSOs with 53 countries on all continents — 1163 on c.w. and 375 on 'phone. During this week-long period of operation Luis found conditions generally quite good on 3.5, 7, 14 and 21 Mc., the four bands used. On each band, respectively, CEØAA worked 46, 202, 1256 and 34 stations.

Luis worked the U.S.A. 996 times, Argentina 108, Chile 97, England 68, New Zealand 36, Brazil 26 and Canada 22 times. CEØAA, averaging well over 20 QSOs per hour of total operation, had a peak hour that brought joy to 61 eager beavers (60 Ws and one KH6). W3OP made it just under the wire; his was the last W contact.

The return trip home began on August 15th and Luis, operating as CEØAA/MM aboard the *Angamos*, ran up some 200 additional QSOs before arriving Valparaiso on the 25th, thirty-two days after the DXpedition had set forth.

For CE3AG the affair was his greatest radio thrill since scoring WAC as sc2LD in 1925 with a UV-202 Hartley transmitter. For hundreds of rabid DXers the working of Easter Island from their end was perhaps as great a thrill.

Luis, of course, extends his thanks to all who gave encouragement and assistance toward making CEØAA plans become reality. On behalf of the DX world, our heartiest *gracias* to CE3AG!

Below, *left*, Luis takes a moment to pose near one of the many curious and ancient statues that dot Easter Island to the bewilderment of archaeologists. *Right*, the shack of CEØAA. One end of the antenna is visible at upper left.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W1VMW

How:

In a fashion, our 160-meter band comes very close to filling description as the "oldest amateur band." Certainly it isn't far distant from the near-200-meter wavelengths that saw the birth of amateur radio around a half century ago. And, although it came into official being along with

W1BB's 160-meter "royal flush plus one."

sister harmonic wavelengths down the line, one-sixty is the first ham band you'll trip across when contemplating the traditional amateur panorama of "200 Meters and Down."

Activity reached a dizzy peak on one-sixty just before WW-II when it became the heavy favorite for short-haul 'phone work. At that time an amazingly high percentage of all amateur activity took place on this buzzing band. During that period, a sunspot maximum, 160's DX potentialities lay unexplored with the exception of limited experimental tests. Indeed, its reputation as a "local" band became so firmly entrenched that a typical expression of the height of impossibility in those days was to the effect that "Joe Blow needs only five more continents for his 160-meter WAC," followed by derisive laughter.

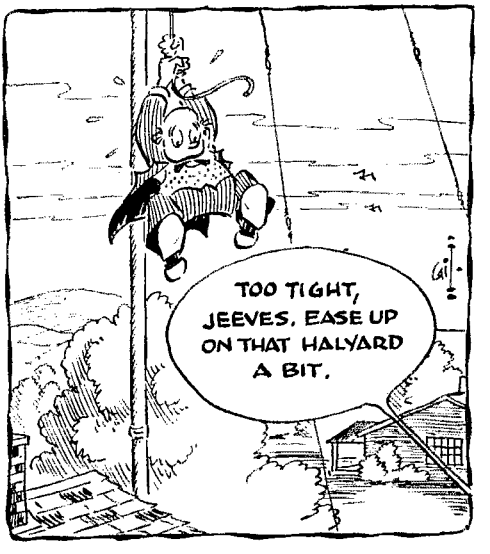
After the war ten meters took over as No. 1 cross-town band, being one of the first reopened to amateurs. What with its belated availability, one-sixty was relegated to the sidelines. But as the postwar sunspot maximum and DX boom began to wane, many DXers, faced with spotty high-frequency conditions and also in need of more DX worlds to conquer, began to give 160 a serious try.

Stewart S. Perry, W1BB, who had been keeping an enthusiastic eye on the 1.8-Mc. range for quite some time, set his own sights for more and better 160-meter DX. Stew began hitting the jackpot with several firsts as previously recorded on these pages. The climactic one of all became fact recently when W1BB received an eagerly awaited QSL from New Zealand. Yes, after all these years somebody has finally confirmed the heretofore "impossible" — a *160-meter WAC.* W1BB is the guy!

How many countries and continents can *you* work on 160 meters this season? See you there.

What:

Twenty c.w. has been behaving a little better in the daytime but acts even more blotto at night. Notwithstanding, W9HUZ upped his power to 300 watts and made out all right with this assortment: CN2AO (14,018), CRs 4AJ (038), 6CS (076), CT2BO (003), DU7SV (082), EAs 6AF (030), 9AP (004), EL2A (015), FK8AO (066), FO8s AB (048), AC (048), AI (058), HR1AA (062), HZ1HZ (029), KX6BF (080), LZ1KPZ (070), MD5RM (095), MP4BBD (018), OD5s BH (026), LX (100), OQ5s GU (062), NK (082), VN (070), SU1s GG (040), SS (038), XZ (012), VK9s RM (050), WL (025), YY (094), VPs 2MD (005), 3VN (082), VQ4AQ (022), VS1s DF (065), DF (065), FE (065), FF (125), GA (067), VS2DF (065), YI2AM (094), YO6CD (099), W5ZOJ/KJ6 (043), ZD2G (124), ZD4BN (042), ZE5JV (074), ZKs 1AB (005), 2AA (068), ZPs 5AY (095), 6CR (045), 3V8AN (070), 4X4s BX (018), DE (048),



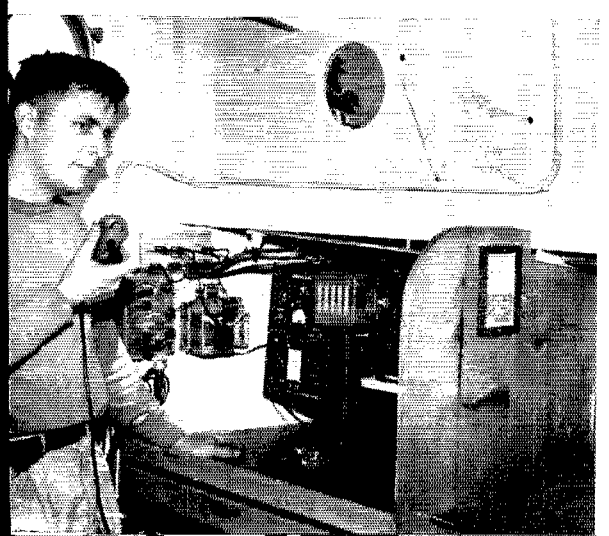
* DX Editor, *QST.*

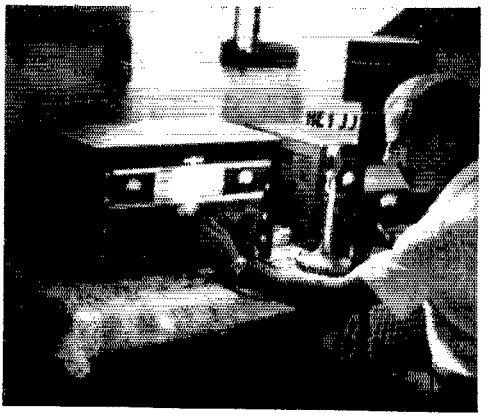
DF (048), DK (040), FQ (005) and HQ (048). Van was among the fortunates to cash in on CEØAA and VQ1RO festivities . . . . HH2FL (056), KR6IN (056), TF3AB (011), VR2BZ (012) and a VP2 answered W7RME . . . . W6NTR, W7MO, KL7PI, W6LW, W1LZE and others collided with JZØKF, presumably of Dutch New Guinea, (030-050) from whom we still await identification. QSLs for him have been accumulating here at Hq. in the meantime . . . . W1DHO and W4NZR come up with two cuties — G3GDW/VS7BJ and NE1AA (065), respectively, the latter probably aboard ship. Another at-sea fellow was LB8BD, worked by KL7PI . . . . W6GQK caught up with W7IIS/KP6 on Palmyra (097) at 0430 GCT, while W8YHO encountered FB8BE (045) . . . . In his four months of General Class work, W1WLW has become an avid DX chaser. FA8DA (055), FF8AG (020), GC2FZC (025), GD3UB (035), IS1AHK (005), MF2AG (075), OE13USA (010), TA3AA (020), ZC4IP (055) and others already mentioned have succumbed to Joe's 40 watts and dipole and he already has WAC and 71 countries worked . . . . Reporting a better-late-than-never QSL from ST2AR, W2HSZ bespeaks of HK1TH, FQ8AF, VQs 1RO and 2AB . . . . W4ZAE kept his new Viking-II warmed up on CP1BX (021), CR6AI (020), EAs 8BC (033), ØAB (042), EL1DFX (022), FP8AP (060), KA2JF (093), OX3GL (047), PJ2CF (015), VS1s AU (030), DX (029), ZB1BU (083), ZD9AA (021), 4X4BN (051) and a successful 7-hour stalking of CEØAA . . . . W4WXZ's first three weeks on 14-Mc. netted him 30 countries and CEØAA . . . . VS9AP (078) and ZC5VS (078) go well in W5MPG's ledger, while W6BIL kept busy with FM7WD, KH6ASU/KM6, PJ2AK and others. George is battening down his WAP and WCZ efforts . . . . I1BLS/Trieste, SP9KAD and 5A4TG came back to W3OQO, and W6ZZ found JAs 1FA 4BB and KA9DR available . . . . New ones for W1LZE were (times GCT) CP1BX 2317, CR4AJ 0008, FK8AO 0514, YI2AM 2058 and ZP5AY 2131, while FA8AY, TF3AB, VP3VN and ZB1CU are to be found among W9ESQ's recent catches . . . . CE3QW, FA9VN, JA1AA, VK1RL and YV5BB fell prey to W4TJI's 814s . . . . W2ZVS unknowingly had his receiving antenna disconnected when working some of these: EA8BF, FB8UU, FK8AE, JAs 1CB 2AT 3AF 3BB 8AE 8AQ, KAs 2AA 2AW 7AR, SP1KAA, SU1s GB MQ, VQ2DT and VP8AJ. Dixie hears the U boys but they're still giving Ws the go-by . . . . CR5AD (045) 2230 CST, CT3AN (057) 1242, I5FT (045) 1300, KJ6BA (023) 2330, KS6AB (064) 2220, KX6BC (070) 0740, VQ5CL (032) 1330, ZD4BN (075) 1620 and 9S4AX (040) 1435 are among the rarer candidates listed in the West Gulf DX Club *DX Bulletin*.

Twenty 'phone keeps G3HLS very much occupied. Arthur's recent successes include AC4NC (14,120), Togoland's FD4BD, Iwo's KAØIJ (205), Nicobars' VU5AB (150) and assorted Oceanians. AC3SQ (096) keeps eluding the net. G3HLS rolled up 207 A3 countries in some 20 months of effort. Other 'phones logged at G3HLS are KP6AA, VRs 3C and 4AE; Art says CR8AA is also on tap . . . . CS3AC of the Azores, KG4s AN AU, KS4AU, OE13USA, VQ4s EH (105), AC and 5A2TZ worked W9BDW. Lewis is now with M. I. T.'s W1MX crew . . . . W1WQC reports good luck with EA8BQ (198), KR6MD, VP2DL, VQ3RJB (180-220) and YS1A (320). "Incidentally, during this period were the best openings to the Pacific and Asia that I've heard in two years — KAs too numerous to mention." . . . . The path between Hawaii and Europe is always a toughie. To date CT1SX is KH6WW's only European 'phone contact . . . . CR5SP (195), M1B (170), MP4s ABW (120), KAC, OQØDZ (170), SU1MR (132), VS5AQ (209), ZK2AA (184) and 3A2AM (195) are gaudy ones accounted for by listener L. Mark Michel of Pennsylvania . . . . ZC6UNJ prefers to invoke the element of surprise rather than use the overworked CQ system — likes to pick out a weak W calling CQ and raise him on his frequency. These Ws have been pushing good 14-Mc. 'phone signals into Jerusalem through stupendous European A3 QRM: W1LOS, W2s JT KLI, W3s IXJ JNN KDD RIS WUH, W8OGZ, W9s AVJ and GMB . . . . HR1s GM (152), TL (152), KG4AN (248), YV4s AA (167) and AI (279) contacted W9LMC . . . . WGDXC stalwarts have been concentrating on 'phones CR6CK (190), FF8AP (180), FO8AD (150), FQ8BA (150), HZ1AB (220), JY1XY (150), OD5LC (190), ST2NW (170-230) and VS6CL (250).

Forty holds few secrets from W5WZQ. Dave reached 33 7-Mc. countries rapidly by way of folk like HH2OT (7100), HR1KS (50), JA1s CO (25), CR (25), KG4AI (30), KV4AA (05), KX6BF (50), LU3ZS (56), PJ2AN (22), TI8JR (20), VPs 4LZ (15), 9BF, VK9YY (63), YV5FL (08) and several ZSs. Novice-type DX QSLs have arrived from WH6s ATT AWT, WL7AVP and WP4TQ . . . . W6KJR took on JA1s AI CH, KG6FAA (48), KX6UZ (22), LU3ZO, PZ1WX (13), TI2PZ (30), VP7NV (140), VR2CG (120) and a long-haul ZS . . . . LU4ZO, SP9KAD, ZK1AB and CEØAA came back to W2QHH's new 60-watter. With the old 35-watt rig Howy succeeded in working over 100 countries on each of the 3.5-, 7-, 14- and 28-Mc. bands. No VFO or beams were employed in the process . . . . W6LW and W6NTR mention PK6RN (33) of Biak, Netherlands New Guinea, a possible competitor for JZØKF. The latter could be ex-PJØX of early N.W.I. fame . . . . W1APA and W4TJI worked VK1RL (50) of Macquarie Isle. W4TJI also reports good fortune with LU5ZO (40), VP5BH (05) and many Oceania stations . . . . SHAPE Hq. station F7SHP, OA4C, TI2CR, VK6WT and VP9XG are included in W9ESQ's listing . . . . W1APU, W2TKG, W2OLU, W4UWA, W4YZC, W6BIL, W6ZZ and WØPRM are getting in on their shares of 7-Mc. DX . . . . FK8AO (37) and VR2AS (24) were nabbed by W9HUZ.

The real DX season on *eighty* has just gotten under way but W4ZAE's Transcontinental DX Club buddies have al-





Karl Ramser, HB9JJ, regularly takes advantage of opportunities to operate in Liechtenstein as HB1JJ/HE. A Collins 32V-1 and 75A-1 are used with a 3-element beam and long wires at a mountain location some 5000 feet high.

♦

Jack Wheeler, W7FNK, operates FO8AI aboard his ketch *Gemini* while he and the XYL cruise Pacific waters. Unfortunately for DXCC aspirants, FO8AI apparently engages in no land-based amateur activity. Jack's dad in Portland was a ham himself back in spark days. (*Photo courtesy Lawrence Barber, Marine Editor, Portland Oregonian*)

William C. Thomas, KV4BB, used this layout to run up 176,080 points with 828 contacts in the 'phone session of ARRL's 1953 DX Contest. This was the highest score for a single-operator station outside W/VE territory — not bad for a fellow's first contest attempt! Bill ran a kilowatt input to p.p. 250TLs modulated by 810s. His antennae included a 14-Mc. 3-element beam, a 10–11-meter ground-plane and a 1200-foot long wire for other bands.

♦

ready recorded **FF8AR** (3505), **OQ5s** VN (07), AQ (16), **VQs** 3RFF (23), 4RF (11), **VS1AU** (01) and **ZD2MBQ** (44) . . . . W6ZOL tells of an interesting 3.5-Mc. three-way with **ZK1BG** (45) and K6BHA, the latter cutting through well on a mere five watts . . . . . We'll be interested in *seventy-five 'phone* DX doings this season so please edify us concerning your good luck on the band.

On *fifteen* **9S4AX** tells WØPRM he has reached the 53-country mark. **VQ4RF** has the outstanding 21-Mc. signal in Saarland. A tripler stage running 50 watts is ample enough to get 9S4AX plenty of business on this band . . . . . WØPRM further learned that **LZ1KAB** QSOd **KZ5CP** and **HB9EU** on 15 meters, the only Bulgarian 21-Mc. activity to date . . . . . **HC1FS** (21,232), **VQ2HA** (140–207) and **ZP5DC** (275) are reported by W1WPR of W1AW, all three on 'phone . . . . . W6ZZ reached 47 21-Mc. countries with 27 via voice. Recent A3 contacts for Miles: **CE1BE, HP3FL, KH6s** AR NS, **KP4TA, KV4BD, KZ5s** FL GD MJ ML NM SA, **PYs** 2OS 3SI, **TI3LA, VKs** 2ID 9GW and a ZP5. **JA1DM** was raised by W6ZZ on c.w. . . . . A folded dipole and a 25-watt 807 final modulated by a Heising 6L6 stage got **CT1QF, HP1PH, KG4AJ, VPs** 5DX 5SC 6WR, **PJ2AA, XE3BR** and **ZP5FI** for W1MGP. You can really get some QRP results on fifteen these days . . . . . Writes W6ZZ: "I notice the Novices are really invading 21 Mc. now. . . . The more activity, the better . . ." Agreed!

The *one-sixty* gang are rolling up their sleeves early. A group of W stations will be looking for 160-meter DX stations on each Thursday and Sunday morning from 0500 to 0700 GCT and W3RGQ desires to receive reports from any others who join the watch . . . . . W1BB informs us that plans for the annual 160-meter Transatlantics are shaping up — we'll pass along the details.

Don't look now, but we've received two *ten-meter* reports this month. W4ZAE and the TCDXC group scared up **CT1VD** (28,355), **CE4BX** (480), **HC1MB** (490) and a bunch of **LUs**, while VE3BCT reports whopping signals from **LU3DEV** . . . . . With very few interesting exceptions, 10-meter work for W/VEs is strictly a north-south proposition nowadays. Let's hope it won't be long before 28-Mc. rotaries again become logical.

Where:

From ZC4IP via W9DUY: All QSLs for ZC4 stations may be sent to Mrs. Barrett, Box 219, Limassol, Cyprus. She's ZC4IP's XYL . . . . . Regarding Bulgaria-bound pasteboards, this address has worked for LZ1s in the past and W1ODW figures it can do the trick for you: Box 830, Sofia . . . . . Via W9CFT, CN8GU offers to relay QSLs destined for U. S.-citizen CN8s. CN8GU holds the Stateside call WØKWI . . . . . The RCA bureau often listed in this monthly roster stands for the Radio Club of Argentina and not Radio Corporation of America. The latter organization has been called upon to forward LU cards more than once! . . . . . Regarding last month's hint on PK1TM QSLs, W2GT adds that IRCs should be sent with all applications. It's possible that ex-PK1TM can help out with your PK6VK QSL problems, too. Don't forget that full QSO data are requisite.

CN8FN, Lt. T. E. Helderman (W9UFQ), AO-1907848, 735th AC&W Sqdn., % Postmaster, APO 117, New York, N. Y.
CR6CK, P. O. Box 164, Marange, Angola
CR6CS, P. O. Box 244, Nova Lisboa, Angola
ex-FB8BB, Mac Loubet, 8 rue d'Ulm, Paris V, France
FO8AB, (QSL via REF)
FO8AI, (QSL to W7FNK)
FQ8BA, P. O. Box 108, Brazzaville, Fr. Equatorial Africa
HB1AG/HE, Dr. Erwin Huber (HB9AG), Schaan FL Box 95, Liechtenstein
JA3BB, Shigeo Okaya, Box 1042, Kobe, Japan
JA3BP, Seimi Hamada 25, 5 Nagara-cho, Nagatoku, Kobe, Japan
KA2KS, U. S. Naval Radio Facility (S), Navy 830, Box 14, FPO; San Francisco, Calif.
ex-KG4AF, G. B. Fisher, jr., 1533 Morris Ave., Winona, Norfolk, Va.
KJ6BA, APO 105, % Postmaster, San Francisco, Calif.
KT1UX, C. W. Cleveland, American Legation (VOA), Tangier Zone
OD5XX, (QSL via OD5AD)
OK1MB, B. K. Micka, Ukrizku 8, Praha XIV, Czechoslovakia
OQ5VN, J. Van Neer, % Telecommunications, Stanleyville, Belgian Congo
PY2AJ, Joao Ramos Baccarat, rua Guaibe 103, Santos, Brazil
ex-SU1AD, (K2EGI) 5 Stratford Pl., Babylon, L.I., N. Y.
SU1XZ/MD5, (QSL via RSGB)
VP2DL, P. O. Box 103, Dominica, Windward Islands, B. W. I.
ex-VP6SD, (QSL via VE2UW)
VQ2HA, H. B. Allanson, P. O. Box 64, Kitwe, Northern Rhodesia
VQ3RJB, Box 107, Moshi, Tanganyika
VQ4EH, Box 71, Kisumu, Kenya
VR4AE, (QSL via KH6OR)
ex-W2WMV/C9, (QSL to K6AVK)
W7IIS/KP6, Lawrence Benjamin, 2204 NE 7th Ave., Portland, Ore.
XE2NV, A. Vaquero, P. O. Box 147, Monterrey, N. L., Mexico
YU1FR, Tima Popovic, Banat. Novo-Selo, Yugoslavia
ZD2S, (QSL via RSGB)
ZD4BN, (QSL via RSGB)
ZP5DC, % American Embassy, Asuncion, Paraguay
3A2AW, (QSL to SM5ARP)

W1s FWH JLN ODW RWS WPR WQC, ZDP, W2s HSZ MUM OLU, W3OQO, W6s LW NTR ZOL, W9s BDW CFT HUZ, KP4KD and the West Gulf DX Club *DX Bulletin* collaborated to provide this directory.

Tidbits:

Asia — CT1CB, CR8AB's pop, told CT1CL that CR8AB still needs a transmitter before he can log his first QSO. Therefore, somebody unscrupulously has been borrowing this delicious call, at least up through September 1st . . . . . KA2s KS and LY wonder if their marathon 8-hour QSO sets any kind of record. KA2KS (WØNIF) says he and KA2LY soloed at each end . . . . . ZC4IP listed currently legit and active Cyprus stations ZC4s BN CA FB GF HG IP LW MH RX and VP, in a line to W9DUY . . . . . OD5XX is W3ACE when on this side of the pond . . . . . On QSL to KH6WW, KAØIJ states he stands ready to furnish Iwo, the "Black Pearl of the Pacific," to any and all the boys on 20 'phone and c.w. Tex uses a BC-610, Super Pro and Vee beam . . . . . We learn that W4JQO, who regularly flies point-to-point in the Korean area, is keeping an eye on the possibilities for resumption of HL amateur activity.

Africa — From ET2NJ (K2ATR, ex-MI3NJ): "All of the former MI3 call holders retained the last two letters in their new calls [prefix ET2]. There were, however, several men who were using the club call of the Radio Marina Amateur Radio Club while waiting for their own calls to come through. There were no calls issued for about three months prior to the changeover so, for a while, we had about six guys using the club call. Among this group were ET2s CG MW SM VD and WW. Following is a list of the members of the club, now known as the Kagnew Station Amateur Radio Club: ET2s BL CC CE CG KE MK MW NJ SM TS VD and WW. ET2US is the club call. Cards will reach all members if sent to the club at APO 843, c/o Postmaster,

New York, N. Y." Joe adds that Karl Leono, ET2LK, confirmed 103 of 135 countries worked in Eritrea before heading back home to W3NLS. ET2NJ closed his letter with a parting shot at poor h.f. DX conditions . . . . . OQ5RA was scheduled to leave for Europe in late October and figures he'll return to the Congo by mid-1954 . . . . . Via W2HSZ, W8YHO, and others he recently worked, FB8BE takes issue with FB8BB's July "How's" comment anent sparse FB8 DX activity. "FB8 OMs protest. . . . Here 13 FB8 OMs working with 50 watts." If they stirred up more Madagascar activity we'll gladly eat our words! . . . . . W3OQO finds that 5A4TG (W9TYB) runs a VFOd 50-watter into a folded dipole . . . . . According to W1WQC, VQ3RJB is interested in working W1s in his back-home Norwalk, Conn., area.

Oceania — Bill Storer, VK2EG (ex-VK1BS), continues to prepare for this winter's Australian Antarctic Expedition, gathering radio gear and working bugs out of same. Thus far he has a 100-watt transmitter and Super Pro ready to go. "Operating periods won't be specific as I will be away on field trips from our main base quite a lot. Also, conditions are pretty bad in regard to reception, so I hope the boys won't think I am standing them up or passing them by. I will work anyone I hear calling . . ." Newspaper clippings forwarded by Bill indicate that the expedition's scope is considerable and that the undertaking should make quite a news splash when it does take off . . . . . The present ZM6AA told ZL1HY he wouldn't mind giving Tokelaus operation a try. In a letter to W1WPO Dave writes: "The government chaps in Samoa can fly over to the Tokelaus but it would be impossible, I guess, for outsiders. Norm (ex-ZM6AK) said only one boat a year went there . . ." ZL1HY also opines that FW8AB of Wallis isn't yet very DX-conscious and rarely makes himself available. Dave, himself, has ZL1HY on DXCC record as Oceania's top DXer and is bearing down on the 200-confirmed mark . . . . . W5UXP commends VK9YY for fast QSL. The latter is gunning for a Md.-D.C. pasteboard to complete WAS . . . . . ZC5VS, who unfortunately has been ill with malaria, writes W5MPG that he is especially anxious to QSO W1 2 3 and 4 stations. In fact, up through late August, ZC5VS still hadn't worked W1 or W2 . . . . . W7PLI/KG6 pulled the big switch and assures that he has QSLd his Guam contacts 100 per cent. If you still need a strayed card replaced, try Conk's home QTH. In all his six months of operation W7PLI/KG6 couldn't bag a W4 . . . . . Bruce of KG6AAY and W5PXN/KG6 intends to put a BC-610, AR-88 and 3-element 14-Mc. beam into the various DX contests that come along. KG6AAY pushes quite a bit of traffic on the side.

Europe — "I am very sorry to say that HE1C never was in Liechtenstein; he is a pirate. A new regulation in Switzerland is that all expeditions to Liechtenstein must be announced to our 'FCC' in Berne and to the government of the Principality of Liechtenstein. The only real HE at the moment is HE9LAA in Schaan. Any Swiss station operating portable in Liechtenstein must use the portable call." So writes HB1JJ/HE . . . . . W1WPO finds that GM3DHD is the first Scot to hit the DXCC 200-mark . . . . . "Just got my new license with call YU1FR. I will be on the air very soon on 15, 20 and 40 meters." This good word from Tima Popovic of club station YU1BCD, whose picture appeared in the September issue. YU1FR intends to maintain a 100 per cent QSL policy . . . . . Some pitch on Bulgarian doings via LZ1KAB, 9S4AX and WØPRM: LZ1KDP began operations in October with 40 watts input. LZ1KAB is building a new 500-watt 'phone-c.w. transmitter. LZ1KSA is also rebuilding, and LZ1KPZ is a newly activated club station . . . . . GC2FZC, who has 90 countries worked, still searches for Mont., Nev., N. Mex. and Utah for his WAS . . . . . G3HLS could use some advice toward obtaining a 1951 QSL from KM6AW.

The "HZ1AB radio club" mans its widely-worked station with plenty of spirit and coöperation. W4TST, who sent this photo as a QSL to W9BDW, is at the left. A good many DXers owe their Saudi Arabia DXCC credits to this gang.

South America — From Henry E. J. Smith, ex-CP1BK: "In the period February 18, 1952, to October 23, 1952, I worked some 700 W stations and to the best of my knowledge sent out QSLs to all Ws worked, through QSL bureaus. . . . I am having some special ex-CP1BK cards printed up and if anyone is missing my card and can substantiate with full dope (date, time, etc.) a QSO during the above period I will gladly mail one from here in the U. S. A. . . . Since my return to the U. S. I have visited lots of W6s and other DX men I have worked." Henry's QTH is 384 Rockaway Parkway, Valley Stream, L. I., N. Y. . . . . We're going to miss PZ1WX on 40 and 20 meters. He's heading back to the PAØ homeland, according to W1APA . . . . . W2-QHH finds that CP5EK desires to secure an HZ1AB confirmation for a 1951 QSO. Can any past or present HZ1AB op give him help?

Hereabouts — We hear that FCC passed out citations to some of the brethren heard calling "UU" and "7UU" when VQ7UU was the object of pile-ups a while back. Guess we'd better use the call, the whole call and nothing but the call . . . . . KH6ARA may be back on from W2AIS for the lower-frequency DX season ere you read this . . . . . KP4KD, also planning 160- and 80-meter business this season, needs only the right Asian for his DUF–IV certificate . . . . . W1ZL passed the 203-country mark while still sticking to his "versatile vertical," a 14-Mc. half-wave job he uses on all bands . . . . . *The Bugle*, organ of the Confederate Signal Corps with headquarters in Atlanta, has a newsy DX column edited by W4HYW . . . . . Those who worked KF3AA or W5AGB/FM before January 6, 1953, and who still need QSLs will be interested to know that Fred T. Whiteside, P.O. Box 143, Oakdale, La., is standing by for QSL inquiries. He made a gallant effort to confirm 'em all but, as often happens, a certain percentage of cards went awry . . . . . W4RNP, topping a recent *QST* Stray, has plastic slip covers for rig, receiver, mike and other components of his DXing set-up . . . . . W2EQS could use news of the present whereabouts of ex-KS4AQ . . . . . Explaining that his own Juneau location isn't such a hot DX spot, KL7PI nevertheless is about to grab off his DXCC-180 sticker . . . . . Bill Beckett, one of the former VS1BJ ops, paid a visit to VE3ADV. Bill is anxious to get fired up once more, VE3ADV still struggles to confirm an EA9DC QSO and has plenty of company in this respect.

W. F. Meyer, ZS6DW, turned in the top African 'phone score in this year's ARRL DX Competition. Bill is a DXCC member ('phone) of long standing.

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

TROPOSPHERIC DX from Ontario to Mississippi; bursts of aurora to build section totals in the Northeast; literally hundreds of portables swarming over the high spots from Maine to California; unprecedented activity on 220 and 420 Mc. — these are just a few of the impressions to be gathered from a quick look through the rapidly-growing pile of September V.H.F. Party reports, as we go to press. With the reporting deadline still more than a week away, we can present no comprehensive picture, but here are a few highlights:

Highest score in the history of v.h.f. contests — 12,274 points, amassed by W1MHL/1, Pack Monadnock Mountain, Peterboro, N. H. Operated on four bands for the Waltham Amateur Radio Association by W1PYM and W1QMN, assisted by W1RUD, W1LUW and SWLs Finan and Lippincott, W1MHL/1 made 55 contacts in 11 sections on 50 Mc., 230 contacts in 15 sections on 144 Mc., 15 in 8 on 220 Mc., and 4 in 4 on 420 Mc., a staggering total of 304 stations, with a multiplier of 38. Because of their multiple-operator set-up, the boys of W1MHL/1 are ineligible for a certificate award, but we feel sure that v.h.f. enthusiasts everywhere will award them the unofficial v.h.f. contest championship by acclamation!

Top single-operator score, to date, was turned in by Margaret Roberts, W8BFQ, who made 202 contacts on 5 bands for 6727 points. Next to Margaret is another YL, Liane Waite, W2FBZ, with 186 contacts on 4 bands for 6324 points.

One-band operators will have to bear down to beat the total turned in by W4AO, Falls Church, Va. Ross worked 151 stations in a record-breaking 19 ARRL sections for 2869 points. W2AZL and W2UK, pushing for sections, had 18 each on 144 Mc.

Outstanding mountain-top work was done by W3KX/3, manned by members of the Electric City Radio Club; W6MXQ/7, Ashland Peak, Oregon; W6VSV/7, Mt. Rose, Nevada; W1PZA/1, Mt. Kearsarge, N. H.; W1UIZ/1, Mt. Monadnock, N. H.; W3PZK/8, West Virginia, and scores of others.

Activity on 220 and 420 Mc. reached the point where it was no longer necessary to work a fellow on a lower band and then have him look for you on the two pay-off bands. Especially during Saturday evening, many contacts were made on the two higher bands without prior arrangement on lower frequencies. The advancement that 420 has seen is summed up in one experience at W1HDQ. We listened on 432 Mc. around 8 P.M., and heard W3KX/3 coming through very well. Contact was no sooner established than c.w. QRM developed. This turned out to be W1MHL/1, whose modulator was giving trouble. When a New Hampshire station knocks out a Pennsylvania station, we say 420 has grown up! You would have to have been active in the early days of 420 to appreciate what this means.

More details next month.

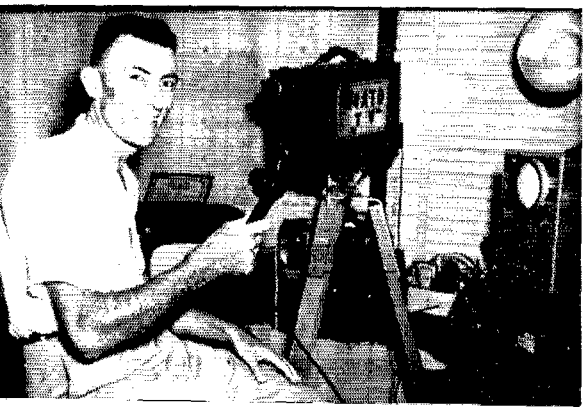
Here and There on the V.H.F. Bands

It's not much fun to be isolated from any large body of v.h.f. activity, so that you have to rely on none-too-frequent DX openings to hear any signals at all. Ask VE1QZ, Dartmouth, Nova Scotia, who has had plenty of experience at this sort of thing. Oscar wants to find out, once and for all, whether it's worth the time and effort to keep going on 144 Mc., so all during September he ran automatic c.w. from 0500 to 0600 EST and 1600 to 2300 EST on 144.45 Mc. He will continue this through October, if there is interest in trying to hear his signals. Needless to say, he'd like to have reports, even negative ones. If nothing comes of this, he's going to 220 and 420 Mc., feeling that duct effects are much more likely to produce DX on these frequencies than on 144.

We've always felt that it should be possible to work anywhere in the West Indies on 6 when the band is open for sporadic-*E* skip, but it's not been done too often. Much of this has been laid to insufficient interest in the Islands, but VP5EM, Constant Spring, Jamaica, says that the shoe may be on the other foot. He has heard TV signals and com-

* V.H.F. Editor, *QST*.

Two amateur TV enthusiasts who have camera equipment and 420-Mc. stations ready to go are W4ATO, Albany, Ga., and W4HER, Burlington, N. C.



2-Meter Standings

	Call	States	Areas	Miles		Call	States	Areas	Miles
W1HDQ		18	6	850	W6IJA		3	3	1390
W1IZY		16	6	750	W6BAZ		3	2	320
W1RFU		15	7	1150	W6ZL		2	2	1400
W1MNF		14	5	600	W6WSQ		2	2	1390
W1BCN		14	5	580	KG6AAV/6.		2	2	275
W1DJK		13	5	520	W6NLZ		2	2	237
W1CTW		12	4	500	W6GCG		2	2	210
W1KLC		12	4	500	W6EXH		2	2	193
W1MMN		10	5	520	W6ZEM/6.		1	1	415
W2UK		22	7	1075	W7LEE		3	2	240
W2NLY		22	7	1050	W7YZU		3	2	240
W2ORI		20	8	1000	W7JU		2	2	140
W2QED		18	7	1020	W7JUO		2	2	140
W2AZL		18	7	1050	W7RAP		2	1	165
W2PAU		16	6	740					
W2QNZ		14	5	400	W8BFQ		24	8	775
W2UTH		13	7	880	W8WJC		23	7	775
W2SFK		13	6	—	W8WRN		20	8	670
W2DFV		13	5	350	W8WXV		19	8	1200
W2CET		13	5	405	W8DX		19	7	675
W2DPB		12	5	500	W8UKS		18	7	720
W2FHJ		12	5	—	W8BAX		18	7	655
					W8EP		17	7	—
W3RUE		20	7	760	W8RMH		16	7	690
W3QKI		20	7	820	W8WSE		16	7	830
W3NKM		19	7	660	W8RWW		16	7	500
W3KWL		16	7	720					
W3LNA		16	7	720	W9EHX		23	7	725
W3FPH		16	7	—	W9FVJ		22	8	850
W3GKP		15	6	650	W9EQC		21	8	820
W3IBH		13	5	570	W9BPV		20	7	1000
					W9UCH		20	7	750
W4HHK		22	7	850	W9LF		19	—	—
W4AO		20	7	950	W9WOK		17	6	600
W4JFV		18	7	830	W9ZHL		17	6	—
W4MKJ		16	7	665	W9MB		16	7	660
W4OXC		14	7	500	W9KLR		16	7	—
W4IKZ		13	5	650	W9BOV		15	6	—
W4JFU		13	5	720	W9LEE		14	6	780
W4CLY		12	5	720	W9FAN		13	—	680
W4JHC		12	5	720	W9UIA		12	7	540
W4OLK		12	5	720	W9GTA		11	5	540
W4FJ		12	5	700	W9JBF		10	5	760
W4UMF		12	5	600	W9DSP		10	4	700
WN4WCB		9	4	650					
W4LRR		5	2	900	WØEMS		23	8	1175
					WØGUD		22	7	1065
W5RCI		16	5	790	WØIHD		18	6	725
W5JTI		14	5	670	WØONQ		17	6	1090
W5QNL		10	5	1400	WØINI		14	6	830
W5CVW		10	5	1180	WØZJB		12	7	1097
W5AJG		10	4	1260	WØOAC		12	5	725
W5MWW		9	4	570	WØWGZ		11	5	760
W5ML		9	3	700	WØJHS		9	3	—
W5ERD		8	3	570	WØHXY		9	3	—
W5ABN		8	2	780					
W5VX		7	4	—	VE3AIB		20	8	890
W5VY		7	3	1200	VE3DIR		17	7	790
W5FEK		7	2	580	VE3BQN		13	7	790
W5ONS		7	2	950	VE3BPB		12	6	715
W5FBT		6	2	500	VE3AQG		11	7	800
W5IRP		6	2	410	VE1QY		11	4	900
W5FSC		6	2	500	VE3DER		10	6	800
W5DFU		5	2	275	VE2AOK		6	2	340

mercial mobile stations all through the region either side of the 6-meter band on numerous occasions, but never a ham until Aug. 27th. That night, while TV signals were rolling in from Cuba, Jacksonville and Charleston he finally heard his first 50-Mc. ham. He caught the call as W8QRB, though the identification is not certain. Where, VP5EM asks, were all the other 50-Mc. Ws that night? A good question!

Everyone professes to be yearning for a Vermont contact, but that doesn't do W1MMN, Orange, Vt., much good. George is on night after night with a good set-up in a much-better-than-average (for Vermont) location, but his contacts are few and far between. W1MMN is far enough north so that it takes a good night for him to work into most Southern New England stations, and QSOs with New Jersey and the New York area are rare. He can't guarantee to be on every night, as he's on 24-hour call for the State Police, but he'll be glad to keep a sharp lookout for anyone who needs a Vermont contact on 2. He catches just about every aurora, especially since the Montreal TV station opened up on Channel 2. Aiming directly north for his TV reception, he seldom misses the first warning of a developing aurora.

If you want to get that Vermont contact drop W1MMN a note (George Chandler, R.F.D. 2, Barre, Vt.) giving your frequency and operating schedule, and he'll put you on his looking list. His frequencies are 144.18 and 144.13 approximately, and he can use c.w. or voice, and horizontal or vertical polarization, concentrating on the former for his monitoring of the band.

The 950-mile 2-meter DX work between W4HHK and W2AZL and W2UK continues pretty much as reported last month. Signals, or fractions thereof, are heard on just about every try, and the boys at both ends of the path are straining for the last small advantage in transmitter power, receiver noise figure or antenna gain that may make this dream of regular communication over a path close to 1000 miles possible. W4HHK is erecting a large rhombic in a quiet country location, and increasing his power to the legal limit. W2UK, in addition to his 40-element array, now has a rhombic 30 wavelengths on a leg, aimed at W4HHK. The beam still seems to be holding its own so far, however. Tests are being run daily, both morning and night, the morning test having been instituted at the suggestion of Villard, W6QYT, who feels that, if meteor scattering is responsible for the signals getting through, the early morning might be more productive of results.

Aurora DX on 220 Mc.? We've been wondering about this one for a long time, but not too many opportunities have arisen to find out whether 220 is destined to be good for this sort of thing. (We once felt that 144 was useless but look at it now!) During the aurora opening of Sept. 18th, W8BFQ went to 220 Mc. at your conductor's request. We've tried several times unsuccessfully before, but this time an aurora c.w. signal was heard. Too weak to be copied, it was heard only a few seconds, but it was enough to raise hopes that we may, one day, work some stuff on 220 by the auroral route. W3LZD, Dunmore, Pa., has seen aurora effect on TV Channel 11 from Binghampton, N. Y., 60 miles north of his location, so he is confident that 220-Mc. work is possible. Wanted: recruits to go to 220 when the 144-Mc. band is open. Can *you* key your 220-Mc. rig?

That 220-Mc. band is coming along these days, and we hope that the series of articles for the beginner that started in October *QST* is going to help things along considerably. W3LZD reports working W3VIR recently, with signals on 220 running 6 db. better than on 144. This is over a path of about 100 miles of very rough terrain. W3VIR, W2QED and W2FBZ all come through well on 220 at W1HDQ, anytime the 2-meter signals are at all good. The distances are 170, 210 and 120 miles, respectively. During the v.h.f. party we worked 14 different stations on 220, most of these contacts having been made without prior arrangement on a lower band. Not like the old days!

What may have been the first Texas-Kansas QSO on 144 Mc. came off on Sept. 20th, when W5AJG, Dallas, worked WØZJB, Wichita, who also worked W5HHU in Dallas. This started at 0715, which is the time of WØZJB's regular morning operating schedule. WØZJB and WØMVG at Salina, Kans., have been keeping this morning schedule regularly for some time, teaming up again at 2130 and 2215 CST. W5HXK, Watonga, Okla., works into Wichita, 150 miles solidly, and negotiates the 210 miles to Salina most of the time. Vince has worked W5IOW, Ada, Okla., 235 miles, frequently and W5HDH at Buffalo, 170 miles, comes through well. To the north he is having fairly good results with WØDSR, Greenleaf, Kans., 175 miles, and WØONQ, Kansas City, 190 miles. TV reception, even on the high channels, is good over these and greater distances in several directions, so WØZJB and WØMVG feel that much more business should be possible on 144 Mc. and possibly higher bands.

The hot weather of early September produced some beautiful inversions along the Atlantic Seaboard. During the first three days of the month, W3PYW worked 52 different W1s, 2s, 3s and 4s, most of them more than 150 miles distant, and quite a few running only a few watts.

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.: W5AXY, W5BDT — W5RCI
520 Miles — October 5, 1952

420 Mc.: W1RFU — W4TLM
410 Miles — July 26, 1953

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

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

3300 Mc.: W6IFE/6 — W6ET/6
150 Miles — October 5, 1947

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

10,000 Mc.: W4HPJ/3 — W6IFE/3
7.65 Miles — July 11, 1947

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

And speaking of low power, VE3BMB, River Canard, Ontario, feels that many of the fellows who are burning up kilowatts overriding QRM on lower bands would switch to v.h.f. if they realized how well they would be able to work out with low power. Dave has never run more than 9 watts input, yet he has worked more than 140 different stations, from Central New York to beyond Chicago. His rig uses receiving tubes throughout, and the components are largely salvaged from earlier uses. The line-up is a 6AK6 oscillator, a 12AU7 tripler-doubler, another 12AU7 tripling to 144, and a 12AV7 final. The modulator uses a 6AV6, 6SN7 (one half as a tone oscillator), and a 6L6 output. The antenna is a 4-over-4, mounted just above the roof.

W9OVL, Hammond, Ind., writes that 220-Mc. activity is coming along well in the Chicago area. W9DRN is now working out with a new 9903 final, and W9DDG, Sheboygan, Wis., is testing a new 100-watt rig on 220. W9REM started something with his crossband 220-144 work. Many others have taken up the idea on 220 now, and the 2-meter gang are getting a lot of fun out of it, too. The two bands make an ideal duplex combination, and hearing a fellow talking with someone you can't hear almost invariably generates the urge to get something going on the other fellow's band.

Hints on Lowering Noise Figures

Though he already had the lowest noise figure on 144 Mc. that we've heard of to date (under 3 db.), W2AZL was still not satisfied. Checking the input impedance of his 417A cascode r.f. amplifier, he found it to be only about 300 ohms. Feeling that this was the result of the cathode lead inductance, Carl experimented with various values of cathode by-pass on the first stage of the cascode, to tune out the effect of the lead inductance. Reducing the by-pass capacitor from 500 to 100 $\mu\mu$f. brought up the input impedance to 3000 ohms. Going to 30 $\mu\mu$f. raised it to 17,000 ohms, but at this point the stage became unstable.

Experiment showed that 50 $\mu\mu$f. stabilized the circuit, but brought up the over-all gain considerably. The improvement in noise figure was nothing short of phenomenal, the indicated result now being under 1 db.! Admittedly, this may not be an exact noise figure, but a similar operation has now been performed on several converters, and in each case the improvement in performance has been the same. The results also check on two different types of noise generators.

The input circuit is self-resonant, with the antenna tapped at the center of the coil through a 7–45 $\mu\mu$f. ceramic trimmer that tunes out the reactance of the coupling system. Otherwise, the circuit is the conventional cascode. This approach is probably most helpful with very high-g_m tubes like the 417A, but it raises the possibility of employing the same technique on 220 and 420 Mc., with the idea of getting effective performance with the cascode circuit on these higher bands. There is a good chance that somewhat better noise figures might be obtainable than we now get with the grounded-grid stages generally used on 420. This will take some doing, however, as the 6AJ4 job described in August *QST* checks out under 6 db. at 436 Mc.

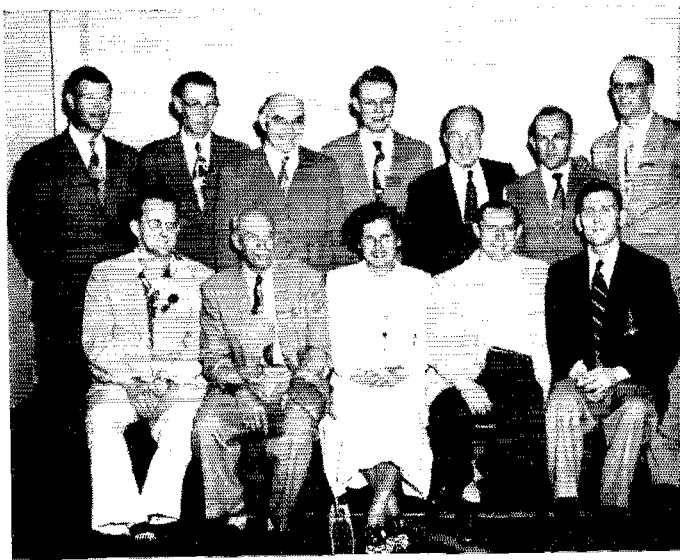
Another idea for hopping up stages using tubes like the 6BQ7 is suggested by W3LZD. Ted finds that running the tube hot helps. He uses only 50 ohms cathode resistance on a 6BQ7A or 6BZ7, thus making the tube draw more plate current, and raising the g_m. With 150 to 200 volts in the plate supply, the usual 100 ohms or so of cathode bias cuts down the tube performance appreciably. We tried this on 6BZ7 stages currently under construction for 220 and 144 Mc., and found that a slight improvement was observable as the cathode resistor was changed from 100 to 68 ohms. Reduction of the cathode by-pass value, as suggested above, did not affect the performance of these converters, but we hope to try it soon with the hotter tubes, and at 220 and 420 Mc.

Here are two more ideas for improving 420-Mc. reception. W3VIR, Willow Grove, Pa., had excellent results with his 6AJ4 preamplifier as described in August *QST*, except that there was considerable spurious stuff along with the signals. He reduced the value of the coupling condenser, C_1 in Fig. 2, to 15 $\mu\mu$f., dropping the spurious signals down without affecting those in the desired frequency range.

In the same type of amplifier, W2FBR, Montclair, N. J., found it helpful to tune out the reactance of the output coupling loop, L_2, with a series trimmer. Ralph was able to get a noise figure about 2 db. lower with this trimmer than without it.

OES Notes

We hope that all OES appointees enjoyed the big Bulletin prepared largely by W1YYM, and mailed out during September to nearly 300 holders of the appointment. If we can keep Ellen on the job, perhaps you'll be hearing from us in that way more often than in the past. The OES family is growing steadily, but there is room for many more. If you



When the Southern Ontario-Western New York V.H.F. Group throws a party, outstanding v.h.f. enthusiasts come from far and wide. Here are a few who attended a recent meeting in Buffalo. *Seated, l. to r.*: W2RUI, W2SJV, W8BFQ, W2QED, VE3DIR. *Standing*: W3WBM, W8WJC, W2ORI, W2ALL, W2UK, W8WXV, W3QKI.

have a continuing interest in the frequencies from 50 Mc. up, why not join up? A card to your SCM (he's listed on Page 6) or to ARRL Headquarters will give you all the details.

Though space limitations don't allow a section under the above heading in every issue of *QST*, OES reports are always used in compiling the v.h.f. column. Signing up for the OES appointment puts your name on the mailing list, not only for the OES Bulletin, but also for copies of any special official bulletins that have to do with v.h.f. work. You'll get the latest news on outstanding v.h.f. accomplishments and projected tests or expeditions, and what is perhaps even more important, you become a full-fledged member of the ARRL family.

W2UTH, Rochester, voices a complaint that is heard all too often these days. Hank says that there is too much digging for DX and not enough willingness to work the fellows who may be in areas that most of us have worked. The Western New York gang have a particularly bad time of it on this score. During aurora openings, especially, the "wheels" tune rapidly over anyone signing "W2," with the result that many of the boys out Rochester and Buffalo way have trouble getting contacts with W1s, New Jersey W2s and other relatively near, but normally hard-to-work, areas.

W4FLW, Dresden, Tenn., says that things are looking up on 50 Mc. in western Tennessee. He runs nightly schedules with W4RFR in Nashville, with a high percentage of success on voice. Power is about 90 watts at both stations. There is a local 6-meter net workout every Monday and this is generating interest on the part of a number of Novices and SWLs in the area who have commercial receivers that cover the 50-Mc. band. Harry hopes to have more activity on 6 there soon.

W8UZ, Columbus, Ohio, is accumulating 3-cm. gear. George is not expecting to do much two-way work on that band, but hopes to get acquainted with the techniques and be ready, just in case anyone else wants to give it a try in that area.

W9GFL, Green Bay, Wis., reports that their new v.h.f. club now numbers 53 paid-up members, including 37 licensed hams. The advent of u.h.f. TV in Green Bay has caused little or no trouble to date. All bands through 144 Mc. are being worked regularly all through the area.

W9LEE, Westboro, Wis., has been working WØBBN, Grand Marais, Minn., regularly on schedule for more than two years. A schedule like this, kept religiously, will show that 144 Mc. (or any other v.h.f. band, for that matter) is much better for daily work over 150 miles or more than most people realize.

Which probably makes this as good a place as any to report that your conductor's 0700 sked with W2QED, Seabrook, N. J., is also well into its third year. So far in 1953 the operation has been about 90 per cent successful, a considerable improvement over 1951 and '52. Since early summer, W2QED has also been received practically every day on 435 Mc., and he is now set up to transmit on 50 and 220 Mc., also, at will. Contact is established on 144 Mc., and the other bands are checked at frequent intervals. The 50 and 144 bands seem much alike, ordinarily, with 144 running ahead when conditions are good. Two-twenty and 435 react to weather variations much more, and the strongest signals ever heard over the path have been on 435 Mc. Ken will run as much as 20 db. stronger on 435 than on 144, when conditions are favorable, and not more than 5 db. below 144 under adverse conditions.

50 WAS Mc.

WØZJB.....48	W5VY.....48	W8OJN.....39
WØBJV.....48	W5MJD.....47	W8LPD.....37
WØCJS.....48	W5GNQ.....46	
W5AJG.....48	W5ONS.....45	W9ZHB.....48
W9ZHL.....48	W5JTI.....44	W9QUV.....48
W9OCA.....48	W5ML.....44	W9HGE.....47
W6OB.....48	W5JLY.....43	W9PK.....47
WØINI.....48	W5JME.....43	W9VZP.....47
W1HDQ.....48	W5SFW.....43	W9RQM.....47
	W5VV.....42	W9ALU.....47
W1CLS.....46	W5FAL.....41	W9QKM.....46
W1CGY.....46	W5FSC.....41	W9UIA.....45
W1LLL.....46	W5HLD.....40	W9UNS.....45
W1LSN.....44	W5HEZ.....38	
W1HMS.....43	W5LIU.....37	WØQIN.....47
W1DJ.....41	W5FXN.....37	WØDZM.....47
		WØNFM.....47
W2AMJ.....46	W6WNN.....48	WØTKX.....47
W2MEU.....46	W6ANN.....45	WØKYF.....47
W2RLV.....45	W6TMI.....45	WØHVW.....45
W2IDZ.....45	W6IWS.....41	WØMVG.....44
W2FHJ.....44	W6OVK.....40	WØJOL.....44
W2GYV.....40	W6GCG.....35	WØTJF.....44
W2QVH.....38	W6BWG.....29	WØWKB.....43
W2ZUW.....35		WØJHS.....43
	W7HEA.....47	WØPKD.....43
W3OJU.....46	W7ERA.....47	WØIPI.....41
W3NKM.....41	W7BQX.....47	
W3MQU.....39	W7FDJ.....46	VE3ANY.....42
W3RUE.....37	W7DYD.....45	VE3AET.....41
W3OTC.....36	W7JRG.....44	VE1QZ.....34
W3FPH.....35	W7BOC.....42	VE1QY.....31
	W7JPA.....42	XE1GE.....25
W4FBH.....46	W7FIV.....41	CO6WW.....21
W4EQM.....44	W7CAM.....40	
W4QN.....44	W7ACD.....40	Calls in **boldface** are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.
W4FWH.....42		
W4CPZ.....42	W8NSS.....46	
W4FLW.....42	W8NQD.....45	
W4OXC.....41	W8UZ.....45	
W4MS.....40	W8CMS.....43	
W4FNR.....39	W8BFQ.....42	
W4IUJ.....38	W8YLS.....41	
W4BEN.....35	W8RFW.....41	

The Biggest Antenna?

Antennas are getting bigger every day. Time was when a fellow who put up a 16-element array for 144 Mc. had something pretty good, but things have reached the point where the 16-element job and the Twin-Five are kid stuff. W2NLY started it when he expanded the "Brownie Beam" to 30 elements, and the competition has been going on ever since. W2UK went to 40 elements, adding another pair of 5-element arrays to the stack of six described by W2NLY. Then W1CCH, and following his example, W1NH, doubled the W2NLY design, making huge arrays that were 4 sets of Yagis wide and 3 sets high, with full-wave spacing each way.

Now we hear of what may be termed, with some assurance of being able to make it stick, the "antenna to end all antennas." W3QKI, Erie, Pa., has 104 elements! This monstrosity came about when Herb decided to find out what could be done with long Yagis. First step was 10 elements in line. When this job was matched up properly, checks were run with W8WJC, making comparisons with a reference dipole. Carefully-conducted tests indicated 13.4 db. gain over the 100-mile path. Then adding another 3 directors netted about one more decibel.

This seemed to be the practical mechanical limit for in-line elements, so 8 of these 13-element jobs were made and assembled 4 wide and 2 high, the vertical spacing being about 10 feet. This nightmare, 27 by 10 feet in size, was then hoisted to 43 feet above ground. Anyone who has worked with large arrays will understand that getting optimum performance, or even accurate performance data, is no cinch with a colossus like this, but Herb's results indicate that it is at least 8 db. better than the 10-element array, despite a difference in height of 23 feet, in favor of the 10-element job. Gain is in excess of 21 db.

Nulls either side of the main lobe are about 15 degrees apart, and the main lobe is 10 degrees wide at the half-power points. In ground-wave work the antenna is terrific, when correctly oriented, but aiming is something of a problem, because of the sharpness of the pattern. In aurora work the thing is red-hot, but here again, the directivity is troublesome. Shifting of the angle of arrival of the signals becomes very noticeable, and frequent turning of the array is necessary.

(*Continued on page 126*)

M.A.R.S.

The Military Affiliate Radio System will observe its fifth anniversary of operation on November 26, 1953. A special message is being prepared for transmission from the headquarters station WAR/AIR. The message will be transmitted on MARS frequencies 3497.5, 6997.5, 14,405, 20,994 and 27,994 kc. at 0100 GCT on November 27th. It will be repeated at 0400 on the same day, using the same frequencies.

Army MARS stations are planning a 24-hour Command Post Exercise on Army MARS frequencies to be conducted on the anniversary week end. The exercise will begin at 1800 GCT on November 28th and will be conducted in contest form. Details have been furnished MARS Directors for dissemination to member stations at the local level.

In general, the purpose of this exercise is to test the flexibility and efficiency of MARS operators and equipment, and to permit MARS operators to establish contact with other MARS stations using military frequencies and call signs.

Participation in the contest will not preclude use of the system for its assigned mission. MARS administrative or quasi-official traffic which has a precedence higher than routine will be handled by means of a special prosign on c.w. circuits and by means of a special proword on voice circuits.

Exercise logs will be graded and checked by the Chief, MARS (Army), Room BE-1000, The Pentagon, Washington 25, D. C.

Silent Keys

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

W1CBY, Edward V. Krukonis, Lawrence, Mass.
W1FU, William Ellis, Fall River, Mass.
W1GNP, Edward J. Hennessey, Cambridge, Mass.
W1NWL, Arthur C. Jones, Stoneham, Mass.
W1QQR, Edgar L. Parker, Everett, Mass.
W2CBO, Ross A. Lash, Fayetteville, N. Y.
W3CKO, Elmer A. Krall, McKeesport, Penna.
W3DQB, Cmdr. Lyman C. Millard jr., USN, Seattle, Wash.
W3LPL, Lawrence I. Barbier, Takoma Park, Md.
W3PSH, Henry M. Martin, Abington, Penna.
W3VYG, Douglas I. Beman, Bellefonte, Penna.
W4HTT, Anderine Chapman Fox, Greeneville, S. C.
W5UQE, Wesley R. McMillan, Dallas, Texas
W6BT, George A. Sears, Los Angeles, Calif.
W6JWH, L. R. McWilliams, Los Angeles, Calif.
W6NRV, Fred W. Lines, Los Angeles, Calif.
W7LCM, Earl Mead, Huntley, Mont.
W8DJH, Earl Wise, Pontiac, Mich.
W8NJ, William P. Siegman, jr., Royal Oak, Mich.
W9IEO, Everette W. Sowders, Bloomington, Ind.
WØNNH, George S. Bennage, Marionville, Mo.
WØQQC, Henry W. Fox, Numa, Iowa
VE7AMI, George P. M. Reeves, Ta Ta Creek, B. C.

U. S. N. R.

Naval Reserve Electronics Division 12-21 (K6NAC) of San Mateo, Calif., and the North Peninsula Electronics Club (W6PMK) of South San Francisco, Calif., teamed up on ARRL Field Day activities. W6QIE, of the club, furnished a trailer with communications equipment. Antenna masts and a gas-engine generator were furnished by the Reserve electronics unit. The group made 556 contacts on 80, 40, 20 and 2 meters, using both c.w. and 'phone. Naval Reservists participating: W6s GXF, LAD, MFW, QIE. Other operators: W6s MHV, MMG and NVO.

Outstanding Units

The following activities have been designated as the outstanding Naval Reserve electronics units of their respective types in the naval districts as listed.

Third Naval District: Electronics Division 3-2, Auburn, N. Y. (K2NAQ); Electronics Company 3-37, Red Bank, N. J. (K2NAF); and Electronics Pl. 3-1, Middletown, N. Y.

Fourth Naval District: Electronics Division 4-1, Chillicothe, Ohio; Electronics Company 4-13, Princeton, N. J.; and Electronics Platoon 4-6, Bradford, Penna., (K3NAB).

Fifth Naval District. Electronics Division 5-1, Parkersburg, W. Va. (K8NAT); and Electronics Company 5-10 Ashland, Ky.

Sixth Naval District: Electronics Division 6-7, Dalton, Ga.; Electronics Company 6-23, Marianna, Fla. (K4NBO); and Electronics Platoon 6-30, Brewton, Ala.

Ninth Naval District: Electronics Division 9-18, Eau Claire, Wis. (K9NAD); Electronics Company 9-170, Valparaiso, Ind. (K9NRT); and Electronics Platoon 9-10, Monroe, Wis.

Twelfth Naval District: Electronics Division 12-7, Petaluma, Calif. (K6NBQ); Electronics Company 12-10, Palo Alto, Calif. (K6NRD); and Electronics Platoon 12-53 Alturas, Calif.

Club Activity

The Caddo Amateur Radio Club of Shreveport, La., meets monthly at the local Naval Reserve Training Center. Special projects consist of a TVI committee and a mobile club for disaster work. The training center furnishes code practice for prospective amateurs. Among the most active members are W5JSW, W5JTR, W5NEL, W5PVR, W5QCZ, W5SSR, W5SUM and W5WNR

Here and There

Cmdr. L. M. Hill, USNR, (W7QXM) of Thirteenth Naval District Headquarters was recently selected for promotion to Captain, USNR.

The following Naval Reservists recently received their amateur licenses: George W. Cook, jr. (W4TDY); Marion C. Wicht (W4ZXA) of Naval Reserve Electronics Platoon 6-44, Gainesville, Ga.; W. F. Warren (WN4YPD) of Naval Reserve Training Center, Columbus, Ga.; and W. J. McCoy (W5YQA) of Naval Reserve Training Center, Gulfport, Miss.

The following amateurs are on duty with the Navy Department in the Washington area: W1s MXA NK, W2ZNM, W3s EK KUC KYJ SSL TCB USX VDI WAM, W4s CMF DDT RPI RQK RXO SGX TCJ VIB WUF YVZ ZTD, W5s JMI PLQ RCB, W6s BEK PIL, W9s EMM YCL, WØs MMH MZL and KG6HF.

HAMFEST CALENDAR

WISCONSIN — Sunday, December 6th, at the Petrifying Springs club house, Kenosha — the Kenosha Radio Communications Society will hold a hamfest known as "Operation Frostbite." There will be a transmitter hunt, treasure hunt, and plenty of entertainment for the whole family. Eats, coffee and soda pop will be provided. A good speaker is expected to address the group. Registrations should be mailed to Earl Burden, Route 1, Box 217, Kenosha, for receipt not later than Nov. 21st. The price is $1.50 per person, $2.00 per family.

Operating News

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

GEORGE HART, W1NJM, Natl. Emerg. Coördinator
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, WN1ZJE, Administrative Aide

Annual Report Statistics. The last annual report of the Communications Manager indicated that the ARRL Field Day, reaching new highs in participation each year, is the greatest operating activity explaining us amateurs in favorable terms to the public. It is believed that the '53 Field Day "did it again." The League code proficiency and W1AW program continued to have outstanding results, and reached new areas of real service to the whole fraternity. Popularity of this already popular program was (in '52) 70% above the previous year's level. There were 40 emergencies, major and minor, involving amateur communications in '52 and reported in *QST*. Station appointments were up 13% for the year. DXCC applications, barometer of current DX conditions, were off 12% on the year (286 issued) but the Rag Chewers Club forged ahead to an all-time high of 2254 certificates issued (a plus 30%) for '52. DXCC endorsements (at 1141) held at the top level due to the accumulated group holding that award. The number of WAS certificate awards (324) has been stabilizing since the all-time high of 599 issued in '49.

Net Periods for WNs? W5TFB, Wichita Falls, Tex., kept his NTX net operational all summer. In his August bulletin he appeals for outlets in a list of additional cities, or where coverage is needed on more nights for *daily* radio service. NTX, working on 3760 kc., invites WNs to QNI from 3735 kc. at 1900 week-day nights, on transmission of "QSX WN5" by the NCS. It's an idea for many section nets to try out, too, we think. This can be a way for some nets to get more coverage this fall, and may be made part of the standing cordial invitation of nets to extend membership to the newcomer. Of course, the individual members will all use regular section net frequencies when they have General Class.

Operating as a Communicator. We in amateur radio think of the communicator as one who makes the world go around through responsible handling of *two-way* communications, rather than one imitating broadcasters or entertainers. The Novice must develop operational skill to a degree to pass the Government examination. General Class amateur, commercial, government and private system operators must carry good practices and procedure technique even further. To rate esteem as a communicator right operating habits should be cultivated from the start; then there is less to unlearn in acquiring a reputation among one's fellows of being a *top operator*. Clean accurate sending is the first aim in code work; businesslike attention to accuracy and clarity (avoiding excess wordiness) if communicating by voice. Surprisingly, real communications efficiency is based on proper sending which will eliminate most occasions for repeats. Brevity is essential to convey a maximum of intelligence correctly in minimum time of operation. The standard form of procedure pays dividends in message work, aiding in accuracy and check of word count. The handling data, call and time, the operator's receipt (R), accepting responsibility for consequent handling of the traffic so indicated, is recorded right on the message.

In concluding a transmission use a *one-times-one* call. To receipt send R for OK (no wasted words). Above all, never contradict "R" by asking for missed portions! If repeats are required, ask them by AA? or AB? and omit sending "R" which implies "*all* received OK." Use of common Q code (abbreviations as indicated on pages 14–15 of *Operating an Amateur Radio Station*) can save plenty of time, permitting interchange of more intelligibility on other subject matter, and helps prepare one for General Class license by assuring familiarization with the terms.

If you like, drop a line or radiogram to ARRL requesting the free Operating Aids card which explains use of K, AR, $\overline{\text{KN}}$, $\overline{\text{SK}}$, CL. In concluding a transmission use the appropriate ending signal *only*. The communicator does not waste words "turning over" a contact; he uses these correct procedure signals or the voice equivalents, "go ahead," "over," "end of message," "closing station," as required.

Suggestion from K6DV. Always listen three minutes before transmitting and that includes any testing. Such consideration for others prevents unnecessary QRM and is the way to help improve operating conditions for ourselves as well as others. During a recent code proficiency transmission from W6OWP there was QRM on both 7138 and 3590 kc. Evidently some amateurs don't read any radio journals, because their interference must be unintentional. It is suggested that on monthly Qualifying Runs of W1AW or W6OWP, so closely followed by hundreds of amateurs, that when such QRM difficulty appears, the stations identified as causing trouble be notified and asked for future coöperation.

20th ARRL Sweepstakes Contest. This is a Saturday-evening-and-Sunday activity with two periods starting Nov. 14th and 21st, and always the top nationwide radio operating event in the new fall radio season. This year, in addition to the usual certificate awards to section 'phone

and c.w. winners in each of the ARRL sections (see Page 6), there's a section certification also for the highest-scoring Novice or Technician wherever at least three submit logs to constitute competition. Don't miss this chance to give the station *a real workout* if you're on the air anywhere in U. S. and Canada. Work in the "SS" builds operating skill. You are bound to meet new friends and find some new states, if on the road to achieving WAS status. Best luck in the SS!

— *F. E. H.*

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....252	W3BES.....245	W6SN.....239
W8HGW....250	W6ENV.....243	W3JTC.....238
WØYXO.....246	G6ZO.....241	W4BPD.....238
W6VFR.....246	W2BXA.....240	W2AGW....237
G2PL.....246	W3GHD.....240	W3KT.....237
	W6AM.....240	

RADIOTELEPHONE

PY2CK.....228	W1NWO.....209	W8HGW....204
W1FH.....224	W1JCX.....208	W2APU.....202
VQ4ERR....220	ZS6BW.....207	W1MCW....201
XE1AC.....215		SM5KP.....201

From August 15, 1953, to September 15, 1953, 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

G3CBN.....111	SU1AD.....104	OH2XK.....102
VS1DZ.....109	G2SA.....103	W2JME.....101
W9IHN.....104	W1GDY.....102	WØVBQ.....101

RADIOTELEPHONE

SM5FA.....100

ENDORSEMENTS

W2QHH.....220	SM5CO.....162	G2AJB.....122
ON4AU.....212	G3HLS.....151	SM5FA.....121
W5EGK.....210	W3LVJ.....150	W5RX.....120
GM3DHD...200	W5BZT.....150	W2CGJ.....120
W5FFW.....194	PY4RJ.....147	G5JU.....117
W2TQC.....192	SM3EP.....143	W2CC.....113
OQ5RA.....191	W2VWN.....142	W8AAI.....111
W2CNT.....181	W1ZW.....141	W2VRE.....110
W2RWE.....181	W7AYJ.....141	W4EXO.....110
W1WK.....177	HB9MQ.....141	W4FNS.....110
KG4AF.....173	W1JNV.....140	W9JIP.....110
ON8MI.....171	OH2TM.....134	HB9AT.....110
	PY7LJ.....133	

RADIOTELEPHONE

W8BF.....180	G3HLS.....150	KL7AFR....130
CX2CO.....180	ON4PJ.....150	CN8MM....130
EA2CA.....170	W3BET.....149	PY4KL.....122
LU4DD.....155	PY4RJ.....146	W2WZ.....120
	PY4VX.....130	

CODE-PROFICIENCY AWARDS

Have you received an ARRL Code Proficiency Certificate yet? Twice each month special transmissions are made to enable you to qualify for the award. The next qualifying run from W1AW will be made on November 16th 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 on November 7th 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 are made from W1AW each evening at 2130 EST. (Exceptions: There will be no code practice transmissions from W1AW November 19th, when a special Frequency Measuring Test will be transmitted, and November 26th, Thanksgiving Day.) 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 is reversed during certain of the slow-speed transmissions. To get sending practice, hook up your own key and buzzer and attempt to send along with W1AW.

Date	Subject of Practice Text from September *QST*
Nov. 3rd:	*The "Little Firecracker"* . . ., p. 10
Nov. 5th:	*The Simplest Modulator*, p. 15
Nov. 9th:	*An Auto-Alarm Unit for "Conelrad,"* p. 17
Nov. 12th:	*The "Hot-Rod" Mobile Antenna*, p. 18
Nov. 18th:	*"De Luxe" Keying Without Relays*, p. 20
Nov. 24th:	*A Command Set Receiver for 6 and 10*, p. 22
Nov. 27th:	*Short Antennas for Mobile Operation*, p. 30
Nov. 30th:	*Remote Tuning for the High-C VFO*, p. 36

CODE-PRACTICE STATIONS

The following is an up-to-date list of all stations currently transmitting code practice in the ARRL Code-Practice Program:

W1ACT, Fall River ARC, 57 Richmond St., Fall River, Mass.; 3545 kc.; Mon., Wed., Thurs. and Fri., 1900 EST; 5–7 w.p.m.

W1SRB, Al Vesce, 84 N. Main St., Thompsonville, Conn.; 29.6 Mc.; Mon., Wed. and Fri., 1930 EST; beginners' speeds.

W2FSL, Adolph F. Elster, 53 Commercial Ave., Avenel, N. J.; 3675 kc.; Sat., Sun. and holidays, 0730 EST; beginners' speeds.

W2HEI, William Teso, Mountain Ave., Hillburn, N. Y.; 3950 kc.; Sat. and Sun., 1400 EST; 5–18 w.p.m.

W2NRM, Howard B. Jack, Browns' Trailer Court, R.F.D. 6, Lodi, N. J.; 1880 kc.; Mon. through Fri., 2200 EST, Sat. 0800 EST; 3–8–15 w.p.m.

W2WDT, Henry Bergmann, 1028 Jefferson Ave., Brooklyn 21, N. Y.; 29 Mc.; Wed., Thurs. and Fri., 2100 EST; 5–10–15 w.p.m.

W4IYT, Andrew C. Clark, 41 Lenape Dr., Miami Springs, Fla.; 28.7 Mc.; Mon. through Fri., 2030 EST; beginners' speeds.

W4RUR, Edward J. Blatt, 536 16th Ave. So., St. Petersburg, Fla.; 28.05 Mc.; Mon. and Wed., 1900 EST; 6–22 w.p.m.

W6JZ, Ray Cornell, 909 Curtis St., Albany 6, Calif.; 3590 kc.; Mon., Wed. and Fri., 1830 PST, 5–25 w.p.m., 1920 PST, 35–45 w.p.m.

W6QBN, Bob Conley, Route 1, Box 411, Escondido, Calif.; 3760 kc.; Sun. through Thurs., 1830 PST, 4–6–10 w.p.m.

K6USN, Cmdr. J. M. McCoy, 12th Naval District Reserve Electronics Stn., Bldg. 7, Treasure Island, San Francisco, Calif.; 3590 kc.; Tues. and Thurs., 1830 PST; 5–25 w.p.m.

K7FAG, Russel R. Henderson, Capt. USAF, MARS Base Dir., Davis-Monthan AFB, Tucson, Ariz.; 29.6 Mc. Thurs. 1830 MST, 3–24 w.p.m.

W7FWD, O. U. Tatro, 513 N. Central, Olympia, Wash.; 3646 kc.; Mon. through Fri., 1700 PST, 4–25 w.p.m.

W8MAI, Blossomland Amateur Radio Assn., RFD 1, Box 147F, St. Joseph, Mich.; 1890 kc.; Mon. through Fri., 2000 EST; 5–20 w.p.m.

W9ODD, Radio Amateurs of Marquette Univ., Marquette Univ., 615 N. 15th St., Milwaukee 3, Wis.; 29.224 Mc.; Mon., Wed. and Fri., 1930 CST; beginners' speeds.

W9UIN, Joseph H. Kadlec, 1148 Ashland Ave., Evanston, Ill.; 7240 kc.; Sat. and Sun., 0800 CST; 5–7½ w.p.m.

WØBOL, R. A. Prehm, 1130 Delaware Ave., St. Paul 7, Minn.; 29.2 Mc.; Tues. and Wed., 1900 CST; letters to 6 w.p.m., practice from 8–15 w.p.m.

WØEGQ, Bob McMullin, Route 1, Lehigh, Nebr.; 3690 kc.; Mon. through Fri., 1700 CST; 5–13 w.p.m. with text from *The Braille Technical Press*.

WØQDF, W. H. DuBord, 10247 Midland, Overland, Mo.; 29.6 Mc.; Mon. and Wed., 2000 CST; Mon. 5–13 w.p.m., Wed, beginners' speeds.

AMATEURS SUCCESSFUL IN SURPRISE F.C.D.A. ALERT

A number of West Coast and Alaskan amateur stations participated directly for the first time in an FCDA (Federal Civil Defense Administration) simulated emergency operation June 20th. The FCDA test exercise involved a simulated enemy attack on Alaska and sections of the West Coast. During initial communications, a prearranged group of amateurs were alerted via regular FCDA communications channels. Contact was quickly established between W3SEI/4, operating at an FCDA emergency operations center, and W7ZT, Carson City, Nevada, who relayed via W6JZ to the Berkeley, Cal., FCDA Regional Office. Shortly thereafter contact was established with W7LIO, Seattle, who handled traffic via landline to the Seattle Regional Office. W7BA also worked directly with FCDA National Hq., providing a relay to KL7AIR for Alaskan traffic.

A portion of the FCDA traffic with the two regions and Alaska was transmitted in both directions over this temporary amateur route during a period of four and one-half hours. Good contact was maintained on 14,100-kc. c.w. between W3SEI/4 and the W7 stations participating, despite erratic conditions. W7ZT shifted between 14 and 7 Mc., relaying to W6JZ on the latter band, and W7BA relayed to KL7AIR on 14-Mc. 'phone. All traffic was successfully and promptly delivered, despite some difficulties arising from unfamiliarity with FCDA traffic procedures.

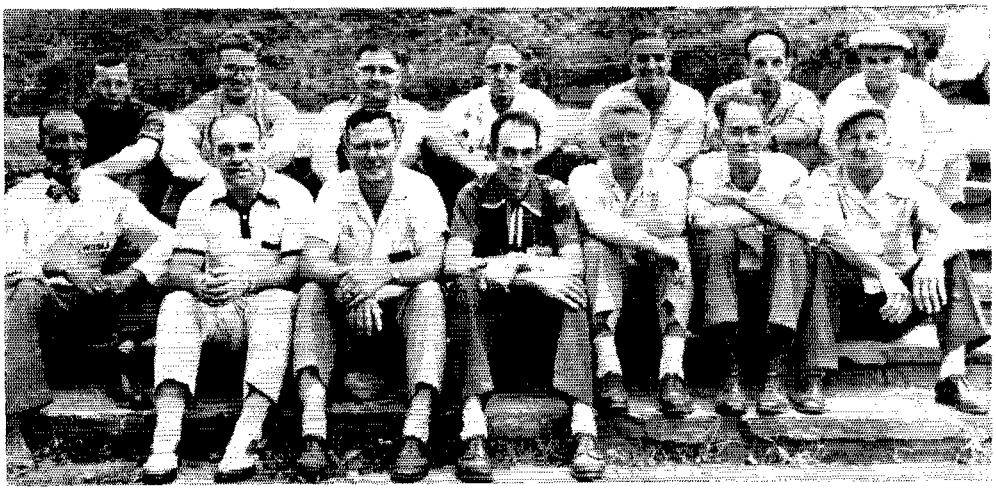
NET DIRECTORY

Here it is, the first installment of the annual ARRL Net Directory. These nets are the ones registered with ARRL up to and including September 17, 1953. If your net is not listed below, please send us the registration data requested on page 64, September *QST*. Registration cards are available from ARRL Headquarters, but their use is not mandatory for net registration. The next list, supplementing this one, will appear in January *QST*.

The complete cross-indexed directory of all registered nets will be available about December 1st. If you have not yet registered your net, *do it now* if you want to get in the complete directory. Nets are registered in the ARRL Net Directory *only on request*, and only upon receipt of complete information.

Name of Net	*Freq.*	*Time*	*Days*
Ala. Emerg. Net C.W. (AENB)	3575	1900 CST	Daily
All College Net (ACN)	3575	1715 EST	Thurs.
AREC Net (Calif.)	3900	1030 PST	Sun.
Arlington, Mass. C.D. Net	53,400	2100 EST	Tues.
ARRL Trunk Line J	3565	1945 CST	Mon.–Sat.
Barnyard Net	3924	0800 EST	Mon.–Sat.
Caravan Club (Tex.)	3995	1300 CST	Sun.
College 'Phone Net (CPN)	3895	1515 EST	Fri.
Dog House Emerg. Net	3820	1800 EST	Mon.
Early Bird Transcontinental Net	3845	0545 EST	Mon., Wed., Fri.
Eastern Area Net (EAN)	3670	2030 EST	Mon.–Fri.
E. Pa. C.W. Traffic Net	3610	1930 EST	Mon.–Fri.
Fifth Regional Net (RN5)	3645	1945 CST 2130 CST	Mon.–Fri.
Finger Lakes Net (N. Y.)	145,350	2000 EST	Fri.
First Regional Net (1RN)	3605	1900 EST	Mon.–Fri.
Fla. Emerg. 'Phone Net (FEPN)	3910	1815 EST	Tues.
Fla. 'Phone Traffic Net (FPTN)	3945	0700 EST	Mon.–Sat.
Fourth Regional Net (4RN)	3615	1945 EST 2130 EST	Mon.–Fri.
Gator Net (GN)	7105	1835 EST	Tues.
High Noon Net (HNN)	3725	1200 EST	Daily
Hit & Bounce Net	7040	0100 EST	Daily
	7140	0630 EST 1600 CST	
	7150	0630 EST	
Illinois (c.w.) Net (ILN)	3515	1900 CST	Mon.–Fri.
Ill. Emergency Net (IEN)	3940	1800 CST 0900 CST	Tu., Th. Sun.
Kansas C.W. Net (QKS)	3610	1830 CST	Mon., Wed., Fri.
Knights of the Kilocycles (Fla.)	3910	0730 EST	Sun.
Lancaster (Pa.) Emerg. Net	146,000	2000 EST	Mon.
Malden (Mass.) Emerg. Net	29,540	1930 EST	Mon.
Maple Leaf Net (MLN)	7160	2100 EST	Daily
Md.-Del.-D. C. Section Net (MDD)	3650	1930 EST	Mon.–Fri.
Md. Emerg. 'Phone Net	3820	1830 EST	Mon., Wed., Fri.
		1300 EST	Sat., Sun.
McKean Co. (Pa.) Emerg. Net	3535	0900 EST	Sun.
Mich. QMN Net	3663	2300 EST 2400 EST	Mon.–Fri.
Mission Trail Net (MTN)	3680	2000 PST	Mon.–Sat.
	3854	1900 PST	Daily
	145,080	1930 PST	Daily
Mo. Traffic Net (MON)	3580	1900 CST	Mon.–Fri.
Nebr. C.W. Net (NEBR)	3520	1900 CST	Mon.–Fri.
New Mex. Breakfast Club	3838	0700 MST	Mon.–Sat.

At a hamfest sponsored by the South Hills Brasspounders and Modulators in Pittsburgh, this picture of the Western Penna. ORS Traffic Net and some friends was taken. Back row, *l. to r.*: W1WPR (ex-W3ODU, now at W1AW), W3UVD, W3CA (SEC), W3MIZ, W3NUG (RM), W3MEF and W3KWL (ex-SCM). Front row: W3SIJ, W4JTP, W3UHN (RM), W3NCD (SCM), W3BIP (SCM), W3GEG (Director) and W3NRE. You'll hear a lot of these calls on 3RN, too.



BRASS POUNDERS LEAGUE

Winners of BPL Certificates for August traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
KA7LJ	658	2293	1882	411	5244
W6IAB	67	1524	1386	67	3044
W6KYV	102	1062	277	787	2228
W4PL	22	1120	888	194	2224
W4USA	28	1003	1041	10	2082
W5MN	51	753	415	331	1550
W7BA	25	745	689	55	1514
W6OFJ	33	711	664	29	1437
W3WIQ	22	647	646	30	1345
KH6AJF	94	596	523	73	1286
K4WAR	138	490	400	90	1118
W4YIP	7	544	530	36	1117
W9NZZ	365	374	1	370	1110
WØSCA	8	536	539	3	1086
WØCPI	10	505	466	39	1020
WØKHQ	4	479	465	8	956
K6FAL	416	331	130	34	911
WØBDR	7	453	438	11	909
WØQXO	6	433	344	86	869
K2WAO	23	371	346	25	765
W3USA	22	364	337	27	750
KA2KS	105	336	260	21	722
W2BTB	9	351	336	23	719
W7PGY	13	333	325	8	679
W9JUJ	8	344	280	21	653
W4TAV	7	273	296	23	599
KV4BD	116	212	97	161	586
W9UNJ	24	285	184	82	575
W2ZOL	7	275	264	17	563
W5TFB	33	246	225	24	528
KØFCR	143	195	177	5	520
K5FFB	31	235	226	16	508
K2BX	0	252	111	141	504
W6SWP	25	246	189	44	504
Late Reports:					
W6IAB (July)	73	2619	2672	49	5413
W6OFJ (July)	21	665	628	15	1329
W6MN (July)	41	387	177	203	808
W5UGO (July)	11	306	258	35	610
K3WAS (June)	68	267	247	20	602
W9UNJ (July)	22	260	128	119	529

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

W4WHC.....279	W7FRU.....137	W2JZX.....103
W9LHB/Ø.....165	W2JOA.....124	W2OMG....103
W4ZFV.....152	W4DRD.....120	W2AEE....101
W9AB.....149	W9SWM.....113	
W6MBA.....147	W8IQJ.....112	

The BPL is open to all operators who report to their SCM a message total of 500 or more or 100 or more originations-plus-deliveries for any calendar month.

New Mexico C.W. Net	3633	1900 MST	Mon.–Fri.
N. M. Emerg. 'Phone Net	3838	1800 MST	Tues., Thurs.
		0730 MST	Sun.
N. Y. State Net (NYS)	3615	1900 EST	Mon.–Sat.
N Y. State Slow-Speed Net (NYSS)	3595	2000 EST	Mon.–Fri.
Ninth Regional Net (9RN)	3565	1945 CST	Mon.–Sat.
N. C. C.W. Net (NCN)	3605	1900 EST 2200 EST	Mon.–Fri.
N. Texas Emerg. Net	3930	0800 CST	Sun.
N. Texas/Okla. Traffic Net (NTO)	3960	1730 CST	Daily
N. Texas Traffic Net (NTX)	3760	1900 CST	Mon.–Fri.
Novice Hurricane Net	3725	1935 EST	Thurs.
	7188	1005 EST	Sun.
Okla. C.W. Net (OLZ)	3682.5	1900 CST	Mon.–Fri.
Okla. 'Phone Emerg. Net (OPEN)	3860	0800 CST	Sun.
Ont. Restricted-Speed Net (RSN)	3645	1330 EST	Sun.
Ont. Section Net (OSN)	3535	1900 EST	Daily
Palmetto Net (Fla.)	3675	1905 EST	Mon.–Sat.
Penn. Fone Net	3850	1830 EST	Mon.–Fri.
Quebec Emerg. Net (QEN)	7150	1100 EST	Sun.
Reseau de Traffic VE2 de la Province de Quebec	3740	1815 EST	Daily
River Forecast Net (RFN)	3656 7170	0700 CST	Sun.
River Forecast Net (RFN)	3910	0900 CST	Sun.
River Forecast Net (QRFN)	3725	2200 CST	Mon.
Rockingham Co. (N. H.) Emerg. Net (RCEN)	3685	1000 EST	Sun.
Second Regional 'Phone Net	3980	1000 EST	Mon.–Sat.
Sound Traffic Net (Wash.)	29,100	2030 PST	Sat.–Thurs.
S. Dak. C.W. Net (SD)	3615	1900 CST	Mon., Wed., Fri.
S. Dak. 'Phone Net	3870	1830 CST	Mon.–Sat.
		0930 CST	Sun , Hol.
Teen Agers' Net	3630	1815 EST	Daily
Tenn. C.W. Net (TN)	3635	1900 CST	Mon.-Sat.
Tenn. 'Phone Net (TPN)	3980	0645 CST	Mon –Fri.
		1830 CST	Tues., Thurs.
		0800 CST	Sun.
Thirteenth Regional Net (TRN)	3675	1945 EST 2130 EST	Mon.–Fri.
Transcontinental 'Phone Net	3970	1800 EST	Daily
Transcontinental Relay Net (TCRN)	7042	0115 EST 2115 EST	Daily
Tropical 'Phone Traffic Net (Fla.)	3945	1800 EST	Mon.–Sat.
Truckee Meadows Net	7268	0900 PST	Daily
Trunk Line Atlantic-Pacific (TLAP)	3630	2030 EST 2200 CST	Mon.–Fri.
Vermont C.W. Net (VTN)	3520	1900 EST	Mon.–Fri.
Vermont 'Phone Net	3860	0930 EST	Sun.
Virginia C.W. Net (VN)	3680	1900 EST	Mon.–Fri.
Virginia Fone Net (VFN)	3835	1900 EST	Daily
Va. Novice Net (VNN)	3705	1930 EST	Mon.–Fri.
Virginia Slow Net (VSN)	3680	1830 EST	Mon.–Fri.
Wash. Section Net (WSN)	3575	1900 PST	Mon.–Fri.
Watch Dog Net (WDN) (Ill.)	145,692	1930 CST	Daily
Weber Co. (Utah) AEC Net	29,600	1800 PST	Mon., Wed., Fri.
Western Mass. Net (WMN)	3560	1900 EST	Mon.–Fri.
Wis. C.W. Net (WIN)	3625	1900 CST	Daily

A.R.R.L. ACTIVITIES CALENDAR

Nov. 7th: CP Qualifying Run — W6OWP
Nov. 14th-15th, 21st-22nd: Sweepstakes
Nov. 16th: CP Qualifying Run — W1AW
Dec. 6th: CP Qualifying Run — W6OWP
Dec. 15th: CP Qualifying Run — W1AW
Jan. 8th: CP Qualifying Run — W6OWP
Jan. 9th-10th: V.H.F. Sweepstakes
Jan. 9th-24th: Novice Round-up
Jan. 13th: CP Qualifying Run — W1AW
Jan. 16th-17th: CD QSO Party (c.w.)
Jan. 23rd-24th: CD QSO Party ('phone)
Feb. 6th: CP Qualifying Run — W6OWP
Feb. 9th: Frequency Measuring Test
Feb. 11th: CP Qualifying Run — W1AW
Feb. 12th-14th: DX Competition ('phone)
Feb. 26th-28th: DX Competition (c.w.)
Mar. 7th: CP Qualifying Run — W6OWP
Mar. 12th: CP Qualifying Run — W1AW
Mar. 12th-14th: DX Competition ('phone)
Mar. 26th-28th: DX Competition (c.w.)

There is a great deal of organizational talent among 100,000 amateurs. There is bound to be. The trouble is that most of this talent is tied up in other fields during normal times, and the organization and leadership of our amateur groups are left to whomever remains to do it. Sometimes this remainder is aces high, sometimes it is mediocre, and sometimes there just *is* no remainder. In any event, emergencies generally see the coming to the fore of leading intellects who are unable to restrain their leadership qualities despite the fact that they have not been active organizationalwise. This quite often leads to intra-amateur strife.

We have always been of the opinion that if you want to do something badly enough you'll somehow find the time to do it. Those who say they're too busy to participate in AREC don't really mean that; what they *really* mean is that they have other activities they consider more important, that whatever time for relaxation they get (and *everybody* gets some), they prefer to spend in other ways. This is quite all right, of course, and no one can or wishes to challenge their right to decide this for themselves.

Come an emergency, however, these same people who do not care to participate in preparedness exercises or organization are right in there to do their part. If the local group is properly organized, there will be a place for them, a job for them to do, even though they have never previously lifted a finger. They're what military minds sometimes callously refer to as "bodies," and even without organizational training there are things they can do on the spot, like answer telephones, keep logs, or service equipment. Yes, they can and should and probably will do these things if the local EC, who perhaps works behind the counter at the local radio parts store, has the temerity to ask this of an engineer in a large manufacturing concern, or a professor of physics at the local university.

What we are trying to say to all concerned is this: The EC who knocks himself out during normal times to keep the local AREC unit going and to build it up into an effective emergency communications facility is not just keeping a chair warm for someone of superior ability who will make himself available when the need for his services is great enough. All local amateurs are responsible for, and in an emergency responsible to, the EC holding that job, no matter who or what he is. *Could be* that someone else could do a better job, if they "had the time." Your EC is *taking* the time to do it, or to try to do it, in the best way he knows how. If you have the time to assist him, that's fine; if not, then you ought to be prepared to do as you're asked to do without demurral if or when the time comes that an emergency arises of such gravity as to warrant contribution of your valuable time.

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On August 13th, W3ECP monitored the Tarheel Net and the Virginia 'Phone Net during the better part of the evening and until 0300 EST. Operating activity was limited to "shooing" off a few stations who might otherwise have interfered with the nets. On August 14th, W3ECP reported into and monitored the Maryland Emergency 'Phone Net from about 1000 EST. At 1148 EST, upon inquiry from NCS of MEPN as to alternate frequencies on which c.w. traffic could be handled, the MDD Section Net was activated on 3650 kc. W3CJT and W3ECP alternated as NCS of MDD until the need for further communication ended at 2025 EST. Those who reported into MDD during the period of emergency activation: W3s BFF CJT ECP NJT RRT TRN TXL UOE, W4TYC, W2HJD, K2CWQ. — *W3ECP, RM Md.-Del.-D. C.*

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The AREC organization of Bristol, Tenn.-Va., was pressed into service on July 22nd–23rd when health authorities decided to conduct a mass inoculation of gamma globulin to arrest the epidemic of polio. On July 22nd one transmitter and two receivers were set up at the headquarters building, and amateur radio circuits were provided with centers in West Bristol, East Bristol and Abingdon, Va. That night a fifth station was provided for the center at Lodi, Va., where only one four-party telephone was available.

Two frequencies in the 160-meter band were used. During the first few hours of operation we were nearly swamped with messages. Thereafter, a fairly constant stream of traffic kept all operators busy. Traffic concerned medical supplies, food, workers, automobile dispatching, inoculation statistics and occasional consultations between doctors. The operation was termed "Operation Ouch," and the assistance of amateurs was required because of the limited telephone facilities available between inoculation centers.

The supply of gamma globulin was exhausted on July 23rd and the operation concluded, officials expressing the greatest appreciation for the valuable communications assistance given by the amateurs. Those participating: W4s GHM IYU JGS SAQ SSV THM TYJ UJH VTU YAU. — *W4IYT, EC Bristol, Tenn.-Va.*

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In the Waco tornado disaster (July *QST*, p. 64, and Aug. *QST*, p. 65), the following amateurs not previously reported have now been reported as having been active: W5s AMK DXD JIB LM MXT TEO VEX VLF WDW.

In the Worcester tornado disaster (Sept. *QST*, p. 46), we inadvertently neglected to mention the invaluable participation by W1BB, who was quite active.

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The AREC gang in Eastern Florida has set up a series of networks and established continuous monitoring service of designated frequencies in order that hurricane alerts might be disseminated immediately. This is called the Weather Amateur Radio Net (WARN). There are two c.w. net frequencies monitored: 7105 kc., for daytime (and the Gator Net meets on this frequency on Tuesdays), and 3675 kc. for night (where the Palmetto Net meets daily). W4IYT and W4DVR are NCS, respectively. The Florida Emergency 'Phone Net on 3910 kc. also establishes a 24-hour watch during any WARN alerts. Other nets participating are the Florida 'Phone Traffic Net, the Tropical 'Phone Traffic Net and the Novice Hurricane Net. Says W4IM, East Florida SEC, "We probably won't have any storms."

NATIONAL CALLING AND EMERGENCY FREQUENCIES

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

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* — 3815, 14,160, 28,250 kc.

NATIONAL RTTY CALLING AND WORKING FREQUENCY

3620 kc.

This frequency is generally used by amateurs using radioteletype throughout the United States. Other frequencies are under discussion and will appear under this heading in future issues of *QST*.

On April 9th, a "Gateways" test was run in the city of Philadelphia, Pa., to test communications between Philadelphia's four c.d. control centers and the eleven c.d. "Gateways," the only roads into the city that will be open in the event of a civil emergency. Members of the Phil-Mont Mobile Club turned out en masse, and some 30 amateurs participated, ten of them operating their own mobile units on 29.493 kc. Several dozen test messages were sent from each control center to various gateways and vice versa. Much valuable data on radio conditions were learned, and a critique meeting will be held — *W3DYL, EC Philadelphia*

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Thirteen SEC reports representing 2681 AREC members were received covering July activities. One new section, New Mexico, has entered the ranks of sections represented in the reports received this year, making the total 22.

TRAFFIC TOPICS

Our recent correspondence brought a note from an old-time traffic man to the effect that many of our QN signals are a useless duplication of existing Q signals on the International List. He cited such as QNT and QRX, QNY and QSY, QNJ and QRK, QNM and QRM, QNP and QRJ, and QNV and QSV. To this we might add QNB and QSP, and QNX and QRT. If we use the meaning of the signals loosely, as most of us are wont to do, the point is well taken.

That's just the trouble — we use *most* of our Q signals loosely, as a matter of tradition. We use QRN for atmospherics, QRM for interference, QSO for contact, QSL for a piece of pasteboard without giving a second thought to the fact that these signals were coined to portray an abbreviation of an entire sentence, not just a single word. We'll continue to do this; it's too late for us to change our erroneous ways now, as regards international Q signals. But we traffic men are trying to hew to the line on the QN signals; besides, there is not as much duplication as you might think. While most of the above examples refer to the same general topic, the actual meanings are far different. For example, QNM is telling someone *he* is interfering, while QRM means *I* am being interfered with; QSV is a request to send a series of Vs, while QNV is requesting someone to request someone else to send a series of Vs. All the QN signals have been carefully calculated to fulfill a net traffic need and are used only for that purpose. True, some of them aren't very often used, and through lack of use become almost unknown (e.g., QNA, QNQ and QNV). Perhaps we *could* use QSY instead of QNY, and assign some other needed meaning to QNY for net purposes. Suggestions? There is nothing sacred about the QN list — and since it's strictly an amateur list, we can change it any old time we want to.

But we ought to *use* it, and we ought to use it *right*. The other day we sprang a QNQ on one of the net members and took him completely by surprise. There was quite a pause while he fumbled in his desk drawers for his copy of the QN list. Do *you* know what it means? Besides knowing the meanings, we ought to know how to use them. For example, a lot of traffic men do not seem to realize that there are no question marks sent after QN signals. Where either meaning can apply, the way it is used and who uses it determines whether it is question or statement. The signal QNN used alone is asking "Who is NCS?" When followed by call letters, it is indicating the NCS. QNJ alone means "Can you copy me?" but when followed by a call it is asking if you can copy someone else. QNX used by the NCS is a direction, but when used by a net member it is a request. Similarly, QNQ. Many of our QN signals depend on circumstances for their meaning. The use of a question mark after any of them is never necessary.

We traffic men like our QN signals and want to stick by them; but only by using them right do we get maximum benefit from them.

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K2BWQ wonders if his son K2BWP, age 13½ years, is the youngest active ham in traffic. K2BWP had the highest traffic total (124) in the N.N.J. Section in June. Anybody younger have as good or better a total?

—•••—

The Teen Agers' Net in August conducted 31 sessions for a traffic total of 223, an average of 7.2 per session. The best session accounted for 18 messages. We should also report that the Mission Trail Net handled 473 in 31 July sessions, averaging 15 per session, with a high of 35 for one session. Their July report was misfiled with net registrations.

—•••—

National Traffic System. The latest NTS caper is the Pacific Area Staff (PAS), now activated and in operation on an experimental basis. Meet the members: W6JZ, Assistant TCC Manager for the Pacific Area, who has been elected Chairman; WØKHQ, Member-at-Large, who is Alternate Chairman; W6HC, Member-at-Large, Secretary; W7NH, Pacific Area Net Manager; W6IPW, Sixth Regional Net Manager; and W7PKX, Seventh Regional Net manager. W6ELQ, who helped formulate the idea for PAS, is being drafted as a member and will probably (we hope) be serving as the third member-at-large when you read this. The PAS is in effect a decentralization of NTS policy matters affecting the Pacific Area into the hands of Pacific Area traffic men. Its function is chiefly concerned with inter-net liaison arrangements, the aspect of NTS which makes it a system instead of a scattering of nets. It does not delve into intra-net functions except in an advisory capacity.

The members hold weekly meetings to discuss problems concerning the movement of traffic through Pacific Area NTS nets. Thus, no regional or area net manager's problems are his alone, and each manager becomes aware of and has an opportunity to assist with the problems of other net managers. If this experiment is successful (and there's no reason why it shouldn't be), we'll take steps to organize similar staffs in the Central and Eastern Areas. There is ample reason to believe that such decentralization could be of like benefit elsewhere.

August reports:

Net	*Sessions*	*Traffic*	*High*	*Average*	*Most Consistent*
1RN	21	210	23	10.0	W. Mass., Vt.
3RN	34	124	13	3.6	E. Pa.
4RN	20	163	23	8.2	Va., N. C.
RN6	45	358	23	5.8	LSN
8RN	16	41	16	2.6	Ohio
9RN	26	1163	109	44.8	All
TEN	42	1061	54	25.2	Minn.
TRN	21	39	10	1.8	Ont.
EAN	21	523	61	25.0	All
CAN (July)	22	589	88	26.8	9RN, TEN
CAN	18*	409	47	19.4	9RN, TEN
PAN	21	926	98	44.2	RN7
QIN (Ind.)	23	171	40	7.4	
QKS (Kans.)	13	97	15	7.5	
WSN (Wash.)	21	147	25	7.4	
WSN (Wash.) (July)	23	175	17	7.6	
LSN (Los. A.)	26	280	27	10.8	
LSN (Los. A.) (July)	27	380	26	14.0	
Total	382	3159	109	44.8	
Record	382	4256	109	44.8	

* Out of 21 conducted.

Nine newcomers during August, sent up from section nets, are reported by 1RN — a very encouraging development. We need new blood. W3BIP is bowing out as 3RN manager because of his new SCM duties; 4RN returned to its regular operating schedule on September 1st. W4AKC has released a very fine statistical report of 4RN operation since November, 1952. W4LDM and W4KX have received 4RN certificates.

W6OFJ has been awarded an RN6 certificate for his fine section representation and liaison work.

W8DSX is proposing a change in time of 8RN in hope of getting more activity.

Certificates for 9RN have been issued to W9s RXD RBX RTP and W4PXX.

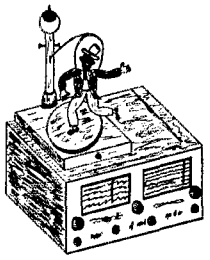
TRN is not sure it wants to be partitioned, but they're still considering.

W8UPB is the latest recipient of one of those scrumptious EAN certificates.

WØKHQ is holding up the liaison circuits into and out of PAN almost single-handed and deserves a lot of credit. He has just received his PAN certificate.

W1AW OPERATING SCHEDULE

The Fall W1AW operating and general-contact schedule, effective September 27th, appeared on page 73 of October *QST*. See that issue for information on when and where to look for W1AW.



Over a period of many years National Company has built thousands of communications receivers. A great deal of this equipment is still in use continually. Some of it, due to the habits of the ham, will collect dust for a few years, then will be dragged out and again put in use as activity is revived in some half-forgotten phase of his former one and only love.

We here in the National Company Service Department find the activities in ham radio quite unpredictable. Who can predict when the rig will again take the front seat to TV, or when 10 meters will again become active? For many years we have taken in for service almost anything that could be identified as being produced by us, regardless of age (with the exception of surplus gear), from "Rastus", the dancing doll, to our more recent productions. We believe that this service has been appreciated and intend to continue the practice as much as scheduling will permit. However, in many instances, items are returned to us at the factory which should be processed by our Field Service Agencies. This results in a long delay and additional transportation expense to the individual as well as considerable delay in all other processing here at the plant.

In the past, all returned equipment has been accepted and processed, authorized or otherwise. We now find it necessary to request authorization for all returns in order that we may live up to promised schedules. We do not wish to flatly refuse unauthorized shipments, but such returned merchandise will take a back seat until such time as proper authorization and identification can be worked into our schedule. Therefore, in the future, we will require advance notice of any returns and will send authorization when such return is approved.

On the opposite page will be found a list of our present authorized service agencies and their locations throughout the country. These agencies are kept up-to-date with our latest methods of repair and revision, and in most instances are in a better position than we to expedite service with fewer shipping hazards and less expense. Only in rare instances are there service problems which cannot be adequately handled by our Field Service Agencies.

When shipping to any of our service centers, or to us, avoid rigid packing. Use plenty of corrugated cardboard to absorb vibration and jolts. Do not reuse damaged shipping material. Corrugated inserts and containers can take only so much abuse, after which they lose all spring and cushioning properties. The paint should be protected from the packing material by a waxed paper.

If at any time information is desired pertaining to servicing our equipment, please feel free to call upon us in the Service Department. Many times small bits of information can save hours of the needless toil that we all have experienced at one time or another.

DON SWAIN, *Service Manager*

Authorized Service Stations

CALIFORNIA

COMMUNICATION RECEIVER SERVICE
5016 Maplewood Avenue
Los Angeles, California
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Station Activities

• 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

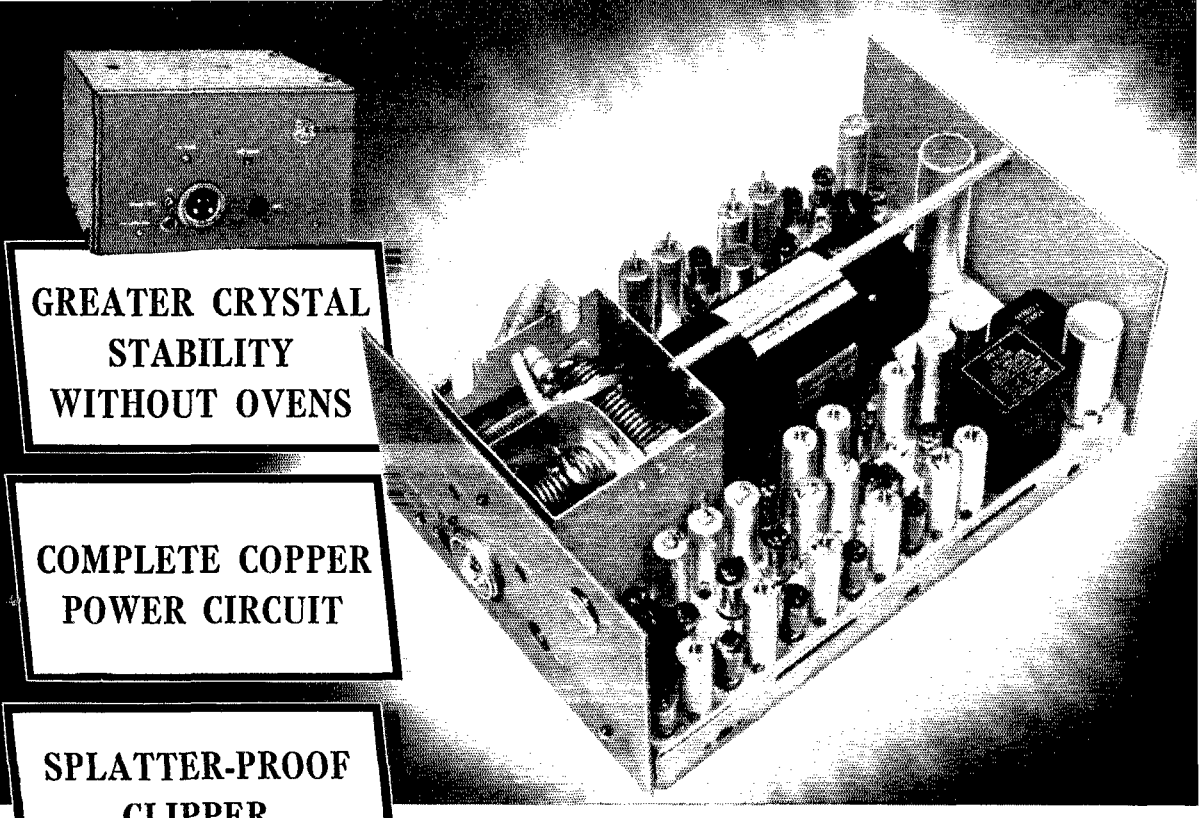
EASTERN PENNSYLVANIA — SCM, W. H. Wiand, W3BIP — SEC: IGW. RM: AXA. PAM: PYF. E. Pa. Nets: 3610, 3850 kc. Net time changes are as follows: PFN and AN 1830, EPAEN 1900, EPA 1930, all EST. The annual picnic of the Lancaster RST was held at Long Park, Lancaster, Aug. 23rd with thirty amateurs and guests present. The main event was a 2-meter transmitter hunt won by NOI, followed by MFW and CXE, with GJA hiding the transmitter. The Delaware-Lehigh ARC enjoyed an illustrated talk by ARRL's NEC, George Hart, 1NJM, using the new ARRL AREC slides. UQJ reports a new radio club in Red Lion with VNH, pres.; OCF, vice-pres.; WCT, secy.; and WGO, treas. Meetings are held the first Tue. of each month. UDM and his XYL will be seen on NBC-TV in a program called "Industry on Parade," a half-hour weekly film telecast of men and/or women at their work and with their hobbies. UDM will be on the Remington Rand show, being a member of the research staff of that company. Watch your local paper for the date and time of the program. SDE and KF, pictured operating their stations, were featured in an article on ham radio in their company's monthly magazine, Both work for Hunter Spring Co., Lansdale. UQJ and NNV, experimenting on 420 Mc. are attempting contacts from York to Philadelphia, a distance of 85 miles. PYF, using TCH's Lysco, operated fixed portable from Point Pleasant, N. J., during the first two weeks of August. SHP now is running a full gallon to his final using clamp-tube modulation. PMG reports LCK has 420-Mc. gear in operation, while LZD and MRQ are building new gear for the same frequency. QV now is the new manager of the E. Pa. Emergency Net, relieving PDJ, who was called into Uncle Sam's service. All stations are invited to report into EPAEN each Mon. at 1900 EST on 3610 kc. Traffic: (Aug.) W3BFF 181, ONA 168, NOK 76, KAG 64, QOL 56, BIP 47, MAC 45, PYF 45, OZV 39, GES 30, MLY 18, DUI 11, AXA 9, SHP 8, VN 7, PVY 6, TEJ 6, PDJ 4, AD 1. (July) W3NOK 26, UQL 19, MLY 18, AD 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Arthur W. Plummer, W3EQK — VGV informs me he is manager of a 40-meter 'phone net known as the Intra Baltimore 'Phone Net (IBPN), which meets Tue. and Thurs. on 7210 kc. at 1900 DST. New members who can handle traffic in Maryland and surrounding states are needed. VGV's QTH is 141 S. Bouldin St., Baltimore 24, Md. The Antietam Radio Association of Hagerstown reports a very successful Field Day program with 8 full-time and 7 part-time operators using three transmitters on 80-meter c.w.-'phone, 40-meter c.w.-'phone, 20-meter 'phone, 10-meter 'phone, and 2-meter 'phone. The majority of operation from the Hagerstown Area seems to be confined to 75- and 2-meter 'phone with 7 75-meter mobiles in action. On Aug. 23rd the ARA held its second annual picnic at Cacapon State Park in West Virginia with 40 present among whom were 17 hams. OYX is getting the AREC organized and a meeting was held to discuss E.C. activities. Applications for OES are expected from the Hagerstown Area shortly. Hagerstown's newly-formed TVI committee already has cleared satisfactorily its first TVI complaint. How about some of the Hagerstown gang getting together with the Cumberland fellows and helping them with their TV troubles? CIQ says the Hagerstown boys are planning skeds into MEPN and TCPN and he hopes to work into MDD on 3650 kc. Five of the ARA members now report into MEPN and 2 into PRVN. ARA meetings are held every other Tue. The next one will be held Oct. 27th. LZY is hitting 2 meters. CVE reports 7 Mc. was very erratic recently. TCRN-2 is on at 0215 GMT daily. K7FBL is clearing overseas traffic for TCRN-1 while 6KYV is on a much-earned vacation. QZC was at camp in Connecticut during July and August. COK reports a visit to BIP and arrangements with BIP for ONB and COK to run things for 3RN this winter. It is reported that 3RN and all three section nets probably will have only one session, similar to the manner in which MDD operated last winter. WBP handled Hurricane Barbara traffic with the newly-appointed EC for Worcester, BM, at Ocean City, Md. EEB reports handling DX traffic from KH6, FK8, and DL4. EEB reports activity in the CD Party, a new 10 and 20 beam, a new shack, and a sked every day with DQZ on 40 meters while vacationing in Vermont. PRT, a new ORS, reports 153 QSOs in 38 sections with 30 watts in the July CD Party, plus DX with the same 30 watts on 21 Mc. with ZS2FD. WN3VOZ W3VOZ (Tech.) has BC-788 and will be on 420 Mc. shortly. OXL and RAH have been selected as Asst. ECs for Washington County. PZW has been in the Far Arctic since last spring. ECP did an FB job of alerting and activating MDD and monitoring MEPN and Virginia 'Phone and Tarheel Nets during the Hurricane Barbara emergency. On July 31st at Laurel, Del., a meeting was held for the purpose of organizing the Eastern Shore Radio Club. Present at the meeting were VUK, DOG, BAK, BSV, TKL, ULQ, TCQ, DB, STS, MCD, VV, HLI, WDM, UVT, SBR, PVO, BM, RRF, TRN, TXL, NTB, FU, WN3WDS, W2LEO/3, W4SR, W6RLV/3, and several would-be hams. TCQ, Seaford, accepted the chairmanship pro tem and FU was named secretary. A steering committee was appointed to present a plan of organization. Traffic: (Aug.) W3USA 750, CVE 230, COK 59, QCB 37, JE 35, EEB 18, NNX 4, OYX 2. (July) K3WAS 138, W3PGO 126. (June) K3WAS 602, W3QZC 75.

SOUTHERN NEW JERSEY — SCM, Herbert C. Brooks, K2BG — SEC: UGV. We are all grateful to Lloyd Gainey, our former SCM, for doing a swell job. It is hoped that the entire section will support the new SCM and SEC. With your help and coöperation we will be able to do a better job in maintaining our present emergency nets and in setting up facilities for handling emergency traffic in areas not now covered by our present nets. The SJRA Hamfest and 37th anniversary went off as per schedule. The club station, K2AA, operating on 2, 10, and 75 meters, assisted those who found it difficult to locate the picnic site. EWN, EGP, and PTM vacationed in New England. EZM visited VP7-Land this summer. NJN, on 3695 kc., continued its fine job of traffic-handling throughout the entire summer. The Hamilton Twp. Radio Assn. visited the home QTH of K2AT, where they witnessed a demonstration and heard a very interesting talk on transistors. Traffic: (Aug.) K2WAO 765, W2RG 111, HAZ 8, ZI 8. (July) W2ASG 20, ZQ 3.

WESTERN NEW YORK — SCM, Edward G. Graf, W2SJV — SEC: UTH. RM: RUF. PAM: GSS. NYS meets on 3615 kc. at 7 P.M. and 3980 kc. at 6 P.M.; NYSS on 3595 kc. at 8 P.M. NYS C.D. meets on 3500.5 and 3993 kc. at 9 A.M. Sun. WZQ is going back to R.P.I. and will be heard as 8Z from K2NAG. CPN has a new antenna farm. 32V, and 60-foot telescoping tower and is busy erecting antenna. The Lockport ARA members had a family picnic at the summer camp at RUI. BTB visited 8ZGT and attended NYS Convention committee meetings in Buffalo. UYG and CJA have new QTH. KL7ATL, formerly of K2FAV, is in Alaska with the USAF. K2BPK, DOZ, OZR, AFY/mm, and ORG/m provided ship-to-shore communications for the Lake Erie Lightning Class Sailing Regatta. Spectators on the beach were kept posted by means of a p.p. system connected to the 75-meter receiver on shore. FXU is de-bugging new 813 rig. KN2CLB has a new NC-125 and Lettine 240. KN2s ENH, ENI, DPD and DPH are new additions to Buffalo Novices. AZA dropped the "N" from his call. The Bishop Timon H. S. Radio Club is growing rapidly. QNA made a business trip to Michigan. ZRC and ZRW vacationed in Washington, D. C. K2DKM is heard on 75 meters. VP9 calls into TCPN. Nice coöperation, boys. QQ vacationed in VE3-Land and while there picked up two 100-foot antenna sticks to plant at his new QTH, ZXH, ZQQ, JPE, and GIH vacationed in VE3-Land. QLI built a walkie-talkie for emergency use. The Corning Area Net is on 10 meters at 9 A.M. Fri. K2CEH dropped "N." 3QKI has a very FB signal on 2 meters in Rochester with 104-element beam. Too many 2-meter stations are calling DX and not enough are working locals, from reports received. We regret to report RQF's father passed away at the age of 79. RUF is leaving for a vacation to the West Coast and Mexico. In her absence IFP will be Acting NYS C.W. Net Manager. VTP is visiting SRR and working 2-, 10-, and 75-meter mobile. KKZ has a new Viking II. VLR is trying a T2FD antenna on 10 meters. CBM and FTY installed Balun coils. COV now has Lettine 240. DVD is on 10 and 75 meters. EMW is building vertical antenna. RHQ is back on the air with s.s.b. after a recent illness. Appointments: NAI as OBS and OPS. Renewals;

(Continued on page 78)



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ZRC as ORS. Net certificates have been issued to FWQ, TAU, BKI, DUC, CTQ, BSI. KKZ has a new Viking II. Traffic: (Aug.) W2BTB 719, ZOL 563, RUF 312, RHQ 148, ZRC 140, BNC 126, OE 58, UTH 37, SJV 25, RQF 20, RUT 17, CPN 16, WZQ 16, EMW 13, COU 10, IPC 10, OZR 10, DVE 2. (July) W2QLI 4.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W3NCD — SEC: Ken Speer, jr., W3CA, Lowber, Pa. PAM: AER. RMs: NUG, GEG, UHN. All Emergency Coördinators are asked to give Ken their fullest coöperation in building up the Western Pennsylvania AREC. Mail him your reports concerning your local EC organization. For those interested amateurs in counties where there is no EC organization or nets operating, you may write Ken and receive full information and assistance in forming same. New calls listed up Erie way are WN3WAX, WN3WAY, WN3WJA, and W3UQG. Congratulations, fellows, and welcome to the fraternity. LKJ now is at home convalescing and well on the way to full recovery. The SXS's are the proud parents of a new daughter. OIH is reported to have a fine mobile VFO in operation. From the Pittsburgh Area it is said that the KWH gang participated in the V.H.F. Contest. VBL and NRQ are said to be ham TV actors (they were on the local TV station presenting ham radio at its best to the public). Now if you fellows have anything of interest, please forward to me the first of each month so that I may get this column filled and in by the 7th of each month. Traffic: W3WIQ 1345, AER 20, SIJ 14, KNQ 10, LXE 6, LSS 3, UHN 3.

CENTRAL DIVISION

INDIANA — SCM, Clifford C. McGuyer, W9DGA — SEC: LZI. Section Nets: IFN, 3910 kc.; QIN and RFN, 3656 kc. REC: TT. PAMs: BKJ, DOK, and NTA. RMs: JUJ, JBQ, WWT, QLW, and YWE. WBA is station manager of AB. TT is a member of TCC. JBQ reports RFN traffic as 62. DPT is rebuilding. DKC has a new antenna. QYS is on 75-meter 'phone. OGX has a home-built mobile. JBQ is rebuilding. The New Albany Club had an entry in the Soap Box Derby. UVD vacationed in Florida. PWB visited G.E. in New York. JUJ received a second call at the Lakes as ZUX. NZZ reports VES traffic continues good. VNV has 75-meter mobile. QBD is a new Tech. Cl. licensee in Kokomo. Kokomo had an FB hamfest. Their mobile contest in the home-built class was won by VJX; CMT and FZW tied in the commercial class. A new Novice at Indianapolis is ZRQ with a Heath transmitter. RBX kept schedules with CYQ/8 on Lake Michigan. PPS reports all his rigs are now TVI-proof. K9FCN is active on IFN from Rockville. STW is back on with a Viking. ERB handles traffic for TCPN. 5AUP is attending Valpo Tech. and will be active on the traffic nets. New Novices in Evansville include AJR, ABW, ABX, YZM, ZHJ, and YZO. NJR moved to Indianapolis. IFN issued a list of net stations and net aids. The Vincennes group is forming a club. NTA has 147.3-Mc. f.m. rig. New Novices in New Castle are ZSP and VZP. ZSC is mobile on 75 meters. PPD visited Jamaica. EIA is back from France. The New Castle Club has started a series of ARRL training films. NDH is mobile on 10 meters. STC and QYQ are new OPS. QYQ has an oil company and a theater. KVE was elected president of the TARS. RDJ is mobile on 75 and 10 meters. EHU has a glove compartment mobile rig. AIN visited South Bend. LXW won the jackpot at the TARS meeting. Those making BPL this month include NZZ, JUJ, AB, and SWM. URJ and Novice ZVS are new at New Albany. The TARS TVI committee consists of UMS, AIN, DGA, BBC, MWM, QAV, UIA, and LXW. SWM is on 40-meter 'phone and schedules NTA. BBN got married. The Lake County ARC received ZKW as its call. The Club rig is a Viking II and an SX-71. UHV, PQR, and FJI were in charge of the TARS Annual Hamfest. RCD is in the I.C. Hospital at Chicago. UHV is building a 220-Mc. long-line oscillator. Traffic: (Aug.) W9NZZ 1110, JUJ 653, AB 301, TT 259, SWM 222, YWE 179, RBX 114, PPS 109, ERB 107, STC 77, NTA 65, QYQ 63, DPE 51, JBQ 46, CMT 45, GUX 33, KDV 32, OLX 32, UMS 32, UQP 32, VNV 32, STW 30, DOK 23, ZIB 23, WBA 22, DKR 15, BDP 5, FYM 4, DGA 3, YVS 3, QLW 1. (July) W9SKP 26, LQE 16, EUC 16.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAM: ESJ. RMs: MQV and UNJ. Nets: (WIN) 3625 kc. 7 P.M. Mon.–Fri.; (BEN) 3950 kc. 6 P.M. daily. State mobile and c.d. frequency: 29,620 kc., WIN Net Mgr. MQV put the wheels in motion for the season with a newsletter to all members. RTP has a new Eldico TR-75. The Door County Radio Club has a new call — AIQ. LGR/9 is putting out a big signal from Watertown with only 10 watts. VKR received his WAS certificate, obtained in 7 months on 7 Mc., in addition to his Code Proficiency certificate at 30 w.p.m. KWJ has a weekly sked with his son Dan at 3PQT. A new ham at Port Edwards, WN9YAH, makes a total of 6 in a town of 1300 population. HQT and CAR are busy mobiling. The Racine Megacycle Club held its annual picnic Aug. 30th. BPL becomes a habit with UNJ after 4 in a row. CXY is moving traffic again after a summer layoff. VBZ reports in with a nice traffic total. Green Bay's new v.h.f. club reports 4

(*Continued on page 80*)

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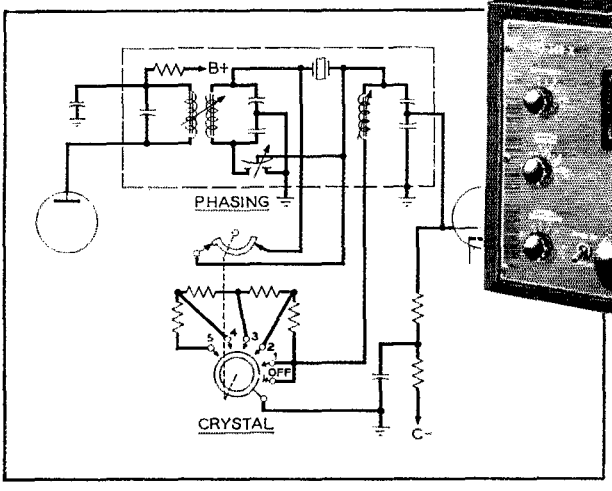

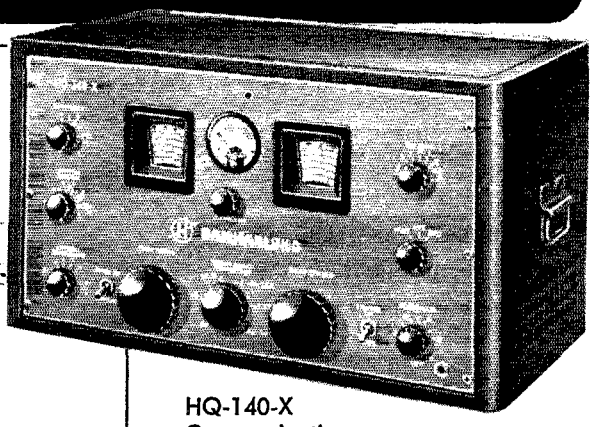

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For Details Write for Bulletin S5.

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new hams: AEE, ZJA, WN9YNX, and WN9ZIX. ZIX is on 144 Mc. with 2E26 and a 5 x 5 antenna. GFL is completing 250-watt mobile. OPA and UMJ are building 144-Mc. rigs. TKZ and SOG have new 75-meter mobiles. FAN, GFL, OPA, and 55 other v.h.f. enthusiasts attended a picnic sponsored by RXS and TQ. DDG is working 220 Mc. with an 832 final and thirty-element phased array. JZS, DSP, and GDW are back on 144 Mc., and NPT has a receiver and big plans. The Blackhawk Club furnished communications for the Janesville JAYCEES and the National Sports Car Race Aug. 23rd, with the mobiles of NUC, KBT, LVB, LIJ, SGG, QIQ, VKS, YNO, JEY, and HSQ on 28 Mc., assisted by IQB and WN9YLR. KBT has a new RME-55. VCH dropped the "N" from his call. WN9AEM is new at Milwaukee with HQ-120X and 75-watt 807 rig on 40 and 80 meters. The Annual Ground Hog Party was held at Watertown Sept. 13th. GPI was elected president, NLH secretary, and LED treasurer of the Wisconsin Council of Clubs. MAREC has 144-Mc. pack sets under construction. Traffic: W9UNJ 575, VBZ 188, CXY 179, MQV 126, RTP 84, SAA 83, LGR/9 77, ANM 30, GMY 29, VKR 25, KWJ 20, IQW 19, CFP 9, RQM 7, HDV 4, OOF 3, OVO 2.

DAKOTA DIVISION

SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — Asst. SCMs: Earl Shirley, ØYQR; Martha Shirley, ØZWL. SEC: GCP. RM: OLB. PAMs: UVL and NJQ. The South Dakota 75-Meter Net is in full-time operation, with NJQ as Net Manager. He has accepted PAM appointment. BLZ, after a 15-year absence, is a new ORS. KØFCR again made BPL with a total of 520. New calls at Ellsworth AFB are QEK, QAK, QAP, and QPC. QEK is ex-WNØMBL. OVE is MARS director at Ellsworth, succeeding ORR, who has returned to W8-Land as a civilian. LRN has left Rapid City to attend Ohio State University. The Prairie Dog ARC won from the Sioux Falls ARC in the Field Day contest. WNØLWW, ex-7AOD, has dropped the "N." About 50 hams and their families attended a picnic at Pickstown. The picnic committee consisted of PRL, RMK, NEO, DGC, and OZC. KVB, formerly of Omaha, transferred to Aberdeen with the telephone company. It's a new daughter for CSD. LBS is attending School of Mines, after having worked 89 countries this summer. Traffic: KØFCR 520, WØOJQ 45, IUH 6, LBS 4.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, øGGQ. SEC: ZDU. RM: DQL. PAMs: JIE and UCV. HUV is building a mobile rig for operation this winter. GTX signed up 8 stations for the Mobile Corps. If every EC signed up 8 new members this month it would make your SEC very happy. Sept. 1st was K6EA's last day aboard ship on the Pacific and he is back in Bemidji again. HFY now is running 450 watts to a pair of 812As. KJZ is assisting as NCS of the MJN. More members are needed, so all you Novices please call in. Through some error the MSN has been listed in *QST* as operating on 3795 kc. This frequency is incorrect and should be 3595 kc. JPH, YXO, TKX, ELA, and PIG worked the Easter Island DX Expedition, CEØAA. Traffic: WØHFY 187, DQL 139, UCV 88, DYD 79, HMV 60, SYN 52, GGQ 29, BYG 16, BUO 14, MBD 13, HUX 12, TJA 11, EMH 10, FFU 8, KMI 6, RA 3, OPA 2.

DELTA DIVISION

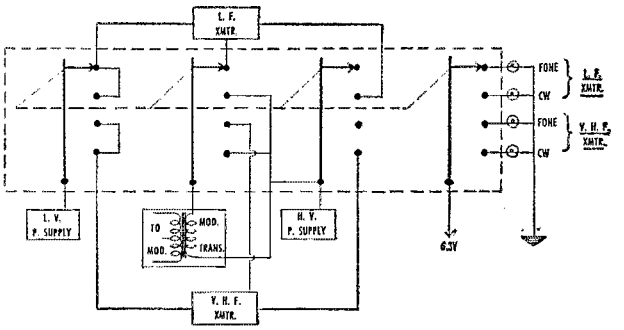
ARKANSAS — SCM, Fred E. Ward, W5LUX — Arkansas is now working on civil defense plans and all will want to take part in that, I'm sure. Contact your EC for instructions or, if no EC, the mayor or county judge. The Union County Amateur Radio Club sent me a copy of its new club paper, the *Hot Wire*, and it sure is a dandy. Wish more of the clubs would send me a copy of their publications. YHT has BC-458 on 80 meters with 80 watts. The OZK Net opened Sept. 1st on 3695 kc., and all c.w. men are urged to attend the 7-P.M. session, if possible. Several of the fellows have expressed an interest in a slow-speed net, but when EA recently tried to start one, no one showed up. Guess the best thing we can do for the present is to welcome the slow-speed boys to take part in the OZK Net. Traffic: W5EA 33.

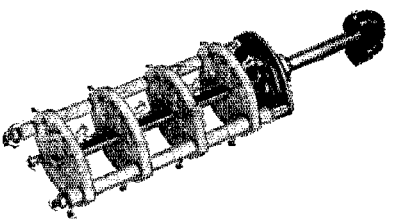
LOUISIANA — SCM, Robert E. Barr, W5GHF — MWE is handling the RN5 Net and would like volunteers from the Baton Rouge, New Orleans, and Lake Charles Areas, as well as others. EB now is on s.s.b. and says he has the TVI situation whipped to a frazzle. KC, CEW, and EB still are the DX leaders of the State, with other competitors getting closer all the time. HKJ, the schoolmaster, again is very active on 75 meters during the preschool hours in the morning. The 1953 Delta Division Convention, held Sept. 5th and 6th at the Jung Hotel in New Orleans, far exceeded all expectations in becoming the greatest division convention ever staged, thanks to the combined efforts of the Greater New Orleans Radio Club and the Westside Radio Club. Total registration was 603, 386 of whom were licensed amateurs. League President Dosland and Midwest Division Director Bill Schmidt, along with George Grammer and the Delta Division Direc-

(*Continued on page 82*)

MALLORY HAM BULLETIN

Switch Common Power to several RF Transmitters with Mallory "Hamband" Switches





Mallory #1600 Series Rotary Switches, better known as "Hamband" switches, were designed especially for coil switching in high frequency transmitter service. However, the heavy, wide-spaced contacts, high quality ceramic insulation, and positive indexing which make these switches so desirable for use in transmitter plate circuits, also, give them exceptional capability for many other switching functions.

For example, the diagram above shows how a #164C (4 section "Hamband" switch), connected as a circuit changer, permits operation of two separate RF chassis from common power supplies and a single modulator. VHF operators in particular, who operate separate rigs above and below 50 megacycles, will recognize the economy and convenience this arrangement adds to such a station. With contact carrying ability of several hundred milliamperes, and with 1000 volt insulation, this switch is entirely adequate for transmitter powers up to 100 watts.

The circuit shown was devised by a dyed-in-the-wool VHF man to permit the addition of a low frequency RF unit to his existing VHF transmitter, and still use only the common power supplies and single modulator shown. However, there is no reason why a dyed-in-the-wool *low frequency* man couldn't make the change the other way 'round, and let the #164C switch help him explore the possibilities of VHF operation with a minimum expenditure of funds for new gear.

When using the #164C for this application, the usual high voltage wiring precautions should be observed, even though the exact circuit arrangement may be modified to suit individual requirements. The one shown has the indicator-lamp circuit located adjacent to the panel, the low voltage supply next, then the high voltage, and last the modulator transformer shorting section for CW operation. The physical location of the switch in relation to the power supplies, modulator and RF chassis is not important, and may be placed for maximum convenience. The circuit shown has the switch located within the modulator housing. Separate input and output sockets for each piece of equipment are mounted at the rear of the modulator.

The convenience and efficiency added by this circuit has been reported by its user to be most satisfying. Why don't you investigate the money saving possibilities Mallory rotary switches offer? Your Mallory distributor will be glad to help you select the right one.

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tor Jim Watkins, represented ARRL Headquarters at the Convention. ØGFQ and ØBFY also were in attendance. HHT, UXQ, and LDH are ECs in the Greater New Orleans Areas. GIX and EVQ have been maintaining schedules for quite some time on 2 meters from Baton Rouge to Alexandria, a distance of approximately 100 miles. The CAP 2-meter frequency has been kept in good use by the high-frequency boys. Stations in this activity include EVQ, GIX, VFP, HCM, VLQ, TDY, TFK, UJK, JBW, CZ, and WN5ZRL. Thanks to GIX for this FB report on 2 meters.

TENNESSEE — SCM, Mark M. Bowelle, W4CXY/WLG — SEC: NJE. RM: AGC. PAM: QT. 'Phone net frequency: 3980 kc. C.w. net frequency: 3635 kc. This report is being written just before your SCM leaves on his vacation and before the monthly reports are in from the gang, therefore some traffic totals may be included with next month's report. PL and YIP make BPL again this month easily. Two or more stations consistently making BPL through the summer months in a section the size of ours is mighty fine going in anybody's league. By the time you read this the fall traffic season will have opened and the c.w. net will be back in full swing. From the way it looks now this may well be one of the best traffic seasons in the history of Tennessee. Both the 'phone and c.w. nets will be well populated with a fine bunch of traffic stations and that should assure quick delivery of all traffic headed our way. Most of you will have received the dope on the fall season in the station bulletin, *CQ Tennessee*, by the time you read this. By the way, if you are not on the mailing list for the bulletin and want to receive it, just drop your SCM a card with your QTH. Traffic: W4PL 2224, YIP 1117.

GREAT LAKES DIVISION

KENTUCKY — SCM, Ivan C. Kelly, W4TUT — At this writing the Kentucky gang still is in the summer doldrums and traffic still is down a few notches. There is lots of ragchewing but little building and fixing. WHC still is trying to get his mobile going between airborne military activities. CDA is rebuilding from three finals to two under one shed. KZF has a new jr. operator — the skywire now is a clothesline. ASK is a new ham in Erlanger. WN4ZLK now has 24 states. BAZ is 2-metering aeronautical mobile and rebuilding his fixed station. SZB goes to high-level modulation. YZE now has General Class license. SBI, a new EC, ORS, and OPS, is preparing to give all nets a workout. WNH, now ORS and OPS and an AREC member, is giving the band a hard time after school hours. UWA is working 40 meters and raising the score before leaving for college. 9PVN now is running K4WBG at Fort Knox. W5GWT/4 is a member of the AREC. JUI stopped measuring frequencies long enough to take a trip to W6- and W7-Land. URF holds OBS appointment. Traffic: (Aug.) W4TAV 599, WHC 306, SBI 53, UWA 39, K4WBG 28, W4SMU 27, YZE 25, TUT 22, NBY 21, BAZ 17, NIZ 8, WN4ZLK 7, W4KZF 3, SZB 2. (June) W4BAZ 110.

MICHIGAN — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Joe Beljan, 8SCW; Bob Cooper, 8AQA; Mickey Wills, 8CPB. SEC: GJH. New appointments: ORS to NUL, OPS to FLM. The QMN Net commenced its winter schedule Oct. 5th, with UKV managing the 6-P.M. Net and URM handling the 7-P.M. session. The BR Net continues with sessions from 5:30 to 7 P.M. Mon. through Fri. MEN meets at 9 A.M. Sun. with JYJ as NCS. The UPEN at 10 A.M. Sun. is under NEJ. The gang at Mount Pleasant set up a portable station and information booth at the County Fair, and according to the local paper they scooped the show. RTN reports approximately 24 hams took part in the Flint tornado rebuilding project. (Houses, that is!) IV finally got back on the day shift. JYJ boasts a nice new 20-meter beam; we hear he topped it with a 10-meter job. IKX and FGB report activity on the Coast Guard Net. FX is vacationing in the East, and we suspect he took the little 50-watt QMN job along with him. The Saint Joe-Benton Harbor gang is working on a mass-production program for mobile rigs, with SCS in charge of the antenna problems. That's a big job, but Tiny is a big boy! SJF has been QRL canning and garden work. It's no wonder they have company over there during the winter months! HSG has been reporting regularly on the progress of the license-plate business. Seems there still is some antagonism about it, but "Cos" still is in there battling it out. 4YW (ex-8NQ) sent his greetings to the Michigang via HSG. GJH reports the State RACES plan has FCDA approval, and now goes to F.C.C. Traffic: (Aug.) W8IQJ 201, NUL 159, FLM 103, JYJ 64, TBP 32, NOH 25, FX 24, RTN 24, IKX 23, HKT 19, FSZ 16, FBV 15, AQA 14, IV 11, HSG 6, SCW 4, PUV 3. (July) W8NOH 68, ZLK 64.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: C. D. Hall, 8PUN, and J. C. Erickson, 8DAE. SEC: UPB. RMs: DAF and PMJ. PAM: PUN. New ORS appointees are HRN, HXB, and IFX, while FBC was made an OPS and GDQ an OBS. No BPL cards were issued this month. BRA has moved from Cleveland to Cincinnati. From all accounts the Akron and Findlay Hamfests produced good turnouts. ANO and GDQ worked

(*Continued on page 84*)

TYPICAL OPERATION (Frequencies below 120 mc.) Radio Frequency Power Amplifier and Oscillator Class C Telegraphy or FM telephony (key down conditions, one tube)	
D-C Plate Voltage	2500 volts
D-C Screen Voltage	350 volts
D-C Grid Voltage	-150 volts
D-C Plate Current	200 ma.
Driving Power	3.8 watts
Plate Power Input	500 watts
Plate Dissipation	125 watts
Plate Power Output	375 watts

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ZL1WW on 160-meter 'phone on Sept. 6th. DZO is trying out 40-meter 'phone. OSD, the daughter of SPU, passed her General Class exam. WE's XYL took her Novice Class exam. RO is among those who would like to have a Great Lakes Division QSO Party. HNP, Lucas County EC, has been appointed Deputy Communications Director C/D for Toledo and Lucas Counties. His aides are BN, YGR, and PNY. FJX is now DL4JX. AJH, Cuyahoga County EC, has staged three hidden transmitter hunts and IWP won all of 'em. Any amateur finding he is not listed, or listed incorrectly, in the 1953 Summer *Call Book*, should advise IF at 114 North Third St., Columbus, as the CARA is revising the list of Ohio amateurs to provide a new listing for the 1954 Call Letter License Plates. The Fremont gang is sponsoring the SVARC QSO Contest. A trophy will be awarded the winner. Springfield's *Q5* states that FPA is attending VHF School at Great Lakes and AYC, C. E. at WIZE, supervised the obtaining of all communication units for the local fire department. The Queen City's *Mike and Key* announces they have 25 applicants for their Tue. code classes at 2145 Florence Ave. Time is 8:00 P.M. In addition IVE and HRK have been giving on-the-air lessons Tue. and Thurs. at 9:00 P.M. on 29,200 kc. A recipe for pepper relish graces the pages of Toledo's *Shack Gossip;* however, hammy items relate of TWD joining the 2-meter gang and MGB endeavoring to do the same, while LVU now is on 160-meter mobile. The *FHARA Bulletin* of Hamilton informs us that two new licensees in the area are Novices ODO and OEQ, the latter the eleven-year-old son of HXB; UNW is on 75-meter 'phone with 60 watts; TYA is active on 160-meter 'phone; and MDJ was the Area's only representative at the Convention in Houston. *Ham Flashes*, edited by FRY, originator of the QSL card idea, mentions that UUI is rebuilding; SRW has a new sixteen-element 2-meter beam which is 72 feet above ground; BFQ is running 800 watts on 2 meters; and JIF is enjoying himself on 40 meters, both 'phone and c.w. Your SCM begs to call attention to the fact that many bulletins refer to amateurs in their areas by name but not by call letters. Let's try to include call letters so that reference may be made to them in this column. After all, a reader in Cincinnati may never have heard of Hugh Hangem of Columbus but the chap's call may ring a bell. Traffic: (Aug.) W8KQY 174, UPB 152, DAE 133, HNP 119, DG 108, CTZ 75, SRF 72, RO 64, KXG 47, DL 38, GDB 38, IFX 37, ZAU 24, BEW 20, IJH 18, TLW 16, AJW 14, EYE 14, WYL 13, UZJ 11, AL 10, EQN 8, WE 8, WRL 8, HOX 6, KIH 6, MGC 5, DZO 4, ET 4, THJ 4, RN 3, CRS 2, BGS 1, KZM 1. (July) W8IFX 81, KZM 5, MGC 4.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RMs: TYC, KBT. PAMs: IJG, JQI, K2CA. PCQ is on vacation in Canada and will be looking for U. S. contacts on 144 Mc. K2BAR has built the super selective i.f. amplifier which appears in the 1953 *Handbook* and is well pleased with it. K2ELD is the new call for Dutchess County c.d. K2BUI, RTE, EFU, and LRW were awarded Section Net certificates for activity on NYSEPN. VDX was the guest speaker at the RVWARS recently. K2BSD is using a new off-center-fed antenna on 3.8 Mc. K2BUI has a new Elmac A54H and will be using it from his new QTH in Buffalo. K2BNI and his XYL, KN2DKU, had a very enjoyable summer working mobile. Doc also is trying out a new T2FD antenna. The Hudson-Mohawk Training Net will resume operations this month with a new time schedule as follows: Sun. at 1:00 P.M., Thurs. at 7:00 P.M. on 3716 kc. BSH, who is doing an excellent job conducting a class for the Novices, also is making a drive for parts. His object is to build elementary rigs for his graduates. Endorsements: FQL, KED, and LXP as EC; NOC as OO. QGH, EC for Westchester, and YXE, EC for Rensselaer, have conducted highly successful AREC-c.d. tests in their counties. All ECs are requested to check their endorsement so that loss of appointment will be avoided. RTE has a new 260-foot antenna and works all bands from 28 to 1.8 Mc. HSM has moved to Mahopac. ILI is working mobile on 144 Mc. and is doing quite well. HEI will attend Johns-Hopkins University. Bill is one of our very active OBS appointees and also a member of NYSEPN. Best of luck to you, Bill, from the E.N.Y. gang. Traffic: W2EFU 67, K2BSD 51, W2ILI 48, LRW 42, CFU 32, TYC 32, K2BUI 24.

NEW YORK CITY AND LONG ISLAND — SCM, Carleton L. Coleman, W2YBT — Asst. SCM, Harry Dannals, 2TUK. SEC: ZAI. RM: VNJ. PAM: JZX. The Kings County AREC and RACES group has been revamped under the direction of KGN, the EC. With the assistance of IEJ, MHM, PYX, BSM, and the XYLs, every known W2 and K2 in Brooklyn was contacted. If anyone was overlooked, please contact KGN. AEE, Columbia University ARC (now an ARRL affiliated club) is in full swing with the 'phone and c.w. nets. AIP, the club veep, reports a new bridge-limiting modulator for the 'phone rig and that a new RTTY project is under way. KFV has a new Viking II on the air and is building a new 2-meter rig. KQC has been active with the Queens AREC net on 2 meters. The

(*Continued on page 86*)

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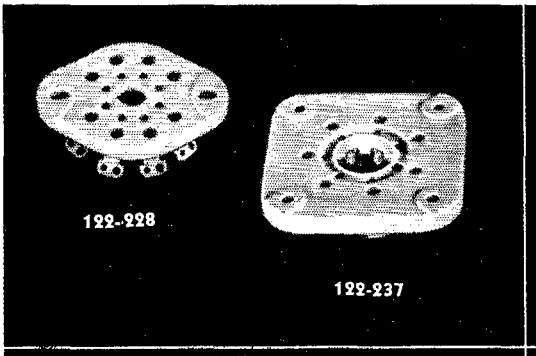

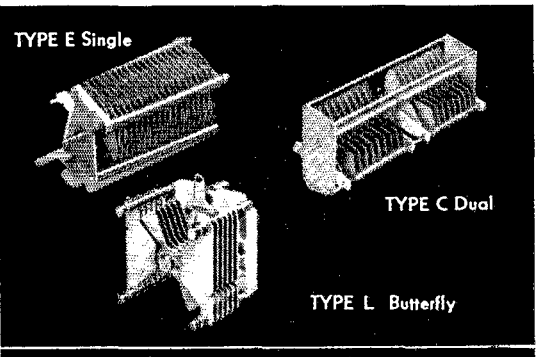

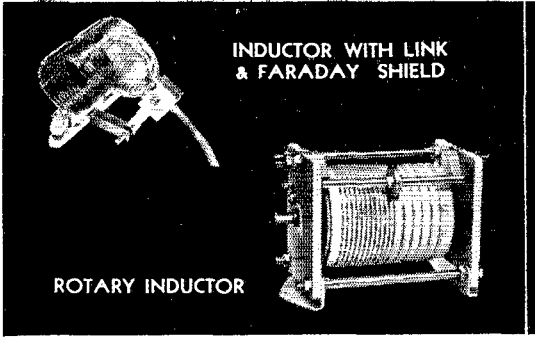

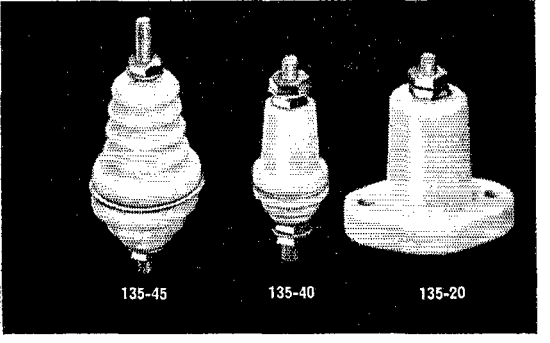

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Type L. Ideal for mobile application: Ceramic soldered—no eyelets or rivets. All brass, soldered construction. "Bright alloy" plated. Silver plated beryllium copper contact spring. Panel space only 1⅜" square. Air gap .030", .020", .060" and .080" Butterfly, single and differential types.

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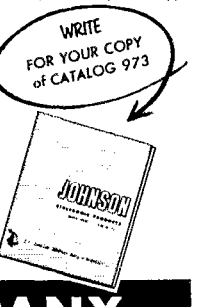

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Astoria Radio Club held a get-together with a 70 per cent turnout during the month. Old DX man CSO has been spending most of his time experimenting lately. LPJ has moved to Maryland. JOA is going after traffic in a big way and reports the TAN Net now meets at 1815 on 3630 kc. EC has received RACES authorization. DIC is spending all his time traffic-handling. WFL was portable in Maine during his vacation. IGV was on from Massachusetts and YBT from Connecticut. GF is now /4 from Chattanooga. OMG's traffic total in September *QST* was incorrectly listed as ONG. LGK has a new mobile with 8 watts on 10 meters. This makes nine members of the Tu-Boro Radio Club on 10-meter mobile. MES is the latest Tu-Boro member to join up. EEY, an active OO, started college and is after an E.E. degree. JZX, the new PAM, is active in 6 nets and reports that activity is increasing and that the N.Y.C.-L.I. 'phone nets have resumed daily operation on 3980 kc. at 8 P.M. and Sun. at 10 A.M.; also at same times on 147 Mc. IDK and ZM are spending most of their time on the traffic nets. SIM, busy with RACES work, has a Communicator on 2 meters and also operates 20-meter mobile. RWQ completed a new VFO. CLG returned from the West Coast with a new Gonset receiver for 2 meters. PF is on active duty at Ft. Monmouth so has not much time for operating during the month. A lot-speed net on 3755 kc. at 1100 Sat. is conducted by JUP as NCS. BO is back with a new Sonar rig for mobile and fixed station operation. The Queens C.D. Net is conducting a course for those interested in obtaining a General Class license. Contact HNG, Box 131, Jamaica, L. I., for information. OME is a new OPS. KFV is a new OBS, and BSM and JCI are new ECs in Brooklyn. DMP now is DL4RC and expects to return to this side next summer. Congrats to JCI and his XYL, KQL, on the new harmonic added to the family. DIR is back on the air with his version of a Viking III. Traffic showed a big increase during the month, with the following stations making the BPL with 100 or more originations plus deliveries: JOA, AEE, OMG, and JZX. Traffic: (Aug.) W2JOA 360, AEE 328, OMG 265, JZX 238, LPJ 100, EC 56, ZM 48, DIC 33, IGV 27, LGK 20, CLG 10, KQC 9, PF 8, YBT 7, IDK 6, KFV 6, SIM 6. (July) W2AEE 115, SIM 11.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: NKD, PAM: CCS. RMs: NKD, WCL, CGG. KN2EFK is a new Novice in Englewood and is on 80-meter c.w. ZPD has been busy setting up civil defense radio section in Bloomfield. NKD now is on 28.5 Mc. with 6146 in final and ground-plane antenna. He also has a new c.w. rig using a pair of 813s running 400 watts. K2WAH, Hq. station of the N. J. National Guard, is on the air with a new Viking transmitter and new SX-71 receiver. The new set-up is located at the Sussex Ave. Armory, Newark. Present schedule calls for operation on Mon. and Thurs. evenings. Visitors are welcome on those nights. New hams in Elizabeth: Tom McGuire and his XYL, Jane, who both got Novice tickets. They use KN2DQE jointly on 80-meter c.w. CDNJ needs volunteers on its 3695-kc. net at 1900 Sun. This is the only long-haul frequency used for training c.w. operators in traffic-handling procedures for RACES operation. Normal RACES operation will take place on 3505.5 kc. when we have to use it. 3695 kc. is a training frequency used on Sunday evenings to give newcomers a chance to get familiar with network operation. Please check into this net, we need you badly. A well-organized training program is being worked up by NKD if enough stations report in to make it worth while. K2BWP, age 14, is just one of a family of hams. Sister Barbara is K2CLO and dad, K2BWQ, is in there pitching, too. If you teen-agers in this section are interested in starting a teen-agers net, drop a card to K2BWP for details. His QTH is 26 Lenox Avenue, Clifton. The section sends best wishes for a speedy recovery to K2BG, Southern New Jersey SCM, who has been hospitalized. RM WCL is looking forward to an active traffic season and is looking for new members for NJN. NJN meets at 1900 daily on 3695 kc. West Englewood reports two new Novice stations in KN2CZY and KN2EKO. CCS reports he has a new 20-meter beam now in operation. EAS has new 500-watt linear amplifier on c.w. as well as on s.s.b. BTG and YLS vacationed up Maine way. CWK was a recent speaker at RVRC meeting. NQA plans to move to new QTH. FQN is busy with Middlesex County c.d. activities. AJB is back at Villanova for his third year. KN2BJP and KN2CAR are readying for General Class exam. A pair of twins, INL and IUI, commence their freshman year at Dickinson College. LTI is active on 75-meter 'phone and MARS. KN2AGE, son of W2NIC, will try for Gen. Class ticket. Congrats to LTI on his 70th birthday. This office wishes to thank Edward Larkin for his help in compiling records for the SCM during the hot summer months just passed. ENM, Area 9 RACES Officer, has assembly line set up building 2-meter equipment for civil defense. All equipment is turned over at cost to the various towns in Area 9. A record turnout is expected this fall on the AREC 2-Meter Net. C.d. units in Monmouth and Ocean Counties interested in such equipment should contact ENM as soon as possible. Traffic: K2BX 504, W2CCS 162, CUI 158, WCL 152, EAS 151, K2BWP 74, W2NKD 56, HIA 21, GVZ 3, NIY 3.

(Continued on page 88)

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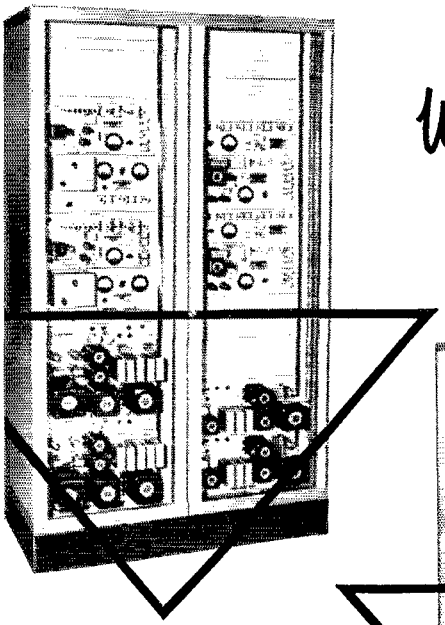

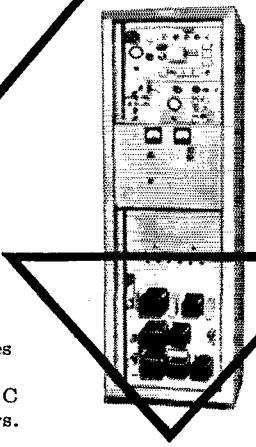

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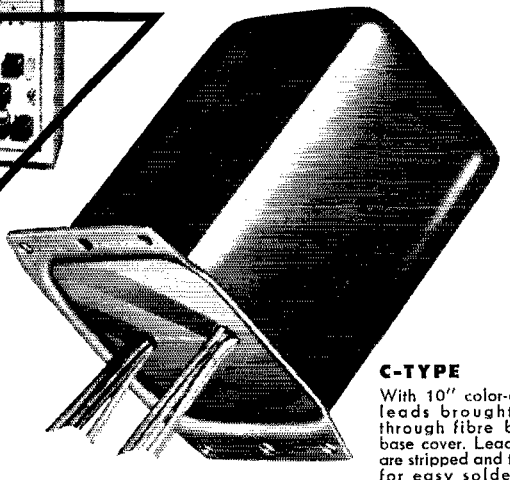
Illustrated at right: REL 900 MC Transmitter, Series 707-757. Illustrated immediately above: REL Model 759 70 MC Dual Transmitters and Receivers. These systems make wide use of CHICAGO C-Type "Sealed-in-Steel" transformer units.



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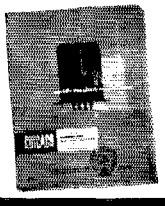

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HARSHEEL

MIDWEST DIVISION

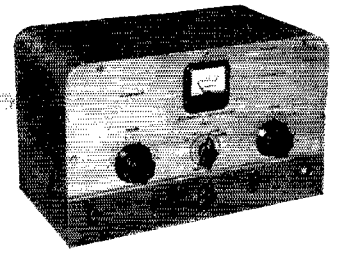
IOWA — SCM, William G. Davis, WØPP — Asst. SCM: Dr. A. J. Plogg, ØSCA. While our SCM, WØPP, is vacationing in the Rockies SCA will pinch-hit for him. During the two days of the Soldiers Reunion at Griswold the local hams had two portable stations in operation. KJN and KJM, with KJK, KJE, FUW, MXP, OLM, and MYN helping. Messages were sent to servicemen. BDR has a new Braille writer and soon will have a kw. final. The usual nice report was received from QVA. BDL moved to Wisconsin and his call now is W9AHL. NPF is a new TLCN member. 8ICB now is WØQEE at Burlington. AUL and PZO have new antennas. WNØQJF is a new Mt. Pleasant ham. WNØPKS is a new Marshalltown ham. We hope BVE soon will have the Tennessee Indians conquered. Both the Iowa 75-meter 'Phone Net and TLCN are doing an FB job even when conditions are almost impossible at times. Keep up the good work, gang. Thanks to those listed below for FB traffic reports. This is election year again for director and vice-director. Cast your vote for the one you think has the best interests of amateur radio at heart, but be sure to vote. BDR and SCA received A-1 Operator Club membership. Traffic: WØSCA 1086, BDR 909, CZ 202, KJN 113, QVA 86, PZO 83, ERP 51, KJM 45.

KANSAS — SCM, Earl N. Johnson, WØICV — SEC: PAH. RM: KXL. PAM: FNS. One of the Midwest's most ardent v.h.f. enthusiasts, ZJB, is encouraging more activity by printing the *V.H.F. Newsletter* each month. Those interested in v.h.f. activity may receive copies by sending three self-addressed, stamped envelopes to ZJB, Box 1237, Wichita, Kans. The Kansas-Nebraska Hamfest at Superior went over big and more than 100 registered. The Tri-Cities Hamfest at Dodge City was highly successful and had the largest attendance of any this season with more than 285 registered. Large prizes and an FB program highlighted the affair. Cars from Texas, Oklahoma, and Nebraska were seen on the picnic grounds. UWN, of Waterville, says a new 'phone net known as the Ham Butchers Net, which meets on 7265 kc. Tue. and Thurs. at 1230, is gaining members rapidly. UWN is NCS. FEO, one of QKS's top traffickers, is moving back to Manhattan and will have a 300-watt rig to keep skeds. HIS is building an all-band rig with an 829B in the final. ZUX, EUP, and YLO are three new mobiles in Scott County. IUB has a new bandswitching rig 10 through 160 with an 813 in the final and new 15-meter beam in operation. MLG, a new trafficker in QKS, is taking on traffic like an old-timer with his NC-125 and Telvar. AGC, of Topeka, has finished a new Viking II and is quite active on the QKS Net. Traffic: (Aug.) WØBLI 207, NIY 109, FEO 102, WMQ 87, MLG 27, VBQ 26, GHR 16, IFR 10, SGK 7, ICV 6, MLL 3, LOW 2, WGM 2, DEL 1, DSY 1, FDJ 1. (June) WØMLG 6.

MISSOURI — SCM, Clarence L. Arundale, WØGBJ — SEC: VRF. PAMs: AZL and BVL. RMs: OUD and QXO. On Aug. 30th the MO-AR-KY met with RMX and Gene furnished the gang with a watermelon feed. Paul tells us Eldon boasts of the "super-6," consisting of TGG, NZI, and ORG and WNØs QPI, ORC, and ORF. An AREC application was received from OIZ in Korea and Ron soon will be back in Webster Groves. FLN will be active at the University. BYJ, GPB, and RLM have installed 10-meter mobile rigs and the latter has worked 15 states and Canada. 9LHB/Ø earned a BPL certificate and an ORS appointment. JHY has the 10-watt mobile rig in operation and reports WNØPYM is a new ham. GAR, who has been catching up on work, is back on the traffic nets. ARH and FIR renewed their ORS appointments. CPI earned another BPL certificate before going South on his vacation. FIR is having excellent results with his Discone antenna. QMF has installed a 20-meter ground-plane antenna. SPR is in Oklahoma City for a 9-week training course in DMA at the CAA school. QXO has earned another BPL certificate. WNØMRM joined the AREC. PME is being transferred to Jefferson City and will become active in traffic nets again. BVL has returned from his National Guard camp activities. 9RCX (ex-ØMRD) has joined the staff at California Polytechnic. Those interested in traffic are urged to participate in MEN Mon., Wed., and Fri. nights at 6:30 P.M. CST on 3900 kc. or MON Mon. through Fri. nights at 7:00 P.M. CST on 3580 kc. Outlets are needed in all parts of the State. For additional information and reporting forms, write your SCM. Traffic: (Aug.) WØCPI 1020, QXO 869, W9LHB/Ø 399, WØIJS 82, GBJ 68, BUL 49, EBE 49, HUI 38, OUD 32, CKQ 14, BZK 13, QMF 11, ETW 8, CXE 7, KIK 6, SPR 6. (July) WØRLM 34, BVL 4.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM, NCS: Thomas S. Boydston, ØVYX. SEC: JDJ. PAM: EUT. CQX is back on the air on 20- and 40-meter 'phone with 32V-3 and NC-183D. JJK now is mobile. RQK can be heard on 40-meter 'phone after these many years. The new call at Lewellen is PZH (ex-9CDB). The Nebraska Slow-Speed Net (NSS) will be called Mon. through Fri. at 5:15 P.M. CST on 3750 kc. by MAO, at Lincoln. Novices who wish to work the Net will be asked to operate within the top 10 kc. of the Novice band, 3740 to 3750 kc. EGQ is having regular code practice sessions at 5 P.M. CST. The SCM would like a line from all Novices in the State. EWO has a home-built Slicer and reports FB

(*Continued on page 90*)



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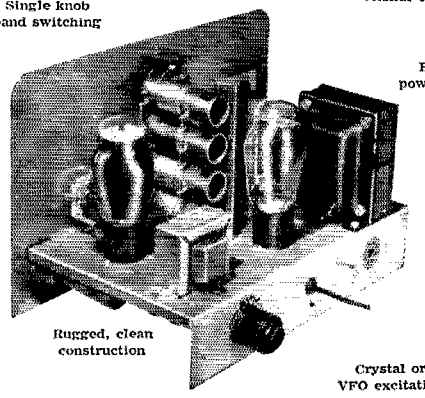

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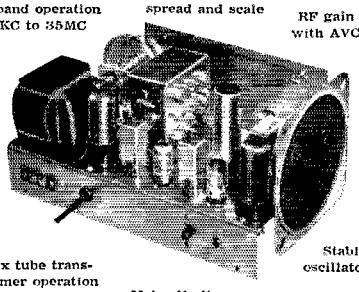

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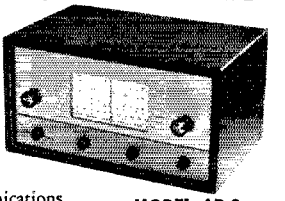

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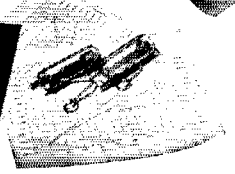

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results. EKP has a TNS working nicely. EXP moved his rig to another room with the same results. The Naval Reserve Training Center (KØNRL) had an RTTY station in operation making contacts with the Training Center in Omaha for actual transmissions during the Midwest Division Convention. Also in operation was a portable station on 40 and 80 meters, c.w. and 'phone. KØNRL, located in the Reserve Training Center, was open both days of the convention. NCS reports 85 members for August, with 20 stations QNIing 25 days or more and 40 stations QNIing 15 days. Traffic: WØBUR 124, KØWBF 36, WØNAA 34, VYX 29, WR 24, HTA 17, AIAO 16, TIP 15, MJK 14, JKE 12, PQQ 10, CBH 8, DJU 8, EGQ 8, DDP 7, WKP 7, BWK 6, LEF 6, UVU 6, FMW 5, HXH 5, IAY 5, ORW 4, QOU 4, BEA 3, HQQ 3, FTQ 2, ISV 2, NGZ 2, QHG 2, ZJF 2, FSE 1.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Roger C. Amundsen, W1HYF — SEC: LKF. PAM: FOB. RM: KYQ. CN-3640, CPN-3880. CEN-29,580 kc. RTG, after having a leg amputated, is coming along nicely. He hails from Norwich. APA still is happy over his TVI-less operations. WN1YVP reports that TI2TG looks for Novice contacts on 40 meters. ZCR and ZCS are new Novice YLs from ARRL Headquarters, where others are awaiting calls. Fort Shantok was the scene of a swell family picnic held by the Norwich-New London gang, with QV cooking the chowder. The date was Aug. 16th. BFS, VOV, LWW, HYF and their families were among the non-local attendees. Among those attending the New Hampshire Convention at Concord on Sept. 13th were YYM, WPO, WPR, ABZ, NLM, HDQ, MHF, UBM, EBO, and HYF. DHO worked Ceylon and is busy after DXCC. NJM, WPO and others at Headquarters are conducting a WAS Novice Contest, strictly among themselves. 2YBT. I is vacationing at Lake Candlewood. YCQ is off to Purdue. PCH is building a garage. MHT has a new Lincoln. YYM worked VQ4 on 21 Mc. A3. Traffic: W1KYQ 127, LIG 84, AW 69, BDI 46, LV 32, CUH 30, EFW 28, RRE 26, HYF 20, RFJ 14, KV 12, UNG 6, QJM 4.

MAINE — SCM, Bernard Seamon, W1AFT — SEC: BYK. PAM: BTY. RM: LKP. The Sea Gull Net meets Mon. through Fri. on 3960 kc. at 5:30 P.M. The Pine Tree Net meets Mon. through Fri. on 3596 at 7 P.M. A grand time was had at the annual ham picnic at BOK's. About 225 attended with some 50 mobile rigs. EBJ won the hidden transmitter hunt with JSY and BYK as runners-up. Many from outside the State were present, including some most welcome VEs. Late in August the Knox County Amateur Club held a lobster and clam bake near Rockland which was attended by about 60. Your SCM had a fine visit with MJE and her husband, KON, and received a note from VXV, who is leaving Sebago and moving to Ft. Lauderdale, Fla. He wishes to express his 73 to all the fellows in Maine. LHA and his XYL took a long vacation trip through Pennsylvania and New Jersey. The last we heard of him he was north of Camden coming in fine when his rig conked out. DX just heard was 6MDV mobile 1 with an FB signal. A tip to the Maine gang: If you are in the Boothbay region on a Friday night, better check with LHA and find out if the Northeastern Amateur Radio Club is meeting. It's a real up-and-coming organization. On a bright and sunny afternoon in August your SCM journeyed up to the town of Hanover where he married a most beautiful YL by the name of Polly. You'll be hearing her on 3960 kc. Traffic: W1LKP 114, SUK 48, TVB 43, TWR 37, AFT 36, BX 29, VYA 22, VV 7, PTL 5.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — UE is the new Route Manager for the 80-meter c.w. band. Appointments endorsed: MCR Boston, MOJ Millis, BB Winthrop, BKR Westford, Tyngsboro, Littleton, Carlisle as ECs; BB and WK as OOs; LMU as OES and OBS, JCK, UTH, and HWE as ORS. WN1YLG is a new ham in Quincy on 40 meters. MP and MOJ are mobile on 75 meters. Mobile on 10 meters: LMD, UOB, OZ, ITB, and RES. SSB, who has been on the Boston Light Ship, has retired and has gone back to Rockland, Maine. On 10 meters: NLU, MJ, OAR, HNY, OHB, WAE, QQQ, IAO, QBP, and WCB. Heard on 2 meters: VOU, mobile in New Hampshire, OPI, JQH, and WN1WID. UIZ has been operating KBN. The South Shore Club had a summer meeting. The Braintree Radio Club is going to have a new station in a new location. EKG and OSX are working on it. MKW is on 75 meters. NF is active on 2 meters in the car. BGW is working RTTY. WHD has General Class license and will be on 20 meters with his Viking II. LXO, ex-4KZW, ex-6JPT, is back in Natick and on with a Viking II and HRO-7. 2JOA, manager of the Teen-Age Net, writes that the 80-meter net will be on at 1815. JLN, of Lynn, has his call back after 14 years and has a Viking II, VFO, and Collins 75A-2 on all bands. Fred Gibson, HRF, still is in the Norfolk County Hospital in Braintree and would like to hear from any of the gang. Sorry to hear of the death of QQR, of Everett. RLF has a new baby at his QTH. CTR visited EFR in Portland. TQS will be on 75 meters when he gets home from the Cape. QFN, our Fall River EC, has been on

(Continued on page 92)

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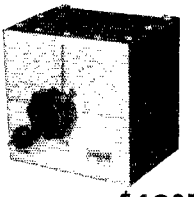

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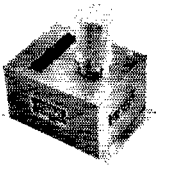

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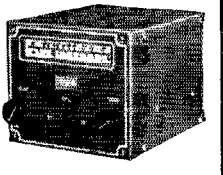

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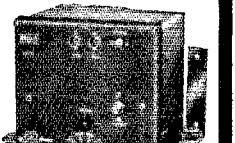

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mobile. UBC is going to Worcester Polytechnic Inst. and has been on 20-meter c.w. PJ, NWO, and VCJ are now grandfathers. The Wellesley Amateur Radio Society has two new Gonset Communicators for its net and a Lysco-306 6-meter ground-plane antenna and a VFO for TBS-50. JJY, who is in charge of the National Guard Communication Plan, writes that equipment has been issued to 25 armories in this State. The Southeastern Amateur Radio Assn. held a meeting at c.d. headquarters and will resume regular meetings the 2nd and 4th Thurs. at the New Bedford YMCA. Anyone is welcome. Anne Fitch, executive secretary of the New Bedford C.C. Office, has been very coöperative with the local amateur c.d. group. BTL visited the Club. YIY has a new Viking. WGN is on every night on 10 meters. CTZ is working on mobile rig on 10 meters. 3MAQ/1 lives in New Bedford now. LAZ is going mobile in his new car. AVY is ham radio traffic center for his area. AWH got his operator license back again. HPH put his TBS-50 in the car with a super-duper dynamotor. ZE took a trip to the Catskill Mountains. APN is mobile on 10 meters. KHV is building a kw. rig. AGG got his old call back and is on 10 meters. ME has an Elmac receiver and transmitter and an alternator power supply. UPZ is busy in MARS net. WAG worked KP4PZ on 80 meters. TQS says he is going to live in Provincetown for good. BB made WAC on 160 meters, first on record. He worked ZL1AH and ZC3RB for Oceania. OLP has a radio control (6 meters) on his model sea-sled. Traffic: W1UXL 103, LM 79, AVY 67, YQF 58, EMG 47, WAG 29, UTH 19, TQS 12, CTR 7, BB 6, QON 5, WU 5, TVZ 1.

WESTERN MASSACHUSETTS — Roger E. Corey, W1JYH — SEC: KUE. RM: BVR. PAM: RDR. WMN meets at 7 P.M. Mon. through Fri. on 3560 kc. HRV and TVJ renewed their ORS appointments. Is your appointment overdue? YCG/3 is up to 42 states and hopes to make WAS before returning to school at Amherst. VBG, LRA, SRB, PIR, OBQ, MNG, and VNH had a private Field Day on Sweetman Mt. operating on 2, 6, and 10 meters with emergency power. LFI is the section's latest s.s.b. convert, with JYH to follow shortly. TVJ leads the section in traffic again and has a new BC-312 which should help him go even higher. KFV worked CE9AA with 35 watts and no QRW. HRV has built a new garage and rushed completion so as not to interfere with the fall traffic season. RYT is on s.s.b. from Monterey. CGY and KK are building parallel 813 finals for their s.s.b. rigs, while QWJ prefers parallel 4/125As for his. YEW is the new call of the Worcester c.d. station. AVK enjoyed a summer vacation in Europe. ARA has a new Viking II. The HCRC is sponsoring a monthly QSO contest for its members; a good example of what clubs can do to promote activity. Traffic: W1TVJ 383, UKR 72, BVR 45, HRV 19, SPF 10, JYH 9, MVF 6, OBQ 1.

NEW HAMPSHIRE — SCM, Carroll A. Currier, W1GMH — SEC: BXU. RM: CRW. PAM: UNV. Because of the serious illness of our SCM, GMH, this report has been written by CRW to keep New Hampshire in *QST*. QJY and KYG are now settled in Long Beach, Calif. NHEN is now on 3850 kc. at 1 P.M. NHN is on Mon. through Fri. at 7 P.M. on 3685 kc. New members are welcome on either of these nets. WLR is doing a nice job from Keene. SAL is a famous fisherman. QGU is back in New York after his nice summer in Snowville. QJX, CDX, POK, and QGU are very consistent on NHN. BST is on 75 meters with a Viking II. Traffic: W1CRW 165, ZET 27, QGU 21, CDX 11, QJX 7.

RHODE ISLAND — SCM, Merrill D. Randall, W1JBB — SEC: MIJ. RM: BTV. RIN went on its every-day 7 P.M. schedule on Sept. 14th. Contact BTV for a place on the c.w. net. In particular, you fellows who recently acquired your General Class tickets are invited. R. I. c.d. meets every Sun. at 10 A.M. on 3993 kc. If you want to have a very good ragchew, join the new Sunday R. I. 'Phone Net at 11 A.M. on 1890 kc. June Burkett, VXC, 24 Roger Williams Ave., Rumford 16, R. I., wants to get as many R. I. YLs as possible into a YL net. Write to her and get the dope, gals, or listen for her on 75 or 10 meters. 6TWT 1, NCRC's prexy, took 18 of Newport's members to PRA's Sept. 1st meeting, thereby giving PRA a chance to get revenge for the auction which NCRC financed at PRA's expense several meetings earlier. Now that it looks as if the fall season is on us in earnest, we are pushing plans for an R. I. Amateur Council similar to the one which performed yeoman service a couple of years ago. We would like your comments — particularly about license plates. Traffic: W1VXC 34, OIK 13.

VERMONT — Acting SCM, Robert L. Scott, W1RNA — SEC: NLO. PAM: AXN. RM: OAK. FPS appointed RNA as Acting SCM Aug. 27th until his term officially begins. Ray is to be congratulated on his FB work as SCM. The c.w./'phone family picnic, held at Groton State Forest, was attended by 78 persons. Two transmitters, operated from 2.5-kw. generator, on 75- and 10-meter 'phone, were operated as KOO/1 from the picnic area. VTN resumed fall and winter sked Sept. 14th, Mon. through Fri., 1900 hours, 3520 kc., with JLZ, VZE, TAN, and VTP NCS, respectively. OAK was visited by BVR and his mother. The first edition of *Maple Sugar RF* has just been issued as a combined c.w./'phone monthly bulletin. Essex County

(*Continued on page 94*)

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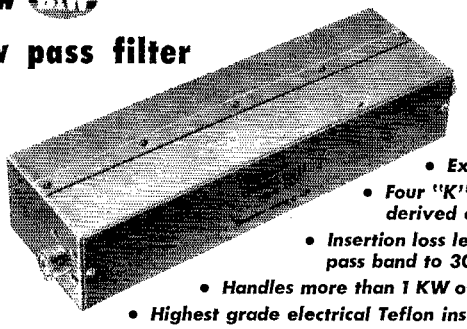

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The Wave Guide principle employed in the design of these new B & W Low Pass Filters has permitted a novel type of multi-section construction. The simplicity and compactness of this new mechanical construction allows more sections to be built in less space than normally and, as a result, an extremely high order of attenuation is accomplished.

The attenuation achieved in the new B & W Filters is a minimum of 85 db throughout the TV band and more than 100 db on TV channel #2.

With a minimum voltage attenuation ratio of 17,780 to 1—the equivalent of 85 db.—the second harmonic voltage output from a 1 KW transmitter, equipped with these new B & W high performance filters, will be reduced to approximately $\frac{1.1}{10,000}$ volts or 110 microvolts.

These calculations are based on a 1 KW input at 75% efficiency and an output load equal to an impedance of 50 ohms.

Laboratory power test runs, under conditions of feed line mismatch within the normal expectancy limit, disclosed these units capable of continuously handling more than 1 KW of modulated r-f power with ease.

In all applications including AM, FM, CW, FS, RTTY, and SSB service, the mighty performance of these new B & W Low Pass Filters will prove to be a substantial aid in overcoming TVI caused by harmonic radiation.

Model 425: 52 ohms Impedance • Model 426: 75 ohms Impedance

Barker & Williamson, Inc.

237 Fairfield Ave., Upper Darby, Pa.

now is on the ham map, with YEL its one and only native station at Island Pond. Traffic: W1OAK 123, RNA 100, AVP 34, VZE 12.

NORTHWESTERN DIVISION

IDAHO — SCM, Alan K. Ross, W7IWU — Hansen: SGS has applied for membership in the AREC. He says he won the Idaho Section Award in a recent Novice Roundup. Lewiston: IDZ sent in a nice report of the gang — namely, FRM is chief engineer at KLER. ZI has a new Elmac. (I also heard that ZI finally got on 'phone!) JWJ moved to Bremerton. DTJ and ONP are very busy with piped-in TV (a community antenna to receive Spokane TV stations). Speaking of TV, Boise Area lost KFXD on 6 recently, leaving KIDO on 7. Boise: 6EBK and family visited IWU for dinner. TCI, a new ORS, has lots of power on 75, 80, or 40 meters. I would appreciate it if the various radio clubs throughout the State would send in news frequently. I have an 80-meter Zepp up now, so will get on 75 meters frequently to make some personal contacts for news and good ragchews. Traffic: W7NH 104, TCI 59.

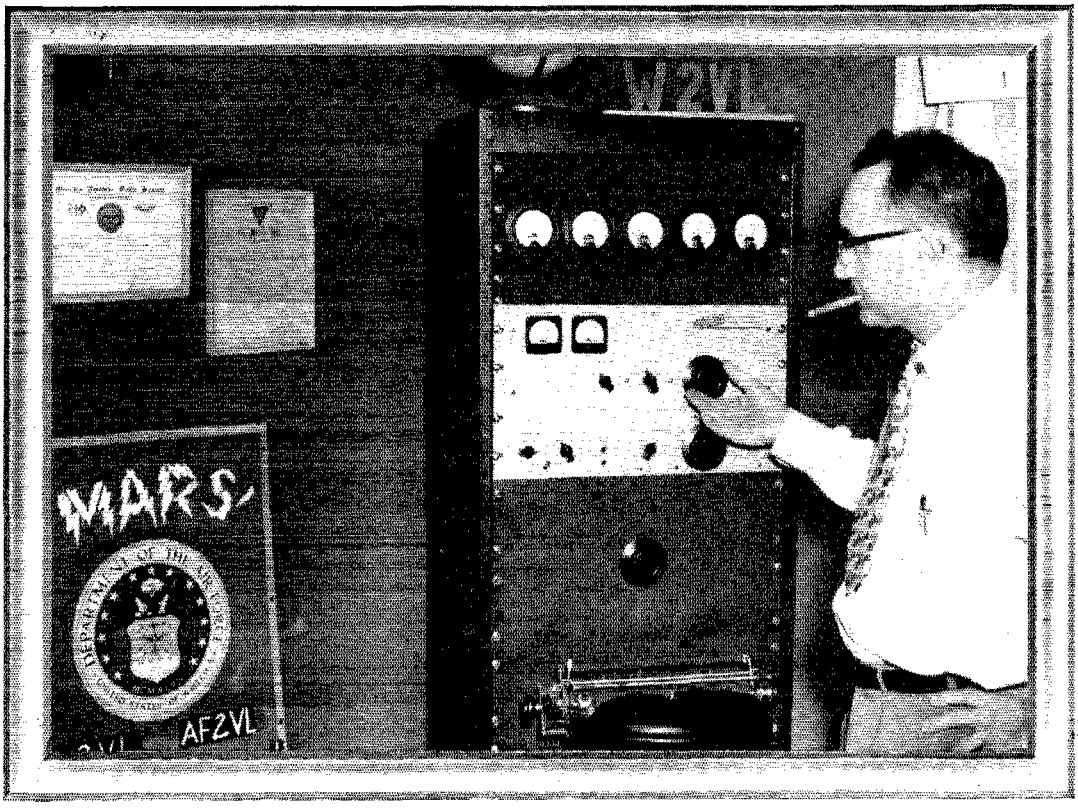
MONTANA — SCM, Edward G. Brown, W7KGJ — With several television stations going on the air here in Montana many of us will be having TVI troubles, so let's get our TVI committees organized so they will be ready to go to work. We don't want to hurt the public good will that seems to prevail throughout the State. Many stations probably will be off the air until their rigs are TVI-proofed, so our nets will have to be carried by a few stations. It might be well to set up a temporary net either before or after sign-off time. WN7UAO is another new call in Harlo. RYZ reports the Livingston gang is reviving the Old Faithful Radio Club with about a dozen members. MM plans to organize a 160-meter net so anyone interested should get in touch with Earl. SWW reports a new QTH; he is having very good luck with his Lettine 240 transmitter on 40-meter 'phone. LCM says he is going to the hospital for an operation soon. PTW and KGJ spent an afternoon visiting LOD. OPM is new Billings Area EC. Anyone wanting information or applications for appointments, please drop your SCM a line. Traffic: W7MM 58, OPM 20, FTO 6.

OREGON — SCM, John M. Carroll, W7BUS — Fall activity will be high over most of the State, according to reports received from many clubs. H.f. propagation is improving and the results expected, based on early fall reception, may prove interesting to all with that type of gear. PRA has increased power to 150 watts. The Oregon Slow Net needs additional members in Eastern Oregon. HDN is active on OEN again. NTN has a kw. under construction. CZ is putting out propaganda on s.s.b. and FLS has a rig for s.s.b. under construction. CZ is EC for the McNary Dam District. Traffic: (Aug.) W7QPS 69, AJN 68, HDN 64, EDU 3. (July) W7HDN 31.

WASHINGTON — SCM, Laurence M. Sebring, W7CZY — RM: FIX. PAMs: EHH, PGY. ETO is going to night school studying TV servicing. AIB rebuilt two 40-foot masts that came down last winter. SAW moved to Spokane from Billings, Mont. The newest ham in Spokane is WN7UOJ. KCU is baby-sitting with an 86-year-old invalid. FWD resumed code practice transmissions Sept. 8th. He put in an antenna patch panel so that either FWR or FWD can use the same antenna system. OE added a BC-474 portable emergency rig for either commercial power or 6-volt battery. A 160-meter net for the Inland Empire elected the following directors: OIZ, RSP, UDB, and ADX. The NCS is JPE, with alternates OIZ, ADX, and NC. UJA is a recent arrival in Clarkston on the air with 40-meter Command gear. POZ, HDT, and OOW have walkie-talkie gear for Clarkston C.D. UMK's Navy permission for operating was short-lived; the permit was received on the 24th and made invalid on the 28th. The Spokane Hamfest-Picnic was attended by 63 hams and their families. OHB won the 20-meter beam as first prize and TLI the 10-meter beam as second. Among those attending were W4MZP, 6BWZ, 6HUV, W7s APN, AQN, BBK, BVF, CTS, DG, EHH, EXY, FFD, FLQ, FNF, GBU, GSS, HAK, HCJ, HQT, IGQ, IOH, IPE, IYK, JEM, JKF, JNP, JXC, JYO, MLO, MS, NCS, ND, NIJ, NVB, NWJ, NXN, OHB, OHI, OOF, OOY, OOW, OPR, OWJ, OWS, PCV, PKJ, POZ, PTG, PTI, PUL, PXA, RFP, RMO, RJK, RWV, SBA, SGE, SJI, SWH, TLI, UJA, and ULL. GBU, MNK, and NVB operated mobile VE7 during their vacations. PHP is delayed at Thule AFB, Greenland, but should be at KF3AA by now. HMQ and NZM are working on mobile rig for NZM. TGO has his code speed up to 25 w.p.m. PXY has screen-modulated 1625 on 75 meters. RME and RVD team up on the 20-meter DX. The VARC held a picnic at Lake Tanwax and had a fine turnout. Visitors were CZY, OGP, RMI, and PPR. VI has converted prop-pitch motor for rotator. KZP refinished his shack. JNC and JXR both have new jr. operators. LAF and VI have organized a group, the Christian Radio Fellowship, which meets the last Mon. of each month, and invite interested parties to contact them. Traffic: W7BA 1514, PGY 679, CZN 298, FRU 263, RAQ 182, APS 136, FIX 112, KCU 98, AIB 84, QYN 74, LVB 54, RXH 50, EHH 45, KT 44, OEB 39,

(Continued on page 96)

"OPERATION—TVI PROOFED"*



Amateur Radio Station W2VL, MARS Radio Station AF2VL

"*The proof of the pudding is in the eating.*" The proof of Eldico's TR-1 TV Transmitter is to listen on the amateur bands during *television hours*, listen to the S9 signal and you will find TR-1 TV's in operation. Or sample the Eldico mailbag and you will read of happy amateurs now operating without television interference, and complimenting Eldico on quality of components, ease of construction and the fine appearance of the TR-1 TV transmitter.

The unsolicited letter on the right is proof. Other names and calls are available on request.

Gentlemen: Have received my TR-1 TV Exciter/Transmitter recently and wired it up in several days. The first evening that I had it on the air I contacted several South American and European DX stations with good reports and have worked many more since. The big thrill strangely enough was not the DX contacts but the fact that I was again operating while my two TV sets are operating without a trace of TVI.

You might be interested in knowing why I choose the TR-1 TV over the several kits available in the 100 watt class. First, for less money I am able to use several times the power both on phone and cw and with a tube that is not being pushed to its limit to produce its advertised output. In addition I am able to continue to use my entire transmitter less the RF section which I feel is a feature that is bound to sell many units for you. Please accept my thanks and appreciation for being thoughtful enough of the Ham's pocketbook to make this available. I am sure that the rapid bandswitching feature and the smooth operating Pi Network will be a pleasure to use in the coming Sweepstakes Contest. If you wish you may use this letter; it is little enough to offer in return for the great pioneering work you have performed for the hams in licking the TVI problem.

Very 73, M. R. GUTMAN, W2VL-AF2VL

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FWD 29, RTQ 29, BLX 27, BG 19, AMC 18, ETO 17, QOU 14, GAT 9, OE 8, UMK 7, NWP 4, POZ 4, BMK 3, HDT 3, PQT 1.

PACIFIC DIVISION

HAWAII — SCM, James E. Keefer, KH6KS — The HARC Convention of Aug. 15th was a success in every sense of the word from all reports. However, because of official business on Guam the SCM did not attend but managed to visit KG6FAA, KG6ACS, KG6ADY, and KG6AEX (ex-KP6AA) and to spend a few minutes with KH6ACK/-KX6 (ex-W6VIG), who nurses Navy Electronics at Kwajalein. Only three stations reported for August. I don't want to slight anyone and am equally certain that a great many of you were as mixed up as the new SCM on this traffic reporting matter, so please all of you, expecially FEARL, try to beat the deadline by a day or two and I will try to maintain the standard set by my predecessor, KH6RU. Traffic: (Aug.) KA7LJ 5244, KH6AJF 1286, KA2KS 722. (July) KG6FAA 5811, KA7LJ 4352, KH6AJF 1683. (June) KG6FAA 9153, KA7LJ 6214, KH6AJF 1076. (May) KH6AJF 762.

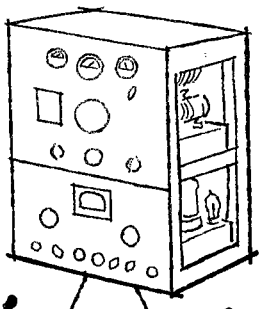
SANTA CLARA VALLEY — SCM, Roy I. Couzin, W6LZL — Field Day is over but the memory lingers on as the clubs are amassing scores to see who in the area will be the proud holder of the plaque offered by the Central California Radio Council. The SCCARA is preparing an exhibit for the Santa Clara County Fair. LZL is the exhibit chairman. AEV, the SEC, reports that the north end of the section needs revamping as there is too much area for one EC, so reorganizing is in order to relieve QIE, who is doing a swell job under the handicap. We were real sorry to get the report that Louis Pierri, ex-W6DL, was killed in an air accident. FKG still is very busy in his home QTH where he has his transmitting tube factory rebuilding b.c. station tubes. He has very little time to get on the air, but plans are in the offing and rigs will appear in the not-too-distant future. NTQ has moved into his new shack out in the garage. MMG is back from his annual trip to W1-Land and mentioned that he met YHC in Dayton, Ohio. He is a captain for TWA and now is stationed in Detroit. While back home MMG got his younger brother interested in ham radio. HC is especially busy with college work so will have to confine his efforts as Net Control to two nights a week. Harry was elected secretary of the Pacific Area Staff, and is a candidate for vice-director of the Pacific Division. Traffic: (Aug.) W6OFJ 1437, HC 259, AIT 2, MMG 2. (July) W6OFJ 1329.

EAST BAY — SCM, Ray H. Cornell, W6JZ — Asst. SCMs: Guy Black, 6RLB; Harry T. Cameron, 6RVC. SEC: WGM. RMs: IPW, JOH. PAM: LTI. ECs: AKB, CAN, CX, DNX, FLT, NNS, QDE, TCU. A section meeting was held at the Albany City Hall on Aug. 25th to discuss fall activities. JDD gave an impressive demonstration of transistors to the EBRC at the September meeting. VSV and MXQ demonstrated microwave techniques to the SARO. The So. Alameda County C.D. gang covered a "Mock Disaster" in Castro Valley on Sept. 13th. Why don't you join in the fun by volunteering your services? The gang meets the 1st and 3rd Tue. Call BNB for further information. The Solano County Emergency Net, SCEN, meets on 28.62 Mc., 1900 PST, Thurs. The NBARA would like to have any spare junk parts for a beginners' class. Capt. Walt Hunter, custodian of K6FAL, was lost in the recent B-36 crash in the Atlantic. His passing comes as a great shock to his many friends in this section. ATM runs a code and theory class at Vallejo Evening College. KN6BAS retransmits the Mon. and Fri. night code transmissions of JZ on 146.25 Mc. at 1830. K6FAL has a BPL card for every month this year and hopes to make it a clean sweep. YDI is well settled in his new QTH at Martinez. RLB has returned from his Eastern vacation feeling fit, fat, and thirty. CX, GSR, JIG, JZ, LYL, NHY, PAZ, YPR, ZJX, ZLX, and ZRH are Army MARS affiliates. Heard on 75-meter s.s.b.: US, YFA, RPR, QZZ, TT, PYH, and FAQ. New officers of the Northern California DX Club are JK, pres.; LW, secy.; PB, editor of *DX'er*. LDD, TT, PYH, TI, PB, QDE, and many other local DXers have QSOed the CEØAA Expedition to Easter Island, with LDD working him on three bands. KN6BRO is a new ham. DEC and CZQ are fooling with n.f.m. after all these years. AKB, CML, EKF, LL, QZ, VJN, WSH, and YDI QNI MTN regularly. SAC had a visit from KH6OR, and W6s PWR, UYX, ELW, and UZX. SAC reports regular QSOs with HZ1AB and TZ3AA. IDY and LTI worked ZL2IA on s.s.b. on 7130 kc. when the band apparently was dead. BXE worked ZL1WW on 75 meters along with MWF and URH. W6s PIR, QEN, QCM, RST, and NHT are all General Class now. PIR and QEN have Viking IIs. TLZ is attending U.C. Active mobiles in the Concord Area are MEZ, HMQ, HSY, CGS, IDY, and LTI. Traffic: K6FAL 911, W6IPW 127, JOH 79, JZ 52, YDI 2.

SAN FRANCISCO — SCM, R. F. Czeikowitz, W6ATO — SEC: NL. Phone: PL 5-6457. Congratulations to the new SCM of this section, the well-known and well-liked Walter Buckley, W6GGC, who was elected on an unopposed nomination. Please give him full coöperation and above all, send in news of your club and individual doings. This

(*Continued on page 98*)

for Peak Performance...



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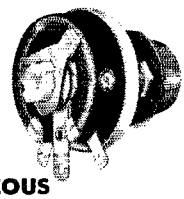

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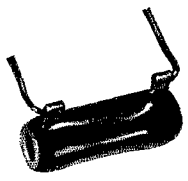

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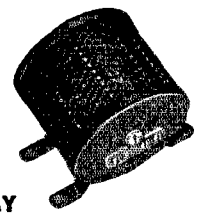
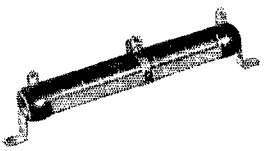
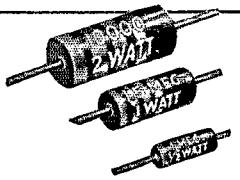


DUMMY ANTENNA RESISTORS
Practically non-reactive within recommended range. 100-250 Watts. 52-600 Ohms.

FREQUENCY-RATED PLATE CHOKES
It's easy to select the right unit for all frequencies. Seven sizes, 3 to 520 mc.



DIVIDOHM® ADJUSTABLE RESISTORS
Wire-wound, vitreous-enameled. Adjustable lugs. Seven sizes—10 to 200 watts.



LITTLE DEVIL® COMPOSITION RESISTORS
Tiny, rugged, insulated units, clearly marked for resistance and wattage. ½, 1, and 2 Watts.

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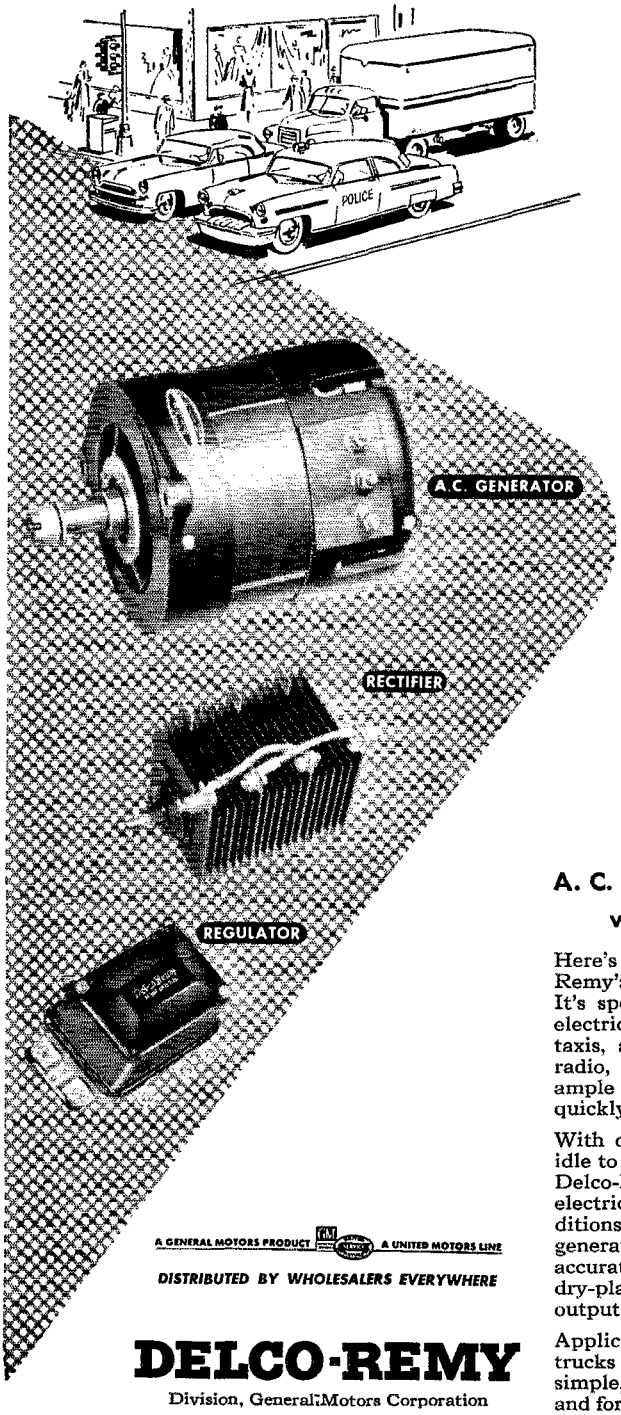
is my last report as SCM and I wish to extend thanks to all the many friends, from San Francisco to Eureka, and beyond the bounds of this section, who have helped to make the job efficient and enjoyable. My term actually expired in April of 1952, but in the absence of nominations for others, I agreed to continue the work on an interim basis, and have done so up to nearly four years in all. Wally, your new SCM, lives at 36 Colonial Way, San Francisco, and can be reached at JUniper 7-4902. He is active on the Mission Trail Net and his radio shack is impressively filled with equipment. Congratulations to SWP, who again has come through for a Brass Pounders League certificate with a traffic total of 504 for August. Pat is our most reliable and consistent ORS. He regularly checks in on SJVN, RN6, BAN, PAN, and occasionally on LSN, SBN, and RN7. In his spare time (?) he handles MARS traffic. HJP, presently signing DL4AY, writes in to state that he wishes he were on Golden Gate Heights in San Francisco again. He is Major Art Monsees, with the 602nd AC&W Sqdn., APO 34, New York. UNF is back on the air with a 900-watt final. An Emergency Corps 2-meter net has been completed from Central California to San Diego, and with CHP, as NCS, recently handled a message from San Francisco to San Diego and received a reply in 18 minutes — 2 meters all the way — CHP to AJF, at Sonoma, to Fresno, to Bakersfield, to Taft, to Los Angeles, to San Diego, where BYE received and replied, with GD and others helping where needed. NCS duty rotates every two weeks. They are now working on the extension of the net to the northward, but at present cannot handle beyond Sacramento. Their long range plan is a 2-meter net all the way to the East Coast. The Marin Radio Club, with the able assistance of Tamalpais Club members OZC and MWF, as well as MTN, handled a radio booth at the Marin County Fair and Home Show at San Rafael, using a Viking I, an HQ-129X, and a 348Q. 75-meter 'phone was used with the call QNB 6, and credit for the work goes to W6s DKH, BAP, JTP, QNB, KYQ, and RQT, K6s BU and AKV, and KN6BDS. Best luck and DX to all. Traffic: W6SWP 504, ATO 5, BIP 4.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — Asst. SCMs: Ronald G. Martin, 6ZF; William van de Kamp, 6CKV. SEC: AVZ. New licensees in the Chico Area are KN6BMU, BWF, BXD, and K6BSY, with KN6BDI of Willows. K6BH now is W6BXD. ACN is active in Oroville. SXF is building a new shack. KN6BCY, BTY, and BUL are new hams in Redding. K6AKF has a new 15-watt c.w. rig; also he is doing very well on 75-meter 'phone with from 3 to 7 watts. The Red Bluff gang visited the Shasta County Radio Club Aug. 3rd. TMP gave a run-down on antenna feeders. PTX has a new 75-meter 'phone. OJB is working San Mateo on regular 2-meter schedule. HVB handles c.w. traffic for the Redding Area. The new OBS for the Redding Area is K6AKF. BIL has 137 countries worked and 134 confirmed; also he works 7.2-Mc. mobile. TYC would like to see all the 'phone nets at one end of the band so that those who want to ragchew can be at the other end. OPY is doing traffic work. ASI is rebuilding with 250THs. CIS contemplates rebuilding or buying a new Viking II. ZF is rebuilding final single-ended pi-coupling output with 4–400A. IEO has applied for ORS appointment. The Sacramento Amateur Radio Club had a turnout of 45 members and visitors to hear a report on Field Day. The club made 3363 points. ETD has the club rig pretty well built and is constructing the modulator. Action is being taken to obtain BVK as a club call. North Sacramento is forming a new radio club. AVZ is the new SEC. I hope you will give him your fullest support as Cliff is doing a wonderful job. At this time I want to thank KME, the former SEC, for a wonderful job while in office. OPY is active on 80-meter c.w., which includes the San Joaquin C.W. Net and the Mission Trail C.W. Net. AHN is going on 144 Mc. CIX is DXing with 60 watts and an indoor antenna. The CCD Net meets Mon. night on 3501 kc. CLV is on 40-meter c.w. with 6L6 and also is on CCDN. K6FAV has a code class of 18 students at McClellan. AK is on 75-meter 'phone with 1 kw. ASE is working hard on a mobile unit. BHX (WN6) is studying hard for General Class. CDG is active on c.d. nets. IAZ is QRL Mission Trail and MARS Nets. REF is a new MARS member. ROO is c.w. all bands. QDT will have his 20-meter s.s.b. rig on soon. VBI finally licked his TVI. HIR is active again on 80-meter c.w. NGG is active on MARS at Mathers Field. LRW has a full wave on 80-meter c.w. 130 foot high. QKJ is building a new mobile for next year's Field Day. DDC converted his Gonset Tri-band so that he now is on 40-meter 'phone. I understand FKI is on 40-meter mobile.

SAN JOAQUIN VALLEY — SCM, Edward L. Bewley, W6GIW — SEC: KRO. RM: EXH. SJVN has been operating without the able guidance of EXH, Net Manager, since he was stricken with a heart attack early in the month. Vic's absence left a great gap in the net, but the gang has been doing a fine job keeping the net going. We are happy to report that Vic is recovering rapidly and we hope to see him at his old post soon. Another great loss to SJVN was OPU, also stricken with illness. Ray is convalescing and on the road to rapid recovery, and soon will be back in the traffic harness. The Kern County Radio Club has moved into permanent quarters in the Bakersfield City

(*Continued on page 100*)



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Hall Annex. The City of Bakersfield has installed a 100-foot antenna pole for the Club and they plan a kw. on all bands. The KCRC also reports their pot-luck picnic held on the 30th was such a big success that they plan to make it an annual affair. The Stockton Club held its annual picnic at Calaveras Big Trees recently. The Merced Amateur Radio Club furnished communications for parade control at the Merced County Fair Parade at Merced on Aug. 29th. OHB/M was in charge of operations and mobile units participating were SQR, BUA, GIW, NDZ, ZRJ, and KN6BGM. Traffic: W6GIW 35, TXM 16, SJJ 10, BYY 5.

ROANOKE DIVISION

NORTH CAROLINA — SCM, J. C. Geasler, W4DLX — To all the North Carolina stations who took part in Hurricane Watch on the night of Aug. 13-14, let me say "well done." The Tar Heel Net was alerted early in the evening and with CVQ, at Raleigh, as NCS a fine job was done throughout the night. Compliments are extended to the following stations: In the storm area; SCS at New Bern, on emergency power at Airport; MDC, MDR, and LCV/MM in the Elizabeth City Area; MVP and NY, Wilmington; RSF, Jacksonville; LR, Washington; YDY, Aurora. Out of the storm area supporting stations: ANU, Raleigh; QDA and PZH, Shelby; WSS/M, Hickory; TLA, at Rocky Mt.; PIF, Morganton.; YPI, Winston-Salem; SGD, Fuquay; and numerous other stations around the State whose calls I do not have. Let me also thank all the East Coast stations for leaving the frequency clear for us to operate. RXI, North Belmont, reports two nice rigs; one with 813 final and one with 24G final and Command equipment on emergency power. He's been burning up 80 and 40 meters. VTO, Balsam, has a Viking II on the air. NHW, MKT, and ZXI, Winston-Salem, are working regularly on 2 meters and looking for more stations. NCN has begun regular skeds on 3605 kc. at 7 P.M. Stations interested in c.w. traffic, should check in with AKC. There are now six more 75-meter mobiles in Charlotte. SGD, to date, has 222 mobile stations in her log. Traffic: W4AKC 199, VHH 24, DLX 8.

SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — New officers of the Naval Base Radio Club are 1AUD, pres.; 4DOW, secy. New officers of the Palmetto Radio Club are CEL, pres.; MAP, vice-pres.; BXI, secy. and treas.; BJI and UVM, directors. TTG attended the Atlanta Hamfest and expects to be on 75-meter mobile soon. BNN expects to be on 75 meters from Dillon soon. The Charleston Chess Club will battle the Clemson Chess Club in a tournament scheduled for Oct. 28th, with FFH and YOS furnishing communications. ULH is new on mobile from Florence. The following mobiles reported into the S. C. Mobile Roundup at 1430 Sundays during August: ANK, ABW, BIZ, DX, DXW, NJG, NQP, SZG, TPE, TWW, UPK, ULH, and ZVY. ILQ has a telephone pole on which he is installing a 20-meter beam. DX is getting excellent results with his "hot rod" mobile antenna on 75 meters. BJE has built a shack in his back yard and, although newly released from the Air Force, he has his emergency gear ready. The South Carolina C.W. Net meets at 7 P.M. Mon. through Fri. on 3525 kc. and all c.w. stations are invited to attend. Traffic: W4FFH 104, ANK 49, FMI 4, TTG 4.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF — Before leaving for college ZFV made a very good summer record with area, regional, and state nets. KFC reports that he will be unable to be as active as usual because business takes him out of town quite frequently. The duties of NCS on Monday evenings therefore will be handled by UHG, whose attendance and punctuality has always been 100 per cent. FF has moved from Virginia and is ineligible to continue as SCM. The new QTH is Deale, Md., 20 miles south of Annapolis on the Chesapeake. Retirement from active every-day work requiring complete rest because of a heart condition forced the change. ZFV will be missed by VN, 4RN, EAN, and CAN. TLC can count on him again in the summer. KFC is new prexy of PVRC with CC, secy. SVARC reports that lightning paid a visit to the shack and obliterated both receiver and transmitter. 6FMZ/4, ex-3IVT, 7FTL, and 6FMZ/C6, now resides at Norfolk and sports the latest ORS appointment. WN4ACC is another graduate from SVARC efforts to foster the Novice instruction classes. Let's have more of the same. Virginia sure has profited from that type of activity. The nets are teeming with former Novices who are away out in front of some old-timers in QNI, speed, and efficiency. YZC, the son of YE, formerly SCM of Alabama and Georgia, recently was graduated from the Novice ranks and is the proud possessor of 25-w.p.m. certificate as well as OBS and ORS appointments. KH6OR, prominent Honolulu ham DXer, visited with PVRC. Tune in on 3680 kc. each Fri. at 2000 hours for special bulletins and information transmitted via 4USN and occasionally by LW and 6BVY/4. WBC and VQZ have ventured on 40-meter 'phone with promises or threats (?) to try 80 meters. Traffic: W4ZFV 292, RJW 97, JAQ 76, LNX 59, KX 53, SHJ 46, TFZ 28, JAU 23, GR 20, CFV 17, LW 14, TYC 14, LJE 12, UWS 11, OWV 9, W8LGF/4 9, W4UHG 5.

(Continued on page 102)

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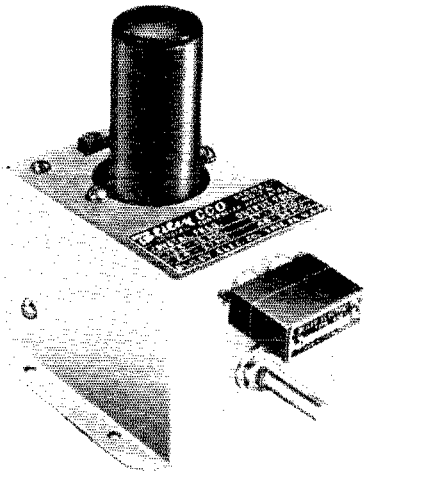


AMATEUR FREQUENCIES • CRYSTAL FILTERS • STANDARD FREQUENCIES				
CODE	TYPE	APPLICATION	TOLERANCE	PRICE
E10	KV3	reference frequency 100 kc	±.005%	$ 7.95
E11	MS433	reference frequency 1000 kc	±.005%	17.00
E13	MC9	13.6275 mc (multiplier to 27.255 mc) CITIZENS' RADIO SERVICE (CLASS "C")	±.04%	$ 5.50
E14	CF3	455 kc—456 kc—465 kc Single Signal Filters	±5 kc	5.00
E15	CF6	455 kc—456 kc—465 kc Single Signal Filters	±5 kc	4.50
AMATEUR FREQUENCIES AND PACKAGED OSCILLATORS				
E16	CCO-2A	packaged oscillator for 2-6-10-11 meters	.....	11.95
E17	AX2	1803-1822 kc; 1878-1897 kc; 1903-1922 kc; 1978-1997 kc	±1 kc	3.75
E18	AX2	3500-3997 kc	±5 kc	2.95
E19	AX2	7000-7425 kc; 8000-8222 kc	±5 kc	2.95
E20	AX2	12.5-13.61 mc; 14-14.85 mc	±30 kc	3.95
E21	AX3	24-24.33 mc; 25-25.5 mc	±5 kc	3.95
SPOT FREQUENCIES FOR NET OPERATION				
E22	MC9	3.0 mc-10 mc experimental frequencies	±.03%	$ 4.80

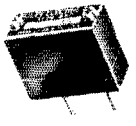
KV3
CODE NO. E10

MS433
CODE NO. E11

MC9
CODE NO. E13 E22

CF3
CODE NO. E14

CF6
CODE NO. E15



AX2 AX3
CODE NO. 17 THRU 21

DIMENSIONS

CODE	TYPE	LENGTH	WIDTH	THICKNESS	PIN SIZE	PIN SPACE
E10	KV3	1 9/32"	1 3/16" (dia.)	...	.093"	.486"
E11	MS433	1 31/32"	1 25/64" (dia.)	...	.093"	OCTAL
E13	MC9	1 11/64"	13/16"	7/16"	.093"	.486"
E14	CF3	1 13/32"	1 3/16"	3/4"	.125"	.750"
E15	CF6	1 7/32"	1 3/16"	.695"	.....	.....
E16	CCO-2A	2 1/4"	3 1/8"	3"	.....	.....
E17	AX2	1 5/16"	1 1/16"	7/16"	.093"	.486"
E18	AX2	1 5/16"	1 1/16"	7/16"	.093"	.486"
E19	AX2	1 5/16"	1 1/16"	7/16"	.093"	.486"
E20	AX2	1 5/16"	1 1/16"	7/16"	.093"	.486"
E21	AX3	1 5/16"	1 1/16"	7/16"	.093"	.486"
E22	MC9	1 11/64"	1 1/16"	7/16"	093"	.486"

BLILEY ELECTRIC CO., UNION STATION BUILDING, ERIE, PA.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Karl Brueggeman, WØCDX — SEC: AEE. At the recent motorboat races at Sloans Lake in Denver DTV, BON, NLF, EKD, DVK, and ENQ handled the communications between the boat pits and the official starting stand. They helped keep the races running smoothly. BON now has an air-conditioned ham shack in order to keep his high-power final from boiling over. LCE has been busy with the tractor this summer with not much time for hamming. KHQ reports summer band conditions very erratic. OYS has a new Viking II and a vertical ground plane. SNH has a new 75-meter antenna and is getting the high-power 'phone rig in shape. FHD also put up a new antenna but is working low power for WAS. WSK (ex-2WSK) is monitoring 10 and 20 meters for his old W2 friends. When all other efforts to contact the addressee failed, BWJ was able to originate an emergency message to Montana which was delivered and answered in less than 24 hours. The message was routed via the FARM NET. 9JYF/Ø is on 20-meter 'phone and c.w. with a Viking II from Denver. JGW and INO have rigs on 220 Mc. Traffic: WØKHQ 956.

SOUTHEASTERN DIVISION

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — A highly successful Dade/Red Cross simulated hurricane test was held under MVR with MJK, RID, VGV, IEH, LVL, SRZ, SDI, NJM, TWG, UPA, UIW, SQA, VGT, WLX, TOJ, WSJ, UUZ, UJX, IJM, TFN, ZIR, DTJ, WYR, and 6RZH/4. Seven emergency and traffic nets now are going. Send to IM or FWZ for a schedule card. Several counties still do not have an EC. How about you? Ye ole SCM thanks you for electing him to another term. Ft. Lauderdale: EUV won the Work Florida Counties Contest. The Outboard Races went over big with communications by mobiles PPR, WFM, and VCQ. Ft. Meyers: HRA (70 years young!) uses a Globe Scout and a Bud VFO. LNE skeds the home folks to DL4s on 14 Mc. PJG mobiles with a Harvey-Wells and Gonset Super Six. New WNs are AGJ and BSW. DKJ is handling 'phone traffic with a Collins and an NC-183D. SMK built the September *QST* modulator. CQZ mobiles with an Elmac. Lakeland: New OM/XYL calls are W4BJI and WN4BGF. WN4AAQ, 15 years old, got some nice publicity with his license via UMI. Miami: S.s.b. activity includes NQN with a 10A exciter, ABU with an SS75, and IEH with a 10A and 811 final, all on 3.9-Mc. 'phone. IEH uses 75A and Signal Slicer. WN4ZMIL and W4UPA are QTH Miami. WN4AWR, 11 years old, is the son of IEH. The Johnson Bi-Net 10–20 antenna is becoming popular in Miami. For the record on OMs and XYLs, WYR belongs to DTJ and SDI belongs to MVR and not in reverse as I reported it before. The Red Cross and Dade Club have a BC-610 on loan from the police. The Red Cross purchased some new gear also and IYT and LVV rebuilt the shack (W4NVU) at the Red Cross Building. Ocala: DVR turned in a nice emergency job for Coast Guard plane-landing. Sarasota: TFP won the Springfield Mo., Hillbilly Club award for working 5 of their locals and Bill also won his award for "Ten Orlando Stations." 'Phone Net traffic: LMT reports 257 for the FPTN and TJU reports 92 for the TPTN. Traffic; W4DRD 224, PZT 214, ZIR 88, KJ 80, LMT 76, QBR 56, BMY 50, SVX 40, RWM 35, TKD 23, DVR 18, IM 14, LVV 12, VIE 11, TFP 8, FWZ 7, IYT 5, TYE 4, AYX 2.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS — SEC: PLE. YRF has increased power and is trying SG 'phone on 40 meters. ZFL is keeping 7 Mc. hot. WN4BGG is awaiting a new NC-88. BBN is a newcomer. YFF, YFG, and YFH have a new Viking II. UHH is heard fighting 7 Mc. in the A.M. 9CGO/4 is going back to Wisconsin. PQW and MS made the Delta Convention. VR is trying invisible antennas. The Eglin Club had a swell write-up in the local paper on the c.d. mobile set-up. UCY had the gang out for chow at his place and many weighty matters were settled in the bull sessions. IREV/4 is trying to clean out the Indians in his 32V-1 and has a new 75A-3 receiver. DXQ keeps things humming out on 9-mile road. WN4ZPN is keeping skeds with his son, KG6ADX, in Oklahoma. AXP is trying to improve his FB rig. AXF keeps an eye out for DX. SZH says his rig is now TVI-proof. RZV keeps the Dagwood Net going. NOX/NYZ lost the power transformer in the HQ-129X and it kept them off the air for several days. PTK keeps the mobile rig hot while the XYL, TTM, keeps the rig at home perking. NJB has an FB new QTH with a super-shack built in. SCR has moved into the Pensy Area. MFY has a swell layout in the car. DAO is strictly 75 because of TVI.

GEORGIA — SCM, James P. Born, jr., W4ZD — The Atlanta Radio Club's Hamfest, held Aug. 30th, was attended by approximately 450 hams, XYLs and jr. operators. The Viking II transmitter was won by ZRA. The Georgia Cracker Radio Club and the Georgia Cracker Net held its second meeting of the year at the Atlanta Hamfest. Attendance was good and plans were made for club and net activities for the coming year. We are all saddened to learn of the death of PJJ. Our sympathies go to WIA, whose

(Continued on page 104)

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son recently passed away. The Cedartown Radio Club's Ham Picnic was a great success with a nice crowd attending, including two old timers, spark-gap hams, 8AIR and 4IJ. ZHM has a new all-band transmitter. PBD now is in Japan and on the air with KA2EA. FBH has a new 14-Mc. beam for DX. The Cedartown Radio Club will operate portable equipment at the Polk County Fair. The Atlanta Radio Club has obtained a truck for emergency station. The truck is equipped with two all-band transmitters and receivers, emergency generators, a complete field kitchen, water tank, ice box, etc. It is to be used in the Atlanta c.d. and other emergency work in this section and will be on display at the Southeastern Fair. MTS is active on 3.85-Mc. 'phone. HYW is a new OO and is active on 7- and 14-Mc. c.w. with new finals. One of the highlights of the Atlanta Hamfest was an s.s.b. demonstration by EGK. Traffic: W4USA 2082, K4WAR 1118, W4ZD 51, OCG 24, FBH 22, MTS 18, HYW 17, IMQ 17.

WEST INDIES — SCM, William Werner, KP4DJ — SEC: KP4HZ. WP4FW visits NCS KP4ID each drill night. KP4FI reports to the 3925-kc. Net from Mayaguez. DV is OO Class II. UB obtained 2nd-class radiotelegraph license and left for California, where he is W6CYX. RM is on the air with a Globe King. TO raised three-element 20-meter beam to 60-foot tower. DJ put up new 20-meter dipole using 75-ohm kw. twin-lead feeder. Dona Maria Luisa, at Mayaguez, now is WP4WT. KE has a new Viking II. PZ has a new 20-meter folded dipole. WP4US now is KP4 and is heard on 75-meter 'phone. KD received WPR-325 endorsement, the highest ever issued. TQ is organizing the Novice Net on 3735 kc. WP4VK is a new Novice licensee at Aguadilla on 3739 kc. The first WPR–N (10 WP4 QSOs) certificates went to KD, RK, and TQ. KV4BD is NCS of the new VINET (Virgin Island Net) meeting each Wed. at 7:30 P.M. AST on 3865 kc. Asst. EC for St. Thomas is KV4AI. SK has folded dipole elements on 20-meter beam. HX has FB Williamson amplifier. HZ is consolidating his station with his sister, NL, at her QTH. MV is building 35-foot wood tower for 20-meter beam. A recent check-up during an emergency drill provided the following information on emergency-powered stations: ES, Ponce, has 3½-kw. power plant; CO, Mayaguez, has batteries and 12-volt generator; GP, Arecibo, has 500-watt power plant; RD, Manati, and PD and ZK, Ensenada, have emergency power available at sugar centrals; CP, Guayama, has arrangements with police to operate 150-B from emergency power at headquarters; DV, Caparra Heights, has 2½-kw. emergency power plant; ID, San Juan, has 500-watt emergency power plant; TO, Carolina, has 1½-kw. power plant; KV4BD, St. Croix, has 1-KVA plant auto start. VH is art editor of PRARC's bulletin, *Ground Wave*. DL/mobile is heard all the time on 3925 kc. Traffic: KV4BD 586, KP4RK 7, DJ 4, DV 2.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W6YVJ — SEC: QJW. RMs: BHG, CMN, and GJP. The PAM position still is unfilled. OESs stand at 2. BMM and CFL. Our Section Net, LSN, now run by RM BHG and Asst. NTN, has a terrific need for outlets, c.w. type, in the Metropolitan Los Angeles Area. Come on, you traffic boys, and listen to 3600 kc. at 2030 PDST for a sample of our c.w. net, West Coast style. The Los Angeles Area Radio Club Council had one regular and one special meeting in August and went on record as approving the education of ARRL members in matters concerning League activities. The Rio Hondo Radio Club in Whittier, RRL as president and KN6AIM as secretary, has applied for ARRL affiliation. The Whittier Radio 50 Club held its September meeting in, of all places, a wedding chapel, says LVQ. GYH renewed his ORS appointment. He has had a perfect report since March 1950 and made BPL 33 times. Cavi reports a nice vacation in North California and a good time at the Santa Clara ARA "Bar-B-Q." QJW announces the appointment of GHJ as EC for San Dimas, and UQL as EC for Temple District. AOP, Los Angeles EC, has had appointment renewed. QJW was portable 6 in Blue Gorge of San Joaquin while on vacation. TDW is golden trouting. FSE has gone high power. The 2 Meter and Down Club picnic was a huge success. The BAYs are expecting. PCO is teaching code to a Novice aspirant. ONI shows a roster of 45 2-meter net members who meet Thurs. at 1200 on 146.8 Mc. "Correction please," says GEB. "I'm a student of Berkeley Campus, U. of Calif." Bill claims 110 worked and 88 countries QSL. KYV tells of 3 QSLs from CEØAA, each legitimate. MBA is an ORS candidate. NTN wants a stab at OBS on 80-meter c.w. BHG, now 2-meter mobile, works San Diego from Downey. ESR's big rig finished with a huge casualty list, including a 4–250A and 500-watt modulation transformer now used as anti-cat ammunition. COZ comes across with another swell copy of *QRM* and reports the TCARA is conducting lots of 10-meter transmitter hunts. PMS celebrated his birthday on 75-meter 'phone. HKD, now sporting an Elmac, is constructing a ground place for 10 meters to match. BLY says that the Whittier Radio 50 Club members all signed up in RACES. The club station is 6HGY at the City Hall. AM worked CEØAA on 7 bands, including the

(*Continued on page 106*)

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only 3.8-Mc. U. S. A. QSO. PZN uses ground plane on 40 meters for DX. OKD is building a three-element beam. MU is working on new 40-75 antenna. LY is OK now after a tonsilectomy. Mr. and Mrs. PIB and the rest of the American Legion Net held their picnic in Griffith Park. Traffic: (Aug.) W6KYV 2228, MBA 285, LYG 284, NTN 192, NCP 177, HLZ 158, GYH 146, CAK 132, NLM 78, BHG 68, K6EA 32, W6ESR 29, HIF 22, COZ 19, GJP 18, HKD 14, BLY 13, AM 8, CBO 7, PZN 4. (July) W6CDU 6, CK 4.

ARIZONA — SCM, Albert Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; Dr. John A. Stewart, 7SX. SEC: OIF. RM: JGZ. PAM: KOY. Arizona 'Phone Net: Tue. and Thurs. 7 P.M. 3865 kc. Arizona C.W. Net: Nightly 8 P.M., 3515 kc. Novice Net: Tue. and Thurs. 6 P.M., 3704 kc. The month of August saw the reorganization of all the Phoenix clubs into one large club, the Arizona Amateur Radio Club, and will include members from Phoenix and surrounding communities. Officers are OYD, pres.; IRX, vice-pres.; Ruth (no call), secy.; MWQ, treas. Meetings will be held the 1st and 3rd Thurs. of each month. In addition to the above officers the board of directors includes KOY, MAE, and OIF. The Arizona C.W. Net will start operation Sept. 15th with JGZ and others in control on 3515 kc. K7FAG is conducting ICW code practice Thurs. at 6:30 P.M. on 29,000 kc. at speeds of 5, 10, 15, 20, and 25 w.p.m. New Novice calls are STV, TZU, UBW, UCB, UEH, ULN, and ULP. New General Class: UNO, RJH got 35-w.p.m. sticker. ACD has a new Collins KW. NGJ is mobile on 75 meters. MJT left for Asmara and will have ET2 call. 5RDB/7 left for French Morocco and will be on 20 meters. JOK now is 5BAG in Alamagordo, N. Mex. IRX and LVR have 75-meter mobile. ROZ is off the air because of loss of power plant. SUI is back in Phoenix. Traffic: W7KOY 110, IRX 34, LVR 14.

SAN DIEGO — SCM, Edgar M. Cameron, jr., W6FJH — Asst. SCMs: Thomas H. Wells, 6EWU; Shelley E. Trotter, 6BAM; Richard E. Huddleston, 6DLN. SEC: VFT. Asst. SECs: FOP, WYA. ECs: DEY, HRI, QJH, SK. PAM: JPM. JPM is thinking of building a 600-watt rig. Ben, who is chief operator at IAB, and his XYL were blessed with a baby girl. Ben tells us Sam, from KA2MB, will be new chief operator at IAB. FCT is back in with the old gang, the Orange County Club. CHV had a three-week tour of duty at Douglas Aircraft. FJH is on all-band mobile, including 2 meters, and is active in the AREC. UJO and QBM are checking into the AREC Net on 3825 kc. now. CAE de-TVIed the rig just in time to work CE9AA, Easter Island. SDM recently visited the Santa Ana group; UEF will be on with a 500-watt c.w. outfit soon; ORR is building slug of two-meter beams; PM has been ill but will be back shortly. BGL is on 40-meter 'phone. LRB checks into San Diego AREC 3825-kc. Net from new QTH, Redondo Beach. The high school gang at IAC will be burning holes in the ether by the time this hits the section news. The boys at IAC will be on 2 meters also. The San Diego clubs collaborated nicely in promoting gear and operators for the San Diego Hobby Show. Thanks again to BOS for the loan of the new HT-20 and 75A-2. VFT showed Helix Club Field Day slides at the club meeting. UJO is on all bands with self-built Viking II. QBM has v.f.o. for the rig. GDG has been in nightly contact with 9GRN, Indianapolis, on 20-meter 'phone for QSPs to sick dad there. WYA, PKV, and SEG did a splendid job of engineering the 10-meter transmitter hunt. IOK won first prize. Traffic: (Aug.) W6IAB 3044, ELQ 7, FCT 6. (July) W6IAB 5413, JPM 8.

SANTA BARBARA — Vincent J. Haggerty, W6IOX — Those seeking code practice may copy official bulletins transmitted by DTY, 7175 kc., Sat. and Sun. at 1:30 P.M. Speeds of from 7 to 10 w.p.m. are used with transmissions up to 45 minutes' duration. KN6BUD is a new ham in Oxnard. OXJ and K6ASB are new ORS appointees. K6NBI reports from Santa Maria. YCF reports the SLO Radio Club had a fine turnout at its picnic held at Morro Bay. DLR is the sole reporter from the City of Santa Barbara. Let's hear from more of you. Traffic: K6NBI 58, W6YCF 21.

WEST GULF DIVISION

NORTHERN TEXAS — Acting SCM, T. Bruce Craig W5JQD — SEC: QHI. PAM: IWQ. RM: PCN. VIM reports ex-W5OBE is back after 2 years as a W2 and now is a transistor expert. TFB and K5FFB made BPL in August. Your Acting SCM held an interesting meeting with the Kilocycle Club of Fort Worth. MTEN is trying a new roll call method. TLW reports the Wichita Falls Club is being rejuvenated. RRM renewed OPS appointment. QDF is chief operator at KG6FAA on 40 meters for early morning skeds to Texas. His home QTH is Clarendon. TCD writes of a hidden transmitter hunt on 10 meters in Fort Worth. MBP and the net are trying to keep 160 meters active. VMF reports activities as OPS and OBS, also a 10-meter ground-wave net for the Dallas Area at 2000 hours each Mon. Fairs are reported to be giving amateurs a chance to get publicity in NTS. UCQ has a new daughter. The Dallas Caravan Club Sheriffs Reserve card is really nice. BFK is a new call in West Texas. RYC is mobile again, roaming between Lubbock and Eastern points. RRA is heard frequently mobile on 75 meters.

(*Continued on page 108*)

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S63N • Std. 6m 3-El. (No T), $12.95. 1 — 8' Boom, ¾" Alum. Tubing; 3 — 6' Center Elements, ¾" Alum. Tubing; 6 — 2' End Inserts, ⅝" Alum. Tubing; 1 — Beam Mount.

S63T • Std. 6m 3-El. T match, $14.95. 1 — 8' Boom, ¾" Alum. Tubing; 3 — 6' Center Elements, ¾" Alum. Tubing; 6 — 2' End Inserts, ⅝" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

D63N • DeLuxe 6m 3-El. (No T), $21.95. 1 — 8' Boom, 1" Alum. Tubing; 3 — 6' Center Elements, 1" Alum. Tubing; 6 — 2' End Inserts, ¾" Alum. Tubing; 1 — Beam Mount.

D63T • DeLuxe 6m 3-El. T-match, $24.95. 1 — 8' Boom, 1" Alum. Tubing; 3 — 6' Center Elements, 1" Alum. Tubing; 6 — 2' End Inserts, ¾" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

S64N • Std. 6m 4-El. (No T), $16.95. 1 — 12' Boom, 1" Alum. Tubing; 4 — 6' Center Elements, ¾" Alum. Tubing; 8 — 2' End Inserts, ⅝" Alum. Tubing; 1 — Beam Mount.

S64T • Std. 6m 4-El. T match, $19.95. 1 — 12' Boom, 1" Alum. Tubing; 4 — 6' Center Elements, ¾" Alum. Tubing; 8 — 2' End Inserts, ⅝" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

D64N • DeLuxe 6m 4-El. (No T), $25.95. 1 — 12' Boom, 1" Alum. Tubing; 4 — 6' Center Elements, 1" Alum. Tubing; 8 — 2' End Inserts, ⅞" Alum. Tubing; 1 — Beam Mount.

D64T • DeLuxe 6m 4-El. T match, $28.95. 1 — 12' Boom, 1" Alum. Tubing; 4 — 6' Center Elements, 1" Alum. Tubing; 8 — 2' End Inserts, ⅞" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

S102N • Std. 10m 2-El. (No T), $11.95. 1 — 5' Boom, ¾" Alum. Tubing; 2 — 6' Center Elements, ¾" Alum. Tubing; 4 — 6' End Inserts, ⅝" Alum. Tubing; 1 — Beam Mount.

S102T • Std. 10m 2-El. T match, $14.95. — 5' Boom, ¾" Alum. Tubing; 2 — 6' Center Elements, ¾" Alum. Tubing; 4 — 6' End Inserts, ⅝" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

D102N • DeLuxe 10m 2-El. (No T), $18.95. 1 — 5' Boom, 1" Alum. Tubing; 2 — 6' Center Elements, 1" Alum. Tubing; 4 — 6' End Inserts, ⅞" Alum. Tubing; 1 — Beam Mount.

D102T • DeLuxe 10m 2-El. T match, $21.95. 1 — 5' Boom, 1" Alum. Tubing; 2 — 6' Center Elements, 1" Alum. Tubing; 4 — 6' End Inserts, ⅞" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

S103N • Std. 10m 3-El. (No T), $16.95. 1 — 8' Boom, ¾" Alum. Tubing; 3 — 6' Center Elements, ¾" Alum. Tubing; 6 — 6' End Inserts, ⅝" Alum. Tubing; 1 — Beam Mount.

S103T • Std. 10m 3-El. T match, $18.95. 1 — 8' Boom, ¾" Alum. Tubing; 3 — 6' Center Elements, ¾" Alum. Tubing; 6 — 6' End Inserts, ⅝" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

D103N • DeLuxe 10m 3-El. (No T), $22.95. 1 — 8' Boom, 1" Alum. Tubing; 3 — 6' Center Elements, 1" Alum. Tubing; — 6' End Inserts, ⅞" Alum. Tubing; 1 — Beam Mount.

D103T • DeLuxe 10m 3-El. T match, $25.95. 1 — 8' Boom, 1" Alum. Tubing; 3 — 6' Center Elements, 1" Alum. Tubing; 6 — 6' End Inserts, ⅞" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

S104N • Std. 10m 4-El. (No T), $21.95. 1 — 12' Boom, 1" Alum. Tubing; 4 — 6' Center Elements, ¾" Alum. Tubing; 8 — 6' End Inserts, ⅝" Alum. Tubing; 1 — Beam Mount.

S104T • Std. 10m 4-El. T match, $24.95. 1 — 12' Boom, 1" Alum. Tubing; 4 — 6' Center Elements, ¾" Alum. Tubing; 8 — 6' End Inserts, ⅝" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

D104N • DeLuxe 10m 4-El. (No T), $27.95. 1 — 12' Boom, 1" Alum. Tubing; 4 — 6' Center Elements, 1" Alum. Tubing; 8 — 6' End Inserts, ⅞" Alum. Tubing; 1 — Beam Mount.

D104T • DeLuxe 10m 4-El. T match, $30.95. 1 — 12' Boom, 1" Alum. Tubing; 4 — 6' Center Elements, 1" Alum. Tubing; 8 — 6' End Inserts, ⅞" Alum. Tubing; 1 — T Match (4'), Polystyrene Tubing; 1 — Beam Mount.

HOW TO ORDER: Remit by check or money-order. We ship immediately by Railway Express, charges collect; foreign shipments cheapest way. 10 day unconditional money-back guarantee.

15 M. BEAMS

S152N • Std. 15m 2-El. (No T), $19.95. 1 — 12' Boom, 1" Alum. Tubing; 2 — 12' Center Elements, ¾" Alum. Tubing; 2 — 5' End Inserts, ⅝" Alum. Tubing; 2 — 7' End Inserts, ⅝" Alum. Tubing; 1 — Beam Mount.

S152T • Std. 15m 2-El. T match, $22.95. 1 — 12' Boom, 1" Alum. Tubing; 2 — 12' Center Elements, ¾" Alum. Tubing; 2 — 5' End Inserts, ⅝" Alum. Tubing; 2 — 7' End Inserts, ⅝" Alum. Tubing; 1 — T Match (6'), Polystyrene Tubing; 1 — Beam Mount.

D152N • DeLuxe 15m 2-El. (No T), $29.95. 1 — 12' Boom, 1" Alum. Tubing; 2 — 12' Center Elements, 1" Alum. Tubing; 2 — 5' End Inserts, ⅞" Alum. Tubing; 2 — 7' End Inserts, ⅞" Alum. Tubing; 1 — Beam Mount.

D152T • DeLuxe 15m 2-El. T match, $32.95. 1 — 12' Boom, 1" Alum. Tubing; 2 — 12' Center Elements, 1" Alum. Tubing; 2 — 5' End Inserts, ⅞" Alum. Tubing; 2 — 7' End Inserts, ⅞" Alum. Tubing; 1 — T Match (6'), Polystyrene Tubing; 1 — Beam Mount.

S153N • Std. 15m 3-El. (No. T), $26.95. 1 — 12' Boom, 1" Alum. Tubing; 3 — 12' Center Elements, ¾" Alum. Tubing; 2 — 5' End Inserts, ⅝" Alum. Tubing; 2 — 6' End Inserts, ⅝" Alum. Tubing; 2 — 7' End Inserts, ⅝" Alum. Tubing; 1 — Beam Mount.

S153T • Std. 15m 3-El. T match, $29.95. 1 — 12' Boom, 1" Alum. Tubing; 3 — 12' Center Elements, ¾" Alum. Tubing; 2 — 5' End Inserts, ⅝" Alum. Tubing; 2 — 6' End Inserts, ⅝" Alum. Tubing; 2 — 7' End Inserts, ⅝" Alum. Tubing; 1 — T Match (6'), Polystyrene Tubing; 1 — Beam Mount.

D153N • DeLuxe 15m 3-El. (No T), $36.95. 1 — 12' Boom, 1" Alum. Tubing; 3 — 12' Center Elements, 1" Alum. Tubing; 2 — 5' End Inserts, ⅞" Alum. Tubing; 2 — 6' End Inserts, ⅞" Alum. Tubing; 2 — 7' End Inserts, ⅞" Alum. Tubing; 1 — Beam Mount.

D153T • DeLuxe 15m 3-El. T match, $39.95. 1 — 12' Boom, 1" Alum. Tubing; 3 — 12' Center Elements, 1" Alum. Tubing; 2 — 5' End Inserts, ⅞" Alum. Tubing; 2 — 6' End Inserts, ⅞" Alum. Tubing; 2 — 7' End Inserts, ⅞" Alum. Tubing; 1 — T Match (6'), Polystyrene Tubing; 1 — Beam Mount.

20 M. BEAMS

S202N • Std. 20m 2-El. (No T), $21.95. 1 — 12' Boom, 1" Alum. Tubing; 2 — 12' Center Elements, 1" Alum. Tubing; 4 — 12' End Inserts, ⅞" Alum. Tubing; 1 — Beam Mount.

S202T • Std. 20m 2-El. T match, $24.95. 1 — 12' Boom, 1" Alum. Tubing; 2 — 12' Center Elements, 1" Alum. Tubing; 4 — 12' End Inserts, ⅞" Alum. Tubing; 1 — T Match (8'), Polystyrene Tubing; 1 — Beam Mount.

D202N • DeLuxe 20m 2-El. (No T), $31.95. 2 — 12' Booms, 1" Alum. Tubing; 2 — 12' Center Elements, 1" Alum. Tubing; 4 — 12' End Inserts, ⅞" Alum. Tubing; 1 — Beam Crosspiece, 1" Alum. Tubing; 1 — Beam Mount.

D202T • DeLuxe 20m 2-El. T match, $34.95. 2 — 12' Booms, 1" Alum. Tubing; 2 — 12' Center Elements, 1" Alum. Tubing; 4 — 12' End Inserts, ⅞" Alum. Tubing; 1 — T Match (8'), Polystyrene Tubing; 1 — Beam Crosspiece, 1" Alum. Tubing; 1 — Beam Mount.

S203N • Std. 20m 3-El. (No T), $34.95. 1 — 12' Boom, 1" Alum. Tubing; 3 — 12' Center Elements, 1" Alum. Tubing; 6 — 12' End Inserts, ⅞" Alum. Tubing; 1 — Beam Mount.

S203T • Std. 20m 3-El. T match, $37.95. 1 — 12' Boom, 1" Alum. Tubing; 3 — 12' Center Elements, 1" Alum. Tubing 6 — 12' End Inserts, ⅞" Alum. Tubing; 1 — T Match (8'), Polystyrene Tubing; 1 — Beam Mount.

D203N • DeLuxe 20m 3-El. (No T), $46.95. 2 — 12' Booms, 1" Alum. Tubing; 3 — 12' Center Elements, 1" Alum. Tubing; 6 — 12' End Inserts, ⅞" Alum. Tubing; 1 — Beam Crosspiece, 1" Alum. Tubing; 1 — Beam Mount.

D203T • DeLuxe 20m 3-El. T match, $49.95. 2 — 12' Booms, 1" Alum. Tubing; 3 — 12' Center Elements, 1" Alum. Tubing; 6 — 12' End Inserts, ⅞" Alum. Tubing; 1 — T Match (8'), Polystyrene Tubing; 1 — Beam Crosspiece, 1" Alum. Tubing; 1 — Beam Mount.

NEW! VEE-D-X BEAM ROTATOR

Rotates full 365 degree traverse at the flick of your finger. Positive control with no over travel assures that you beam directly in desired direction for maximum signal strength. Tempered, long life gearing, positive mast alignment, easy mounting, guyed at top for extra strength. Rugged and powerful, will support 200 lbs. Decorator designed control console provides instantaneous reversible action, ever-dependable compass indication. **Price, $29.95.**

GOTHAM HOBBY 107 E. 126 Street New York 35, N. Y.

MARS members have been warned to keep active or be dropped. PCN is new RM in NTS. SZQ has converted a city bus to an emergency communications unit for the South Plains Area. Club TVI committees are important: be sure to cooperate with yours. Glad to hear KRZ back and active on 75 meters. KBU is new NCS for NWTEN on 3950 kc. at 8 A.M. Sun. VFH is his assistant. TJE is a new OBS in Dallas. Traffic: W5TFB 528, K5FFB 508, W5UFP 108, PAK 98, TLW 24, RRM 19, TYX 17, JQD 16, VMF 2.

OKLAHOMA — SCM, Jesse M. Langford, W5GVV — Asst. SCM: Ray A. Thacker, 5TFP. SEC: AGM. RM: MQI. PAMs: SVR and ROZ. JCW has been vacationing in Colorado and plans to finish in Arkansas. RST returned safely from his trip. SCX reports August 2-meter DX openings nil. The Oklahoma C.W. Net now is open and the activity so far has been good. All are invited to participate whenever possible. EZK is at home but recovering from his illness very slowly. GOL is back on the air. TKE, VHP, and UGO are in school at A. & M. and we hope they will report in as often as their studies will let them. GGK is operating areonautical mobile. The Areo Center Radio Club threw a barbecue and suds-bust Aug. 26th. The Club will sponsor a state hamfest to be held Nov. 15th. TKS made WAS after a long struggle. AXF, of Norman, passed away of a heart attack while in Ardmore. NGE has new 20-meter beam. PMT now is a MARS member. GZK has been occupied with his ranch to the determent of his amateur activities. The station of the Enid Club is being rebuilt to include a pair of 813s in the final. Activity reports have dropped off and this is to remind you that the section needs them whether you handled one or one hundred messages, so send them in each month by the fifth. Net certificates will be sent all participating in State Nets upon request. Traffic: W5MQI 62, KY 41, SVR 38, VQO 28, MFX 19, FEC 17, PML 17, TFP 17, GVV 16, EHC 14, SWJ 14, RST 10, ADC 9, TKS 5, ESB 4.

SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — The Brazoria County ARC is applying for affiliation with ARRL. UUK has worked 62 countries, 130 watts to ground-plane antenna, in 5 months on 14-Mc. c.w. The State Fair of Texas designated Oct. 11th as "Amateur Radio Day." The DARC and Caravan Club of Texas had a program. JQY was chairman. TPF is a new EC who is doing an FB job up in Lufkin. The North Texas Traffic Net needs some outlets in Southern Texas. Please contact TFB, mgr. of NTX. AYX has a 696 and ½-wave doublet. PDE is working 75 meters and conducting tests on 40 meters. RYZ is increasing power on his mobile using 6-volt generator to charge 12-volt battery. MMO is going mobile. WN5AMM, the son of RJW, is a new Novice with a pair of 6L6s on 80-meter c.w. RJW is carrying on his routine ragchewing on 75 meters. JIQ is an engineer at KMCO and has a rig at the transmitter working 75 meters and building a mobile. At a recent meeting of the GCARA, OCG was elected pres.; VUS, vice-pres.; PTV, secy. The Club held a banquet at Bostick's. Mr. McKinney, of the FCC, gave a very good talk on TVI. BGR is working hard and is on 75 meters. JRV is working 15 and "operating" on plant equipment. NSK has a new jr. operator and mobile. OGG works for R.C.A. PMS missed the banquet. Someone please put up a good antenna for PTV. TOM paid a year's dues in advance. ULN is back on 40 meters and obtaining Phil Rand's book on TVI. VUS, calling CQ N.O. on 3900 kc. at noon, soon will be calling CQ N.Y. on 160. WVI is pouring the coal to an 813 — also his hot rod. WXU also has no antenna. String one up for him, too. WN5WYR is firing up a Globe Trotter. YBL is testing mobile rig. FJF has his new 24V system and mobile going. Traffic: (Aug.) W5MN 1550, FJF 42, (July) W5MN 808.

NEW MEXICO — SCM, G. Merton Sayre, W5ZU — SEC: MYI. PAM: BIW. RM: NKG. The youngest YL Novice in New Mexico is presumed to be Dorothy, WN5BMO of Tucumcari. She is the 12-year-old daughter of YPC. WBC sends in the first report from Silver City and is often heard on the New Mexico Breakfast Club and NMEN on 3838 kc. YWG was the hidden transmitter at Roswell Aug. 30th. RWH won the hunt. CEE reports the first AREC drill held at Hobbs Aug. 28th. He and BIH recently assisted the C.A.A. in a simulated search. WN5BAQ is a new Novice at Hobbs. RFK and RFJ are New Mexico's aeronautical mobile operators. They flew to Roy to visit RTS and MOX and kept in contact en route on MARS frequencies with an 8-watt transmitter. BIW and DRA are putting out an excellent section monthly bulletin, *CQ NM*. Active in New Mexico nets are the following husband-wife teams: MOX-RTS, LLG-YAS, RWH-ZER, RFF-RQK, and RFJ-RFK. MYI talked to the Sandia Base RC on emergency matters. FVY is in Presbyterian Hospital, Albuquerque, with a ham receiver near. TBA made a trip to Mexico on business. A Novice net is being formed to meet nightly on 3705 kc. at 7 P.W. A Caravan Club is being discussed for the State. Traffic: K5WSP 142, W5NKG 36, WPA 27, BIW 24, ZU 24, RWH 15, CEE 14, JZT 10, WBC 6.

CANADIAN DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC: FQ. EC: EK. RM: OM. Activity reports this month

(Continued on page 110)

National

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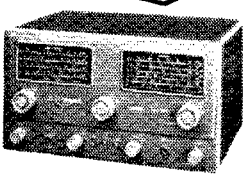


NC-88

World-Master in coverage... World Beater in value

The advanced NC-88 circuit uses 8 high-gain miniature tubes plus rectifier, covers 540kc to 40mc with calibrated bandspread for amateur bands. Built-in speaker; two IF stages; 2 audio stages with phono input and tone control; antenna trimmer; separate high frequency oscillator; sensitivity control; series valve noise limiter; delayed AVC; headphone jack . . . and other features that add valuable performance characteristics to this popular model.

NC-88 complete with tubes..... **$129.95**

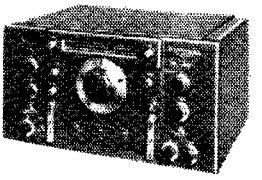
SW-54

Mighty Midget with a 7-continent "pull"

For the compact ham shack — a truly modern receiver only 11" long, 7" wide, 7" high, yet designed and built to hold a selective, sensitive chassis, a good speaker and a front panel as handy and handsome as any. Slide rule general coverage dial with police, foreign, amateur and ship bands clearly marked. Unique, adjustable bandspread. Covers 540kc to 30mc in 4 separate bands. Includes receive-standby switch, AM-CW switch, phone jack.

SW-54 complete with tubes..... **$59.95**

HRO-*Sixty*



Latest and greatest of the great HRO's!

This famous receiver gives you dual conversion on all frequencies above 7mc plus 12 permeability-tuned circuits in the three 456-kc IF stages. Other new features include current-regulated heaters in the high-frequency oscillator and 6BE6 mixer. Four panel plug-in coils cover 1.7 to 30mc; bands switch automatically when coils are plugged in. Edge-lighted, direct frequency scale shows only the band in use. Negligible drift. Provision for crystal calibrator unit and NFM. High-fidelity push-pull audio with phono input jack. Controls: Bandswitch, Oscillator, Tuning, Tone, Antenna trimmer, Dimmer, AVC, Limiter, AF gain, Calibration, CWO, Phasing, Selectivity, On-Off, RF gain, AM-NFM-Phono. Accessory socket for Select-O-Ject.

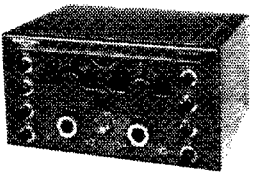
HRO-60T Table Model, complete with tubes, less speaker..... **$533.50**
Includes 4 coils, A, B, C, D, for 1.7 to 30mc.

HRO-60R Rack Model, supplied as above..... **533.50**
Other coils, covering broadcast, marine and other commercial and amateur bands, available.

HRO-60RS Rack Model Speaker..... **26.00**
HRO-60TS Table Model Speaker..... **16.00**
NFM-83-50 Narrow Band FM Adapter..... **17.95**
SOJ-3 Selecto-O-Ject..... **28.75**

NC-183D

12 tuned IF circuits.
1mv sensitivity on 6 meters

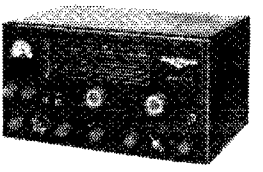


Steep-sided skirt selectivity with 3 IF stages (16 tuned circuits on the 3 high bands; 12 on all other bands) plus a new crystal filter, new bi-metallic, temperature-compensated tuning condenser for drift-free operation and other features make the NC-183D a revelation in all-around performance. Adaptable to NFM. Phono output jack. Covers 1.5-55mc, with bandspread dial on all amateur bands including 6 meters, and bandspread possible on all frequencies within range. Controls: Main tuning, Bandspread tuning, Band switch, RF gain — AC on/off, AF gain, Send/receive, AVC/MVC, tone CWO, CWO pitch, Limiter, Selectivity, Phasing, RF trimmer, Radio/Phono.

NC-183DT Table Model, complete with tubes, less speaker..... **$383.50**
NC-183DR Rack Model, complete with tubes, less speaker..... **383.50**
Speaker..... **16.00**
NFM-83 Narrow Band FM Adapter..... **17.95**

NC-125

With built-in Select-O-Ject



An up-to-the-minute general coverage receiver incorporating late engineering improvements and including the Select-O-Ject audio filter. Select-O-Ject can boost any single selected audio frequency 38db or reject any single frequency 45db within a range of 100 cps to 12,000 cps. It practically eliminates annoying heterodynes, whistles and unwanted signals, gives selectivity surpassing that of much higher-priced receivers. Also: Edge-lighted direct-reading scale with amateur, police, foreign and ship frequencies clearly marked; voltage-regulated, stabilized oscillator; jack for phono or NFM adapter; socket for battery operation and other valuable features.

NC-125 Complete with tubes, less speaker..... **$199.95**
NC-125TS — Speaker..... **11.00**
NFM-73 — Narrow Band FM Adapter..... **18.95**

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reflect the condition of our bands generally, reports to hand hitting a new low for all time. Our Canadian Director, VE2BE, and his XYL recently paid us a short visit while on a motor trip through VE1-Land. VE3CAA is a new mobile ham in Halifax with the CBC. AAW entertained recently at a very enjoyable party. We understand from the Provincial Radio Officer that some FB equipment is immediately available for the Provincial Control Center and will include a 300-watt transmitter and ex-Army communications receiver of the superhet variety. This is a very welcome step forward in c.d. work for this Province. Glad to hear ET back on the air again. Walt is recovering from a very serious operation. We hear that PT and HC have returned from their trip to the U. S. and that FQ plans a vacation trip to W-Land and VE2-Land. TA, AW, OC, and DQ have been comparing notes on their TV reception which has been quite spotty of late. Traffic: VE1AAW 275, FQ 196, ZM 41, OC 10.

ONTARIO — SCM, G. Eric Farquhar, VE3IA — SEC: KM. I regret to report that NG had the misfortune to break a leg. Hope you come along rapidly, OM. DNE emerged from a damp basement and took to the fresh air. He says he was surprised that there was so much sunlight. We welcome DFM, who sends in his first report of activities since 1947. Many will recall him under the call QK when he was SCM of this section in 1936, a job he handled very ably. Congrats to Mr. and Mrs. BSF on their recent marriage. BUR has added more wire to the antenna. VE7PL, ex-3BZM, vacationed up Lake Huron way. TO is working 3.5-Mc. mobile and looking for contacts on 430 Mc. API, formerly of New Liskeard, now is located in Paris, Ontario. XZ recommends a complete overhaul of all antenna halyards. VE1FQ mobiled his way to this section and visited YR. Traffic: VE3ATR 200, BUR 190, NG 111, IA 90, EAM 39, NO 18, VZ 12, DFM 11, TO 6.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — The annual meeting and picnic of the Radio Amateurs of Quebec was held again this year at Cap Sante on Aug. 16th with informal get-together and ragchew on the previous evening in Quebec City. At Cap Sante 72 VE2s registered, together with families and friends. Results of the election of officers is as follows: ALH pres.; FS, vice-pres.; ZL, secy. general; KB, treas.; AOB, secy. adm.; BE, advisor, with directors from various sections of the Province. It was announced that 255 VE2s had obtained their call-letter license plates for this year. KG has renewed OBS appointment and would like to see more of the VE2 LOs on the air on LO-NITEs. DR reports into OSN daily at 7 P.M. and has been finding conditions very trying, especially for traffic-handling. ADU, 15 years old, is a newcomer in Three Rivers. BK is confined to mobile, the main rig still needing completion of its control circuit. ANN, working mobile from White Face Mountain, Plattsburgh, QSOed BK and BR in the Laurentian Mountains. CA reports skeds with the North Country washed out, the old gang having departed, and conditions so poor that Phyl has not been able to arrange skeds with the new crews. PQN anticipates operating Mon., Wed., and Fri. at 7 P.M. on 3570 kc. All VE2s are invited to call in on this net with traffic. Traffic: VE2DR 27, EC 21, CA 16, UM 9.

ALBERTA — SCM, Sydney T. Jones, VE6MJ — HM has taken off on an extended trip to Eastern Canada. We understand SC has taken up permanent residence in VE7-Land and we extend to him our sincere good wishes and many thanks for a good job as treasurer of the NARC. A most successful hamfest was held in Edmonton on Sept. 5th and 6th. The attendance was good and included VE5s, VE8s, and our old friends, W7DSS and his XYL from Great Falls. Highlight of the affair was the barbecue held at the farm of Lord and Lady Rodney, VE6GY, Fort Saskatchewan. EH and LQ have definite plans for 144-Mc. operation. The gang wish KH and KF a speedy recovery from their injuries. VE7ZF was a visitor to Edmonton. LQ topped the local gang in the May Frequency Measuring Test, closely followed by HM, DZ, ZR, and MJ. Traffic: VE6HM 154, WC 32, OD 22, MJ 4.

BRITISH COLUMBIA — SCM, Peter McIntyre, VE7JT — The mobile jaunts and hidden transmitter hunts have been well organized affairs, with each club taking charge of them in turn for each summer month. The Totem Club had a mobile jaunt up to Cultus Lake and the Island gang converged on AKN at Jordan River. AHY, ex-8DM, now is operating in Vancouver. New mobiles heard around Vancouver on 75 meters are KX, AJB, and AGP. Had a visit with W6EY, mobile VE7, and W6AQN while they were in town. Summer holidays somewhat depleted the roll on the AREC Net but there still were approximately 40 regular checks. UT and family have been moved to Digby Island, near Pt. Rupert. OF has been appointed EC for District No. 4. FS, newly-appointed ORS and OPS, is chief bailer of one cruiser he is trying to keep afloat on the lake at Kelowna. Anyone wishing to form a c.w. net, contact the RM, TF, at 397 Mundy Road, New Westminster. Also anyone is welcome to check in on 3755 kc. between 1800 and 1900 hours Mon. through Sat. I would still like to hear from the outside clubs and individual amateurs in any activity in their district. I'm no mind reader and the crystal ball won't work so don't know what's going on outside Vancouver. The two activity reports

(*Continued on page 112*)

NEWARK'S Page of Values!

VARIABLE CAPACITOR BUY!

Ideal for VFO

63 Mmf

High quality variable capacitor originally designed for use in the master oscillator section of the famous BC-375. Extremely rugged construction and fan tail tracking adjustment make this unit ideal for VFO use. 3500 volt flashover. Stator plates fastened to end sections by 4 point, screw type suspension. Micrometer adjustment. Wt., 2 lbs. **1.35**

54G583. Special Price.....

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At a Fraction of Their Original Cost. Highest quality round can oil-filled capacitors. Porcelain insulators. Av. shpg. wt., 1 lb.

No.	Mfd.	VDC	Each	10 for
54G024	1	1000	.98	7.50
54G028	2	1500	1.39	...
54G032	1	2500	1.39	...
54G009	0.5	600	...	7.50

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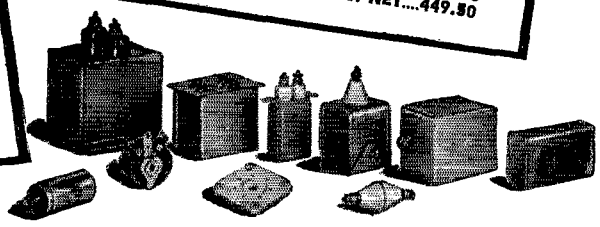
97F309. Collins 32V3 Transmitter. **NET**.....775.00
98F323. National HRO-60 Receiver. **NET**.....483.50
98F307. Speaker for HRO-60. **NET**.....16.00
98F300. National NC125 Receiver. **NET**.....179.95
98F301. Speaker for NC125. **NET**.....11.00
97F455. Johnson Viking II, kit. **NET**.....279.50
97F460. Johnson Viking II, wired. **NET**.....337.00
97F410. Hammarlund HQ140X Receiver. **NET**..264.50
97F404. Speaker for HQ140X. **NET**.....14.50
98F001. Hallicrafters S76 Receiver. **NET**.....199.95
98F003. Hallicrafters S40B Receiver. **NET**.....129.95
98F005. Hallicrafters S38C Receiver. **NET**.....59.95
98F008. Hallicrafters SX71 Receiver. **NET**.....249.95
98F022. Hallicrafters **HT-20 Transmitter. NET**....449.80



NEWARK CAPACITOR SPECIALS!

.01 Mfd. 8000 VDC Test. Rect. oil-filled. Single porcelain insulator. 1 lb.
54G585. 10 for 7.50. EACH.....**98c**

2 Mfd. 600 VDC. General Electric Pyranol-filled capacitor. Flange type mounting. Ceramic pillar terminals, 10/32" studs. Size, 2x2¾x1". Wt., 1 lb.
54G006. 10 for 3.00.....**Each 39c**

5 Mfd. 1000 VDC. Type BAR. Oil filled. Solder terminals. Size, 3⅝x3¾x 1¾". Wt., 1 lb.
54G400. 10 for 7.50.....**Each 98c**

.2 Mfd. 5000 VDC. Sprague oil-filled unit. Ceramic terminals, 10/32" Stud. Size, 3⅝x3¾x1¾". Wt., 2 lbs.
54G586. 10 for 10.00.....**Each 1.29**

.1 Mfd. 3000 VDC. Round can capacitor. Upright mounting. 2¾x1 15/16" dia. Shpg. wt., 1 lb.
54G008. 10 for 1.25.....**Each 20c**

1 Mfd. 5000 VDC. General Electric Pyranol-filled filter capacitor. Large ceramic terminals. With mtg. clamps. Size, 4½x3¾x4⅛". Wt., 3 lbs.
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3C24/24G ..... **.89**
805 ..... **4.50**

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35 ohm, 50-watt Pot. Ohmite Type "J" wire-wound pot. Heavy ceramic form. ¼" shaft for ⅜" mtg hole. 1 lb.
54G587. 10 for 5.50.....**Each 69c**

Feed-thru Insulator. Double cone high glaze ceramic insulator. 1¼" diameter. Mounts with 1" above chassis. Complete with 10/32" threaded rod, washers, and nuts. Wt., ½ lb.
54G580. Special Price... **10 for 1.00**

Low-loss Steatite Socket. For 829B/-3E29 or 832 tube. Center has large cooling hole. Less shield Base. Mfd. by Johnson. 2" mtg. centers. Wt., ½ lb.
54G588. 10 for 5.00.....**Each 56c**

Mallory Type NF-1-2 Noise Filter. For filtering generator hash. Will handle either 6 or 12 VDC at 50 amps. Formerly used on 92 volt aircraft systems. Easily mounted on car generator. Wt., ½ lb.
54G502. 10 for 5.00.....**Each 69c**

SAVE ON TRANSFORMERS!

Thordarson T-45166 Output Transformer. Single 6L6 to 2-4-8-500 ohms voice coil. Case size 2½x2½x3" high. Shpg. wt., 5 lbs.
54G581. 10 for 12.00.....**Each 1.50**

Driver Transformer. P.P. 2A3's to grids. Case size, 3¼x2½x3" high. Shpg. wt., 5 lbs.
54G111. 10 for 15.00.....**Each 1.95**

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Special bargain offering of High Quality Standard Brand Capacitors. All oil-filled, rectangular cased. Have porcelain insulators. Less mounting brackets. Av. shpg. wt., 2 lbs.

Stock No.	Capacity and WVDC	Net Each
54G201	2x2 mfd. 600 volts	.89
54G202	.5 mfd. 600 volts	.49
54G203	2 mfd. 2000 volts	1.75
54G204	1 mfd. 1500 volts	1.25
54G205	.5 mfd. 2000 volts	.89
54G206	2 mfd. 2500 volts	2.10
54G207	1 mfd. 3000 volts	3.50
54G208	2 mfd. 4000 volts	6.95
54G209	.5 mfd. 3000 volts	1.25
54G210	1 mfd. 6000 volts	8.95

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I received from DH and QC were left at home while I typed this at work, so they are not included in this report.

MANITOBA — Leonard E. Cuff, VE4LC — XO is building new broad-band, all-band exciter and should be heard by the time you read this. RO still manages to work DX in spite of ill health. CV has been spending the summer working in VE6-Land. VK3PD, Geoffrey Clark of Melbourne, Australia, arrived in Winnipeg Sept. 4th and is thinking of making his home here. We all extend a warm welcome to you, Geoffrey, and hope that you will find Manitoba and its people to your liking. GJ has taken up residence in Winnipeg again after an absence of about 15 years. Welcome back home, Vic. Ex-RX and TX, who now reside in the warmer climate of W6-Land, are looking for contacts on 20 meters with the VE4 gang. At last reports they expected to be operating VE4RX/W6. SR and JY made the trip to the Dauphin Hamfest and report a good time was had by all. Once again SR walked off with one of the prizes. We also hear that a number of you attended picnics at Killarney, Manitoba, and Lake Bronson, Minn., U. S. A. No traffic counts were received by your SCM this month. If you do not send in your traffic count and news items to your SCM he cannot put them in this column.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — Sorry there was no report last month, fellows, but I received only one station report and it takes a lot more than that to make the column. Now that we are into the fall and winter season, let's hear from you. FG reports that the WARC held its 4th Annual Field Day at Trossachs with a record attendance to make the event the most successful yet. PQ now is mobile. PD and AS are doing fine on mobile. MV took the big step. We all wish you and Shirley the best. 7OD, his XYL, and daughter visited HR on his trip East. W2UNR and his XYL, K2ACN, visited DR and HR on their way to KL7-Land. W8MKN and his XYL visited Saskatoon on their honeymoon, complete with mobile and canoe. LU has a 75A-3 and is all set for winter activities. 5TE now is 4TE. CC now is located at Melfort. GR has been transferred to Ottawa with the D.O.T. Traffic: (Aug.) VE5RE 12, PJ 10, FG 4, HR 4. (July) VE5PJ 4.

November 1928

. . . September hurricane emergency work by np4AAN at St. Thomas, Virgin Islands, and 4AFC (4AGR operating) at Palm Beach is commended in this month's editorial.

. . . Associate Technical Editor Ross A. Hull furnishes constructional data on 4-tube, 3-tube and 2-tube "High-Frequency Receivers for the Coming Year."

. . . The subject of "Frequency Stability by Magneto-striction Oscillators" is treated in considerable detail by Technical Editor Harold P. Westman.

. . . In "Some Suggestions for 1929," H. M. Walleze, 8BQ, outlines a few general precautions one should observe in obtaining optimum transmitter performance.

. . . The six-stage circuit used by Howard Allan Chinn at Massachusetts Institute of Technology is featured in "A 28-Megacycle Crystal-Controlled Transmitter."

. . . A "160-Meter Low-Power Transmitter" described by George B. Hart, 8DK, can be built of receiving-type parts at an approximate cost of ten dollars.

. . . In "Experimenting with By-Pass Condensers," John F. Rider discusses the proper choice and use of condensers to be used as r.f. by-passes in audio circuits.

. . . "Some Radio Uses of Lamp Banks" and "Another Way of Playing an Old Prank," by L. Vee Iversen, 7AW, and Rufus P. Turner, are good food-for-thought articles.

. . . A new variable condenser announced available by Radio Engineering Laboratories has its shaft rotated in a pool of mercury to eliminate noise.

. . . "Now We're in the Air!" by Wallace S. Wiggins, W6CHZ, sums up the work of Los Angeles area amateurs who provided 1928 National Air Races communications.

. . . Clair Foster, W6HM-W2QW, writes on activities of the mysterious "sj5BX" worked by a good many DXers earlier in the year.

"PICON"

There's a short but potent sentence in the Communications Act of 1934, as amended, which reads:

> *The Federal [Communications] Commission, if public interest, convenience or necessity will be served thereby, subject to the limitations of this Act, shall grant to any applicant therefor a station license provided for by this Act.*

Thus the fate of an application for a new broadcast station, for example, may depend entirely upon the applicant's ability to demonstrate that his proposed station will operate in the "public interest, convenience or necessity." The phrase is so often used in Washington that it is sometimes shortened to "picon."

There is no space on the application form for an amateur station license, you may have noticed, requiring your proof of "picon."

Why not? For a very good reason:

Because amateur radio as an institution, through your American Radio Relay League, has established itself as a service operating in the public interest, convenience and necessity. Proof of your individual right to a station license is furnished for you by ARRL speaking for the amateur service.

*Are you doing **your** part to support organized amateur radio activities by membership in the League?*

QST and ARRL Membership
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50- and 144-Mc. Mobile

(Continued from page 20)

crystal must be within one of these ranges: 8.333 to 9.0 Mc.; 12.5 to 13.5 Mc.; 25.0 to 27.0 Mc.

Tuning of the exciter portion of the transmitter is perfectly straightforward and, at 50 Mc., requires only that C_5 and C_{12} be resonated at 25.0 and 50 Mc., respectively. A voltage and current chart shows the approximate operating conditions for the 5763s and, if this section of the rig checks out, it is time to test the final.

Before moving on to the amplifier, turn the supply off and connect a jumper between Pins 3 and 5 of J_2. Check to make certain that the bulb is connected to J_1 and that S_1 is set at the 50-Mc. position. Now, apply power and resonate C_{17} as indicated by a dip in plate current. The proper setting for C_{17} will be well toward minimum capacitance, provided that the tuner is similar to the original one. Next, set C_{18} at approximately full capacitance and reresonate the plate tuning control. The voltage-and-current chart lists amplifier data that apply to operation with the dummy load in use. If interested in checking bias voltages, make the measurements with a vacuum-tube voltmeter, or with a general-purpose test instrument connected in series with an r.f.-choke inductance of at least 1 mh.

The set-up for testing at 144 Mc. is similar to that used at the lower frequency. Work with just the two exciter stages at first and employ a crystal in any one of the following ranges: 8.0 to 8.222 Mc.; 12.0 to 12.333 Mc.; 24.0 to 24.666 Mc. If a 12-Mc. crystal is selected, the oscillator may be tuned to either 24 or 36 Mc. In either case, the multiplier must be tuned to 72 Mc. by means of C_{12}. The oscillator is always tuned to 24 Mc. when crystals within the 8- and 24-Mc. ranges are used.

Amplifier operation at 144 Mc. is also tabulated in the voltage-current chart. Naturally, S_1 must be snapped to the 144-Mc. position. The amplifier plate current will show only a slight dip when the tuner is resonated, because of the doubler-type operation and the fact that plate-circuit losses are somewhat high until the stage has been properly loaded. Resonance of the tuner and the series-tuned output circuit will occur with both C_{17} and C_{18} adjusted well toward minimum capacitance.

The series-tuned output circuit for the transmitter is intended for use with low-impedance antenna systems and, as a result, it is recommended that quarter-wave whips be used in the actual mobile installation. One system would involve the use of a 2-section 50-Mc. whip that can be reduced to a length suitable for 144-Mc. operation by removing the top section.

Any of the 10-watt modulators that have been described in the *Handbook* and in *QST* may be used with the transmitter providing power input to the amplifier is kept below a 20-watt level. More audio will be required if the 2E26 is to be operated with a plate voltage in excess of 300 volts.

HARRISON SUPER SPECIAL!

Squirrel Cage BLOWER and MOTOR

Brand new, surplus blower with motor, manufactured by Redmond. Ideal for cooling large transmitting tubes and interiors of rack cabinets. Extremely quiet operation. Capacity 140 cubic ft. per minute. Rugged, dependable motor is completely enclosed and operates on 115 volts, 60 cycles AC. Speed: 1600 RPM. 18 watts. **Blower with Motor** **$7.95**

DISCOIL

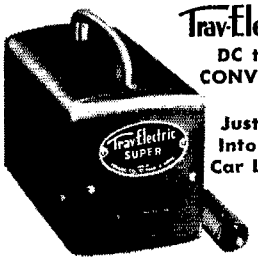
The newest idea in mobile center loading coils, just out of the great state of Texas! Pancake wound high Q coil, 7¼" dia., provides capacity loading. Easy to tune, and to tap for 40, 20, and 15, as well as 75. Rugged poly construction. Takes standard ⅜ SAE top and bottom whips. **DISCOIL** **$11.95**

SHERRICK

Snap-in loading coil mount for quick band QSY with high efficiency. (See page 111, Oct. QST.)
Mount, with coil for 75, 40 or 20. **$15.00**
Complete with coils for 75, 40, 20 (and 10) **$22.50**

Good quality top and bottom whip to give 8 ft. 10" overall length. ... **$6.95**

Trav-Electric DC to AC CONVERTERS



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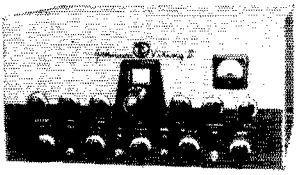
New

6 and 12V. Models

Converts 6 or 12V. DC to 110 volts, 60 cycles AC. No special installation necessary — merely plug into outlet occupied by your car cigarette lighter. Capacity 60 watts continuous, 75 watts intermittent. Suitable for operating soldering irons, dictating machines, wire recorders, portable phonographs, small radios, electric shavers, small drills, etc. Completely filtered. Convenient handle for carrying. Wt. 8 lbs.
For 6V. Super Model 6-71160... **$25.30**
For 12V. Super Model 12-71160. **$28.63**

As above except 40-45 watt capacity.
For 6V. Senior Model 6-1160... **$10.63**
For 12V. Senior Model 12-1160. **$11.97**

Latest JOHNSON HAM GEAR



Famous VIKING II

Fully shielded, filtered and TVI suppressed. 180 watts CW input, 135 watts phone. Covers all bands from 10 to 160 meters. New 6146 final gives high efficiency at lower cost. With tubes, cabinet, detailed assembly, wiring and operating instructions. Less crystals, key and mike.
Complete Kit **$279.50**
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JOHNSON VFO KIT

For use with Viking II or similar xmtr. Provides full excitation on all bands from 10 thru 160 meters. 5" dial calibrated directly in frequency. Simple assembly — build unit in an evening. With cabinet.
Complete Kit, less tubes... **$42.75**
Wired & Tested, with tubes... **$60.40**

JOHNSON "Match Box" Antenna Coupling System

Matches practically any line and can be used with any transmitter up to 250 watts. Loads antennas from 25 to 3000 ohms. Instant band-switching: 80, 40, 20, 15, 11 and 10 meters. Impedance 52 ohms. Self-contained antenna changeover relay. Shielded cabinet. **$49.85**

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JOHNSON Bi-Net Resonator

Change bands while in motion! Fully automatic, dual 10 and 20 meter band antenna resonator permits use of single whip for transmission and reception. Needs no switches or relays. **$10.95**

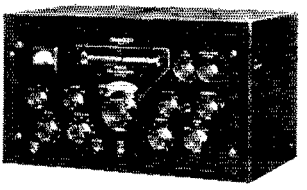
GONSET COMMUNICATOR II

NEW!

with Built-in Adjustable Squelch and Ear-Phone Jack

$229.50

New, improved model of popular Communicator 2-meter station. Cabinet modified to include ventilating screens. Ideal for CD work because of squelch and automatic speaker muting when phones are plugged in. Has receiver dial light on-off switch and built-in speaker, noise limiter and 19" whip. Takes crystal or carbon mike. Crystal control. With tubes, less crystal and mike.



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Featuring sensational new Collins mechanical IF filter. Gives a practically straight-side, flat-topped selectivity curve! Plug-in provision for two mechanical filters. 3 kc filter standard equipment. 800-cycle plug-in unit available as optional accessory for greater selectivity on CW. Double conversion superhet covers 160 thru 10 meter bands. Accurately calibrated directly in 1/10 mc. Here's a natural for the SSB operator! With speaker. **In Stock!** **$550.00**

800-cycle mechanical filter plug-in unit. **Type F455B-08** **$55.00**
100 kc plug-in crystal calibrator for 75A-2 and 75A-3. **8R-1** **$25.00**
Plug-in NBFM Adapter. **148C-1 $22.50**

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Heterodyne Exciter

(Continued from page 24)

then adjusted for maximum grid current to the 1625. It should be possible to obtain as much as 4 ma. of grid current, although the amplifier will operate satisfactorily with less. As a final adjustment of the driver stages, C_6 and C_8 should be stagger-tuned to give most uniform output over the band. Coupling between the oscillators and the 12SA7 should be the minimum that will produce the necessary grid current to the final amplifier. The output circuit is resonated by C_{18}, of course.

If you have a g.d.o., short the output coax connector and resonate C_{19} and L_7, by adjusting L_7, to the TV channel where TVI is most noticeable. If you do not have a g.d.o., you can adjust L_7 while watching the interference pattern on the TV set.

Running about 18 watts input to the final amplifier, very excellent reports have been received from the East Coast, down to Argentina. Plate-screen modulation is used on 'phone and, since both oscillators run continuously, there is no chirp on c.w. With a 600-volt supply, the input is increased to 60 watts.

Novice Rig

(Continued from page 30)

your wiring; it's likely you've made a mistake in the hook-up. Look also for unintentional grounds — spots where bare spots of wire are touching the chassis. Sometimes a blob of solder will hang from a terminal and touch the chassis.

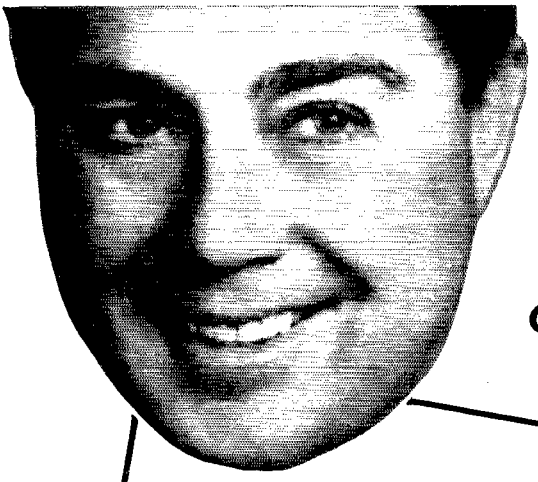
Antenna

The type of output circuit used in the rig will load with almost any length of wire. However, it will load with a 30-foot length of wire on both 80 and 40 meters a great deal easier than with some lengths. As stated earlier, the writer tested the rig at his home and the antenna used in that case was a 30-foot length of No. 14 wire. One end was connected to the output terminal and the other end was suspended on an insulator at the far end of the house. If the antenna is to be strung outside, be sure it doesn't touch any metal or other objects, and is insulated at its far end.

Output Indicator

The rig *can* be tuned up by the meter, but sometimes a beginner may become confused trying to interpret the readings he gets. There is a simpler gimmick to use to show that the antenna is taking power. All you need are two pieces of wire, about two feet long, and a 2-volt 0.06-ampere flashlight bulb, either No. 48 or 49. The bulb is connected between the two pieces of wire, one lead to the tip of the bulb base and the other lead to the shell of the base. We now have a four-foot length of wire with the bulb in the center. One end of this wire is connected to the output

(Continued on page 118)



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terminal, or clipped to the antenna at the output terminal, while the other end is clipped on the antenna, three or four feet up. When the rig is turned on and the condensers are tuned, a point will be reached in the tuning where the bulb will glow, or light up. Tune the condensers for maximum brilliance in the bulb; this indicates maximum power going into the antenna.

Operating

All you need to do now is start calling other stations or CQ. Don't be discouraged if you don't get an answer on the first call or two. Keep at it, and suddenly you'll find that you are in business.

If you should receive reports of your signal having a click, the installation of C_4 should clean up this condition. To the highly-critical ear, the signal without the use of C_4 might show clicks, but the writer didn't have this trouble, so C_4 was left out.

We didn't talk about 40-meter tune-up procedure, but it is the same as for 80 with the exception of using the correct crystal, and shorting out the section of L_1. Remember to listen on your receiver when tuning up the rig on 40 or 80. If you're tuning up on 40, the signal should be definitely louder on 40 than on 80 meters, and vice versa for 80-meter tune-up.

TVI shouldn't be a problem. The rig described here was thoroughly tested and showed no trace of interference.

One thing more — daytime contacts on 80 or 40 will always be over much shorter distances than those made at night. Likewise, daytime contacts will be less bothered by interference from other stations. The little rig may not be the highest-powered job in the world, but it will prove itself by producing plenty of contacts; some amateurs have worked all continents with as much power.

Color Television

(*Continued from page 84*)

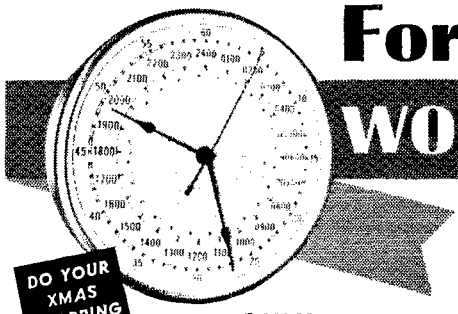
wheels. Carrying knockdown antennas and masts, it permitted our setting up in any spot that seemed best suited for the purpose, and required no accommodations other than room for its four wheels and the antennas. In buying the car, too, we had in mind that it would be mighty handy for carrying the TVI demonstration equipment described last month.[3]

Although the reduction of radiation had not been a consideration in the design of these experimental receivers, the level was unexpectedly high and the frequency distribution so wide that two of the participating organizations, RCA and Hazeltine, undertook to see what could be done to reduce it in their receivers. Arrangements were made to conduct subsequent tests under identical conditions, after the receivers were modified. At these tests it was found that even though the measures taken in both receivers were not elaborate, there was a marked reduction in radiation.

(*Continued on page 120*)

[3] "ARRL TVI Demonstration Completes Its First Tour," *QST*, October, 1953.

For a Ham's Xmas!



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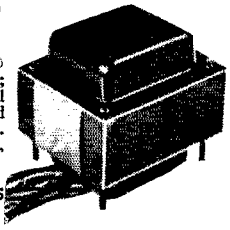

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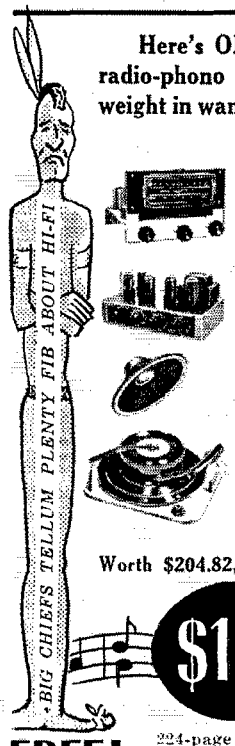

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It is appropriate to note here that since the sidebands extend several hundred kc. on either side of the subcarrier it is again impracticable to clean up the situation by moving the subcarrier frequency, within the possible limits of such a shift. This puts it squarely up to the receiver manufacturer to reduce the radiation to an acceptable level. The following quotation from the report of one of the organizations on this point also is appropriate: "Fortunately, the interference is easily reduced by adhering to good design practices in the application of circuit layout, shields, and filters in the various circuits. The cost of applying these remedies is minor and does not seriously affect the final cost of the color receiver."

Monochrome Receivers

Tests similar to those above also were conducted with monochrome receivers receiving a color signal. The presence of color sidebands in the video circuits of such receivers, although not utilized, opens possibilities of interference that did not exist with a pure black-and-white signal. Representative receivers in current production were used in these tests.

It is gratifying to be able to report that under no circumstances did the operation of the 80-meter transmitter cause any visible interference attributable to the presence of the color signal. This aspect need not worry us, therefore.

Radiation from the receiver is another matter. The color sidebands do get radiated, although with considerably less intensity than in the case of a color receiver. However, since there is no local oscillator at 3.58 Mc. in the receiver there is no modulation of its harmonics by the sidebands; hence the only harmonic radiation is by direct generation of harmonics from the sidebands. This fortunately, is negligible, so only the 80-meter band is affected by the radiation. Again, this is a problem for the receiver manufacturer.

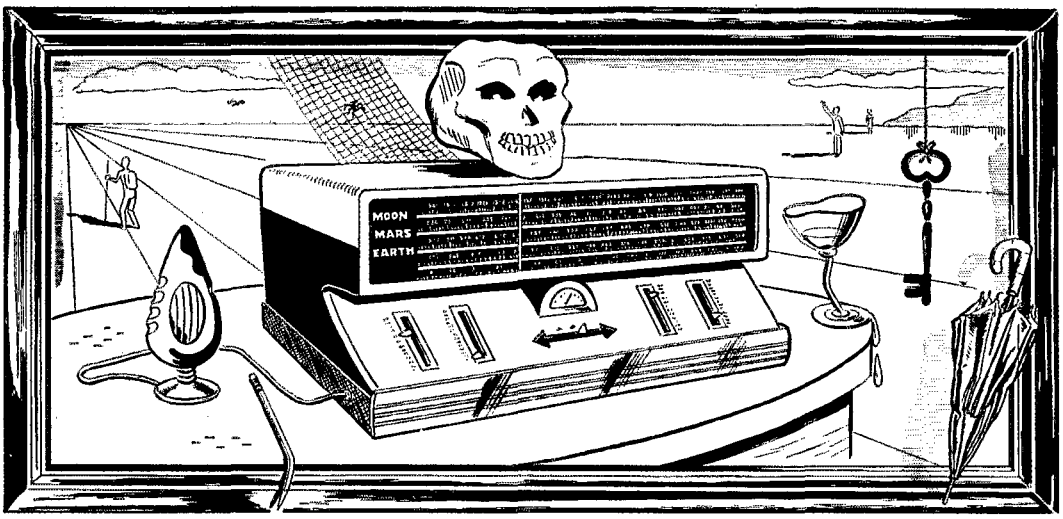
In Summary

In fact, the whole question is one of receiver design. This has been obvious right from the beginning. The League's purpose in raising the question with NTSC was to make the industry aware of the interference possibilities so that, if the opportunity existed to change the subcarrier frequency and such a change would help relieve the design problems, it could be done before the standards were made final by FCC adoption. The work of the Amateur-Color TV Interference Committee not only showed that the visualized possibilities of interference did exist, but further showed that moving the subcarrier frequency did not constitute a satisfactory answer. So it is in the laps of the receiver manufacturers, and there is reason to believe that it will not be ignored in future production.

Along these lines, the committee's final report [4] to NTSC, which is included in NTSC's proceedings and will eventually become part of the FCC

(Continued on page 122)

[4] NTSC-AH-359, June 23, 1953.



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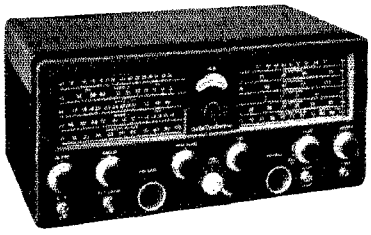

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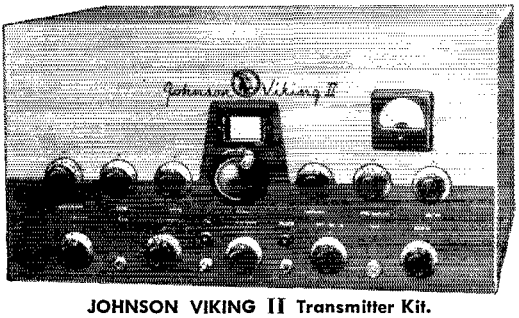

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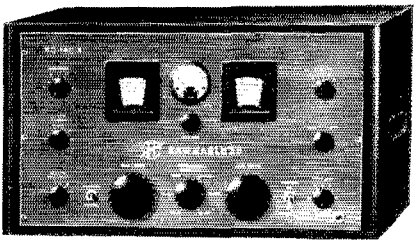

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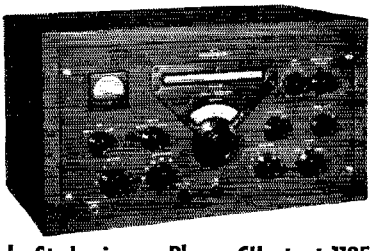

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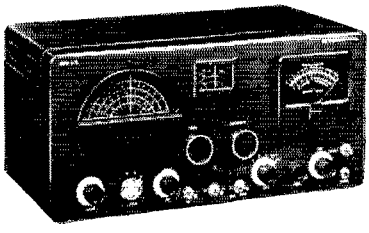

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record in the proceedings leading to the adoption of color standards, makes the following recommendations (the Appendix A referred to includes the reports of the organizations that modified their receivers as described above):

"a. Because the real solution to the bilateral amateur-color TV interference problem lies in suitable receiver design, the Committee considers it essential that the industry do the following:
   1. Design each receiver to minimize radiation at the color subcarrier frequency and its sidebands and harmonics thereof.
   2. Minimize its susceptibility to strong fields created by nearby amateur transmitters.

b. The Committee recommends industry action to establish suitable standards, including measurement techniques, for minimizing such radiation and interference susceptibility.

c. Pending the completion of industry action each receiver design should incorporate measures for accomplishing (a). These may be similar in nature to those described in Appendix A."

Thanks to Vernon Chambers, W1JEQ, who did most of the construction work, the gear was ready to roll by the end of March. The preliminary tests at Princeton came off as scheduled, and showed that our early fears were not groundless. What we learned at Princeton was invaluable in determining the procedures to be used in the scheduled field tests, and also in indicating the desirability of some extensions and modifications of our transmitting and receiving equipment to speed up collecting the necessary data.

It should be emphasized at this point that NTSC itself was faced with many of the same difficulties. The paucity of transmitting facilities, the very small number of receivers scattered around the laboratories of the country and the necessity for bringing them all to one spot at one time for formal trials, all conspired to make the time available for testing of any kind extremely limited. Schedules, consequently, were very tight. Nevertheless, the time we needed was found for us. The committee is especially grateful to Mr. Knox McIlwain, chairman of the NTSC Panel on Field Testing, for his excellent coöperation and sympathetic interest in its problems, and to Dr. T. T. Goldsmith of Dumont for supplying a color signal on both UHF and on WABD at times when other commitments made it impossible to get such a signal from WNBT, the station used in the official field testing.

The committee participated in the NTSC field test held at Bayside, L. I., May 6th. Eight of the major manufacturers and laboratories had receivers there — nearly all the sets in existence, as a matter of fact. All of them were pretty highly experimental — in most cases, the principal attention had been concentrated just on making the receivers work, to the exclusion of other

(Continued on page 124)

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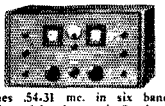

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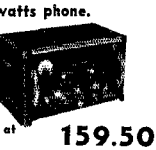

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considerations. If anything, most of them would be expected to be considerably worse with respect to stray pick-up and radiation than actual production models. It was a relief to find, therefore, that in no case did the operation of the transmitter cause color break-up. Such interference as did appear was a relatively mild bar pattern; its intensity varied from receiver to receiver, as was to be expected from the differences in construction. This was with a weak TV signal and the transmitting antenna 25 feet from the TV receiving antenna, with an input of 500 watts: practically all the interference disappeared with greater separation between the antennas

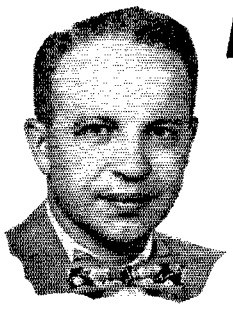
It was established that the interference was most noticeable when the transmitting frequency was on or close to each color sideband frequency. without much variation in intensity throughout the 80-meter band, but practically disappeared when the transmitter was adjusted to a frequency in between the sideband frequencies. Considering the conditions under which the tests were run, this phase of the color TVI question should not give amateurs too much trouble, provided the receiver-building industry now forewarned, takes a few simple steps to prevent undue pick-up on the color circuits.

The fact that interference effects do not tend to be confined to transmitting frequencies near 3.58 Mc. but are more or less equal at all the sideband frequencies precludes the possibility of any significant improvement by changing the color subcarrier frequency, at least within practicable limits.

Receiver Radiation

Excluding transmitter harmonics and receiver front-end overloading, which do not represent new elements in color as compared with monochrome, it seems probable that a color receiver is more likely to interfere with a near-by amateur than that an amateur operating in the 80-meter band will interfere with color reception. On every receiver checked, the radiation level at the 3.58-Mc. oscillator frequency and the associated side frequencies was much greater than from deflection-circuit harmonics, the present source of ITV. Since the color side frequencies are positioned midway between the sweep-frequency harmonics, a receiver that is really "hot" in both respects can do a job that would make some of those jammers that infest the h.f. broadcast bands green with envy.

This radiation is not confined to the vicinity of the 80-meter band. The color demodulator or detector operates at a rather high level, and generates harmonics of 3.58 Mc., each of which is modulated by the same sidebands that are associated with the fundamental frequency. Thus there is a group of radiated birdies centered around 7.16 Mc., another around 14.32 Mc., and so on. All the receivers tested actually put out stronger "hash" on the 7-Mc. band than on 3.5 Mc., and some had radiation of fairly high intensity even in the 10-meter band.



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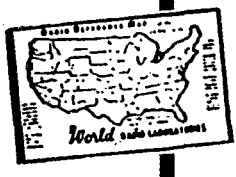

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Coaxial Antenna

(Continued from page 41)

then soldered to the washer of the whip section of the antenna.

The sleeve section is now slipped over the mast and screwed to the sleeve cap. At this point it is a good idea to paint the sleeve, the sleeve cap and the mast. Do not paint the sleeve cap insulator or lower sleeve spacer.

The antenna, now assembled, is ready for installation. The bottom end of the mast section is placed in a hole drilled about four feet into the ground with a post-hole digger. This depth is adequate to support the antenna and also permits the mast to serve as a clothes post. Bricks and rocks are piled in the bottom of the hole and a bag of ready-mix cement mixed up and poured into the bottom of the hole. The balance of the hole is then filled with dirt. The antenna is self-supporting and no guy wires are necessary.

The coaxial cable lead-in may be laid along the ground but the installation will be made more complete by burying the cable in the ground from the antenna to the shack. The trench may be dug with a trowel or lawn edger and need not be more than a few inches deep — enough to put the cable just under the sod of the lawn.

Results with this antenna have been excellent at W9YVZ. When the band is open, east and west coasts and some DX is worked with good results and reports. When the band is "dead" and only locals are coming through, contacts up to 100 miles with reports of S8 to S9 are made. This was not possible with the horizontal antenna previously used at this location. Mobile stations are easier to contact and the range of operation with mobiles has been extended. The power run by W9YVZ is only 18 watts.

There have been many arguments about vertical *vs.* horizontal antennas on ten meters. Here is a vertical coaxial antenna which, at least for the writer, has proved itself superior to horizontal dipoles and yet is simple and inexpensive to construct.

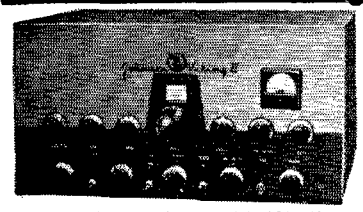
World Above 50 Mc.

(Continued from page 66)

Herb feels that he has learned quite a bit from the construction and operation of this job. It raises the possibility that well-designed long-Yagi arrays could produce higher gains than most of us now attain, without going to excessively large dimensions. An honest 20-db. gain might be possible with perhaps not more than 4 long Yagis, and for the fellow who likes to build 'em big, the possibilities are endless. Who's next?

This one is for the "horsetraders." GW2ADZ wants a couple of 6AJ4s or 6AN4s for his 420-Mc. work, but he can't send over the money for them. Anybody interested in a swap for a subscription to any of the British magazines? Bill, you may recall, recently lost the 420-Mc. record to W1RFU and W4TLM, but he's doing some fine work. He has worked DL3FM crossband, for what would have been another record, and has had two-way contacts with PAØNL, 335 miles, in addition to his 362-mile ex-record with ON4UV.

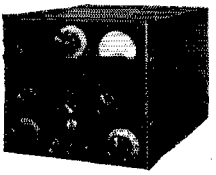
Lafayette for High Voltage BARGAINS!



NEW! JOHNSON VIKING II

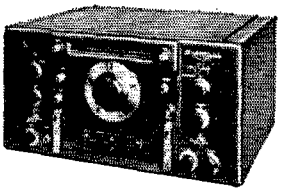
The Johnson Viking II transmitter kit incorporates all the desirable features of its predecessor plus those required for effective TVI suppression. 100 watts output on phone and 130 watts on CW on all bands 160 thru 10 meters. New final amplifier uses parallel 6146 tubes. All parts supplied, including copper plated steel cabinet, chassis, wiring harness, all hardware and tubes. Complete construction test and operation manual also supplied. Viking II Transmitter Kit.....**279.50**

JOHNSON MOBILE TRANSMITTER KIT



New Johnson mobile transmitter kit, a band-switching 4 band rig, 60 watts input, 100% modulated (30 watts on 800 volt supply) 807 final, microphone input—dynamic, crystal or carbon. Crystal or VFO control. Viking Mobile Transmitter Kit (less tubes) **99.50**

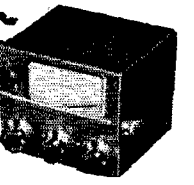
LAFAYETTE — HEADQUARTERS FOR COMMUNICATIONS RECEIVERS



Lafayette has been the Headquarters for fine communications receivers for 32 years. All the latest models are available as soon as released by the manufacturers. Be sure to check Lafayette before you buy your new receiver.

HALLICRAFTERS		NATIONAL	
S-38C	49.50	SW 54	49.95
S-40B	119.95	NC 125T	179.95
S-53A	89.95	NC 183D	369.50
SX-62	299.50	HRO 60	483.50
SX-71	224.50	**HAMMERLUND**	
SX-73	975.00	HQ-140	264.00
S-76	179.50		

RME MC-55 5-BAND MOBILE CONVERTER



MC-55 Net $69.50
MC-53, for 2, 6 and 10-11 Meters..... 66.60
MC-57, for 10, 20 and 75 Meters..... 64.50

STOCK NO. HFS-10

$59.50 for Tuner alone! Reg. $82.50

The Audio "Buy" of the Year!

The famous Espey 512 AM-FM tuner. Guaranteed 100% by Espey and Lafayette. The 512 is a self-powered tuner with built-in preamp, 2 high gain I.F. stages and an R.F. stage for both FM and AM circuits. Equipped with loop antenna for standard broadcast and folded dipole for FM. External phono input — 2 audio output channels — all controlled by the tuner volume control. Tubes: (2) 6BA6, (2) 6BE6, 6SH7, 6SG7, 6AL5, 6C4, 6SQ7, 6U5, 5Y3GT rect. 13½" W x 8½" H x 9" D. Wt. 18 lbs.
ESPEY 512 AM-FM TUNER NET 59.50

HERE IS WHAT YOU GET!

Espey 512C FM-AM Tuner
Bell 2122B 10 Watt Amplifier
Webcor 3-Speed Changer with . . .
GE RPX-050 Triple Play Cartridge
GE 12" PM S12010 Speaker

actual TOTAL price ~~$193.50~~

COMBINATION INCLUDING TUNER:

Our **SMASH** Price **$149.95**

NOW! Compact TAPE RECORDER that has Everything!

$84.50

. . . at a price that's almost nothing!

Equal in quality and reproduction to the larger and MORE expensive recorders — but MUCH smaller, lighter. Dual track recording. Fast forward and rewind — full 7" reel rewinds in 80 seconds. Frequency response essentially flat from 70 to 8500 c.p.s. at 7½ IPS and from 90 to 6000 c.p.s. at 3¾ IPS. Wow and flutter less than ½ of 1%. Handles up to 7" reels. Two hours recording time on one 7" reel at 3¾ IPS using standard tape. 3 watt amplifier. Inputs — mike and radio-phono. Outputs — 3.2 ohm for speaker plus high impedance for external amplifier. Controls — one operating control for record and play and one control each for tone and volume. Size — 8⅝" x 10¾" x 11½". Wt. only 20 lbs., complete. 110-120 volts, 60 cycles AC. Complete with microphone, reel of tape and extra reel. Choice of 2 models: Model 903 — 3¾ IPS; Model 907 — 7½ IPS. Aqua and beige leatherette case.

Lafayette Radio

FAMOUS IN RADIO FOR 32 YEARS

NEW YORK, N. Y.	100 Sixth Ave.
BRONX, N. Y.	542 E. Fordham Rd.
NEWARK, N. J.	24 Central Ave.
PLAINFIELD, N. J.	139 West 2nd St.
BOSTON, MASS.	110 Federal St.

Sweepstakes

(Continued from page 47)

listing and awards.

6) *Awards:* Certificates will be awarded to the highest c.w. scorer and to the highest 'phone scorer in each ARRL section. A c.w. certificate will also be awarded to the highest scoring Novice or Technician in each section where at least three such licensees submit c.w. logs; similarly, a 'phone certificate will be earned by a Novice or Technician in each section where a total of three such licensees submit 'phone logs. Only single-operator stations are eligible for certificate awards. Multiple-operator scores will receive separate *QST* listing in the final results.

A gavel will be awarded to the highest club entry. The aggregate scores of 'phone and c.w. reported by club secretaries and confirmed by the receipt at ARRL of contest logs constitute a club entry. Segregate club entries into 'phone and c.w. totals. Both single- and multiple-operator scores may be counted for club entries. Only the scores of bona fide club members, in a local club territory, may be included in club entries.

The highest single-operator c.w. score and the highest single-operator 'phone score in any club entry will be rewarded with a "club" certificate where at least three single-operator 'phone and/or three single-operator c.w. scores are submitted.

7) *Disqualification:* Failure to comply with the contest rules or FCC regulations or the necessity for avoiding interference with channels handling amateur emergency communication shall constitute grounds for disqualification. In all cases of question, the decisions of the ARRL Contest Committee are final.

"I Have Observed . . ."

(Continued from page 48)

scores. These contestants almost invariably write to ask, "Why wasn't I listed with a score of 5 million?" The answer usually concerns one or more of the following points. These are offered by the ARRL contest checker as a means of avoiding disappointment with *your* next final score:

1) ARRL will furnish, upon request, forms for all its operating activities. The use of these forms, or copies of them, will serve to prevent two of the more disappointing and embarrassing mistakes: the chance that your log may be misplaced, or the chance that you will be entered in the wrong contest. A log on a 5 × 7-inch index card, for example, is often crowded, hard to read, and may not even specify the contest activity to which it refers! Such small papers are easily misplaced among large numbers of contest entries.

2) Use official ARRL lists for counting sections and countries. For example, Newfoundland and Labrador are *not* separate from Canada nor is Delaware separate from Maryland when counting countries and sections respectively. A complete list of ARRL sections appears on Page 6 of every issue of *QST*. An official ARRL Countries List is published every year in January *QST*; or a copy will be mailed to you on request. In most contests, results are grouped by sections and competition is considered to be on a section level. Therefore, when entering such a contest state plainly on your log in what section you live. If you are not sure, send us your operating address and we will be pleased to tell you in what ARRL section you may compete.

3) In several operating activities, you cannot

(Continued on page 130)

LOOK STEINBERGS LOOK

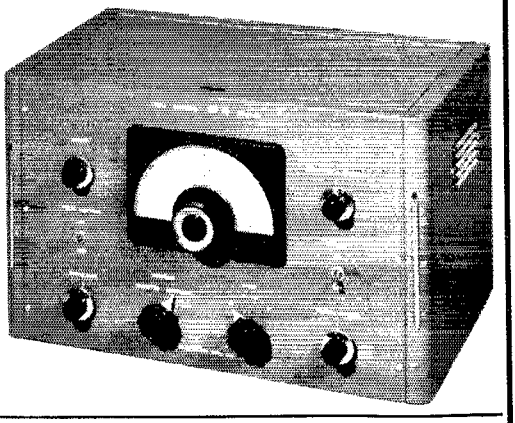
IMMEDIATE DELIVERY

Single Sideband Exciter SS-75

Check these specifications and you'll see why the SS-75 is now the one piece of equipment that places all the advantages of single sideband at your finger tips:

- ★ **Built-in stable VFO, with voltage regulation.**
- ★ **Carrier injection to receiver antenna terminals . . . tune in SSSC signals the same as AM, no other gadgets necessary.**
- ★ **Illuminated VFO tuning dial provides 31 inches of band-spread 3800–4000 KC in 4 bands, with 5 to 1 gear reduction.**
- ★ **Built-in voice control and receiver disabling circuit. Also provides for break-in CW operation.**
- ★ **Specially designed crystal filter network for maximum stability and reliability.**
- ★ **Carrier injection to transmitter available for working single sideband WITH CARRIER, for tune-up adjustments, or CW.**
- ★ **10 watts output, with additional 807 socket for up to 100 watt operation with external power supply.**
- ★ **Handsome grey crackle cabinet, chrome trimmed, 20" x 12" x 12". Complete with 12 tubes, including one 807, operating manual.....$245.00**

Frequency conversion mixer for 40–20 meters, rack mtg. 3½" x 19" less power supply..... 75.00



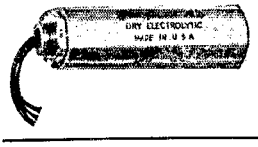
WRIGHT T-R SWITCH

For break-in operation on CW, AM, or SSSC. Use one antenna for transmitting and receiving. It's instantaneous! No moving parts, no power needed to operate. Coax fitting for connections to feeder and receiver. Will handle 1 Kw. With 75 meter plug-in coil.. **$9.95**

40, 20 meter coils, **$1.75** each

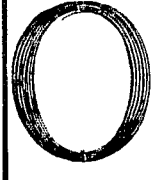
TUBE SOCKETS

For 4-prong tubes 866, 809, 811, 100th etc. Heavy phosphor bronze side wiping contacts, metal shell, white porcelain base. Regular list $1.50, while they last..... **45¢**



Triple 8 mfd. 450 V. electrolytic upright can condenser, separate negatives, all leads insulated from can. Nationally known mfr. Reg. dealer net $2.58.....ONLY **59¢**

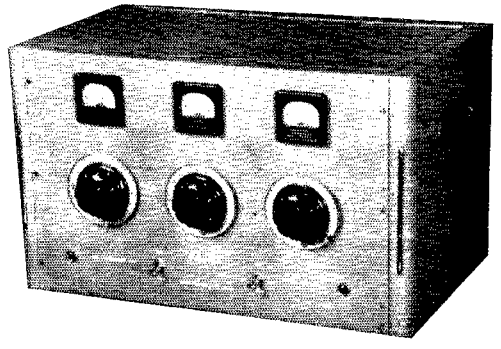
10 for **$5.00**



PHOSPHOR BRONZE AERIAL

125 ft. of the finest aerial wire obtainable. 42-strand phosphor-bronze with linen center. Will not stretch, very high tensile strength, diameter approximately same as No. 14 copper, very flexible. Excellent for transmitting or receiving antenna, control cable, guy wire. Regular list $4.95..... **90¢**

PA-400 LINEAR FINAL



Here is a completely self-contained linear final and power supply, conservatively rated at 400 watts peak input power.

Requires less than 8 watts drive, a perfect companion to the SS-75.

P-P 811-A, with high-capacity final tank circuit. Plug-in B & W coils in grid and plate for 75 meters. Swinging link with co-ax output connector. Zero bias, 1400 plate volts, completely metered in grid, plate and RF output. Finest components used throughout.

Handsome gray crackle cabinet, chrome trimmed, 20" x 12" x 12", complete with all tubes, weight 75 lbs..... **$265.00**

MINIMUM ORDER $2.00. Send 20% deposit with COD orders. Please include sufficient postage or instruct us to ship by Express Collect. Overpayment will be refunded by check.

Steinbergs

Phone CHerry 1880

633 WALNUT STREET • CINCINNATI 2, OHIO

Your order will receive my personal attention and will be shipped the same day order is received. We distribute all top-flight amateur lines . . . let us know what you need.

73, Jule Burnett W8WHE

take credit for working the same station twice. To avoid difficulty (Oh, brother, does it get tough with five or six hundred contacts!) check 'em off as you work 'em with ARRL Operating Aid No. 6, which you can obtain on request from the Communications Department at Headquarters. In one recent contest, several leading scorers lost many thousands of points from their claimed score simply because they had not deleted duplicate contacts.

4) Be sure you count your sections or countries *on the log as you work them*. Many times stations claiming a multiplier of 70 or more have not numbered these as worked. If the checker can locate only 65, the contestant, through his own negligence, loses many points. It is possible that an injustice is done to some entrants in these cases; but on the other hand ARRL cannot give credit unless the multiplier is confirmed by actual count in an inspection of the log.

5) In contest activities where a "club aggregate" may be claimed, be sure to mark the name of your club on the log you submit *and* get after your club secretary to submit an aggregate for the club as a whole. Occasionally we have to pass up known members of a club because these simple precautions have been overlooked. The checker *cannot* enter your log in club competition; you must do it yourself.

Contest activity is a good and growing thing. It promotes good sportsmanship and healthy competition among individuals and clubs. It gives every amateur a chance to test operating ability and gear under trying conditions. It has helped make the American amateur known the world over. If you have not already participated, join the fun, won't you? And if you are already a confirmed contest man, take pride in helping ARRL, its contest committee and its log checker maintain the very highest standards of competition.

Happenings of the Month

(Continued from page 45)

Mr. William P. Massing, Acting Secy.
Federal Communications Commission
Washington 25, D. C.

Dear Sir:

Although in general u.h.f. television has been relatively free from many of the interference problems which plague the v.h.f. service, there is one new aspect which is already causing some difficulty and, as additional stations come on the u.h.f. bands, has serious potentialities of interference not only from the amateur service but from many other communications services as well.

The difficulty, which may have already come to the attention of the Commission in field investigations, is peculiar to v.h.f. sets which are "converted" for u.h.f. reception by the insertion of tuning strips. As is well known, the customary procedure is a dual conversion system. For each u.h.f. channel, an oscillator frequency is selected which permits use of the fundamental for the second mixing process, and use of a harmonic for the conversion at the receiver input.

Let us give a single example of a tuning strip to receive Channel 14 on a v.h.f. set having a 21.25 Mc. i.f. The local oscillator is approximately 165.67 Mc., with its second harmonic employed to beat with the incoming Channel 14

(Continued on page 132)

signal for the first conversion process. We then see that:

Sound channel, TV Channel 14	475.75 Mc.
Second harmonic, 165.67 Mc. oscillator	331.33
First intermediate frequency	144.42
Fundamental, local oscillator	165.67
Second intermediate frequency	21.25 Mc.

This of course works into the proper spot in the present i.f. system of the receiver.

It is to be noted that in this case the first intermediate frequency falls within the exclusively-amateur band 144–148 Mc. Particularly because this frequency within the receiver is an immediate part of the front end, signals from amateur 144 Mc. stations may, through no fault of the operator, ride in and disrupt the picture thoroughly. In fact, this situation has arisen in several localities already.

It is obvious that nothing can be done at the amateur transmitter to alleviate this interference, and such difficulty as is experienced is due solely to spurious response in the "converted" receiver.

It might be assumed that the phenomenon occurs only with a few isolated u.h.f. channels. That is not the case. The use of a common origin for the oscillator signal for both mixing functions necessarily restricts the choice of first intermediate frequency. Further, the existence of v.h.f. receivers with two possible (second) intermediate frequencies — 21.25 and 41.25 Mc. — doubles the combinations which work out to produce a first intermediate frequency within the amateur 144-Mc. band. Listed below are the u.h.f. channels that can be susceptible to this type of interference from amateur 144-Mc. operation, based on an i.f. channel width of 6 megacycles:

21.25-Mc. sound i.f.	*41.25-Mc. sound i.f.*
Channels 14 to 18	Channels 20 to 25
" 41 to 48	" 51 to 58
" 69 to 77	" 82 & 83

This is more than half the total of u.h.f. TV channels.

It is of importance to the general problem, if not immediately to us, to consider the fact that in the cases of the other u.h.f. channels not listed above, the first intermediate frequency falls within bands on one side or the other of the amateur 144-Mc. band, which of course are similarly occupied by communications services and not by broadcasting services. In other words, no matter what the u.h.f. channel, the potentiality of interference from services other than broadcast has been created by the conversion system outlined above, in view of the deficiencies in front-end selectivity to be expected.

We note that in this strip conversion system the first intermediate frequency is determined uniquely by the normal intermediate frequency of the v.h.f. receiver and the order of oscillator harmonic used in the conversion process. We assume that the industry has taken what, to the designer of a broadcast receiver, would be a natural step — to choose oscillator harmonics that would avoid having the first i.f. fall in a band allotted to broadcasting services, in this case v.h.f. television and FM. The probability, then, is that the first i.f. range is confined to the band 108–174 Mc., all of which is assigned to other services.

If those in industry choose to avoid mutual difficulties within the family of broadcast services, we consider it only a calculated risk on their part that the overall interference situation will be less than otherwise. However, the risk is indeed theirs. The amateur service, for one, does not propose to go through another difficult period, again not of its own making, carrying the burden of public misunderstanding and abuse which arises solely because of the inadequacy of television receiving apparatus. We therefore seek the continued coöperation of the Commission, and especially of your field organization, in making it perfectly plain both to the public and to industry where the fault lies in cases of interference arising from the causes we have outlined.

Sincerely yours,

A. L. Budlong
General Manager

HAMS

By Charlie B. Cooper

'Way back eons of years ago
When God created the world we know,
He planted a something in the air,
A something no one knew was there,
Until in Nature's wilderness
Man found and harnessed Wireless.

Yes, Nature is a wilderness
Filled with wonders none can guess,
Of unearthed treasures in its store,
Buried in air or earthen core,
Lying concealed so none can find,
Till God prepares the human mind.

Some folks think that scientists
Discovered all knowledge that now exists
Of Wireless, Radio, and kindred arts.
But myriad Hams, with home-made parts,
Developed and proved, and cut and tried,
In ways that cannot be denied.

And that's what Wireless Hams are for;
To cut and try and to explore
The hidden paths to Nature's store —
Cutting, trying, searching o'er
Theories old, or theories new,
Ever building — never through.

Hams may be doctors or engineers,
Lawyers or merchants, yet pioneers,
Working in so-called Wireless shacks
With breadboard sets, or costly racks,
With no glory given — no flags raised,
And seldom are they ever praised.

Through fifty years in Wireless,
The ones I've found most tireless
Are Hams who cut and try, and yet
The only pay they ever get
Is lure, and pride in what they do
To bring more knowledge into view.

And as with microphone or key
Their signals fly o'er land and sea,
They thrill to mastery of power
That lets them fly from tower to tower,
Exploring this, or that, country
With voice and personality.

Hams have something worth a lot —
An inner something that can't be bought.
It's memory of effort and work well done,
Of much accomplishment, along with fun,
And things that matter — things that last —
Are happy milestones of the past.

So let us thank the Lord that we
Have been a part, and lived to see
Wireless – Radio – TV — grow
Until it spans the world, and so
Let's shape its use to God's great plan
Of "Peace on earth, good will to man."

[This is written to W2FX and to happy memories of the 22 years in which I have had to listen to the thousand-and-one transmitters and aerials he has built (verbally). — *C.B.C.*]

— *Reprinted from QCWA 1953 Year Book*

Hints and Kinks

(Continued from page 53)

CLAMP-TUBE SCREEN-GRID KEYER CIRCUIT

An arrangement used for both the protection and the keying of an ARC-5 final amplifier is shown in Fig. 6. Most of the parts used were taken from surplus equipment, explaining the selection of a Type 12A6 tube for the circuit. The circuit is unlike other clampers in that it provides the amplifier screen grids with a negative potential during key-up periods. Naturally, this condition results in maximum amplifier cut-off, which in turn improves the possibilities of obtaining satisfactory amplifier keying.

In Fig. 6, the bias for the amplifier (either fixed or grid-leak) is fed to the 12A6 through resistors R_2 and R_3 and to the amplifier screens through R_1. A fixed positive voltage is fed to the 12A6 grid through R_4 and R_5 and the key is connected between the junction of these two resistors and ground. R_6 is the normal amplifier screen-dropping resistor and C_1 permits adjustment of the keying characteristics. The regulator tube is connected in series with the amplifier screen lead.

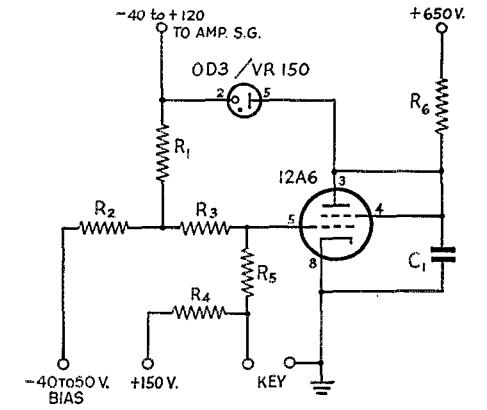


Fig. 6 — Circuit of the clamp-tube screen-grid keyer.
C_1 — 0.05 μfd.
R_1 — 0.47 megohm, ½ watt.
R_2 — 27,000 ohms, ½ watt.
R_3, R_4, R_5 — 0.27 megohm, ½ watt.
R_6 — 50,000 ohms, 20 watts.

In operation, the circuit works as follows: With key up, the grid of the 12A6 is driven positive and the tube draws heavily through R_6 and, as a result, the 0D3 will not conduct. Under these conditions, the screens of the amplifier tubes are connected back to the negative bias supply through R_1 and R_2. When the key is closed, it grounds the grid end of R_4 and thereby removes the positive bias from the grid of the 12A6. At this point, the negative bias takes over and cuts off the clamp tube which, in turn, ceases to draw current through R_6. When the 12A6 cuts off, the 0D3 conducts and a positive voltage is applied to the amplifier screens.

(Continued on page 138)

Most of the circuit constants are not too critical. However, R_3 should be about as shown. If the resistance is too large, it will cause backwave when the final is keyed. If the value is too low, it will cause the bias to change with keying. The value suggested for R_4 is suitable for use with a 150-volt supply and the resistance should be increased if more than 150 volts is employed. The circuit does not perform satisfactorily with the ARC-5 final when the positive bias voltage is less than 150 volts. C_1, as recommended, may be a little large for another type of amplifier, but 0.05 μfd. is, at least, a good value to start with.

— *Jim Tonne, W5SUC*

ANOTHER METHOD OF POSTING QSL CARDS

WHAT to do with the QSL cards is always a problem but it seems that the most popular method of storage is still to post them on the wall. The method shown in Fig. 7 does not leave marks on the wall nor does it damage the QSL card in any way.

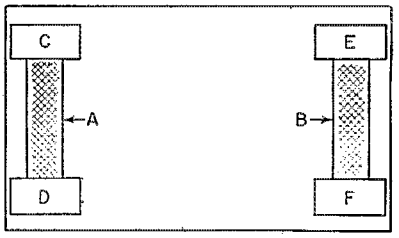


Fig. 7 — Here is how WN6TKA prepares a QSL card for on-the-wall posting. Strips *A* and *B* are placed on the card with the adhesive side out and strips *C* through *F* are mounted with the adhesive against the card.

For each card to be posted, cut six pieces of cellophane tape or, better still, the "wet-or-dry" type of masking tape, of the ½-inch-wide variety. Cut two of the strips just slightly less than the width of the card, and the other four strips about an inch in length. Place the longer strips across the width of the card (one at each end of the card) adhesive surface up, and place the shorter strips face down, one at each end of each longer strip of tape. This will firmly hold the tape to the card, adhesive side out.

Then simply place the card wherever you want it on the wall and presto — there it sticks, firmly and neatly, for as long as you want it there. It will adhere to just about every wall surface encountered, too, from wallpaper to rough stucco or plaster.

Cellophane tape, masking tape or adhesive tape will all work equally well. The masking tape, however, is the more economical and many other uses for it can be found around the shack. Electrical tapes of any kind should be avoided for this purpose, as the black adhesive usually comes off on the wall.

— *Richard F. Van Wickle, WN6TKA*

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 be used which would tend to make one advertisement stand out from the others.

(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 25th 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 noncommercial 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.

(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., 719 World Bldg., New York City.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS. Radio publications. Latest Call Books, $3.00. Mrs. Earl Mead, Huntley, Montana.

QSL's-SWL's Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSLS, SWLS. Samples, 10¢. C. Fritz, 1213 Briargate, Joliet, Ill.

WANTED: Cash or trade, fixed frequency receivers 28–42 Mc. W9YIV, Troy, Ill.

QSLS, SWLS. High quality. Reasonable prices. Free samples. Write to Bob Teachout, W1FSV, Box Q124, Rutland, Vermont.

WANTED: All types of aircraft radios, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

QSL samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

QSLS-SWLS, as low as $1.50 per color. Samples dime. Stronberg, P.O. Box 151, Highland Station, Springfield, Mass.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

RTTY. An amateur teletype monthly bulletin, $1.80 per year, available from Southern California Radio Teletype Society, 3769 East Green Street, Pasadena 10, Calif.

QSL's, SWL's. Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 602 Barker Bldg., Omaha, Nebraska.

CODE Slow? Just the help you need in psychological aids booklet. Two dollars postpaid. Inquiries invited. Donald H. Rogers, 41 Fourth St., Fanwood, N. J.

ATTENTION Bargain hunters! Dozens of real trade-in values including Collins, Vikings, Nationals, Hallicrafters, Elmac, Gonset, RME, Morrow, Harvey-Wells. Write for free bargain bulletin. Complete stocks, all leading brands. We trade and sell on time. Burghardt Radio Supply, Watertown, South Dakota.

WANT *QST*s older than 1920. Have 200 copies from 1932 to 1953 at 25¢ each. WØMCX Jablonsky, 1022 No. Rock Hill Road, Rock Hill 19, Mo.

DELUXE QSLS. Petty, W2HAZ, 17 Southard, Trenton, N. J. Samples 10¢.

QSLS-SWLS, samples, 10¢. Malgo Press, 1937 Glendale Avenue, Toledo 14, Ohio.

DON'T Fail! Check yourself with a time-tested Surecheck Test. Novice, $1.50; General, $1.75; Amateur Extra, $2.00. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

QSL. Something new, something different, samples free. CPS Bladensburg, Md.

QSLS! Interesting samples 10¢. Tooker Press, P. O. Box T, Lakehurst, N. J.

CALL Letters: 25 cents a set. Dress up your rig, car, etc. For samples, write to Robert Connick, Nickcon, P.O. Box 272, Cincinnati 1, Ohio.

WANTED: Bargains in transmitters, receivers, laboratory and test equipment, power supplies, miscellaneous gear and parts. What have you? Harold Schonwald, W5ZZ, 718 N. Broadway, Oklahoma City, Okla.

QSLS! We've printed a million. Hams all over the world use our QSLs. Samples 10¢, refunded. VYS Print, 1704 Hale, Ft. Wayne, Ind.

QSLS. Taprint, 205 South, Union, Miss.

QSLS? QSLS? Get America's finest and largest variety, Super-gloss QSL samples, 25¢. Rus Sakkers, W8DED, Ham Print Shop, 53 East 7th St., Holland, Michigan. Subscriptions, renewals accepted and appreciated, for all amateur radio magazines.

ELECTRONIC Technicians. For permanent positions with Sandia Corporation. Armed Forces acquired radar or electronic experience desirable; trade school certificate with minimum five years experience. Versatility, capability and willingness to work most essential. Sandia Corporation, a subsidiary of the Western Electric Company, operates the Laboratory under contract with the Atomic Energy Commission in Albuquerque, New Mexico. Excellent working conditions and liberal employee benefits, including paid vacations, sickness benefits, group life insurance and a contributory retirement plan. No housing shortage in the Albuquerque area. For further information write to Section (2), General Employment Division, Sandia Corporation, Sandia Base, Albuquerque, New Mexico.

FOR Sale: FM tuner, Meissner 8C, like new, $40.00; or swap for mobile equipment. Howard H. Morgan, Jr., W3SUI, 345 Hazel Drive, Pittsburgh 28, Penna.

COLLINS 32V2 and 75A2 with speaker, excellent condition and appearance, both for $750.00. R. E. McCrory or John Gleason 1355 Getwell, Memphis, Tenn.

SWR Bridge, $11.00; R.F. impedance bridge, $15.00; Heath TV sweep generator, $25.00. W2RLN, Ritter, 1141 Garrett Ave., Niagara Falls, N. Y.

FOR Sale: Complete radio equipment of the late W8ALC, 250 watt transmitter, B221, RME 2-11, lots of BC units, meters, transformers, tubes, selsyns, and lots of odds and ends. *QST*s back to 1920. This equipment all inspected by the local hams and priced right. Write for free list and prices. Mrs. Dickman, 1236 Mifflin Ave., Ashland, Ohio.

SELL: Collins 32V1 factory-converted to 32V2 plus mike and Mon-Key, $450.00. Collins 75A1, $250.00 and also custom-made three-element 20-meter beam, $75.00. Livingston Rice, W1QOC, 70 Cole Ave., Williamstown, Mass.

WILL trade new contax Model IIIA camera F1:5 lens for good Collins 32V2 transmitter. Sell excellent BC-779B in case, power supply, $80.00 f.o.b. San Antonio. Want Model 15 or 19 teletype machine. Millis, W5ALC, 527 Williamsburg Place, San Antonio, Texas.

SALE or trade: G.E. CRO-3A oscilloscope, $25.00; 5 x 7 Graflex f4.5 Zeiss Tessar, $60.00; pair of BC645s with dynamotors, $40; pair of TBY transceivers, $30.00; Mark II tank transceivers, $25.00; PE103, $15.00; SX-71, $150.00; portable beta gamma radiation detectors. I want Collins 70E-8A, BC-221, 54mm and 2¼ x 3¼ cameras, 25 Hp outboard motor. P. Greenwood, W2ZKZ, 127 Dormar Drive, North Syracuse, N. Y.

WANTED: Signal generator, Measurements Corporation 78-B. Herb Warner, K2BN, Long Hill Road, Great Notch, N. J.

MOBILE rig: complete 60-watt St-203A; 6146 final; Carter dynamotor, 500v 170 Ma.; Mallory VP557, 400v. 150 Ma.; 75 meter center loaded whip. Morrow 2BR converter. Used very little, $100.00. Also: Viking II transmitter, low-pass filter installed. Used less than 25 hours, $235.00. Ship to anywhere. C. C. Walters, W5LED, 1914 Cedar Springs, Dallas 1, Texas.

TRADE: Jeanette rotary converter, Model CA-19, with filter; and/or Carter converter Model D-1060-C, for 2 meter mobile converter. Instructograph or automatic sender. W. S. Warner, % Foley, 166 Pearsall Dr., Mt. Vernon, N. Y.

SELL: Sonar MR3 mobile receiver, $70; Stancor ST203A transmitter, converted for 20 meters with 2 xtals; $45.00. Carter dynamotor 425 volts @ 350 mils, $30.00. Complete installation with mike & antenna, $135. C. Lindemann, W1MLM, Wilton Road, Westport, Conn.

SELL: 304TL's, 833A's, 832's, 829, 5BP1. BC645, vacuum capacitors, meters, MB-40L tanks, BC696, 75 watt bandswitching coils; 110V., selsyns, 40 watt modulation transformers, many other items. Ask for detailed list. Prewitt, W9UKT Box 1003, Kokomo Ind.

WANTED: S-76 receiver. State price and condition. WN3VXQ, Richman, 4639 Walnut St., Philadelphia 39, Penna.

NOVICES! Transmitter bargain. 40 watts to a 6L6, $35.00. MacLaughlin, WN1WVV, Darien, Conn.

ELDICO Code Course, 5 microgroove 12" records, $10.00; Garrard RC-80 3-speed Record-changer; GE RPX-050 cartridge, $40.00; Garrard 2-speed GE cartridge, $20.00; GE SPX-001 preamplifier, $5.00; RPX-040 cartridge, $3; Brush BK-401 tape recorder, $100; 9 hours recording wire, $18.00; Intertalk telephone set, $15.00; Rider Chanalyst 162C, $75.00; Approved A-200 signal generator, $20.00; Utah 12" speaker, Kainer projector crowsfoot stand, $12.50; portable dual 12" bass-reflex cabinet, $15.00; vertical ¼" drill press stand, $7.50; small GE portable radio, $10; Zenith 3-way portable, $15.00; Benwood-Linze 20 amp. battery charger, fine for servicing car radios, $15.00. V. R. Hein, 418 Gregory, Rockford, Ill.

SELL: 120-watt, c.w. rig, two power supplies, meters, built-in monitor, all on one chassis, coils for 80, 40, 20, $60.00; Lysco 381VFO companion, $18.00 or $75.00 for both. BC-454 rcvr with Heathkit power supply ready to go, $11.00. McMurdo Silver 802 Superhet rcvr, lots of bandspread, coils for 80, 40, 20, $22.00. Don Fleischhauer, W9DIP, R.R. #1, Mulberry, Ind.

SONAR MB26, 2-meter transmitter, $40; Sonar 9 — 2 meter rcvr, $40; RME 10–20 converter, $40; Hallicrafters speaker, new, $12.00; 250TH tube, $7.50; 100TH tube, $3.50; CW3 receiver, new, with 7 Mc. coils, $20; John Sutter, 2501 Knapp St., Brooklyn 35, N. Y.

SELL: BC348, purchased new with matching speaker, 110 AC installed by W.R.L. and modified per *QST*, $75.00; also BC221 with power supply, $48.00. Carl W. Hines, P.O. Box 610, Wilson, North Carolina.

FOR Sale: NC-183 with speaker, not used over 10 hours. Best offer over $200.00. Also 250-watt 813 final with Meissner signal shifter in excellent condition. Best offer. M. S. Himeles, 3903 Penhurst Ave., Baltimore 15, Md.

BC-455, used, $8.00; BC-453, new, $20.00; Bendix TA-12 xmitter, used, $45.00; 24 v. power supply, mod. for above, $15.00; BC-522, purchased new, $45.00; Type-12 (12 V.) power supply for above new, $15.00; brand new 807's in cartons, $1.00 each; 1.575 to 1 modulation transformer 807's class B to what have you, $1.50; 24 V-50 A. generator, $12; pair 12 V. storage batts. new dry charged, $12.00 each; 25uH variable inductor per Oct. 1952 *QST*, $8.00. King, W8GU, 18944 Sorrento, Detroit, Mich.

LOCAL Sale: Viking I and VFO, TVI-ed, like new, with manuals, $225.00. R.F. amplifier, new 6146s in push-pull, metered, TVI-ed, coils for 10 and 20, well built, no power supply, $50.00. Cash only. W6KSL.

SELL, Trade: VHF152A, 814's, SCR-522 xmitter. Want: 4D32, 832A tubes. Roy Sawdey, Harper Road, Solon, Ohio.

FBS-50C, $82.00; Tri-band, $33.50; dynamotor 6 volt input, 425 volt output, $23.00; other parts for sale or swap, stamp for list. F. C. McDaniel, W6PMM/4, Quarters 422, MCS, Quantico, Virginia.

TRANSMITTER, 180 w. phone, 814 final, 807 modulators, 2 866A h.v., 2 5U4G l.v. neat, compact, 14" grey cabinet, $125.00. Write for photo, circuit. Plug-in coil, Signal Shifter, gud condx, $25 00. de-TVI'd, 813 rig (1953 ARRL Handbook), $100. Entire 10 m. mobile installation, $65.00. W7MUI/9, c/o W9GFC.

SELL or trade: #21A teletype tape printer, #12 page printer, 32V-3, BC-1031 Panoramic adaptor, LM freq. meter, T-23/ARC-5, RA-62, BC-610-E. Want: ART-13, DY-17, APN-9, APN-4, BC-221, BC-348-Q, BC-342, BC-312, Technical manuals, TS or I test equipment. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Tel. Richmond 2-0916.

WANTED: AN/APR-4, APR-5A, ARC-1, ARC-3. ART-13, etc.; TS-146 and other "TS", particularly microwave equipment, even salvage; VHF frequency meters and signal generators; quantities of 723A/B, 3C22, etc., tubes; any laboratory equipment. Top cash or swap. Rush! Engineering Associates, 434 Patterson Road, Dayton 9, Ohio.

I have a 4X150-A tube. Will sell or trade. I want a WE Salt Shaker mike. George Sperry, 108 Oak Hill Ave., Portsmouth, Va.

FOR Sale: Mims antenna rotator and indicator, excellent, $65.00. W4ZSC, Sheppard, Rt. 3, Griffin, Ga.

FOR Sale: All issues of QST from October 1935 to date. Best cash offer takes this gold mine of information. Mark Edwards, W2KPK, 4206 Clarendon Road. Brooklyn 3, N. Y. Ingersoll 2-6375.

NEW Viking mobile xmitter, with tubes, wired and tested on all bands; never used. Kit price $99.50; 40-watt mobile xmitter, 815 final, combination 110/6 volt power supply, $75.00; Gonset Triband converter, $30; Eldico 2-meter receiver, 11 tube Superhet, brand new, $50. Marvin D. Klein, W8UDL, 2374 Euclid Heights Blvd., Cleveland Heights, Ohio.

SELL: Transmitter-modulator with two low voltage power supplies but no high voltage supply. 150 W c.w., 100 W. 'phone, $60.00. Dumont 3" 'scope with spare tube, $25.00. All for $75.00. No shipping. Will deliver within 50 miles. R. H. Beers, 33 Sterling Drive, Livingston, N. J.

WANTED: HQ129X, good condition, for cash. Would consider good Super Pro if reasonable. Roger K. Mayhew, R.F.D. Box 89, N. Conway, N. H.

HALLICRAFTERS SX-42 rcvr and R-46 spkr, excellent, $195.00. Jackson tube-tester, new, $50.00. Sell or trade both on xmitter of equal value. McBride, W7STA, 5803 N. 31st Avenue, Phoenix, Ariz.

FOR Sale: Brand new Eldico TR-75-TV xmitter, coils for 10, 15, 20, 40 and 80 meters. All factory wired and tested, cost $125.00. Also new Precision 5 in. oscilloscope Model ES-500A, cost $170.00. Write for prices. Prefer New York area. John J. Oskay, K2BUW, 70 Senior St., New Brunswick, N. J.

HRO50T only slightly used, xtal calibrator, FM adapter, seven coil sets, speaker, $300.00. C. Dodd, 526 Brookhurst Dr., Dallas, Texas.

SELL Meissner 150-B with Signal Shifter, complete for the best offer over $250.00 F.o.b. South Bend, Ind. Robert G. Kasa, W9OGZ, 821-24th St., South Bend, Ind.

COMPLETE station. Transmitter: 450 w. NBFM-CW, XE-10 exciter, JT-30 mike. Receiver: VHF-52A, 6AC7 preamp, S-40B. Also Elincor beam, control system, etc. Swap for mobile gear, or best offer over $275.00. Ednie, W9TVY, 5528 Ellis, Chicago 37, Ill.

MODIFIED BC-457 50 watt c.w. xmitter for 80 with dual supply, key, xtal, etc. $40.00; 40 watt mod., $20.00; BD-77 Dynamotor, $15.00; 6 v. Dynamotor, output 275 v., 90 Ma., $8.00; 4-16 μfd 1800 v. cond, $5.00 each; 10-2 μfd, 2000 v. cond., $2.00 each; 20 watt mod., $12.00; 600 v.-175 Ma., 6.3 v. supply, $15.00; all components for 600 v.-250 Ma. supply, $17.00; 40 watt Novice xmitter with supply, key, xtal, etc., $35.00; two 2J1H1 selsyns, $8.00 per pair; '41-'47 Buick radios, $10.00 each. W8QKU, 2748 Meade St., Detroit 12, Mich.

MODIFIED BC610-D, complete with mike, nine sets coils, splatter choke, extra meters, 2 spare 250TH, 2 spare 100TH, new spare exciter and modulator decks, extra parts and all technical manuals, $500.00. Transmitter, less spare parts, $400.00. Complete SCR 284 field transmitter, $100.00. Send for list of other parts and bargains. W5DZ.

FOR Sale: Hallicrafters Sky Rider Jr. S-41-W receiver. Good condition, $25.00 or best offer. Jay S. Leiber, W5VUE, 256 Central, Hot Springs, Ark.

SELL contest-winning kilowatt. Lysco exciter driving two finals, three 813s, parallel 40-80-160, pair 4-250As, 20-115-10. Modulators four 838s. Deluxe 4 channel RCA speech. Separate power supplies for modulators, final, screens, and bias. Fully metered. Housed in 167BY commercial cabinet. With tubes. Best offer F.o.b. my shack. Also Hallicrafters communications portable, $60.00. National NC54 $65. Brand new UC1M kilowatt voltbox $30. W2SKE. Call Bill Leonard PL 1-2345, New York City weekdays.

VERY sweet baby mobile antenna, satisfies XYL mobile antenna problem. Beautifully chromed, only 4 feet 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. Is 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 through 10 meters. With mounting hardware and one coil $12.95 each. Specify band. Other coils, $2.75 each. W6VS, Bill Davis, 225 Cambridge Ave., Berkeley 8, Calif.

SWAP Model 1000 speech clipper. Mod. transformer 60-watt Multi-Match. Power trans. 800VCT 200 Ma. Want electronic key. VTVM. W2WER, Chichester, 57 East Utica St., Oswego, N. Y.

SELL: 2-meter 100 w. transmitter, rcvr, and pwr supp, $75.00. G-E wire recorder, $25.00; 75 meter Command xmittr, clamp-tube mod., and power supply, $50.00; 75 meter mobile BC696 xmittr with built-in clamp-tube mod., $30.00. Pick up only, no shipping. W1RYL, Fairbrother, Brattleboro, Vt.

MOBILE, complete (N. Y. Area) Bandmaster Senior, P.E. 103 power, remote control box, cables, mounting fixtures and relays, Gonset Triband converter, noise limiter, steering post mount, Shure 505C mike, 10 meter whip, 20 and 75 meter base mount coils, Master Mobile body mount, $190, or best offer. Sherman Dennis (W2RUH), 414 No. Broad St., Elizabeth 3, N. J.

FOR Sale: Collins 32V2, $425.00. Aldis Hendrickson, Jewell, Iowa

SURPLUS Specials! RG-8/U cable, 225 ft., $12.25; RG-59/U cable, 250 ft., $15.00; coaxial connectors PL-259, 5 for $2.25; SO-239 5 for $2.00; manuals for SCR-522; BC-610, BC-779, BC-348J, N, Q, $1.00 each (plus postage); new tubes 1619, 1625, 1626, 1629, 6 for $1.80; 813, $10.50; 866A, $1.48. Postage extra. Request our Free Bulletin. Lectronic Research, 719 Arch St., Philadelphia 6, Penna.

CASH and carry: Collins kilowatt 202A model. 250TLs modulating 250TIs interlocked overload and low voltage protection. Used but in excellent condx. Make me offer. W9ARK.

FREE List! New and reconditioned receivers, transmitters, etc. A hundred big bargains every month. Highest trade-in allowance. Fast four-hour shipping service. Special Novice department. Write us today. Dossett, W9BHV, 855 Burlington, Frankfort, Indiana.

WANTED: BC-610-E, BC-614-E, BC-939-A, ART-13, DY-17, APN-9, BC-221, LM, TCS, 32V-2, 75A-1, BC-312, BC-342, BC-348-R. Manuals. Will trade for new amateur equipment. Alltronics, Box 19, Boston 1, Mass. Tel. Richmond 2-0916.

TO end family cold war will surrender recently acquired 75A-2 and speaker. Very FB condx and in original cartons. $310.00. Chas. Dutton, W9QLK, Route 3, Box 99, Elgin, Ill.

SELL: HRO-50T, superb condx, extras. Local deal preferred. W2KHJ, Gertler, 139-36 230 Place, Springfield Gardens 13, N. Y.

32V-2 for sale: $500.00. Like new, perfect condition, in original packing. Used about 30 hours. Reason for selling: owner overseas. Contact Dr. Millett G. Morgan, W1HDA, Thayer School of Engineering, Hanover, N. H.

WILL trade new condition RCA broadcast technician course texts for used xmitter. Write for lists. All mail answered. Warren Jarvis, WNVA, Norton, Va.

NATIONAL 101X receiver, $60. 7" TV, $30. 10", $40.00. Want SSB exciter. W4API, 1420 South Randolph, Arlington, Va.

SELL: FM modulation monitor Browning Laboratories Model MD-25A, Serial #301, $250.00. New price, $365.00. W8VLB, Glenn F. Markley, R.F.D. #4, Mansfield, Ohio.

VFO transmitter, 814 in final, 150 watts, all stages metered. 3 power supplies, 'phone and c.w. $150.00 takes it. Larry Bauer, W8GWJ, Holgate, Ohio.

THE Perfect Gift! For your radio shack. Large (8 inches in diameter) practical ceramic ashtray with your call-letters, hand-lettered on center island. Colors, mahogany or green. Price $3.00. Send money order or check along with name, address and call-letters to Carl Bozenski, New England Ceramics, Inc., Torrington, Conn.

FOR Sale: Collins 310B-1, $190.00; six-band frequency multiplier per 1953 Handbook, page 197, $35.00; FU-40 transmitter kit, complete with three tuning drawers, $25.00; T-23/ARC-5 less relay, $20.00; HT-6 transmitter $50.00; BC-348 with power supply, $45.00. W5NXE, 2255 46th St., Los Alamos, New Mexico.

SWAP: 1875 volt, 500 Ma. plate transformer, or RCA kilowatt modulation transformer, with screen winding, for two 500 Ma. filter chokes, one swinging and one smoothing. Also consider cash offer. WØEIV/9, S. Bradley, R.R. #1, Lawrenceburg, Ind.

SELL HT-9, excellent condition, coils 10 through 80, completely shielded and filtered for TVI, $185.00. F.o.b. San Francisco. W8UJO/6, 3500 Fulton, San Francisco 18, Calif.

"DX Log of Awards," the information you have been looking for. Official rules for more than 30 awards with check-list to record your progress. DXCC covers six pages alone. Only one non-DX award: WAS. Contains also postal data, countries cross index and other valuable information. The price: one dollar, prepaid. E. C. Frierson, W4RKJ, Easley, S. C.

FOR Sale: 28V, 67 ampere Exide battery. New, original carton, $30.00. 28VDC, 200 ampere generator and regulator, $7.50. 12VDC, 55 ampere Auto-Lite automotive generator, matching regulator, $25.00. PE-73 dynamotor, new, $7.50. James W. Craig, Jr., 3413 W. Roosevelt, Lake Charles, La.

SALE: 2½ KW engine generator set. Briggs and Stratton 6½ HP engine. Less than 30 hours use, $279.00. W2ZGB, Sellers, 178 Colonial Road, Summit, N. J.

10, 15 and 20 meter beams, aluminum tubing, etc. Perforated aluminum sheet for shielding. Radcliff's, 1720 North Countyline St., Fostoria, Ohio.

NC-125, almost new, $140.00; HT18 VFO, $75.00; UTC 'fone/c.w. transmitter, 100 watts, $100.00. John Tate, W3FYW, 205 Simpson Road, Armore, Penna.

WORLD famous Mockingbird Hill in Gardner, Mass. and W1JR for sale. Transmitters, beams, a basement full of parts, 6 acre hilltop with 86 bearing apple trees, 6-room ranch home. Write Rich or call Gardner 218-R for details. C. C. Richelieu, W1JR.

FOR Sale: complete station. Best offer takes 32V1, TVI'd, all brand new tubes and in excellent condx. Low pass filter and line filter. Push to talk dynamic mike. Eldico antenna tuner. Coax relay. HRO-50-R with ABCDE coils and crystal calibrator. Panadaptor. Mon-Key RME VHF 152A. Will not sell separately. F.o.b. Tucson, Ariz. Write Norman Horwitch, 3018 E. Drachman, W7NYK.

ELDICO TR-1 transmitter, no TVI. Sell or swap for receiver and VFO. W6FXV, Drenon, 2722 University, Fresno, Calif.

FOR Sale: HQ-129X, 100 kc xtal calibrator and speaker, $145.00; BC453 — 85 kc IFs, #7267 new, $1.50 ea; BC459A, $14; Heath VTVM V6, new, $30.00; tube-tester TCIP, new, $40; Eico batt. eliminator, $26.00; Triplett VOM 2400, $18.00; DM32A, $2.00; PE101C, new, modified, $5.95; all plus shipping costs. M. J. Marshall, 455 Washington Ave., Dumont, N. J.

WANTED: Collins 32A's, BC460's, TDO one KW 2 to 18 Mcs transmitters, one KW BC transmitters. Receivers AR88's, also BC610, 614, JB70 and test equipment. Write for catalog. We buy, sell and swap as well. "TAB," 111 Liberty St., New York 6, N. Y.

SELL new 1625 tubes, same as 807 with 12-volt filament. 97¢ each, plus 3¢ postage. W7TBE, 318 W. Galer, Seattle, Washington.

SELLING out ham station. Everything goes cheap. Send for list. Chandler, WØOKM, 23 6th St., N.W., Minot, No. Dakota.

FL 8 filters, 2 for $2.00; BC-348 shock-mounts $2.00 ea., 110V, 60 cycle Autosyn motors, $4.00 ea; BK 5 E relay, $2.00 ea; BC 434A control box with tuning meter, $3.00 ea; BC-221 Q Frequency meter, SCR-522 less tubes, otherwise complete; SCR 522 transmitter (BC-625AM) complete with tubes; DY 11/ART-13 dynamotor. Wanted: HiFi Audio equipment and 4-400 tube. M. D. Haines, W5QCB, 1316 S. W. Military Drive, San Antonio 4, Texas.

FOR Sale: Mobile outfit, AH54 Elmac xmittr with 160 band in, 110 AC power pack; 6 volt dynamotor with base relays, filter chokes, xtal mike, Master Mobile Mount and whip, cables, etc. New Elmac rcvr with pwr supp., spkr, new Dow relay for coax, SPDT relay, $350.00. Two xtals. F. Boyd, W9LQI, Ashton, Ill.

FINEST call-letter signs, quality aluminum, black enamel, yellow reflecting letters. Specify car or rig. Read day or night. $1.50. Joseph Whitley, 133 Airsdale Ave., Long Branch, N. J.

QSLS! QSLS! QSLS! "America's First Choice!" Printed on beautiful Kromekote and shipped within 24 to 36 hours. Samples 10¢. Tooker Press, P.O. Box T, Lakehurst, N. J.

ARE you a Christian minister, interested in ham radio, or a ham yourself, fed up with cities? Position open in a small country town. Attractive parsonage. Good radio location. Strong TV signals from Memphis. First Christian Church, Crockett Mills, Tenn.

QSLS, SWLS. Quality work, reasonable prices. Samples 10¢, refunded. Joe Harms, W2JME, 225 Maple Ave., North Plainfield, N. J.

SONAR MR-3 mobile receivers, $39.95; RME MCH4 mobile converters, $39.95; Meissner EX signal shifters with four coil strips, $39.95; Millen 90700 Variarm VFOs, $19.95; Millen 90800 exciters with tubes and one set of coils, $19.95; other similar bargains in used, reconditioned equipment. Write for latest list to Carl, W1BFT, Evans Radio, Concord, N. H.

NEW crystals for all commercial services at economical prices; also regrinding or replacement crystals for broadcast, Link, Motorola, G.E. and other such types. Over 18 years of satisfaction and fast service. Eidson Electronic Company, phone 3-3901, Temple, Texas.

MOTOROLA FMT-30 DMS transmitter and P-69-13-18 ARS receiver, Gonset Tri-Band Converter, manual, connecting cables, test-meter, firewall speaker, Shure mike and control head. Cost $260.00. $160.00 F.o.b. Ft. Bragg, N. C. M. M. Kovar, W4BMP, 218 Le Blanc St., Fort Bragg, N. C.

SWEEPSTAKES QSLS by W9AVH eliminate contest labor. Imprinted rig, rcvr, score, etc. Govt. cards or Kromekote. Also regular QSLS as low as $1.07 per 100. Maps, cartoons, fluorescent, special Novice deal, fast delivery. Indicate regular or sweepstakes samples 10¢ dozen. H. W. Robinson, W9AVH, 12811 Sacramento, Blue Island, Ill.

MOBILEERS: Improve selectivity. State model of auto radio. $15.95. Green Electronics, 8-03 149th St., Whitestone, L. I., N. Y.

FOR Sale: Gardiner "Model S DeLuxe" Automatic tape sender. Speed 4 to 60 wpm. Complete with 10 rolls, double perforated tape, 20 lessons, $20.00. Also "ICA DeLuxe Signatone" code practice oscillator, $10.00. Will sell both for $25.00. Both are brand new. W5LCB, Edwards, 3112, N.W. 13th St., Oklahoma City 7, Okla.

FOR Sale: QST magazines, August 1920 through 1952. Sell complete. Also speech amplifier. Mrs. Darrell A. Downard, Watterson Trail, Buechel, Kentucky.

FOR Sale: BC 645-A, 450MC transmitter and receiver, new, conversion instructions, $15.00. D. Basolo, W9TJD, 1240 West 96th St., Chicago, Ill.

SELL: Novice one tube xmitter, power supply, crystal, key, (illustrated May-June 1951 QST). Instructograph with oscillator, A.C. motor, key, 'phones, 10 Continental Code tapes. Both for $50.00 F.o.b. First m.o. takes. Lester McLain, WØDEE, Burlington, Colo.

FOR Sale: RME-45, DB-22A. Bargains! W8DED, 53 E. 7th, Holland, Michigan.

SWAP! 100 dollars worth of model airplane equipment, planes and motors. Wanted: S-40B or similar receiver. Contact: Joel Anderson, WN1YZV, R.F.D. #1, Terryville, Conn.

COLLINS 75A2 and 32V2, $900; new condition; BC223A, $30.00; BC474A, $50.00; BC348, $70; BC221, $70. F.o.b. Dunbarton, N. H. QST binders, $1.25. W1THM.

TV set, 10 in. and 12 in., excellent condition, also Webster wire recorder and Ampro tape recorder, like new. Sell any or all, cheap or swap for good camera. W2FUB. S. Cohn, 84-20 126th St., Kew Gardens 15, L. I., N. Y.

FOR Sale: HT-4B (BC-610) with complete set of tubes. Modulator deck, power and modulation transformers removed and in separate packing crates for shipment. In excellent condition. $300.00. Kenneth P. Johnson, WØPTA, Box 273, Mason, Ohio.

WANTED: Would any ham who has a Hallicrafters Model HT-1 transmitter please write me and let me know how to wind some 40 meter coils for mine. Tnx. WN4YBX, Coleman Apts. 9-H, Asheville, N. C.

FOR Sale: 1KW TX plus rest station equipment. Worth $2500. Goes for $600; K6BX, 402 Calla, Palm City, Calif.

SELL: Two BC222 xmitter rcvrs, portable batteries included, in gud condx, $50; Mark II tank set, new, including 235 Mc. complete, $50.00. Cash or trade anything. Caesar Arena, W2SVV, 1942 Pennington Road, Trenton 8, N. J.

FOR Sale: 100 w. 'phone or c.w. xmitter, and SX-17 recv. Make offer. Also complete set QST from January 1930 to December 1952. W1CZV, Joseph E. Huntington, 39 Touro Ave., Medford, Mass.

WANT: H.V. power supply, about 1500v. 300M. K2CQS, Glenn Werlau, Greendale Farm, South Salem, N. Y.

QSTs, bound volumes 3 (1919–1920) through 28 (1944). Will sell all or any of these 26 bound volumes at reasonable price. Also have one copy each of October and November, 1916, issues in good condition. L. A. Morrow, W1VG, 99 Bentwood Road, West Hartford, Conn.

NEW windmill tower, square 33 ft., $95.00; Lincwelder 60 with torch, $35.00; Ekotape Pla-mate code lessons on tape, $75.00. Need: SX-71 or NC-183. G. A. Wildeboor, WØKHJ, Savannah, Missouri.

SALE: National NC-250-D receiver, matching speaker, $140.00; Budd ECO with 40-M coils, $35.00; Heathkit 5# 'scope, $35. W4PNU, Pilafian, 200 S.W. 2nd Ave., Miami, Fla.

GONSET Commander mobile xmitter and VFO, 1 month old. Never in car. $110.00. R. Amdursky, W2OFS, 45 Barry Road, Rochester, N. Y.

SELL: 450TH final, B&W, Johnson, National parts, no power supply. K. Conrad, W2IIE, Akron, N. Y.

FOR Sale: Hallicrafters HT-19 transmitter, A-1 condition, no modifications. J. Thompson VE3BJT, Morrisburg, Ont., Canada.

RCA ATR2—19 portable 6 meter transceiver, McMurdo Silver 100 Kc. IF amp., SPECO signal tracer amplifier, best offer or trade tape recorder, Simpson model 555 tubetester $60 GE FP-400 $15.00; Hammarlund 456 Kc complete, xtal filter, brand new, $23.00. All in excellent condition. W7RRV.

SELL: New 3-4 Mc. Command transmitter, $20.00; Millen exciter with clamp tube, coils, 600 volt choke input power supply, $45.00, New Deci-Log magnesium engineering slide rule, $12.50. Currie, W9LHQ, B-4 Cardinal Court, Normal, Ill.

SALE or trade: CW transmitter BC221 exciter 813s final (or xtal), inquire; Mark IV recvr-xmittr S76, like new. Want: grid dip meter, standing wave indicator, hi-fi speaker. W8VF, R. B. Stewart, Yellow Springs, Ohio.

COLLINS 32V-2 transmitter, absolute perfect condition, $495.00 F.o.b. Highland Springs, Va. Hughes L. Motley, 121 South Holly Avenue.

FOR Sale: Nicely built-in all metal enclosed rack, 300 watt xmitter, 'phone and c.w. 10-160 meters, $350.00. Also RME-45 with matching speaker, $95.00. John Tomasiewicz, W1QAJ, 94 Proctor St., Waterbury, Conn.

TO highest bidder: WRL 175A Globe Champion and Meissner signal shifter, EX model, both in perfect condition. Estate of Henry Weiler, W2JLR, 251 York Ave., S. I. 1, N. Y.

SELL: 1 Kw final w/127As, $35.00; 200W xctr, $30.00; 300W mod. $50.00; pwr supp. 750-V, 350 mils, 450-V, 250 mils, time delay and control relays, $25.00; pow. supp. 2500-V, 500 mils, $30.00; power supp. 4000-V, 1-amp., $125.00; black crackle, steel cabinet, 19" x 15" x 5' 6" w/heavy casters, $45.00; 50-watt speech amp. w/two mike controls, fader and send/rec. control, $50.00; Turner Hi-imp. mike, $15.00; 10-meter mobile trans. $15.00; 2-meter Bendix mobile trans. & recvr., $45.00; SCR-522 new complete with dynamotor control head, plugs, manual, $35.00; SCR-522 test set, $10.00; I-85-B 145-225 Mc field strength meter, new, $25.00; BC-906-C 145-225 Mc freq. meter, new, $125; TS-323/UR Hetrodyne freq. meter, best offer over $400; I-130A 145-225 Mc sig. gen, new, $65; 75 M. c. marker beacontype sign. gen, new, best offer over $50; 2 E-V, mod 630 dyn. mikes at $15; Millen xctr, $25; BC966A rcvr, new, $15.00; An/GSC-T1 code trg set, new, $75. W6SXW, 3850 W. Blvd., L. A. 8, Calif.

SELL: BC-459A and BC-696 converted VFO's with one power supply. Also new 809 and Johnson neutralizing condenser. WØDIB, Wildman, Mitchellville, Iowa.

SWAP: One model A-54H Elmac mobile trans., used 15 hours. For two Bud cabinets, type CR-1772 gray, new. Harold J. Gustin, W8OPL, 9418 Beech Ave., Brooklyn VIII, 9, Ohio.

TWO BC-611-E handi-talkies with 75 meter xtals, like new, $150.00, or trade for 35mm photo equipment. W4QEK, 633 Channing Dr., N.W., Atlanta, Ga.

TRADE: 1 new 100TH, in original carton, never used. For exactly same condenser in article on p. 40 in QST for August 1953. WØJZP, 1506 Sunset St., Albert Lea, Minn.

WANTED: Low frequency navy receivers RBL 15-600 Kcs, frequency meters BC-221, all suffixes. Advise price, condition and modifications, if any. Amber Company, 393 Greenwich St., New York 13, N. Y.

SELL: Collins 75-A-1 with spkr, like new, $325.00; Collins low pass filter, 35C-1, $15.00; B&W low pass filter, $15.00; Thordarson band pass speech filter, T-20C73, new, $8.00; one Sangamo type E .001–1200 volts, two Sangamo type E, 12,000 volt .0002 capacity, $5.00 each. One Astatic D-104 mike, new, $8.00; one Superior powerstat 0 to 130 volts, 15 amp, $35.00; two Mack mercury relays, 110 volt co l, A.C. load 35 amps. Robinson, 522 So. Cumberland, Dallas, Texas.

TEMCO 75GA, efficient low pass filter and two new final tubes, very good condx, $250.00; BC-654 PE103 dynamotor with cable, handset, complete and like new, $40.00. W3QLW, Herrick, 1328 Hillside Ave., Honesdale, Penna.

RT34/APS-13 UHF transceiver. Complete 420 Mc. transmitter/receiver with RF heads, 5 stages of 30 Mc IF, in excellent condition, less tubes and dynamotor, with circuit diagram, $6.95. 420 Mc. coil assembly, 49¢. $2.00 minimum order. APS-13 spare parts prices on request. Kennedy Associates, 2618 Rigsby Avenue, San Antonio, Texas.

REAL BARGAINS! New and reconditioned Collins, Hallicrafters, National Hammarlund, Johnson, Elmac, Gonset, Babcock, Harvey-Wells, Morrow, RME, Millen, Lysco, others. Reconditioned S38, $29.00; S40A, $69.00; S40B, $79.00; S36A, $99.00; S76, $129.00; SX71, $149.00; SX42, $179.00; SX62, $179.00; NC125, $129.00; NC173, $149.00; NC183, $199.00; NC183D, $299.00; VHF152, $39.00; VHF152A, $49.00; Meissner bandswitching VFO, $49.00; Collins 75A1, 75A2, 32V2, HQ129X, HRO50T1, HRO60, HT9, Vikings, many others. Shipped on approval. Terms financed by us. Write for free list. Henry Radio, Butler, Mo.

BARGAINS: Extra Special! Motorola P-69-12 Mobile Receivers, $19.50; 32V1, $395.00; Globe King $299.00; HT-9, $199.00; Supreme AF100 or Temco 75GA, $225.00; HRO-50, $275.00; 75A1, $250.00; SX-71, $169.00; S-76, $149.00; SX-42, $189.00; SX-43, $129.00; HRO-Sr, $99.00; RME 2-11, $99.50; RME-45, $99.00; EX Shifter $69.00; S-40A, $75.00; SX-16, $69.50; VHF-152, $49.00; HF 10-20, $59.00; Globe Trotter, $69.50; MB611 mobile transmitters, $14.95; 90800 exciter, $22.50; DM-36-10 meter converter, $19.50; XE-10, $14.95; Gonset 10-11 converter, $14.95; and many others. We need used receivers. We give highest allowances for S-20R, S-40A, B; NC-57, NC-100, NC-125, SX-24, SX-25, HQ-129X and similar receivers. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Laboratories, Council Bluffs, Iowa.

COLLINS 32V3 just like new, in perfect condition, $640.00 F.o.b. Monroe, Wisconsin. In original carton. Nathan Goetz, Old Fashioned Ice Cream Co., 1015 16th Ave., Monroe, Wis.

FOR Sale: One Eico VTVM Mod. 221, factory-wired, paid $49.95, never used, best offer takes it. Also Johnson Viking I with VFO, factory-wired, TVI suppressed, highest offer. William Madigan, Jr., W1UGE, 159 Nott St., Wethersfield 9, Conn.

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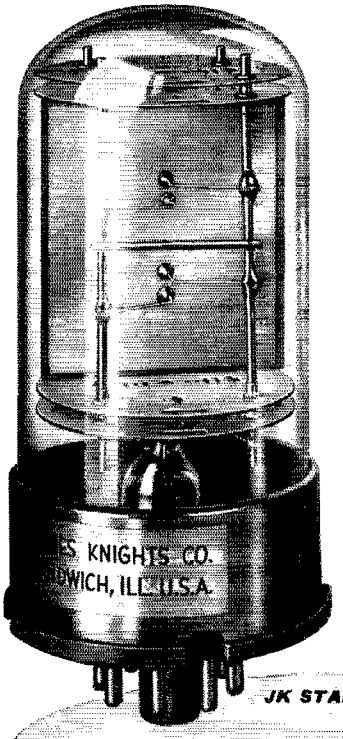

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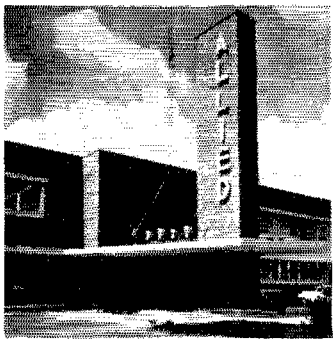

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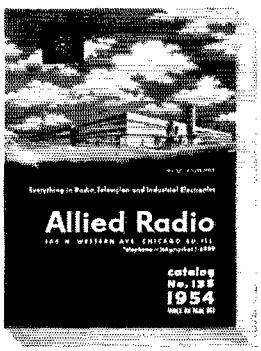

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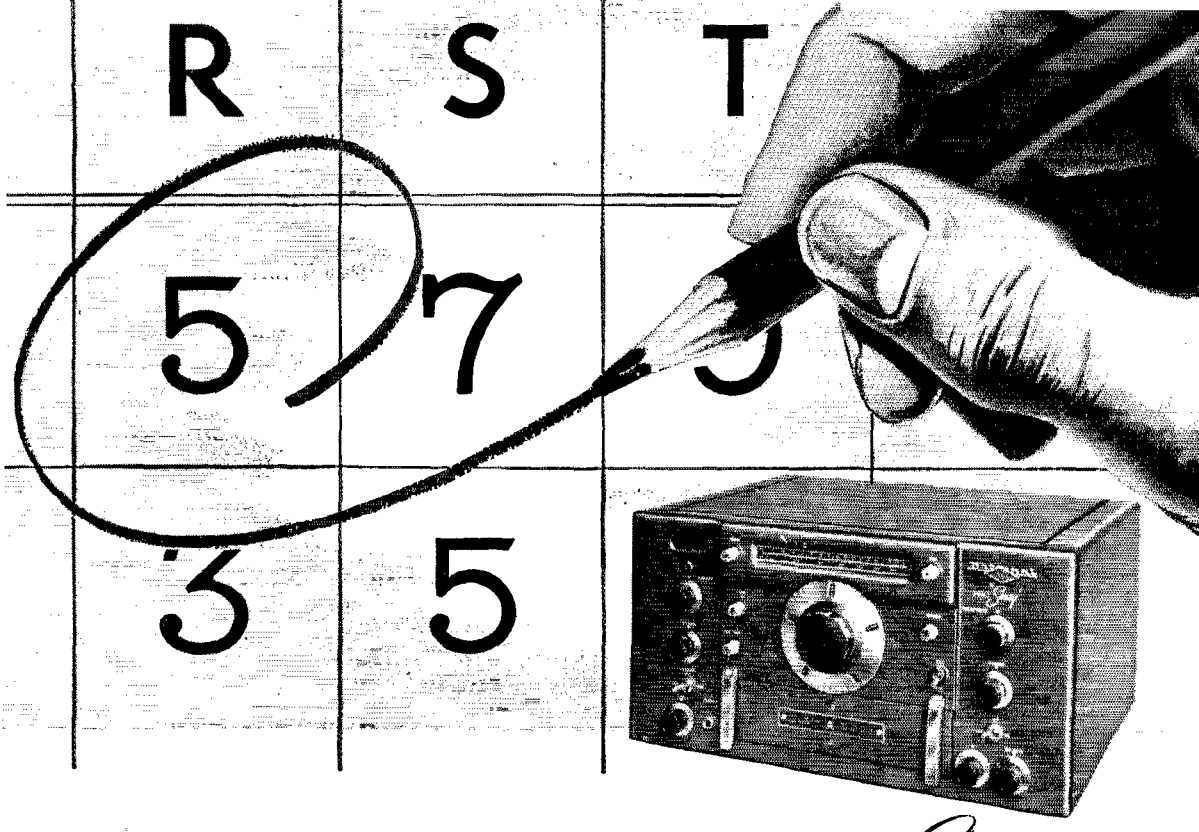

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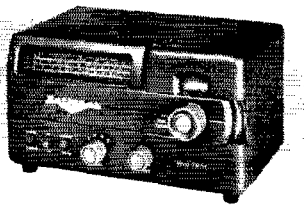

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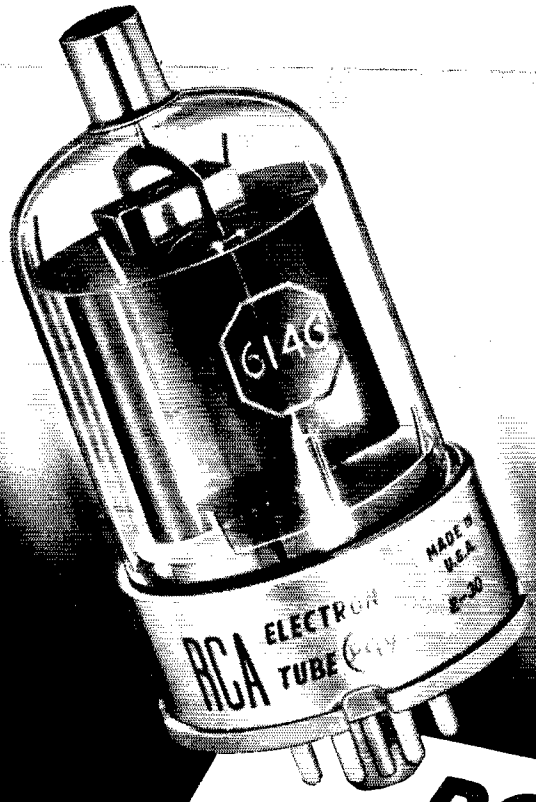

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