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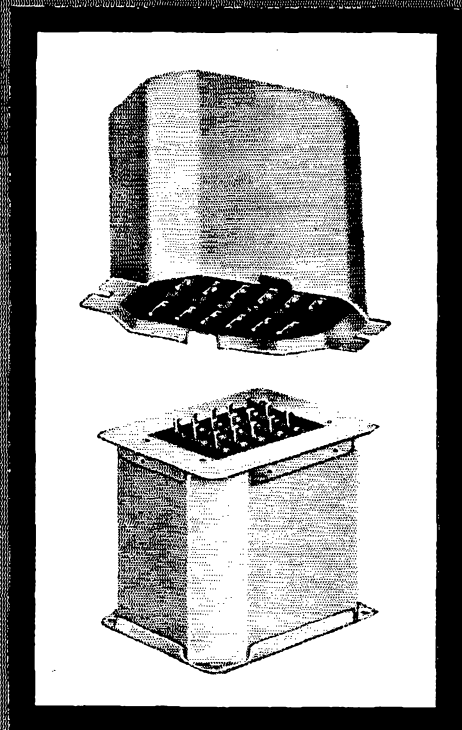
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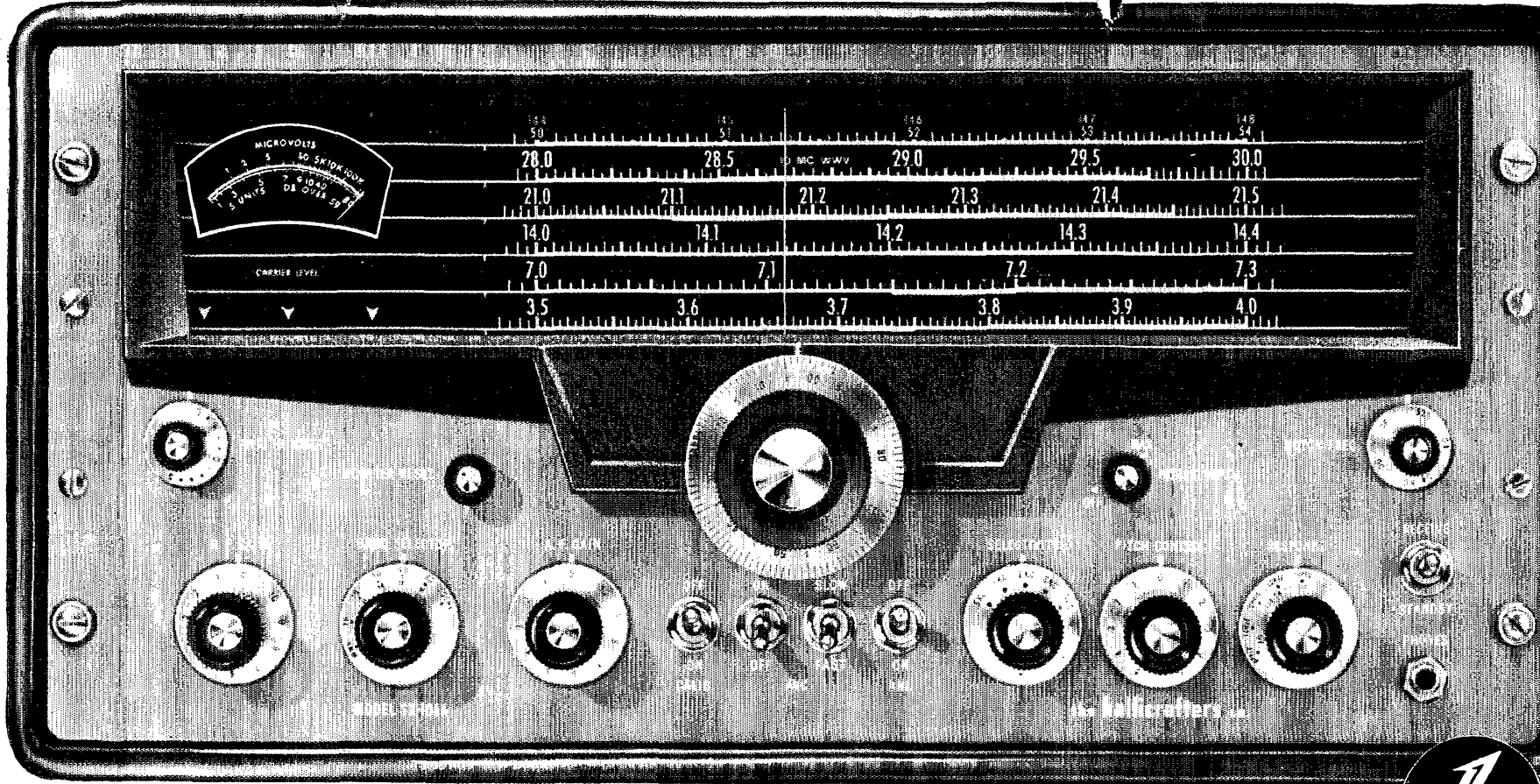
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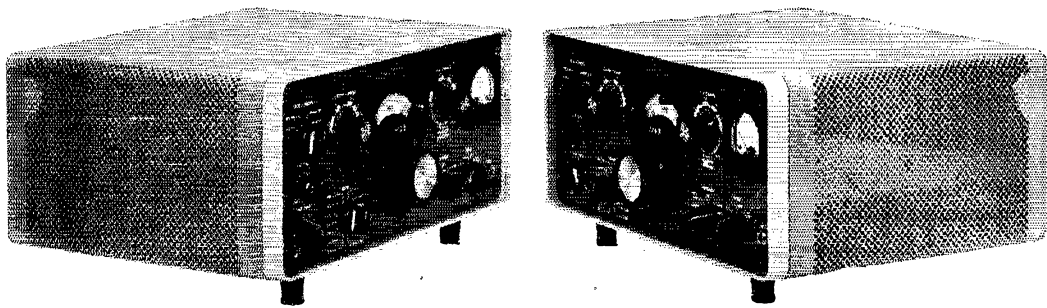
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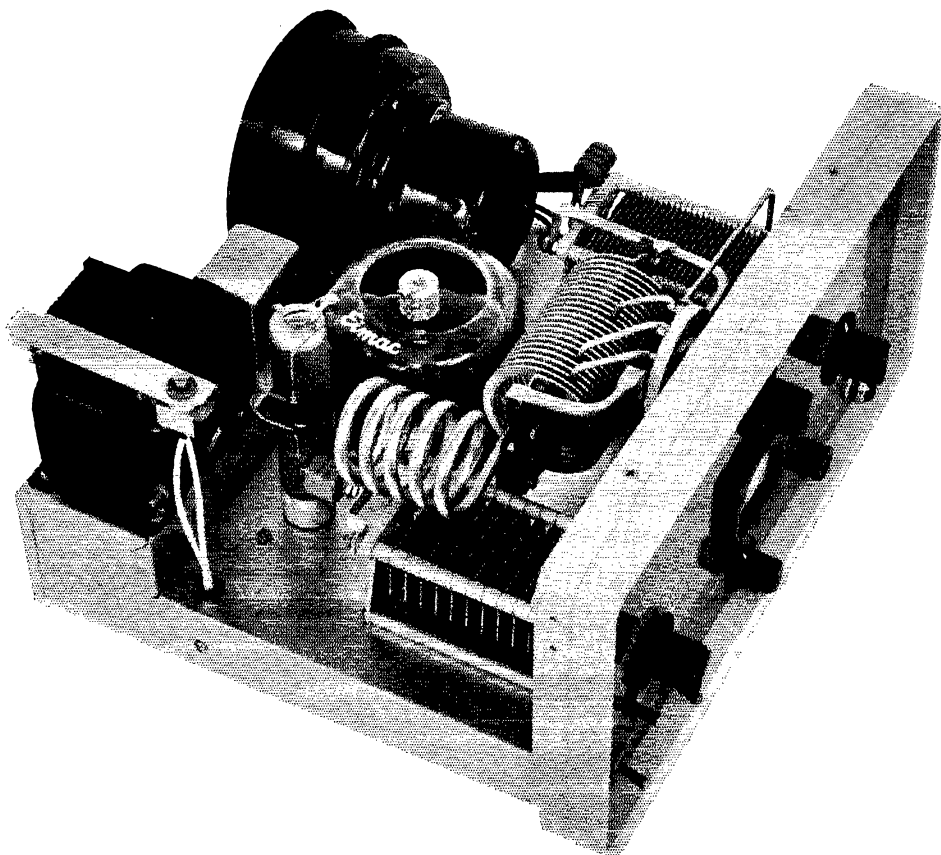
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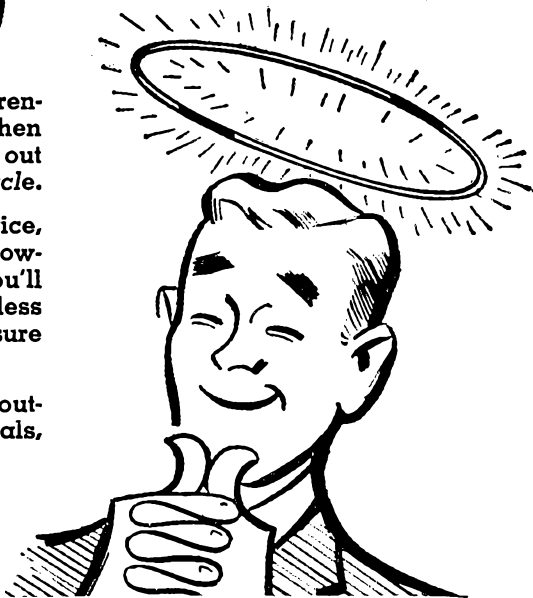


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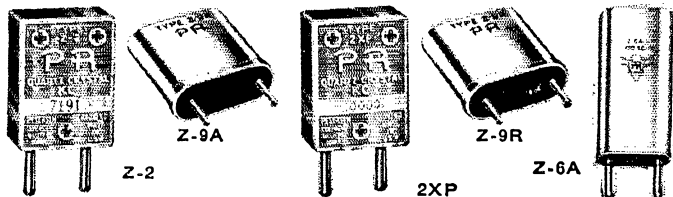
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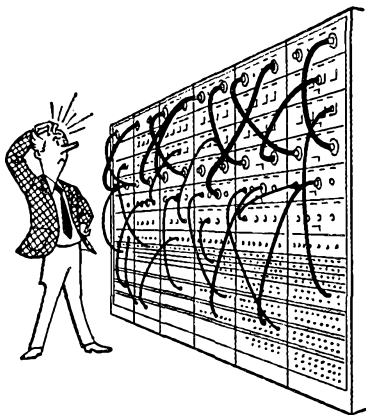
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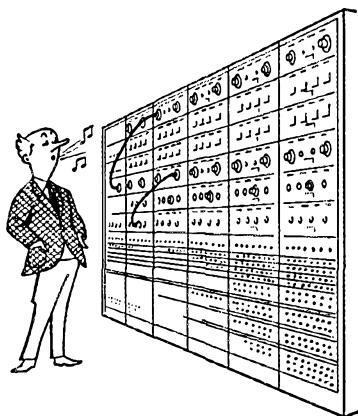
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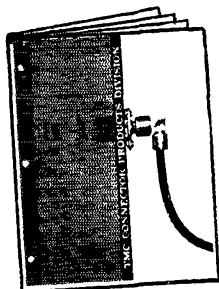
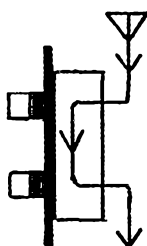
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770 Chapman, San Jose 26, Calif.
- Vice-Director:** Ronald G. Martin . . . . . W6ZF  
1573 Baywood Lane, Napa, Calif.

### Roanoke Division

- P. LANIER ANDERSON, JR. . . . . W4MWH  
428 Maple Lane, Danville, Va.
- Vice-Director:** Joseph F. Abernethy . . . . . W4AKC  
784 Colonial Drive, Rock Hill, S. C.

### Rocky Mountain Division

- CARL L. SMITH . . . . . W8BWJ  
1070 Locust St., Denver 20, Colo.
- Vice-Director:** John H. Sampson, jr. . . . . W7OCX  
3818 Mount Ogden Drive, Ogden, Utah

### Southeastern Division

- JAMES P. BORN, JR. . . . . W4ZD  
25 First Ave., N.E., Atlanta 17, Ga.
- Vice-Director:** Thomas M. Moss . . . . . W4HYW  
P.O. Box 20644, Municipal Airport Branch,  
Atlanta 20, Ga.

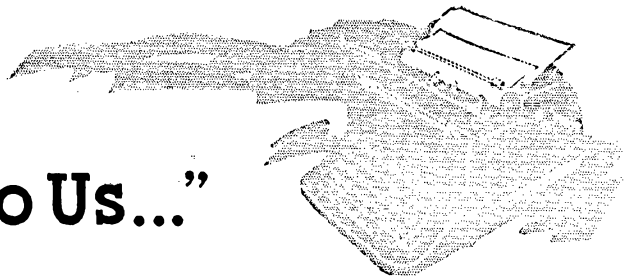
### Southwestern Division

- RAYMOND E. MEYERS . . . . . W6MLZ  
Box R, San Gabriel, Calif.
- Vice-Director:** Howard F. Shepherd, jr. . . . . W6QJW  
127 South Citrus, Los Angeles 36, Calif.

### West Gulf Division

- ROEMER O. BEST . . . . . W5QKF  
P.O. Box 1656, Corpus Christi, Texas
- Vice-Director:** Ray K. Bryan . . . . . W5UYQ  
2117 S.W. 61st Terrace, Oklahoma City 19, Okla.

# "It Seems to Us..."



## CHAOS — OR QSOs?

IN 1927 one of the periodic nightmares called International Radio Conferences was held in Washington, D. C. It was the first held after World War I and after the formation of the ARRL in 1914. The word "nightmare" was especially appropriate for this particular Conference from the U. S. hams' point of view. Prior to the Conference, Americans had been operating in the "Hoover Bands" which included one megacycle at 40 meters, two megacycles at 20 meters. When the Conference decisions finally became effective, a couple of years later, we were allowed only 300 kc. on 40, 400 kc. on 20. In despair some U. S. amateurs gave up amateur radio completely: it would be impossible, they reasoned, for 17,000 hams to cram into those small hunks of spectrum remaining available.

The collective answer of the amateurs, however, acting through their League, was to improve their equipment and operating technique to the point where all could easily fit into the amateur allocations. A two-year campaign in *QST* helped amateurs to develop filtered power supplies, crystal-controlled transmitters, high-Q circuits and selective receivers. That the crusade was effective, there is no doubt. After staying static at 17,000 for three years, the U. S. ham population began to rise again in 1930, reaching 42,000 by 1933, and continuing to grow, except for the war years, ever since.

Lately there have been conditions which, some feel, indicate that the amateur bands are reaching the saturation point. As one tunes the 20-, 40-, and 80-meter bands in particular, and especially on week ends, one can hear a seemingly solid mass of QRM from one end to the other. Certainly, there has been a tremendous increase in the number of amateurs in the U. S. in the past few years. The most recent addition to amateur high-frequency assignments came in 1951 when we started using the 15-meter band. There were, at that time, some 92,000 FCC licensees. Today there are more than 230,000 of us, and more joining the ranks every day. But is this the end? Is there no more room for additional amateurs? Should we set aside our mikes

and keys in favor of tweezers and stamp-albums?

We think not. For if one takes a close look at this mass of QRM, one finds that much of the noise is absolutely unnecessary. On the technical side, one finds splatter, key-clicks, overmodulation, instability. On the operating side, one finds deliberate interference, careless tuning, excessively long CQs, short tempers, selfishness.

The Executive Committee, at its July meeting, recommended that a new crusade along the lines of the 1927 effort be adopted. There is to be more material in *QST* on the proper tuning of modern transmitters, on understanding today's transmitter circuits, on the building and use of effective test equipment. There will also be additional editorial treatment — both serious and satirical — of common and wasteful operating foibles.

A crusade at this time, along these lines, will not be easy to carry out effectively. The threat is not as easy to define nor as readily apparent to the casual amateur as the loss of frequencies was to the amateur of 1927. Some will discount the need for any action. Others will feel it's a good idea — for the other fellow. Some will carefully mark and set aside an article to be read sometime — and continue to operate just as in the past. Then, too, there seems to be less cohesiveness in our ranks than in years gone by. Time was when the only path to an amateur license was through the League and its local radio clubs, where the newcomers were taught the traditions of amateur radio along with the code and the theory. Today many are entering ham radio with no guidance from old-timers, no feeling for the history of the art, no knowledge of *The Amateurs' Code*.

The campaign, to be effective, must reach the newcomers, and rekindle in old timers the spirit of friendliness, cooperation and concern for the rights of others which has been a mark of the radio amateur for so long.

What will it be: enjoyable QSOs; DX and local; ragchew and contest-type; by standard a.m., s.s.b. c.w., RTTY and TV; nets, emergency-preparation, traffic — or uninterrupted chaos?

**QST**

## COMING A.R.R.L. CONVENTIONS

- September 1-3 — ARRL National, Portland, Oregon.  
September 1-3 — Delta Division, New Orleans, Louisiana.  
September 15 — Kentucky State, Lexington, Kentucky.  
October 13 — Hudson Division, New York, N. Y.  
October 19-20 — Ontario Province, Toronto.

## KENTUCKY STATE CONVENTION

Lexington — September 15

The second annual Kentucky State ARRL Convention is to be held at the Phoenix Hotel in Lexington on Saturday, September 15. Early arrivals on Friday have the added advantage of attendance at the midnight initiation ceremonies



**District of Columbia** — The annual hamfest of the Foundation for Amateur Radio, Washington, D. C., will be held Sept. 30, at Gaithersburg, Md., Fairgrounds. The 19 amateur radio clubs of the Washington, D. C. area support this one big hamfest annually. Included in the program are transmitter hunts on six and ten meters, auction and rummage sales, contests, exhibits, MARS and AREC mobile vans. Talk-in stations on three bands. Free parking for the all-day picnic and plenty of shelter in case of rain or cold weather. Professional playground supervisors will take care of the children and entertain them with games, movies, and outdoor play. There will be bingo for the ladies, and just in case you didn't bring your own, there will be food sold by a local ladies club. Admission \$1.00. Contact Tex De Bardeleben, 3729 Maryland Ave., Falls Church, Va., for further info.

**Illinois** — The annual W9-DXCC Banquet will be held Saturday, Sept. 15, in the Tropical Room of the Sheraton Hotel, 505 North Michigan Ave., Chicago, Ill., beginning at 1:00 p.m. DXCC members from outside W9 are invited to attend, and advance registration is required prior to Sept. 5. For further info contact Arlan Bowen, W9QYW, 6007 Oriole Lane, Greendale, Wisconsin.

**Illinois** — The Egyptian Radio Club will hold its annual Hamboree at their club house, located near Granite City, Ill., on Sunday, Sept. 16. One of the largest hamborees in the mid-west, the program includes games and contests. Contact the Egyptian Radio Club, Inc., Box 1300, R.R. 1, Granite City, Illinois, for further info.

**Illinois** — The Lincoln (Mason City) Amateur Radio Club will sponsor a hamfest on Sunday, Sept. 2, starting at 8:00 a.m. The hamfest will be held at Memorial Park in Mason City, Ill., on Route 29. Admission free. Bring pot-luck. Free doughnuts, coffee and iced tea will be served. Swimming pool, tennis court and horse-shoes. For further info contact Forrest E. Howard, W9AHI, Mason City, Ill.

**Illinois** — The Peoria Area Amateur Radio Club Hamfest will be held on September 16 at Exposition Gardens on the northwest edge of Peoria. Follow Route 88 north to Northmore Road at State Police headquarters. Drive west 2 miles following hamfest signs. Plenty of space available for free swap section and parking. Food available on grounds; free coffee and doughnuts 1930 to 1000 CDT. Advance registration (until Sept. 9) \$1.00, at the gate \$1.50. For further info and tickets contact Stan Kujawa, K9JSB, 1612 W. Columbia Terrace, Peoria, Ill.

**Maine** — The Knox Radio Club Hamfest will be held Sept. 9, at Legion Hall, Rockland, Me. Listen for announcements on the Seagull Net, Pine Tree Net and Barnyard Net.

for the Royal Order of the Wouff Hong, the ancient secret society of amateur radio, conducted this year by the Winchester Amateur Radio Club.

There will be group discussions on TVI, the Amateur Radio Emergency Corps, MARS, traffic handling, and topics of interest to newer hams conducted by State and National leaders. Great Lakes Division Director Dana Cartwright, W8UPB, and Section Communications Manager Elmer Leachman, W4BEW, will preside at an ARRL Forum. Richard L. Baldwin, W1IKE, Managing Editor of *QST*, will present a talk about the magazine and the activities at ARRL headquarters.

Talk-in frequencies are 3960 kc. and 50.3 Mc. Hotel reservations may be obtained directly from the Phoenix Hotel, 120 East Main Street, Lexington. Convention preregistration is \$2.50, and registration at the door \$3.00. The banquet tickets are available at \$4.00 per person. Make all checks payable to The Blue Grass Amateur Radio Club and address all inquiries to Dix E. Newton, K4KJQ, 103 Devine Avenue, Lexington, Ky.

**Massachusetts** — The 12th annual New England DXCC meeting will be held Saturday, Oct. 6, in the Grand Ballroom of Motel 128, at Route 1 South (Exit 57), Dedham, Mass. Cocktail hour at 5:00 p.m., dinner at 7:30 p.m. Cost is \$5.50 per person for a roast beef dinner, including gratuity. Deadline for reservations is Oct. 1. New England, as well as all other DXCC members, are cordially invited to attend. Make checks payable to Charles T. Parham, WIBAN, Box 81, Woodstock, Conn.

**Michigan** — QMIN picnic September 9, at W9SCW. No other info available.

**New Jersey** — The South Jersey Radio Association will sponsor its annual gala hamfest September 9, at Molia Farms, Malaga, N. J. If it rains, the new date will be Sept. 30. The day's activities will include 2- and 6-meter transmitter hunt and swap shop. Talk-in for mobiles by K2AA on 2, 6, 10, and 75 meters. Bring your lunch basket and swapping gear. Advance registration for non-club members is \$1.50, deadline Sept. 3. General admission at the gate is \$2.00. For registration and further info contact Herb Brooks, K2BG, 800 Lincoln Ave., Palmyra, N. J.

**New Jersey** — The Raritan Bay Radio Amateurs, Inc. will sponsor an auction-fest on Sunday, Sept. 16, starting at 9:00 a.m. at the Hercules Ball Field and Picnic Grounds (Thoenge's Field), Cheesecake Rd., Sayreville, N. J. Activities include an auction, praised by many as one of the biggest and best in New Jersey, starting promptly at 1:00 p.m. in the main pavilion, rain or shine. Bring your gear. Games and contests will be held for children and adults. Food and refreshments will be sold on the premises, with plenty of picnic tables available. Bring the XYL, jr. ops and friends. Mobile talk-in transmitters will operate on 50.25 and 145.41 Mc. No admission charge, ample parking. Slight fee for gear auctioned. For further info contact Horace Clark, WA2CHN, 12 Cheesecake Rd., Sayreville, N. J.

**New York** — The 8th annual Roundup of the Syracuse VHF Club will be held at the Three Rivers Inn on Oct. 6. There will be presentations by outstanding v.h.f. speakers, awards, dinner, and a floor show featuring nationally known talent. Tickets are \$5.50 for early registration and \$6.00 at the door. Contact Joseph Bancheri, WA2ADG, 215 Westfall Drive, Syracuse 9, N. Y. for reservations and further info.

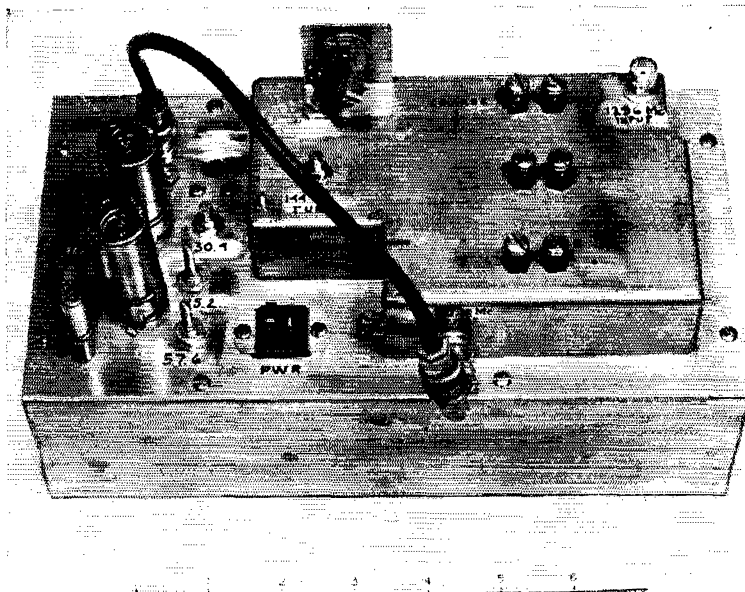
**Ohio** — The Findlay Hamfest will be held Sept. 9, and the Cincinnati Hamfest on Sept. 23. No other info available.

**Pennsylvania** — The 13th annual Gabfest of the Uniontown Amateur Radio Club will be held on Saturday, Sept. 15, on the Club grounds, on Old Pittsburgh Road, just off  
(Continued on page 148)



The last few years have seen increasing activity on amateur frequencies above 1000 Mc. Much of this has come about because of the growing realization that equipment for u.h.f. work need not necessarily be extremely expensive or difficult to build. Here is an example, a high-performance 1296-Mc. converter that is well within the capabilities of the average experienced builder of ham gear.

The 1296-Mc. crystal-controlled converter is built on the cover plate of a chassis. The oscillator and multiplier stages at the left are coax-coupled to the crystal-diode multiplier, which is built into the penthouse atop the cover plate. The six screws with nylon nuts are for tuning the three half-wave tank circuits. The i.f. output frequency, 144 Mc., is taken off through a BNC fitting not visible in this picture.



## A Crystal-Controlled 1296-Mc. Converter

*Top U.H.F. Performance with Simple Circuits*

BY H. M. MEYER, JR.,\* W6GGV

**B**ECAUSE of the growing interest in 1296 Mc., the author wanted to build a converter for this frequency, but it had to be something without a complex string of multipliers and specially-machined cavities, that could be built and put into operation with a minimum of time and trouble. The result, shown in the photographs, is not too much more of a project than a converter for any of the v.h.f. bands, yet its performance on 1296 Mc. is about all that can be achieved without going to parametric amplifiers.

The injection chain has only two 6J6s and a multiplier diode, using a 57.6-Mc. crystal to give injection on 1152 Mc. The output frequency is 144 Mc., chosen to avoid the need for building a low-noise i.f. amplifier stage as part of the converter. Most v.h.f. men already have good converters on 144 Mc., so the needed low-noise amplification at the intermediate frequency is taken care of easily in this way.

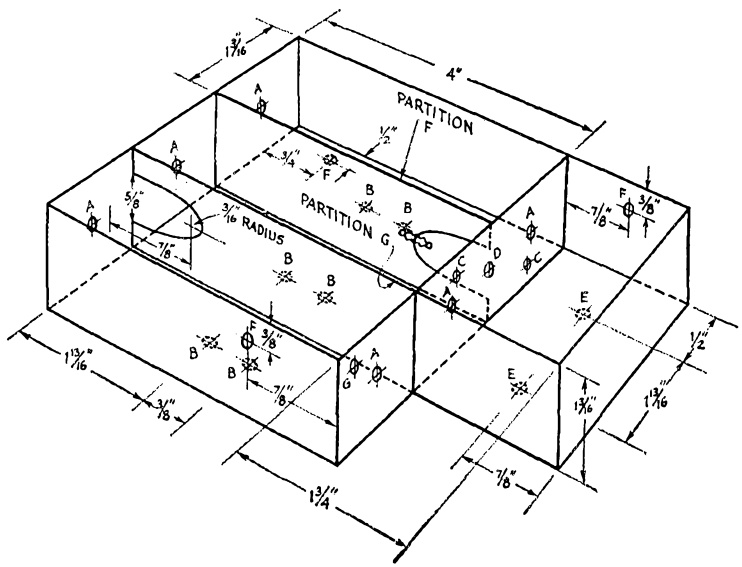
The front end is a simple crystal mixer designed as an integral part of a trough-line assembly.

\* 2435 Parker Court, Mt. View, Calif.

The complete front end is seen from the bottom in the second photograph, with the mixer input line at the top of the picture. The diode multiplier is in the bottom trough. Diode multipliers generate harmonics at all multiples of the driving frequency, so another trough is used to reject frequencies other than the desired 1152 Mc. This middle trough acts like a filter, and as a coupling circuit to the mixer. Aperture coupling is used into this filter, and between it and the mixer. The mixer crystal is visible in the photograph, centered in the aperture between the mixer and filter troughs. The aperture coupling system does not load the  $Q$  of the mixer trough as much as a tapped mixer type, and improved rejection of both unwanted crystal harmonics and out-of-band signals results.

The i.f. tuned circuit,  $L_9$  and  $C_7$  in Fig. 5, is built into a separate compartment of the mixer assembly, at the right side of the photograph, to provide maximum shielding of the 144-Mc. circuits. Unless good shielding is used at this frequency, a few strong locals on 2 meters can cause

Fig. 1.—Details of the mixer-multiplier trough assembly, as viewed from the bottom. The author recommends 0.025- to 0.050-inch sheet brass, but with minor modifications in design thin materials such as flashing copper could be used. Holes are as follows: A— $\frac{3}{8}$ -inch drill, on center line of each trough. B—No. 29 drill, tapped for 8-32 screw. C—No. 35 drill, tapped for 6-32 screw; to line up with No. 27 holes in capacitor parts. D— $\frac{3}{16}$ -inch drill, on center line of partition E of Fig. 2. E— $\frac{1}{4}$ -inch drill. F— $\frac{3}{8}$ -inch drill, BNC fitting clearance. G—Trimmer hole, to suit type of trimmer used; location not critical. The notches at the ends of partitions F and G are coupling apertures.



a lot of trouble. Details of the mixer assembly metalwork are given in Fig. 1.

### Oscillator and Multiplier Circuits

As may be seen from its circuit diagram, Fig. 2, the vacuum-tube portion of the multiplier chain is very simple. The first stage is an overtone oscillator on 57.6 Mc. The second half of the first 6J6 doubles to 115.2 Mc. This is link-coupled to the grids of a second 6J6, which is a push-push doubler to 230.4 Mc. The 230-Mc. energy is coax-coupled to the multiplier trough, where the diode multiplier output is picked off at the fifth harmonic, 1152 Mc. A fair amount of drive is required to make the diode quintuple effectively, and the 6J6 push-push doubler provided the

most output of any tube tried. Substitutions at this point are not recommended, though almost any dual tube will serve satisfactorily in place of the first 6J6.

The diode multiplier is the heart of the converter. The secret lies in the impedance-matching LC network, and in the choice of the diode. Credit for the network and aperture mixing techniques, both essential for successful operation of the converter, rightfully belongs to Bill Troetschel, K6UQH, ex-W7LVO. Several diodes, including the 1N72 and 1N82, were tried, the best producing a maximum of 120 microamperes of mixer crystal current. Diodes were then salvaged from plug-in u.h.f. converter strips for the widely-used Standard Coil TV tuner. Of these, the CBS

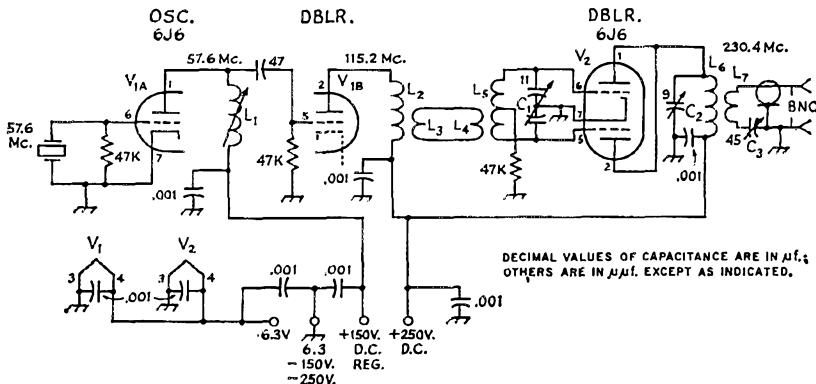
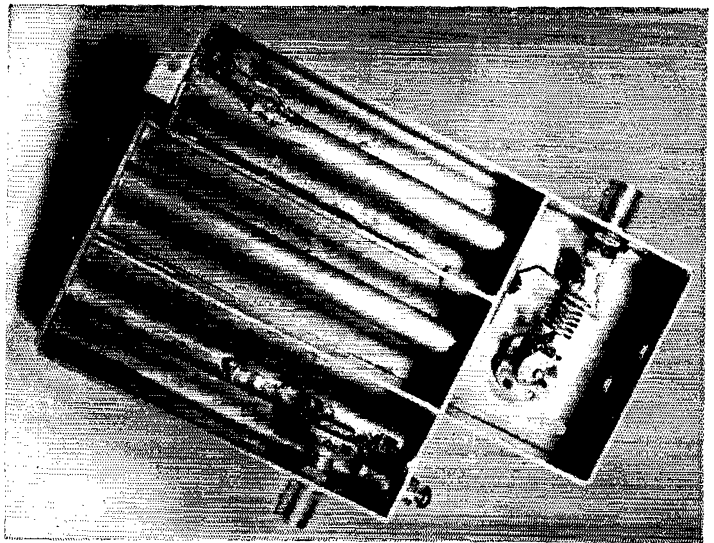


Fig. 2—Schematic diagram of the oscillator and multiplier section of the 1296-Mc. converter.

- C<sub>1</sub>—11- $\mu$ mf. butterfly variable (Johnson 11MB11 or 160-211).
- C<sub>2</sub>—9- $\mu$ mf. miniature variable (Johnson 9M11 or 160-104).
- C<sub>3</sub>—7-45- $\mu$ mf. ceramic trimmer.
- L<sub>1</sub>—10 turns No. 24 enamel on  $\frac{3}{8}$ -inch iron-slug form.
- L<sub>2</sub>—6 turns No. 20 enamel like L<sub>1</sub>.

- L<sub>3</sub>—2 turns No. 24 enamel around cold end of L<sub>2</sub>.
- L<sub>4</sub>—Like L<sub>3</sub>, but at center of L<sub>5</sub>. L<sub>3</sub>, L<sub>4</sub> and link of one piece of wire.
- L<sub>5</sub>—8 turns No. 18,  $\frac{3}{8}$ -inch diam.,  $\frac{5}{8}$ -inch long, c.f.
- L<sub>6</sub>—1 turn No. 18,  $\frac{3}{8}$ -inch diam.
- L<sub>7</sub>—1 turn insulated hookup wire coupled to L<sub>6</sub>.

Bottom view of the r.f. end of the 1296-Mc. converter. The multiplier circuit is the bottom trough. Here a diode delivers 1152-Mc. energy when driven at 230.4 Mc. by the oscillator-multiplier stages. The top trough is the 1296-Mc. mixer. Separating the two is an 1152-Mc. filter and coupling circuit. The mixer crystal may be seen in the aperture between the filter and mixer sections. The small compartment at the right houses the 144-Mc. output circuit.



1N133 and the Raytheon CK710 worked equally well, yielding 300 to 500  $\mu$ amp., which is more than enough. This permitted detuning the LC network to decrease the crystal current to the value that gave optimum noise figure for the diode used.

These plug-in converter strips are available for the asking, or at the worst at very low prices, at most TV service shops in areas where there is or has been u.h.f. television. Several of the diodes have since been used in other work with good results. The author only wishes that he had stumbled on them sooner; they are well worth the going price. Other diodes are undoubtedly suitable, one widely-used type being the Radio Receptor DR-303, also available at moderate cost.

#### Front-End Metal Work

The front-end assembly is constructed of sheet brass or copper, 0.025 to 0.050 inch in thickness. Brass was used here as it is easy to work and makes a solid assembly. The photograph at the top of the page shows the original model, which was made with the mixer signal-input cavity slightly shorter than the others. Later work proved this shortening to be unnecessary, so the drawing shows all troughs of equal length.

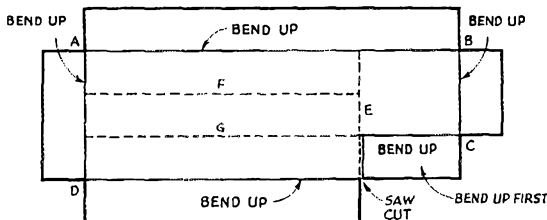


Fig. 3—Bending instructions for the mixer housing. Dimensions are available from Fig. 1. Partitions E, F and G, indicated by dashed lines, are soldered in place after the bending operation is completed. Note that the lower lip of the i.f. output portion at the right should be bent up first.

In making the trough, the sheet metal should be first cut to the dimensions and shape shown in Figs. 1 and 3. Drill all holes and tap where required. Before bending, cut along the line indicated in Fig. 3, then bend as shown. This is easy if you have access to a sheet-metal brake. If not, and you want a particularly neat job, you can have it done by a sheet-metal shop for a nominal fee. In doing the bending yourself, start with the lower lip of the right-hand portion of the assembly first. When the bending is completed, soldering of the joints at A, B, C, and D (Fig. 3) with intermediate or hard solder is recommended. Anything from 30/70 to Easy-Flo will do. Partition E is then soldered in place with the same type of solder. Partitions F and G may be soldered with 60/40 soft solder. The harder variety may be used for all work, but it is not recommended unless you are patient, and skilled with the torch.

When the partitions have been soldered in place, insert the coarse-tuning screws, after first having run an 8-32 nylon nut up to the head of each screw. Now solder a large 8-32 brass nut to the end of each screw. Do this quickly and with a minimum of heat, and do not disturb the nylon nuts until the screws have cooled completely. Now insert the fine-tuning screws, each with nylon nuts, as before, but do not solder the brass nuts to these screw ends.

Now insert the  $\frac{3}{8}$ -inch hollow brass lines in place (in 6 holes marked A, Fig. 1) and soft-solder. File the inside surface of the i.f. compartment, partition E, completely smooth, so that no sharp projection will puncture the insulation that is part of the u.h.f. bypass capacitor. Next, a contact pin removed from an octal socket is soldered to partition F, at the deepest point of the aperture, to make contact with the tip of the mixer diode. Solder a 2-inch length of No. 18 wire to the brass plate (see Fig. 4) for making connection to the i.f. output coil later. The

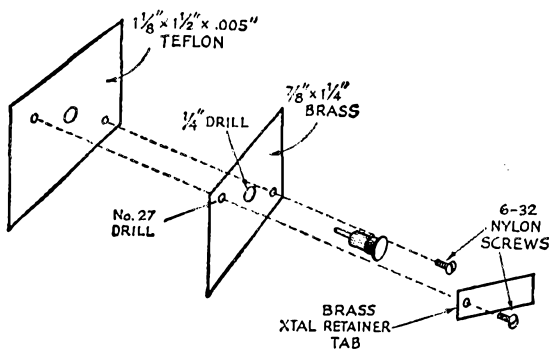


Fig. 4—Details of the mixer crystal mounting and u.h.f. bypass capacitor. These mount on the left edge of the i.f. output section, as seen in the bottom view. Locations of the mounting holes are not critical, so long as these and the mating holes in the mixer assembly line up. The center of hole D should line up with the center line of partition F.

combination crystal-retaining plate and u.h.f. bypass capacitor is shown in Fig. 4. This may be assembled with nylon screws as shown, but if these are not available, insulating shoulder washers and brass screws will do equally well.

Next, referring to Fig. 5, the feed-through capacitor,  $C_6$ , L bracket and closed-circuit jack for monitoring crystal mixer current are mounted as shown in the top-view photograph. The three BNC connectors are then mounted, along with the 7-turn i.f. coil and tuning capacitor,  $L_9$  and  $C_7$ . The appropriate-sized hole is then carefully drilled in partition E at the end of the multiplier compartment to accommodate the small trimmer capacitor,  $C_4$ . In the unit pictured, the trimmer capacitor was padded with a small fixed capacitor to bring the tuning range of the trimmer to the proper point. The trimmer pictured is a 0.5-3 micromicrofarad unit salvaged from an old TV tuner. Use of the next larger size would eliminate need for padding. The small 4-turn coil,  $L_8$ , is soldered from the BNC connector to the trimmer, and the multiplier diode is soldered to the line approximately  $1\frac{1}{4}$  inches from the inside wall of partition E. The optimum point will have to be determined later on, but this is a good place to start.

Connect the mixer output to the i.f. coil, using the 2-inch No. 18 lead previously soldered on the capacitor plate,  $1\frac{1}{4}$  turns from the cold end of the i.f. coil. This connection will be adjusted later for maximum output. The i.f. output coupling loop,  $L_{10}$ , is installed with loose coupling to the cold end of the i.f. coil.

The 1296-Mc. antenna coupling loop is made of No. 18 bare wire and soldered to the BNC connector. Then it is run parallel to the  $\frac{3}{8}$ -inch line and grounded to the trough wall. Several methods of input coupling were tried: the loop as described above, a direct tap on the line, and probe coupling. All worked equally well and all are relatively easy to adjust. The probe method is worthy of further mention since, of the three, it appeared to be the least critical to adjust. A  $\frac{3}{16} \times 1$ -inch piece of brass was soldered edgewise

to the center pin of the BNC connector and adjusted by moving it either closer to or farther from the line.

### Multiplier Chain

The converter was constructed on the bottom plate of a  $5 \times 9\frac{1}{2} \times 2\frac{1}{2}$ -inch chassis. No specific mounting directions are given here since the techniques are quite straightforward. The bottom-view photograph shows the principal layout details. Subsequent models were constructed using a larger chassis. The 1296-Mc. trough assembly was mounted underneath the chassis, instead of on top as shown, to provide a little more shielding. In an effort to achieve greater stability, a longer multiplier chain was tried, to eliminate the third-overtone crystal. However, the unit constructed as shown is readily amenable to the application of more sophisticated techniques if they appear desirable later. If no external multiplier chain is contemplated, mounting the crystal underneath the chassis will help to insulate it from external temperature variations.

### Adjustment and Operation

The power supply should deliver 250 volts d.c., 6.3 volts a.c. at 2.5 amp. and 150 volts regulated. An additional power plug may be added to run power to the 144-Mc. converter if desired. Design of the power-supply unit is left to the needs of the constructor.

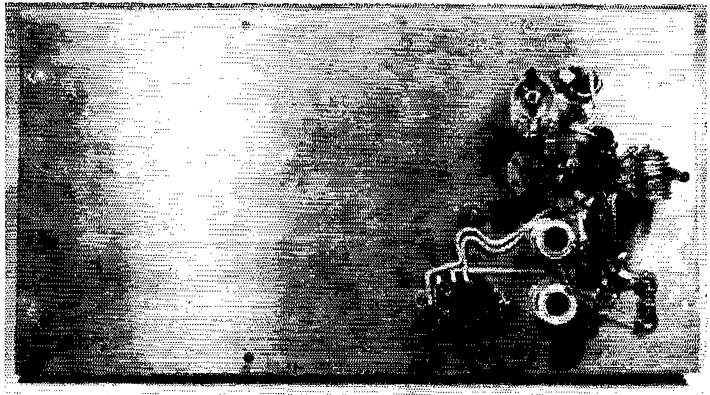
When the trough assembly and multiplier chain have been constructed, apply power to the multiplier and tune up. With the voltage specified, the output at 230.4 Mc. should be capable of lighting a No. 47 pilot lamp to approximately half brilliance. If the output is much less than this, the preceding stages should be checked carefully, and adjusted until the output equals or exceeds the amount required.

The multiplier trough may be preset by turning the coarse-tuning screw until it bottoms on the trough line, then backing off approximately one turn. Set the fine-tuning capacitor to a depth of approximately  $\frac{1}{4}$  inch in the trough. Set the coarse- and fine-tuning adjustments in the filter-mixer trough in the same manner.

The trimmer in the diode multiplier circuit should be set to approximately three-quarter capacity. Insert the mixer crystal (a 1N25 is preferable, but almost any of the 1N21, 1N23 series will do nicely), and plug a 0-100 microammeter into the mixer current jack. Couple the multiplier chain to the crystal multiplier with coax and BNC fittings. With power applied to the multiplier chain, a slight deflection should be noted on the meter. If no deflection is noted, check to make sure that the 1296-Mc. bypass capacitor,  $C_5$ , is not grounded. Caution: Remove the mixer crystal before measuring with an ohmmeter. If there is still no deflection, use a grid-dip oscillator tuned to 230 Mc. and lightly couple into the crystal-multiplier trough. Adjust  $C_2$  and  $C_3$  for maximum dip. A slight indication should now be seen on the microammeter. Adjust the coarse tuning on both the multiplier and



Interior view of the oscillator and multiplier circuits of the converter. The two slug-tuned coils at the lower right are the oscillator and first-doubler plate circuits,  $L_1$  and  $L_2$ . Above is the push-push doubler, with its 115.2-Mc. grid circuit at the right edge and the 230.4-Mc. plate and output-coupling circuits at the left and above the tube socket.



filter troughs for maximum meter indication. Change the meter to a 0-1-ma. type and adjust the fine-tuning and trimmer capacitors for peak crystal mixer current. Adjust the diode multiplier tap on the trough line for maximum mixer current, being careful not to apply too much heat to the leads of the diode when soldering. A pair of long-nosed pliers will conduct most of the heat away if used to hold the diode pigtail during the soldering operation. When all adjustments have been completed, a reading somewhere between 200 and 500  $\mu\text{a.}$  should be readily attainable, depending on the type of multiplier and mixer crystal used.

The injection frequency is 1152 Mc., the fifth harmonic of the multiplier chain. The trough will not tune to the fourth harmonic of the driver, but

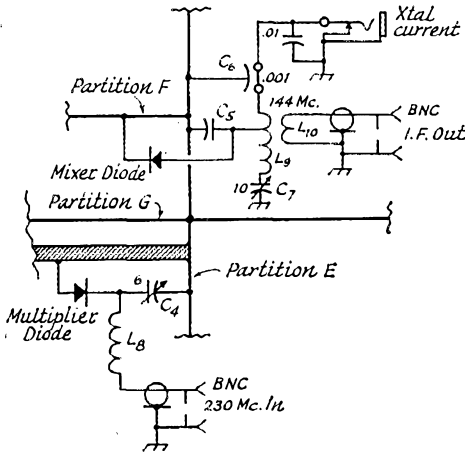


Fig. 5—Schematic diagram of the diode multiplier and i.f. output circuits of the 1296-Mc. converter. Decimal values of capacitance are in  $\mu\text{f.}$ , others in  $\mu\text{m.}$

- $C_1$ —6- $\mu\text{m.}$  plunger-type trimmer.
- $C_2$ —U.h.f. bypass; see text and Fig. 4
- $C_3$ —Feed-through capacitor, 0.0005  $\mu\text{f.}$  or larger.
- $C_7$ —10- $\mu\text{m.}$  miniature variable.
- $L_1$ —4 turns No. 26 enamel, closewound, 1/16-inch diameter.
- $L_2$ —7 turns No. 18, 1/4-inch diameter, 7/16 inch long. Tap at 1/4 turns.
- $L_{10}$ —2 turns No. 24 insulated hookup wire inserted between turns of  $L_9$ . Twist leads to coax fitting.

it will tune to the sixth, 1382.4 Mc. If the maximum amount of mixer current you can obtain is of the order of 60 to 100  $\mu\text{a.}$ , you may have tuned the multiplier and filter trough to the sixth harmonic. For this reason it is best to begin tuning adjustments from the maximum-capacity side.

If you have access to a stable 1296-Mc. signal generator, the rest is easy. A local 1296-Mc. amateur signal will serve nicely, or you may have to build a 1296-Mc. beacon. This is not too difficult. Use a 54-Mc. third-overtone crystal in a transistor oscillator circuit and feed the output to a diode multiplier trough similar to the one described here. The entire unit can be built in a small box about 2 by 3 by 4 inches, including the battery power supply.

Pretune the i.f. coil to 144 Mc. with a grid-dip oscillator. Connect the i.f. output to a good 144-Mc. converter and the input signal to the converter. Tune the signal trough and i.f. tuning capacitor for maximum signal. Adjust the tap on the i.f. coil for best match. This point will be 1/2 to 2 turns from the cold end of the coil, depending on the type of mixer crystal used. Carefully position the output pickup link to the point of maximum signal while retuning the i.f. coil each time an adjustment is made. Next, adjust the input loop or probe for best noise figure, using whatever diode noise generator you may have.<sup>1</sup> You will generally find this point lies in the direction of greater coupling from the position of maximum signal strength. When the input circuit has been adjusted for optimum noise figure, vary the crystal mixer current from 50  $\mu\text{a.}$  to the maximum available. Make comparative noise-figure measurements for every 20- $\mu\text{a.}$  increase in mixer current. You will probably find the best noise figure occurs between 150–200  $\mu\text{a.}$  with very little change for values between 200 and 500. You are now in business with a 1296 converter.

It is appropriate to mention a word of thanks to K6UQH, K6ONM and W6VSV for the help and time they have given in getting this project under way.

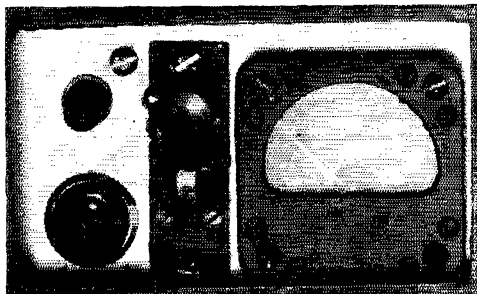
**QST**

<sup>1</sup> Frye, "Adjustment Procedures for V.H.F. Converters," QST, October, 1958.

# QSY De Front Seat

## Motor-Driven Remote Mobile-Antenna Tuning

BY ROBERT S. OLSON,\* W4AVW



Control unit mounted on instrument panel. The push-button switch controlling the motor is above the panel lamp. To the right are the motor-reversing switch and the meter of the resonance indicator. The unit measures only 2 by 3½ inches.

W4AVW makes use of a standard electric windshield-wiper motor picked up in an automobile graveyard to drive a variable tuning inductor for his 75-meter whip antenna.

**D**URING the past year, I did considerable traveling in the southeastern portion of the United States. These trips were normally undertaken in a Plymouth of ancient vintage with the usual array of trappings that adorn automobiles belonging to the "do-it-yourself" members of the ham fraternity. These trappings in my case included a home-brew, rock-bound 75-meter transmitter, stashed away under the hood and fastened to the fire wall. The antenna was cowl-mounted on the left rear trunk deck and consisted of an eight-foot whip center-loaded with a high-Q coil. This is the rig that led me to believe that there must be something better!

My ratio of contacts completed to contacts attempted was highly unsatisfactory, and I soon came to the conclusion that successful mobile operation must include an efficient antenna system with provisions for rapid frequency changes. The 75-meter center-loaded whip described above is quite efficient on its resonant frequency, but any change in the transmitting frequency of more than a few kilocycles requires retuning of the antenna if any semblance of efficiency is to be maintained. At this point, search began for data on remote antenna-tuning systems.

### Remote Systems

Looking through back issues of *QST*<sup>1</sup> proved very fruitful and provided the inspiration to proceed with the task at hand. The first article reviewed was the one by WØIGP.<sup>1</sup> This article described what might be considered the ultimate

in remote antenna-tuning systems. This tuner automatically resonates the antenna to the transmitter frequency by sensing the phase shift accompanying the frequency change. The sensing device then actuates relays which control motor-reversing and start-stop switches to bring the antenna to resonance on the new frequency. This was certainly an excellent system, but I wanted the simplest system that would provide a rapid front-seat QSY capability.

The next article that caught my eye was one by W7RFG.<sup>2</sup> This looked like the right system for me. This article described a system which provides for operation of a rotary inductor located in the trunk by means of a flexible cable from the trunk to the driver's seat. It looked as if this system would meet my specifications. Much to my surprise, I was unable to locate any suitable flexible cable. One look at my automobile speedometer cable convinced me that it would not be suitable for the purpose intended.

While searching in an automobile junk yard for flexible cable, or a motor and suitable reduction gears, one of the attendants suggested that a Chrysler-products electric windshield-wiper motor has reduction gears and might be suitable. I then proceeded to locate a 1953 Plymouth that had run its last mile and, about 15 minutes later, with two skinned knuckles and three dollars less in my pocket, I was the proud possessor of a windshield-wiper motor with reduction gears attached. This became the basis for my remote tuning unit.

### Tuning Arrangement

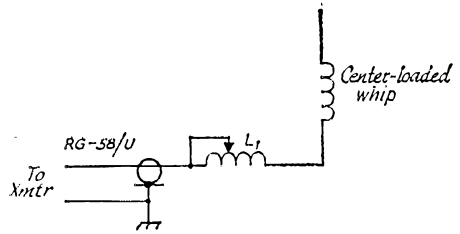
Basically, the system consists of a rotary inductor connected in series with a center-loaded whip antenna, as shown in Fig. 1. The inductor  $L_1$ , is rotated by the windshield-wiper motor which is controlled from the driver's seat. The inductor and motor are mounted on a steel base plate and connected with a shaft coupler. The entire assembly is then mounted in the trunk,

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<sup>1</sup>Hargrave, "Automatic Mobile Antenna Tuning," *QST*, May, 1955.

<sup>2</sup>Morgan, "Tuning the Mobile Antenna from the Driver's Seat," *QST*, October, 1955.

Fig. 1—Resonance in the antenna system is maintained by a motor-driven variable inductor,  $L_1$ , described in the text. This inductor is connected at the base of a center-loaded 75-meter mobile whip.



as close as possible to the base of the whip antenna.

The motor was modified to permit operation in the forward or reverse direction as selected and activated by operate and motor-reversing switches mounted on the dash. Resonance is indicated by a field-strength indicator also dash-mounted on a control panel. This arrangement permits rapid resonating of the antenna to the new transmitter frequency by flipping the motor-reversing switch to cause the motor to run in the proper direction to raise or lower the antenna resonant frequency to conform with the change in transmission frequency. The push-button operate switch is then held closed until the field-strength indicator peaks, which occurs when the antenna is in resonance at the new frequency. The motor drives the rotary inductor at a speed of approximately 40 r.p.m. which accomplishes the desired antenna retuning very rapidly.

The inductor used in this installation is constructed on a ceramic form 2 inches in diameter and 4 inches long, with  $8\frac{1}{2}$  turns per inch. Any similar inductor should prove satisfactory.

The original motor mountings were used without modification to mount the motor on the steel base plate. These mountings contain rubber cushions which provide flexibility, and aid in lining up the shafts of the inductor and motor.

### Control Circuit

The control circuit and field-strength indicator are built as a single unit and mounted in the dash as shown in one of the photographs. The control-circuit details are given in Fig. 2. The push-button operate switch is in series with the transmitter-control filament switch and the ignition system of the car. This arrangement prevents unauthorized operation by the "harmonics" that often are passengers in the car.  $S_1$  and  $S_2$  are the automobile ignition switch and the transmitter filament switch, respectively.  $S_3$  is a push-button operate switch to permit sensitive control of the system. The circuit of the field-strength indicator is shown in Fig. 4. A 1-ma.

meter has been found to be sensitive enough for this application.

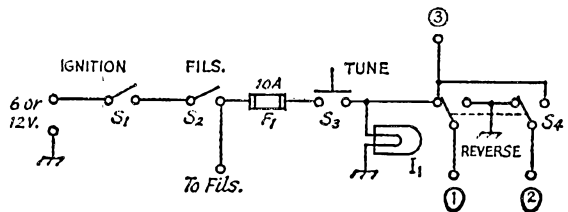
### Motor Modification

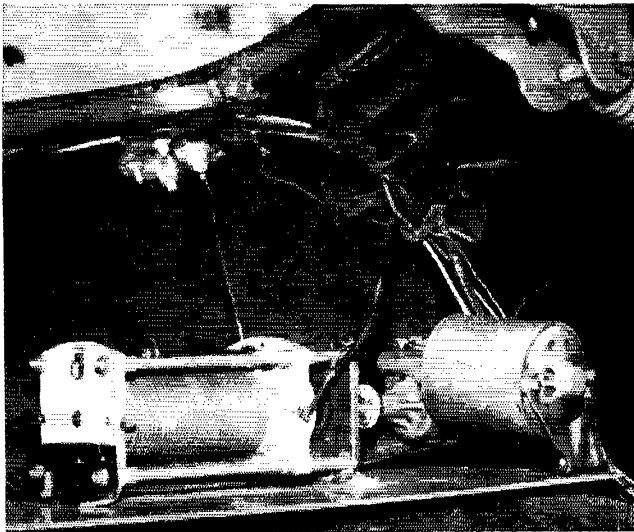
Two types of windshield-wiper motors may be found on Plymouths, 1946 through 1953. The two types are interchangeable as an assembly and therefore either type should be suitable in this application. Internal modification details may vary slightly, however. Likewise, for later-model cars, twelve-volt motors should prove equally satisfactory in this application, but may entail slightly different modification problems.

My motor-and-gear assembly bore Autolite number EWR4001A on the parking-switch cover, and the motor is shunt-wound. The motor and reduction gears were modified by removing all linkage from the small crank arm that extends as a drive shaft from the reduction-gear housing. The end of this shaft was filed down to fit in a standard  $\frac{1}{4}$ -inch shaft coupler. The parking switch, which is located on the reverse side of the reduction-gear box, was removed and discarded. This switch originally functioned to properly position the wipers when they were turned off; it will not be needed in this application. Fig. 3A shows the original motor-winding circuit. Fig. 3B shows the motor circuit after modification to permit reversal of direction. The grounded end of the field-coil winding is lifted and brought out of the motor housing as lead 1. Since one brush of the motor is permanently grounded, the other brush must always be connected to the hot side of the circuit. The lead from this brush is labeled lead 3. Lead 2 is the other field-coil lead. Leads 1 and 3 may be brought out from the motor housing through the original feedthrough hole in the end plate of the motor housing. Lead 2 is on the other side of the motor. To keep from winding this lead around inside the motor, another feedthrough hole should be drilled on the opposite side of the same end plate. A rubber grommet in this feedthrough hole will insure against future short circuits.

When disassembling the motor to make the

Fig. 2—Control system.  $S_1$  is the car's ignition switch. The filament switch is a s.p.s.t. toggle switch.  $I_1$  is a 6- or 12-volt panel lamp.  $F_1$  is a 10-amp. fuse or circuit breaker.  $S_2$ , a push-button switch, starts and stops the inductor-driving motor. The d.p.d.t. toggle switch,  $S_4$ , reverses the direction of rotation of the motor. Numbered terminals are connected to similarly-numbered terminals in Fig. 3B.

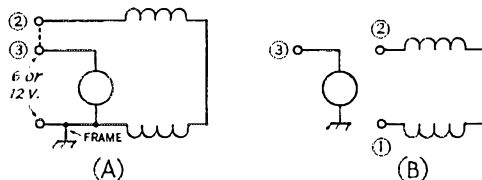




This view shows how the motor and its gear-reduction box are coupled to the variable inductor. The assembly should be mounted close to the base terminal of the mobile antenna.

indicated wiring changes for motor reversal, inspect the motor parts for wear or damage. Worn brushes should be replaced and should be available from any auto-parts dealer. The commutator should be clean and free from oil or grease to insure highest motor efficiency. The commutator can be cleaned with No. 000 sandpaper, if necessary.

Leads 1, 2, and 3 connect to the control circuit as indicated in Fig. 2. Reversal of the motor is accomplished by reversing the direction of the current through the field coils.



(A) shows the original motor connections, Terminals 2 and 3 being connected together in normal operation. In (B), the ground end of the field winding has been brought to a separate terminal for connecting to the control circuit of Fig. 2.

### Operation

Operation is as simple as it has been described; however, one word of caution is in order. The inductor used in this installation has stops at each extreme end. If the operate switch is held down after the inductor slide has reached the extreme end, the motor would be stopped and could be damaged if it were not for the fuse or circuit breaker in the control circuit (Fig. 2). There is no danger of hitting these stops, however, if, after installation, checks are made to determine the maximum QSY range of the system and then make certain that frequency changes are held within this range. If this is done

safe operation is assured.

The antenna system should be made to resonate at the highest intended operating frequency with just a few turns of the tuning coil in the system. Resonance at lower frequencies is then attained by increasing inductance. After the system has been installed, the field-strength indicator can be used with the transmitter to prune the loading coil to achieve resonance on the highest intended operating frequency with only a few turns of the tuning coil in the system. The system described is fed directly with about 15 feet of RG-58/U coaxial cable. No matching system is used since feed-line losses attributable to an estimated s.w.r. as high as 3 would result in a loss of only approximately 0.1 db. at 4 Mc. with the short feed line used. This loss is considered insignificant.

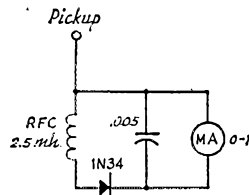


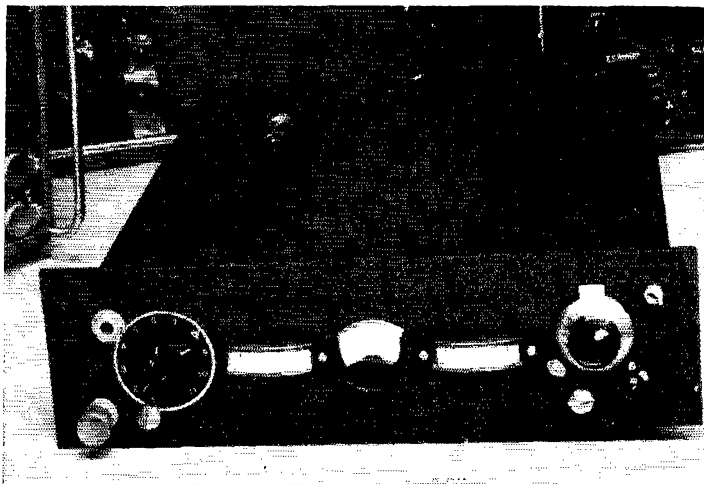
Fig. 4—Field-strength indicator circuit used as a resonance indicator.

If you have been operating single frequency, or have had to stop and get out of the car to retune your antenna every time you desired to change frequency, this system will certainly make mobile operation more pleasant for you. It will also permit you to make many contacts that would be lost without this rapid tuning system. "QSY de Front Seat" can be a reality with little effort and expense!

**QST**



The completed 80-watt (output) transistor transmitter. To the left of the three miniature meters on the 4 × 12-inch panel are the microphone jack, push-to-talk switch and the crystal selector. To the right is the dial for Cs.



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● The gradual but steady decline in transistor prices is beginning to show its effect ●  
● in the area of home-built transmitters, as well as in receiving equipment. Particu- ●  
● larly in the mobile field, a trend toward replacement of vacuum tubes by semicon- ●  
● ductors is inevitable. In his description of a practical transmitter capable of han- ●  
● dling an input of 130 watts, the author includes highly useful general information ●  
● on the handling of power transistors. ●  
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# Transmitting with Transistors

BY RENE GOLDBERGER,\* VE3ABU

THE steady progress being made in r.f. power-transistor design is opening up more and more opportunities to substitute these semiconductors for the more familiar vacuum tube. With some of the transistors now available at unprohibitive prices, it is entirely feasible to build a transmitter that will deliver 80 watts to an antenna at 75 meters. Such a unit, including modulator, can be built within dimensions that make it attractive for all types of mobile work — in the car, plane or boat — as well as for fixed-station use.

The development of the unit shown in the photographs has provided interesting exercises in both packaging and circuit adjustment which should appeal to the experimentally-minded advanced amateur anxious to keep up with progress in the semiconductor art.

### Frequency Limitations

Although transistors that will handle respectable amounts of power at frequencies above 4 Mc. are already available, their cost at the present time puts them well out of reach for most amateurs. Some of the less costly units may be operated at higher frequencies, but the efficiency declines rapidly as the frequency is

increased. Undoubtedly the price of transistors with higher cutoff frequencies will drop eventually. In the meantime, work in the 75-meter band, where reasonable efficiencies may be attained with lower-priced transistors, will provide introductory experience with new techniques which may be expected eventually to replace vacuum tubes completely in the mobile field.

### Temperature Considerations

It will be observed that as the physical size of r.f. power vacuum tubes has been reduced, the need for special attention to the problem of maintaining safe operating temperatures has increased proportionately. As extended into the field of power transistors, this requirement becomes perhaps the most important of the various design factors to be considered. In general it may be said that the lower the operating temperature of a transistor, the greater will be its power-handling capability. As the temperature is allowed to rise, power input must be reduced drastically if satisfactory stability and reasonable life are to be expected. It should be emphasized that the dissipation ratings on power transistors are usually unrealistic, at least so far as amateurs are concerned, since the temperature requirements attached to these power ratings cannot be

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met by means which an amateur would consider reasonable. Both the cost and the physical bulk of temperature-reducing devices increase rapidly as an effort is made to lower the operating temperature. The alternative is to reduce the input power (and thus the dissipation) to a level where the specified operating temperature is achieved by means practical in size and cost. Thus, while the transistors used in the final amplifier of the transmitter to be described here have a dissipation rating of 125 watts each, the maximum permissible junction-temperature requirement of 150 degrees C. makes it necessary to operate at a dissipation far below this figure with the limited cooling system employed.

### Circuit

The circuit of the transmitter is shown in

Fig. 1. A Texas Instruments 2N1908 is used in a simple crystal-controlled triode circuit with adjustable feedback.  $R_1$  provides a means of adjusting the power input. An output of approximately 2 watts is safely obtainable from this circuit. Large-size crystals should be used, since there is danger of fracturing miniature types at this power level.

The oscillator drives a buffer using a pair of transistors of the same type as used in the oscillator. The buffer input circuit is an arrangement that I have not seen discussed elsewhere. It was devised as a means of stabilizing the stage without resorting to conventional neutralizing circuits. In essence, it combines the higher gain of a common-base circuit with the stability of a common-emitter circuit. A full 10 watts of output is obtainable from this stage. Since the first two

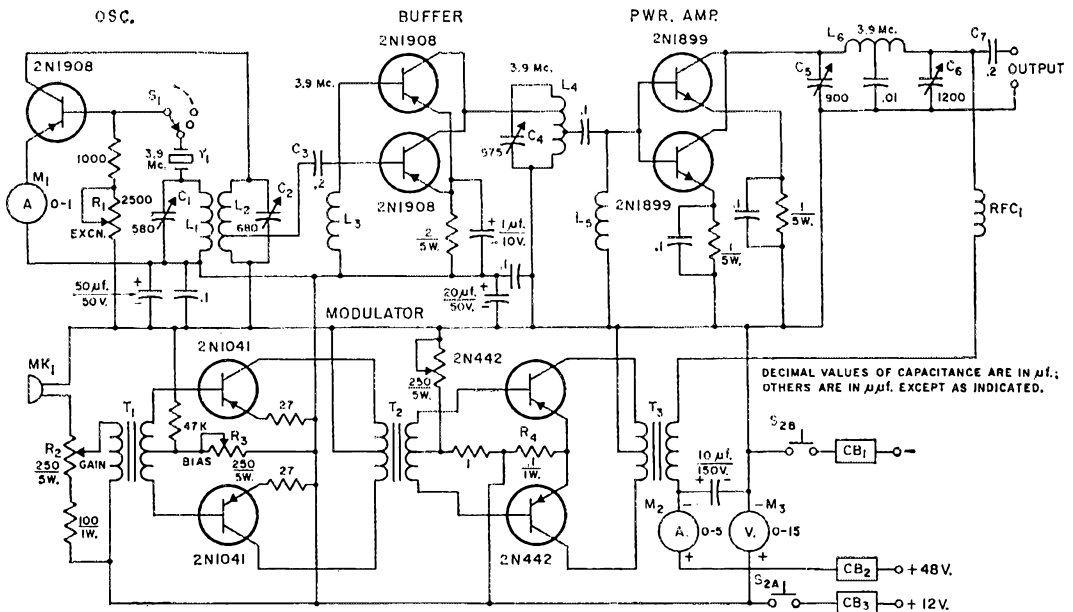
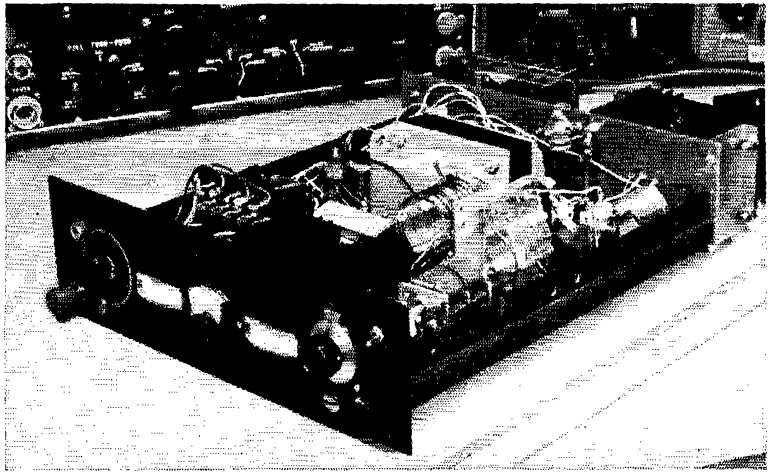


Fig. 1—Circuit of the high-power transistor transmitter. Fixed capacitors are disk ceramic except those marked with polarity which are electrolytic. Resistances are in ohms and resistors are 1 watt unless indicated otherwise.

- $C_1$ —110–580- $\mu$ mf. mica trimmer.
- $C_2$ —140–680- $\mu$ mf. mica trimmer.
- $C_4, C_7$ —Two 0.1- $\mu$ f. disk ceramic units in parallel.
- $C_5$ —275–970- $\mu$ mf. mica trimmer.
- $C_6$ —Dual air variable, broadcast-replacement type, 450  $\mu$ mf. or more per section, sections in parallel.
- $C_n$ —350–1180- $\mu$ mf. mica trimmer.
- $CB_1, CB_2, CB_3$ —5-amp. circuit breaker (Mechanical Products, Jackson, Michigan, type MP-701C).
- $L_1$ —20 turns No. 16, 1/2-inch diam., 2 inches long.
- $L_2$ —9 turns No. 18 wound and spread over  $L_1$ , tapped at 2 1/2 turns from collector end.
- $L_3$ —16 turns No. 18, 1/2-inch diam., 1/2 inches long.
- $L_4$ —16 turns No. 16, 1/2-inch diam., 1 1/2 inches long, tapped at 4 and 12 turns from low-potential end.
- $L_5$ —10 turns No. 18, 1/2-inch diam., 3/4 inch long.
- $L_n$ —10 turns No. 16, 1/2-inch diam., 1 inch long, tapped at center.
- $M_1$ —Miniature 0-1-amp. d.c. meter (Emico NF-2C or other).

- $M_2$ —Miniature 0-5-amp. d.c. meter (Shurite 3203).
- $M_3$ —Miniature 0-15 d.c. voltmeter (Shurite 3108).
- $MK_1$ —Carbon microphone.
- $R_1, R_2, R_3$ —Wire-wound control.
- $R_4$ —Homemade from nichrome ribbon or similar capable of carrying about 5 amps. Usually obtainable at appliance repair shops).
- $RFC_1$ —20 turns No. 18, 1 1/4 inches diam., 1 1/4 inches long.
- $S_1$ —Single-pole rotary switch, positions to accommodate desired number of crystals.
- $S_2$ —Double-pole normally-open push-button switch (Arrow-Hart & Hegeman 80630 or similar).
- $T_1$ —150-mw. transistor audio transformer, 490-ohm primary, 150-ohm c.t. (Thorardson TR-5).
- $T_2$ —300-mw. transistor transformer, 500-ohm c.t. primary, secondary 16 ohms, tapped at 4 ohms, 4-ohm tap used as center tap (Stancor TA-42).
- $T_3$ —40-watt output transformer, 6-ohm c.t. primary, 16-ohm secondary (Triad TY-67A).
- $Y_1$ —Large-size 75-meter crystal.

In this view,  $L_1L_2$  and  $L_3$  are mounted on either side of a small component board immediately behind the variable capacitor  $C_5$ .  $RFC_1$  is the coil at the extreme rear. Other components are identified in the text.



stages operate at 12 volts, this portion of the transmitter might be used alone as a low-power mobile transmitter operating directly from the car battery.

The final amplifier, coupled capacitively to the buffer, uses a pair of Pacific Semiconductor type 2N1899 silicon mesa units. With the heat sinkage provided in this unit, a power input of approximately 130 watts should not be exceeded. At a normal efficiency of 60 per cent, the available output is about 80 watts.

#### Output Coupling Circuit

Mobile operation direct from a 12-volt storage battery is understandably desirable, since it eliminates the inefficiency, bulk and expense of a power-converting device. However, collector load resistance—the resistance to which the antenna load impedance must be matched—is given approximately by

$$R_L = \frac{V_{CE}^2}{2 P_O}$$

where  $R_L$  is the collector load resistance,  $V_{CE}$  the collector operating voltage, and  $P_O$  the power output in watts. From this, it is seen that an output of 80 watts at a collector voltage of 12 results in a collector load resistance of only  $144/160 = 0.9$  ohm. Such a low value of load resistance presents obvious problems in tank-circuit design and coupling to the antenna load.

It will be noted that the load resistance increases by the square of the collector voltage, so that by increasing the voltage to 48, the load resistance is increased 16 times to a value of 14.4 ohms. This is still an extremely low value compared to that associated with vacuum tubes, but at least is a value that can be handled more readily in practice.

The output circuit, designed to feed a mobile whip antenna (approximately 20 ohms), is in the form of a double pi network. Because of the low collector load impedance, adequate circuit  $Q$  cannot be obtained with reasonable  $LC$  values in a conventional single-section arrangement. Even

with this configuration, capacitances much larger than those normally associated with tube circuits are required, the inductance values being correspondingly smaller. Fortunately, the voltages involved are extremely low compared to those that prevail in tube circuits so that the large capacitances can be contained within small physical dimensions.

#### Audio Section — Metering

The modulator operates from a 12-volt source. The circuit is a quite conventional arrangement using a carbon microphone, a pair of 2N1011s (Texas Instruments) as drivers, and a matched pair of Class B 2N442s (Delco). The frequency response is essentially flat from 30 to 3000 cycles. The unit will deliver 40 watts. Audio gain is adjustable by means of  $R_2$ .

Meters are provided for monitoring oscillator-emitter current, r.f. amplifier-collector current and the 12-volt input voltage.

#### Heat Sinks

The importance of maintaining transistor junction temperatures within the manufacturer's rated value has been emphasized. As has been indicated, this requires, in most practical cases, a compromise between the allowable power input and the cost and space that can be tolerated for cooling devices in a particular application.

A simple approximate expression relating junction temperature to permissible collector dissipation is given by

$$P_D = \frac{T_J - T_A}{T_R}$$

where  $P_D$  is the collector dissipation in watts,  $T_J$  is the junction operating temperature,  $T_A$  is the ambient temperature, and  $T_R$  is the total thermal resistance in degrees per watt between the junction and the ambient.  $T_R$  is the sum of the thermal resistances between the junction and the case of the transistor, between the case and the heat sink, and between the heat sink and ambient. The thermal resistance between

junction and case is included among the transistor manufacturer's ratings, while the heat-sink resistance for various thermal conditions is usually specified by the manufacturer of the heat sink.

The junction-to-case thermal resistance of the 2N1899 is given as 1 degree C. per watt. The thermal resistance of the heat sink will vary with its size, shape, color and the material of which it is made. Those used for mounting the final-amplifier transistors are finned types made of black anodized cast aluminum alloy and measure 3 by 4 inches (Motorola MS-10). They provide a thermal dissipation approximately the same as flat aluminum sheets of five times their size. With a transistor mounted with silicone grease directly on one of these heat sinks (no insulating washer), the thermal resistance between the transistor case and ambient is estimated to be about 3 degrees C. per watt.

Based on an ambient temperature of 30 degrees C. (86 degrees F.), a temperature within the range likely to be encountered in summer mobile operation,

$$P_D = \frac{150 - 30}{1 + 3} = 30 \text{ watts.}$$

A small amount of forced-air circulation is recommended. Heat sinks of the type described are obtainable from a number of firms, such as Astro Dynamics of Burlington, Mass., and Delbert-Blinn of Pomona, Calif., as well as from such transistor manufacturers as Motorola, Delco and others.

### Construction

A 12 × 12 × 4-inch steel hi-fi cabinet with removable vented cover was used as the enclosure. The final-amplifier and modulator heat sinks, which are external, extend the depth another 3 inches.

There are only two tuning controls on the panel—one for a 10-position rotary crystal switch, and the other for  $C_5$  which resonates the output amplifier. The oscillator and buffer tuning capacitors, and the output loading capaci-

tor are internal, and are of the screwdriver-adjusted type requiring resetting only occasionally. A range of about  $\pm 25$  kc. may be covered without readjustment of internal controls. The panel also includes the microphone jack, push-to-talk switch, and three miniature meters.

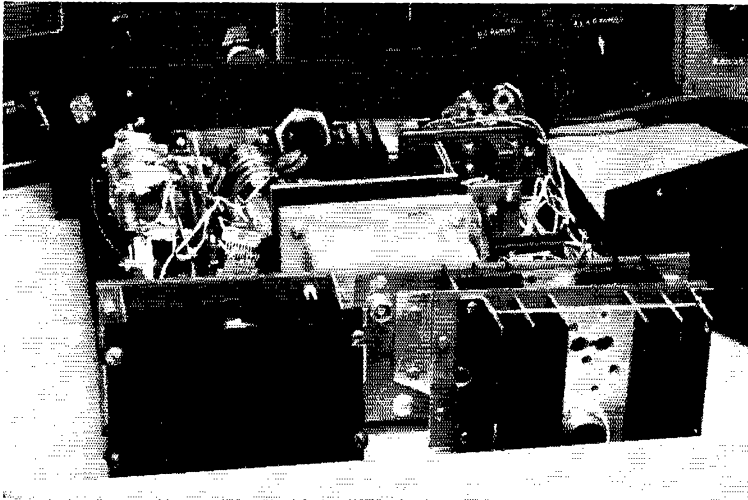
In the course of development of the unit, some shuffling of components was necessary, and some details of the final product do not agree with the photos, which were made before the project was completed. Also, experimentation resulted in some rather untidy haywire which the reader is not encouraged to duplicate now that the soundness of the electrical design has been proved. In the final arrangement, the crystals are mounted on a subpanel spaced sufficiently to the rear of the crystal switch to allow room for the modulator driver transformer. To the rear of the crystal panel, the microphone transformer, audio driver transistors (no heat sink) and associated components are mounted on a small board spaced from the bottom of the chassis.

Along the center line of the chassis, from front to rear, are the oscillator transistor mounted on its heat sink (Delco 7276040), a second heat sink (same as in oscillator) on which both buffers are mounted, the buffer input and output coils, and the modulation transformer.

Along the right-hand side are the final tuning capacitor, and coils for the oscillator and final amplifier.

### Mounting the Power Transistors

To achieve a contact of low thermal resistance between the power transistors and their heat sinks, the transistors are mounted directly on the sinks without insulating washers. The use of silicone grease between the transistor case and sink reduces the thermal resistance of the contact. Electrical insulation, where required, is provided by insulating the heat sinks themselves from chassis ground. This insulation for the modulator and final amplifier is provided by making the rear wall of the chassis, on which the heat sinks are mounted, of  $\frac{1}{8}$ -inch plastic (or fiberglass) strip.



This rear view shows the modulator heat-sink assembly to the right and the r.f.-amplifier assembly to the left, both assemblies being mounted on the insulating board which backs up the chassis.

The two r.f.-amplifier heat sinks are fastened together, back to back, and supported on aluminum brackets attached to the plastic strip with metal screws. The modulator heat sinks (Delco 7277152) are mounted in a similar manner but, since the circuit has a push-pull configuration, the two sinks must be insulated from each other as well as from ground. This is accomplished by mounting the sinks on either side of a glass epoxy board using phenolic screws and spacers.

### Final-Amplifier Power Supply

Since the remainder of the transmitter operates directly from a 12-volt source, only the supply for the final amplifier requires consideration. In some cases it may be feasible to obtain the required 48 volts at approximately 3 amperes from a series of storage batteries, if some means is available for recharging. Otherwise, a 12- to 48-volt converter will be required. For those interested, converter design is covered in an article which appeared in an earlier issue of *QST*.<sup>1</sup>

### Testing

In the testing of transmitter units containing expensive power transistors, negligence, inexperience or mistakes cannot be tolerated to the extent usually permissible in handling tube circuits. However, all transistors have a little forgiveness for wrong polarities, over-voltage, transients and the like, so with reasonable caution, no serious difficulties should be encountered.

The oscillator should operate readily and produce a clean note when monitored on a receiver. In the early stages of development of the unit, some difficulty was experienced with the 2N1908, both as oscillators and buffers. Service life was short, and large variations in collector current were apparent. Some time later (during the middle of 1961) newer 2N1908s having serial numbers above 143 were found to be very reliable and have shown none of the earlier tendencies

<sup>1</sup> Tetz, "Design and Construction of Transistor Power Converters," *QST*, April, 1960.

in over six months of operation. Oscillation is controlled principally by  $C_1$ , while  $C_2$  is used for peaking up the output. Both should be adjusted for maximum indication on a receiver S meter, or an indicating wavemeter coupled to  $L_1L_2$ . If the circuit fails to oscillate, connections to  $L_2C_2$  should be reversed. At 12 volts, a maximum current of 500 ma. can be drawn safely by the oscillator. Less current than this should result in adequate drive to the buffer.

With an antenna or dummy load connected, and power applied to the buffer and final amplifier,  $C_4$ ,  $C_5$  and  $C_6$  should be adjusted for maximum output as shown by an r.f. output indicator, or forward-power bridge, consistent with a collector current of 2.75 amperes. As a final adjustment, the taps on  $L_2$  and  $L_4$  should be varied for best final amplifier efficiency.

With the r.f. circuit working properly, modulation should be applied and the output waveform checked with an oscilloscope.

The transmitter as described has been in regular service for more than six months with no breakdown or other difficulty, even with fairly high transmit/standby ratios. The unmodulated carrier has been fed into a dummy load for continuous five-minute periods while reference measurements were being taken, and thermocouples attached to the transistors indicated no dangerous temperatures when a small blower was used to guarantee air circulation.

The many useful reports and patient tests made by VE3CTE and VE3APK, president and secretary, respectively, of the Oakville Radio Club, during the initial on-the-air adjustment of the experimental transmitter are gratefully acknowledged.

**QST**

### Bibliography

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## Strays

The Catalpa ARS held an Old Timers Night at the Henry Ford Museum in Greenfield Village (Michigan), and it was a great success. Over 330 people showed up for the dinner, and over 500 for the formal program which followed. Among the celebrities present were (l. to r.) W8CJT (who built a 5-meter transmitter used in a Piccard balloon flight in 1934), W4CF (former Traffic Manager for ARRL), K8CFU (Director, Catalpa Amateur Radio Society), K9EBE (representing Hallcrafters), and W2ICE and W2QY of the Antique Wireless Association.





Staff of the Copperhead V.h.f. Associates station, W3JZY/3. Front: K3HFF, W3CJT, W3SFY, W3MUO, K3LMN. Rear: W3LKU, W3OTC, K3IGQ, ex-KN3POX, K3AKK, W3UJG.

## June V.H.F. Party Summary

### Continent-Wide 50-Mc. DX Brings in Record Scores

**W**E could save space and superlatives in reporting the June V.h.f. Party for 1962 by asking you to refer to our report of the 1961 affair, and then plug in the appropriate calls and numbers. The words will be familiar, and for the most part, so will the calls and scores, except that the latter will be bigger than ever. There will also be a few surprises, in the form of 5-figure scores from areas where contest interest used to be low.

Imagine a Florida station working 504 stations, and running up a multiplier of 49, yet coming in second in his section. It happened to W4LIP, Miami, who saw his fellow emigrant from Western Massachusetts, W4GJO, Sarasota, win the Eastern Florida award with a 598-54-32,292 total, which was also the national high for single-operator stations. Grid worked 53 ARRL Sections on 50 Mc., in what may have been the longest and most widespread 50-Mc. opening in v.h.f. contest history. Then there was K4RNG, Miami, who posted an all-time high one-band effort, 404-50-20,200, yet came in third in his section!

The hot *E.* conditions on 6 all across the southern part of the country are reflected in massive section totals of Texas stations. K5ZMS, Duncanville, placed third in the North Texas race, even with 42 sections. He was outrun by K5ARU, Dallas, 273-36-9828, and W5PVT, Andrews, 262-37-9694, all three working 50 Mc. only. The South Texas wallpaper was won by W5GBH, Bellaire, 244-40-9760, also entirely on 50 Mc.

One-band totals of fabulous proportions were reported by 50-Mc. operators in all parts of the country, and for once local activity and extent of DX seemed to balance out quite well on a countrywide basis. ARRL Section awards were won on 50 Mc. in Southern New Jersey (K2TTP, 386-31-11,966), Ohio (K8MMM, 309-24-7416), Maine, Eastern and Western Massachusetts, Virginia, West Virginia, North Carolina, Georgia, Alabama, Oklahoma, Colorado, New Mexico, Idaho, Montana, Nevada, Alberta, and North-

west Territory. One of the most amazing 50-Mc. totals of all was turned in by a fellow who was not even officially in the contest. XE1OE (W8NRM) worked 318 stations in 50 ARRL Sections, for a mythical score of 15,900 points. We've been looking for some reasonable way to include fellows like him who are outside the ARRL territory in the official contest results; see September Party rules on page 54.

One section award was won on 2 meters, and by a Novice, at that. KN1RSJ/1 camped out on Vermont's Mt. Mansfield, highest spot in the Green Mountains, and worked 84 stations in 8 sections. Top 144-Mc. score was by W1MEH, Easton, Conn., who pushed hard for sections and came up with 17, and 2261 points. More contacts, but fewer sections, gave his Connecticut competitor, K1PKQ/1 a 162-13-2106 record. The best score made without use of the 50-Mc. band was W4LTU's 121-20-2460 total on 144 and 420. Walt was just recently out of the hos-



This is portable! The kilowatt 50-Mc. s.s.b. setup of W6UW/6, atop Mt. Hamilton, one of the West's high-scoring stations.

pital, but this doesn't show in his score, which was second in the Virginia Section.

The high scores resulting from 50-Mc. DX bring anguished cries from 2-meter men, but remember, an avowed purpose of these contests is to promote versatility. There is no guarantee of 6-meter DX; come September it is likely that 6- and 2-meter scores will run neck and neck. The winners, at least in the high-activity areas, will have to work both bands for all their worth. They also will be using the higher bands with increasing skill and profit. Use of 220 and 420 is almost a must for a winning score in the multiple-operator category, and 1215 Mc. is coming along well, too.

Not too long ago, the big portable-working groups took along gear for 1215 Mc. merely to make a manufactured contact or two with members of their own party, but no more. The APX-6 is becoming a real factor in contest scoring, and the work being done with this handy surplus box is not all local, by any means. Perusal of the contest file shows numerous examples of APX-6 two-ways over distances up to 75 miles or so.

Top scorers are being pushed into making provision for operation up to at least 10,000 Mc., in order to hold their leading positions. All bands, 50 through 10,000 Mc. were used at W1BU, W1MHL/1, and K1OOR/1, and one or more bands above 2000 Mc. figured in the scoring of a dozen or so others. Crystal-controlled gear on 1296 Mc. paid off handsomely for W1MHL/1, with 10 contacts in 4 sections. Two of these were home stations: W1VNH and W1QWJ, in the Springfield area, some 80 miles distant. K6BPC/6 had a 6 in 4 record on 1215 Mc., using APX-6 gear.

In the portable field records were piled on records. Still unchallenged national leaders, the Waltham Amateur Radio Association's W1MHL/1 held forth from Pack Monadnock Mountain, near Peterboro, N. H., reaching a long-sought goal: a score in excess of 100,000 points. With a staff of 22, the best of equipment for all bands

from 50 through 10,000 Mc., and the considerable know-how accumulated over years of this all-out effort, the Waltham gang made 1136 contacts. A section multiplier of 80 brought their score to 100,240 points.

Their stiffest competition came from a line-of-sight distance, in the form of K1OOR/1, the King Philip Amateur Radio Society, operating on the highest spot in Massachusetts, Mt. Greylock, with a 893-75-73,600 total. The 6220 Club, W2PEZ/2, Northern New Jersey, worked 50 through 1215 Mc. for a 843-63-57,330 score, and third spot in the nation.

In California, as always come v.h.f. contest time, the mountain tops were swarming with v.h.f. operators, and this time the 50-Mc. DX helped them to swell their section totals. K6BPC/6, the station of the Southern California V.h.f. Radio Club ran up the top western score, 673-44-30,932. Runnerup in the West was K6IBY/6, at Sierra Peak, in the San Diego Section, with 640-41-28,249. Both stations used 50 through 1215 Mc.

Reading the letters that accompanied many of the logs occupied the time of your V.h.f. Editor for a good many hours. We can't begin to tell the whole story here, but we've lifted a line or two from some of them, to give you something of the contest atmosphere.

W3JZY/3 — Innovation this year: multiple receivers and antennas on all bands. We credit this with at least 50 contacts with "casuals" we might have missed with one antenna and one receiver per band.

K2ITP — Good party; most activity ever noted on 6 in June.

W9ERT, Northland Amateur Radio Club, Iron Belt, Wis. — Our club station is on one of the highest spots in Wisconsin. Activity is all far to the south of us, with few stations turning their beams up this way. Will continue 2-meter work from Tower Mtn.; look for us!

W5GKP — 50-Mc. band open to somewhere for entire contest. Could hear W6NLZ and W1MHL/1 simultaneously, and most points in between. QRM very heavy, though most operating was courteous. But blast those few who park on your frequency and call incessantly, regardless of your directional calls!

W8PT — Contacts on 220 and 420 should be worth 25 points here. Nearest 420 station 225 miles — and we had thunderstorms 20 hours of the contest!

"The livin' was easy" when these shots of W2PEZ/2 were made. At the left, K2URC logs K2QKR tunes, and W2EEW operates the 2-meter gear. At the right, K2HAZ, foreground, makes 220-Mc. contacts, while K2QKR digs for a weak one on 432 Mc.







Did you get Maine? If not, it wasn't the fault of K1HAV/1 on Mt. Sabattus. K1CFT and K1HAV stand outside the tent, while K1QC works inside.

W2LW1/2, Dutchess County V.H.F. Society (645-272-50,616) — This beats our best previous score by 16,000 points.

W2KXG (128-12-1536, on 144 Mc.) — Would like to see scoring separately by bands, but no matter how you score them, I'm looking forward to September.

K2YNT — Biggest kick was working W3BDK, who was using a 150-foot dish on 144 Mc.!

W0PFP — Thanks (?) to the W1 who speeded up when I asked QRS on c.w.!

K0ITF — Frustrating to have stations in all directions working over and around us on 50 Mc. Had to settle for little more than half last year's score. Took only 3 hours sleep, so didn't miss many chances.

W0ROY — Our 500-foot high antenna (KOAM-TV, Channel 7) made all signals strong, but DX was disappointing.

W1GB/1 — Though we made a substantial improvement over last year, almost none of our gear worked properly. Well, there's always the next one!

K7QQZ (206-15-3090, on 50 Mc.) — My first QSO Party. Most fun I've had on the air since getting my call!

W6SDM/6 — Same old crew, same old stand (see Sept., 1961, QST, p. 29). No fabulous score, but lots of fun, especially with the fine openings on 6.

W4TLC, Taylors, S.C. — Most local v.h.f. activity ever seen. No lulls in this contest!

W0PFP/0 — Real trend to v.h.f. in this area (Boulder, Colo.). Closed-band conditions in September should give real test.

K5IQL — My score, 40-20-800, on 50 Mc., is unimpressive, except that it was done entirely on 2-way s.s.b. Log reads like "Who's Who on Six," with KP4CK and W6YIL on successive calls!

WA4FLJ, W. Fla. — What happened to all the c.w. ops? Whenever 6 started to fold I'd go on c.w., but had very little success.

K8CIH — Biggest beam? 13-element 50-Mc. Yagi on 60-foot boom, on 65-foot tower.

WA2BAH — Highlights were 405-mile "groundwave" QSO with K4VWH, Herndon, Va., on 50 Mc., and large amount of c.w. activity on 6.

W6UW/6 — How can cords and cables, so neatly coiled and placed in boxes, become such a mess? A first — our operation of 50-Mc. s.s.b. at the kilowatt level, from a mountain-top location? It paid off handsomely bringing in multipliers that never could have been pulled out of the mud on a.m.

W3WJC/3 — Spider in the v.f.o. tuning capacitor gave us a lot of trouble for a while. "Getting the bugs out" paid off here!

K3LNZ — As usual, had to waste a lot of time, due to ineffective operating. Got any spare Wouff Hongs around?

W1HDQ — Just to see what would come of it, I worked 50-Mc. c.w. only, for about 4 hours Saturday night. Worked only 27 stations, mostly within normal working range of 200 miles, though band was red-hot to W4-5-0 most of the time. Lots of people are passing up a good bet for relatively

QRMI-free contest work, by not firing up on c.w. part of the time, at least.

WA5ABG (201-37-7437, on 50 Mc.) — My first contest. Though inexperienced (age 14), I sure had fun!

VE8BY, Yellowknife, NWT — Worked VE2AIO, VE2SHI, K2LXJ, K2ERQ and W1HDS, between 0445 and 0530 GMT. All over 2000 miles.

Several contestants in West — Contest-in-progress-at-both-ends rule should apply to spring and fall parties, as well as to V.h.f. Sweepstakes.

### Word of Warning

Many portable-station operators were heard making contact after contact without once using the portable indicator after their calls. Some even submitted their logs this way. Signing portable when you are operating away from your licensed location must be done to conform to FCC rules. To omit it is a direct violation, and could result in invalidation of your contest entry, as well as citation by FCC monitors. Don't let it happen to you! The fraction bar is important to both ends of the QSO; W1HDQ and W1HDQ/1 are separate stations. They count as such in your contest entry, but only if entered correctly therein. — E. P. T.

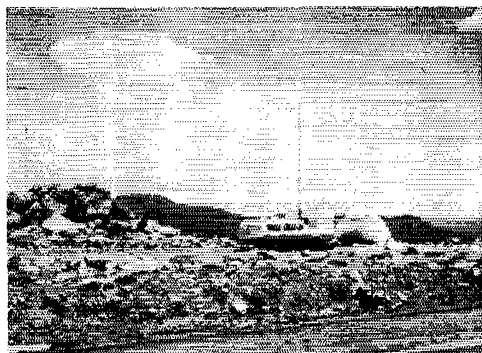
### SCORES

In the following tabulation, scores are listed by ARRL Divisions and Sections. Unless otherwise noted, the top scorer in each section receives a certificate award. Columns indicate the final score, the number of contacts, the section multiplier, and the bands used. A represents 50 Mc.; B, 144 Mc.; C, 220 Mc.; D, 420 Mc.; and E, 1215 Mc. or higher. Multiple-operator stations are shown at the end of each section tabulation.

### ATLANTIC DIVISION

#### Eastern Pennsylvania

K3HGA 10,131-303-33-ABC	W3WJC/3 (8 oprs.)
K3PAT 6948-216-28-A	29,040-499-55-ABCDE
W3CLA 4832-151-32-AB	W3KX/3 (11 oprs.)
W3ETB 4131-153-27-AB	20,580-379-49-ABCD
W3AAJ 2356-124-19-A	K3NUM (13 oprs.)
K3QVP 1600-100-16-AB	12,078-366-33-AB
K3MTT 1095-73-15-AB	W3AWA/3 (22 oprs.)
W3LDA 225-25-9-A	12,040-344-35-AB
K3MBR 80-19-5-AB	W3OI/3 (7 oprs.)
KN3PVK1 52-26-2-B	11,766-314-37-ABCD
KN3PVL 28-14-2-B	W3FDH/3 (AV3s PDH JUZ
KN3SZB/3 22-11-2-B	(GFN) 10,952-296-37-AB
W3CCX/34 (Multiple-operator)	W3SDZ/3 (6 oprs.)
44,770-764-55-ABCDE	8029-259-31-AB



Highest station in the June V.h.f. Party? W0JUR/0, at 12,300 feet elevation, near Mt. Evans, Colo. Trailer in back of the station wagon was built especially for club emergency work by the Mile-High Highlanders Club of Denver.

W3JMP (W3JMP, K3JPL)  
7110-237-30-AB  
K3CNN/3 (W3JLQ, K38  
CNN BW2)  
6484-202-32-AB  
W3HCW/3 (4 oprs.)  
1494-214-21-AB  
K3ABC/3 (4 oprs.)  
3980-199-20-A  
W3AD/3 (15 oprs.)  
344-156-24-AB  
K3CQR/3 (K3s CQR NFE)  
2318-122-19-A  
K3JRO/3 (K3s JRO HWB)  
660-55-12-AB

*Mid.-el.-1) C.*

K3LNZ 5096-182-28-AB  
K3AZH 4089-139-29-ABD  
W4TYH/3  
4000-160-25-A  
W3CGV 3596-104-31-ABUDE  
W3TFA 483-68-7-ABC  
K3NRGA 268-67-4-B  
W3HH 246-41-6-B  
K3OBU 175-25-7-AB  
W3LUL 144-36-4-B  
K3NCL 140-35-4-B  
K3CFD 60-20-2-B  
W3NQC 60-20-3-B  
K3NPUT 38-19-2-B  
K3PAK 24-12-2-A  
K3NRPZ/3 14-7-2-B  
W3JZY/3 (14 oprs.)  
48,246-677-66-ABCD  
W3YMW/3 (4 oprs.)  
6293-203-31-AB  
K3ERM/3 (8 oprs.)  
2940-196-15-B  
W3CBW (K3s OWX OYC  
RGD) 2816-176-18-AB  
K3MOY (K3s KST MOY)  
1926-107-18-A

*Southern New Jersey*

K2ITP 11,966-386-31-A  
W2REB 8120-232-35-AB  
K3SXH/2 7743-267-29-A  
WAZEMB 5904-135-41-ABD  
W2BLV 3977-82-41-ABD  
W2GSO 1664-64-26-AB  
K2QOK 720-48-15-A  
W2HXL 504-42-12-B  
W2ESX 279-31-9-B  
W2PHY 138-23-6-A  
W2POV 129-43-3-B  
W2AWE (4 oprs.)  
4806-178-27-A  
W2ATQV/2 (WA2s TQV  
KLZ) 682-62-11-B

*Western New York*

K2ERQ 7722-234-33-AB  
K2YCO 3260-163-20-AB  
K2GUG 2142-123-17-ABCD  
W2RQD/2  
1921-113-17-AB  
WA2YFF 1800-120-15-A  
W2AKND 1725-115-15-AB  
WA2VAI 882-63-14-A  
K2ZLOK 800-80-10-B

W2ROA 736-92-8-B  
W2UTH 387-43-9-AB  
WA2KVN 315-63-5-AB  
WA2ROK 205-41-5-AB  
W2UAD 189-63-4-B  
WA2OPK 164-41-4-A  
W2QY 80-40-2-B  
WA2KLM 38-19-2-B  
WA2KKP 2-2-1-B  
K2LXJ/22 (5 oprs.)  
18,810-325-55-ABC  
K2RRM (9 oprs.)  
16,236-362-44-ABC  
W2MAU/2 (14 oprs.)  
13,000-313-40-ABCD  
K2POX (10 oprs.)  
7392-226-32-AB  
WA2VMB/2 (12 oprs.)  
7112-250-28-ABC  
K2OVH/2 (K2s AHR OVB,  
W2EJO)  
6970-194-34-ABC  
W2ZKF (7 oprs.)  
5600-171-32-ABCD  
K2KKA/2 (8 oprs.)  
4599-218-21-ABD  
WA2VCM/2 (2 oprs.)  
3530-178-18-ABC  
WA2PJS/2 (4 oprs.)  
2464-154-16-AB  
K2TVB (K2TVB, WA2THS)  
1666-119-14-AB  
K2KTK/2 (5 oprs.)  
1200-108-12-AB  
K2DUR/2 (8 oprs.)  
561-51-11-AB  
WA2CYM (WA2s CYM VCG  
VOJ) 195-39-5-A  
K2DNN/2 (K2DNN, WA2-  
TCZ) 117-39-3-A

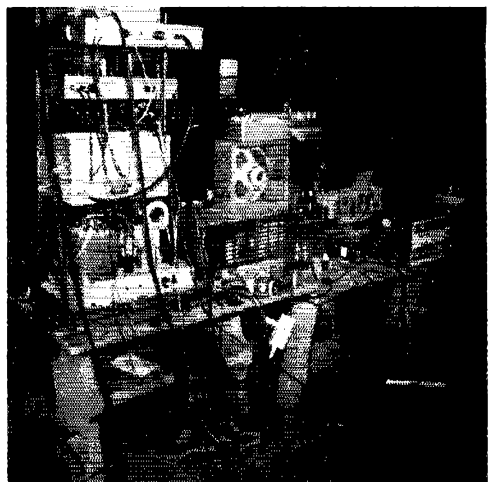
*Western Pennsylvania*

W3RUF 4500-117-36-ABCD  
W3BWU 3630-165-22-AB  
K3KGC 3260-163-20-A  
W3TMY 1140-57-20-AB  
K3DXV 480-47-10-ABD  
W3DJM 304-38-8-A  
W3WHE\* (9 oprs.)  
11,913-359-33-ABC  
W3UCA/3 (8 oprs.)  
10,320-250-40-ABC  
K3HKK/3 (6 oprs.)  
4225-167-25-ABC(1)  
W3WVZ/3 (W3s NYV WFZ)  
3124-132-22-A  
K3GFV/3 (W3s CUK ZQU  
K3MUF)  
1638-78-21-AB  
K3IGC (K3s IGC IGP, KN3-  
SFA) 352-32-11-A

**CENTRAL DIVISION**

*Illinois*

K9DWR 3654-170-21-ABC  
K9FTT 3168-132-24-A  
K9IBV 585-39-15-AB  
K9YNF 256-32-8-A  
K9ZWT 246-40-6-ABC  
W9IDJ 205-38-5-ABC  
K9BGV 174-58-3-B  
K9DCZ 168-56-3-B  
W9KBP 168-24-7-AB



Could this rear view of K2OVH/2 have something to do with the location being known as Mt. Chaos?

K9IOA 135-25-5-ABC  
K9FQO/9 105-21-5-A  
K9VCZ 40-40-1-B  
K9CGD 20-20-1-B  
W9AXT 20-10-2-B  
K9RUJ 16-8-2-A  
K9EHI 16-8-2-B  
W9NBI 12-12-1-B  
K9HDE\* (K9s HDE OQV  
VUX) 7800-390-20-AB  
WA9AHZ (WA9AHZ, K9-  
TWF) 6300-315-20-AB  
K9JXY (K9s JXY CHZ AKS)  
5022-186-27-AB  
K9VIS (Multiple-operator)  
K9ZWJ (K9s UJO ZWJ, W9-  
MEM) 3489-174-20-AB  
K9IUM/9 (K9s EWJ IUM)  
1729-91-19-A  
K9JGH (K9s HQW IKP  
JGH) 1640-97-17-A  
K9GGB (K9s G4G WNU)  
1101-110-10-A  
K9BBN (K9s B V BHP IOA)  
38-53-7-ABC

*Indiana*

K9QCB 7560-315-24-AB  
K9NMH 5106-222-23-AB  
W9MHP  
K9QXS 2112-90-22-ABCDE  
K9MZV 1190-119-10-AB  
K9KCI 504-36-14-AB  
K9WZB 488-61-8-AB  
W9YDP 320-32-10-A  
K9LAK 312-39-8-A  
K9CBL 150-25-6-A  
K9YIA\* (K9s SGV UDW  
YIA) 5394-186-29-A  
K9DNQ (K9s DNQ ZHR)  
3160-158-20-AB  
W9REG (K5WFG, K9LYA)  
2556-136-21-AB

*Wisconsin*

W9JCI 7100-284-25-AB  
W9JOT 532-38-14-AB  
W9TQ 488-36-13-AB  
W9ERT (6 oprs.)  
18-9-2-B

**DAKOTA DIVISION**

*South Dakota*

K0UIDZ 3264-136-24-AB  
W0ENC 3136-112-28-AB  
W0FTI 660-44-15-A  
K0FKP 198-22-9-A  
W0FJZ 24-12-2-AB

*Minnesota*

K0AOZ 606-58-12-A

**DELTA DIVISION**

*Louisiana*

W5GKP 9945-221-45-AB  
K6HNP/5  
9048-232-38-AB  
K5ZQX 612-36-17-A  
WA5AVQ (WA5s AVQ AWF)  
760-40-19-A

*Tennessee*

WA4AJC 2760-138-20-A  
W4HKK 1475-58-25-ABD  
K4LQO 664-83-8-A  
K4DCV 539-49-11-A  
K4RUF/4\* (4 oprs.)  
6496-224-29-AB  
K4KFO/4 (WA4RJS, K4-  
KFO, W4TZG)  
4176-174-24-AB  
W4SKH (6 oprs.)  
3588-156-23-AB  
W4ZZ/4 (K4FTP, W4ZZ)  
55-11-5-A

**GREAT LAKES DIVISION**

*Kentucky*

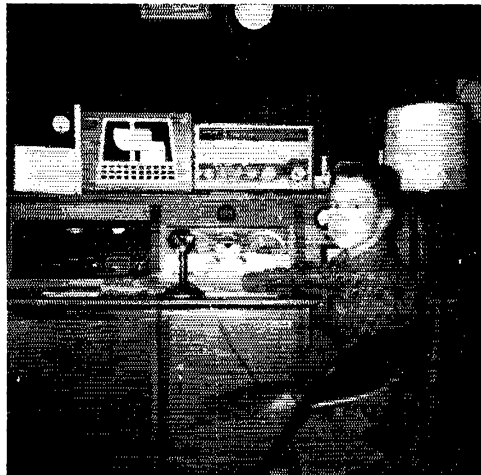
K4RZK 2700-150-18-AB  
K4KWJ 1040-89-13-A  
WA4OTL 10-5-2-A

*Michigan*

KSSRE 3024-1-6-24-AB  
K8BGZ 784-91-24-B  
W8YIO 1170-11-10-1B  
K8URAI 792-66-12-A  
K8IXU 612-68-9-A  
W8PT 224-32-9-BCD  
K8YCT 125-25-5-AB  
W8VRH 110-55-2-B  
K8LVP 924-33-3-B  
K8XLP 70-35-2-AB  
K8SBN 18-9-2-A  
K8OIH\* (2 oprs.)  
8316-287-28-ABCD  
K8NBG/8 (4 oprs.)  
5975-239-25-AB  
K8SMC (K8SMC PZZ YZR)  
3000-154-20-AB  
K8WPI/R (K8WPI, K8-  
CRH) 1921-113-17-AB  
K8JZP (K8s DVR JZP SBH)  
1360-85-16-AB  
K8OHC (K8s OHC WFO)  
780-65-12-AB  
W8XJU (W8NBR, W8XJU,  
K8UPO) 3880-76-5-AB

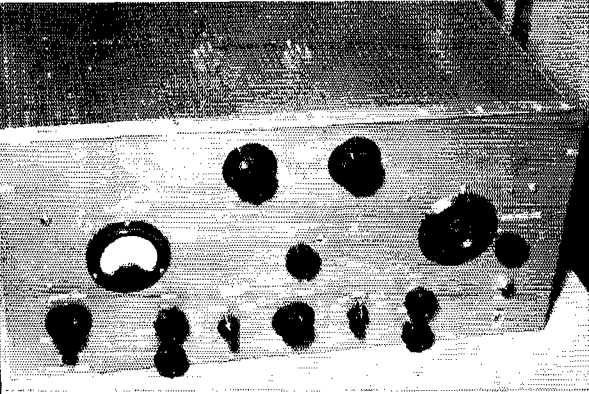
*Ohio*

K8MMM 7416-300-24-A  
K8SSK 3772-162-24-ABCD  
K8KNS 2337-123-19-AB  
W8CZD 1836-108-17-A  
W8JRN 1274-91-14-AB  
K8YMY 116-43-12-A  
K8DQW 1071-63-17-AB  
K8PRR 864-72-12-A  
W8MOW 756-63-12-AB  
K1CRQ/8 500-50-10-B  
K8VGL 460-46-10-AB  
K8BHH 300-43-6-B  
K8PLD 215-43-5-B  
W8IPT 57-19-3-B  
W8QLJ 30-10-3-B  
W8HRI/\* (10 oprs.)  
11,109-483-23-AB  
W8CCT (13 oprs.)  
9420-309-30-ABC  
K8YOG/8 (7 oprs.)  
2288-176-13-AB  
K8NLT (W8LXU, K8NLT)  
355-71-5-AB



Youngest v.h.f. contest winner? Ronnie Rusk, K3HGA, Croydon, Pa., made a 303-33-10,131 record on 50, 144 and 220 Mc., to win the Eastern Pennsylvania Section Award.

(Continued on page 142)



The panel is of standard rack width and 8 3/4 inches high. From left to right along the bottom are the microphone connector and audio gain control, the two carrier-balance controls, the sideband-selector switch, driver tuning control, mode switch, VOX and excitation controls, pilot lamp and key jack. The band switch is at the center of the panel, and the final-amplifier tuning and loading controls are at the top. The ARC-5 dial at the right controls the v.f.o.

## Another Phasing-Type S.S.B. Exciter

*Some Modifications of the Basic K4EEU Design*

BY RICHARD L. EVANS,\* K9YHT

**A**FTER deciding to get my feet wet in s.s.b., previous designs were reviewed to determine what type of exciter might appeal to me most. The accompanying diagrams and photos indicate the result. The unit combines features of three previously described designs as well as a few variations of my own.

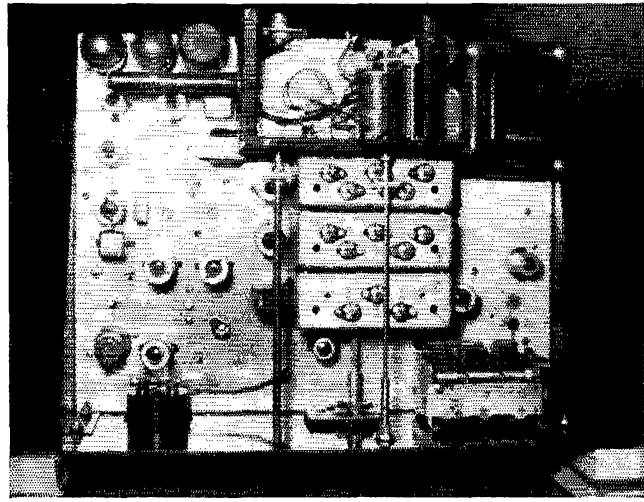
The circuit is basically that of the exciter described by K4EEU.<sup>1</sup> However, the beam-deflection-tube balanced modulator described by K2FF,<sup>2</sup> and the v.f.o. and VOX circuits of W6TEU's Sideband Package<sup>3</sup> have been inserted in place of the corresponding sections used by K4EEU. In addition, pi-network output has been substituted for the multiband tank arrangement used by both W6TEU and K4EEU. A 6CL6

drives the 6146 final. Sufficient output is obtained from the balanced modulator to drive the driver stage directly without the need for an intermediate stage. Reference should be made to the three articles mentioned for any details that are not made clear here.

### Construction

The unit is assembled on a 17 x 13 x 3-inch chassis. Many of the components used were from surplus or old TV receivers as suggested in the reference articles. Suitable standard-component substitutes are listed here along with the diagrams. The low-level r.f. coils were wound as described in the previous articles. Approximate inductance values are given here so that those who prefer not to wind their own can make a selection from available ready-wound coils in the instances in which such coils will make acceptable substitutes. Power-supply components were salvaged from an old TV set.

\* 117 Sauk Trail, Park Forest, Illinois.  
<sup>1</sup> Kelley, "A Phasing-Type Sidebander," *QST*, November, 1959.  
<sup>2</sup> Vance, "Exciter Circuits Using a New Beam-Deflection Tube," *QST*, March, 1960.  
<sup>3</sup> Bigler, "A Sideband Package," *QST*, June, 1958.



Top view of K9YHT's s.s.b. exciter. The sideband generator occupies the left-hand side of the chassis, with the remainder devoted to the v.f.o., band-heterodyning circuits, final amplifier and power supply.

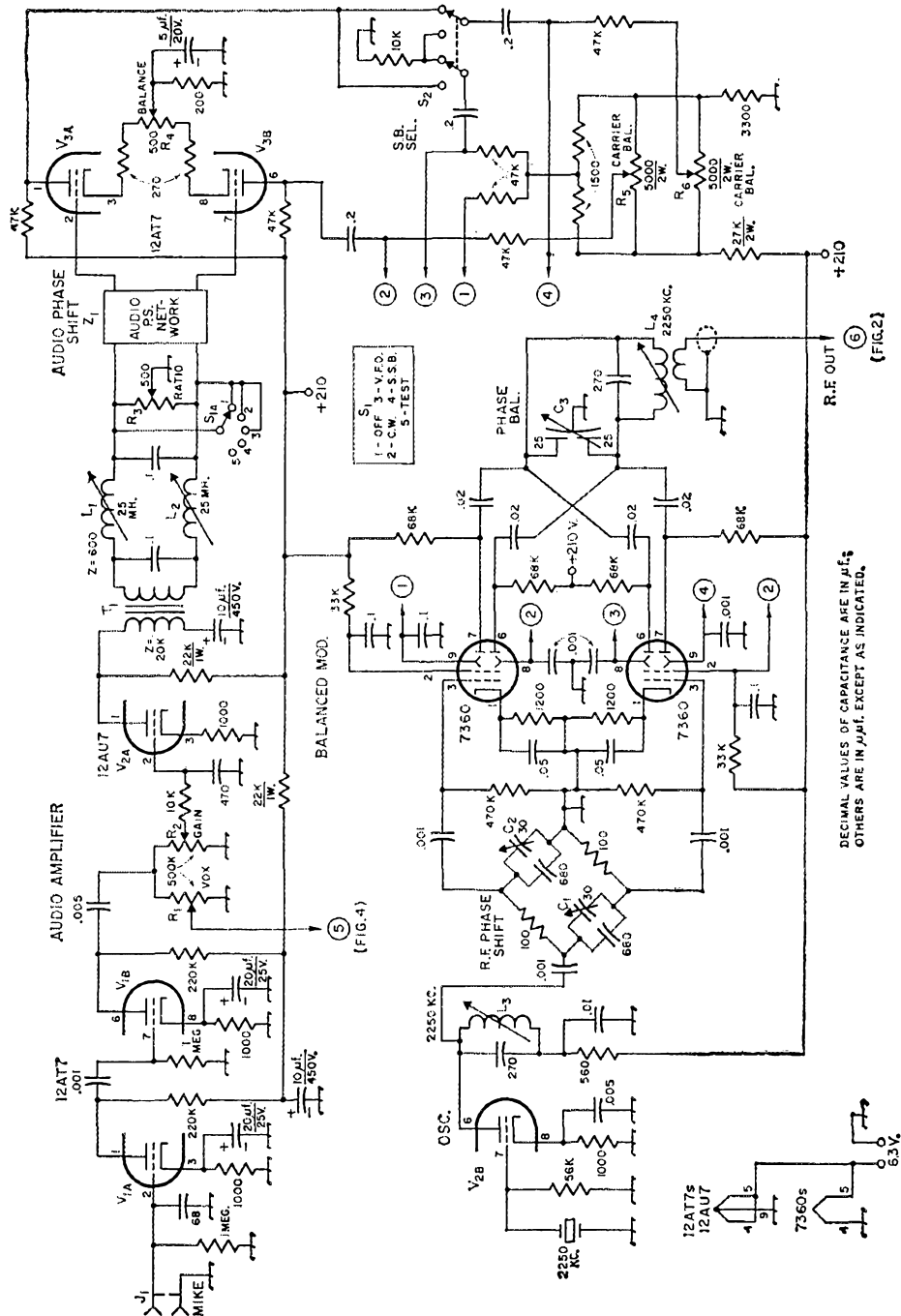


Fig. 1—Circuit of K9YHT's sideband generator. Resistances are in ohms and resistors are 1/2 watt unless indicated otherwise. Fixed capacitors of less than 0.001  $\mu$ f. should be mica or stable ceramic; others may be disk ceramic except those marked with polarity which are electrolytic.

C<sub>1</sub>, C<sub>2</sub>—Miniature air variable (Johnson 30M8/160-130).

C<sub>3</sub>—Differential capacitor (Johnson 25LA15/167-32).

J<sub>1</sub>—Microphone connector.

L<sub>1</sub>, L<sub>2</sub>—4-30-mh. iron-slug coil (adjust to 25 mh.).

L<sub>3</sub>, L<sub>4</sub>—Approx. 18-mh. iron-slug coil; L<sub>4</sub> has 3-turn link.

R<sub>1</sub>, R<sub>5</sub>, R<sub>6</sub>—Linear-taper control.

R<sub>2</sub>—Audio-taper control.

R<sub>3</sub>, R<sub>4</sub>—Wire-wound control.

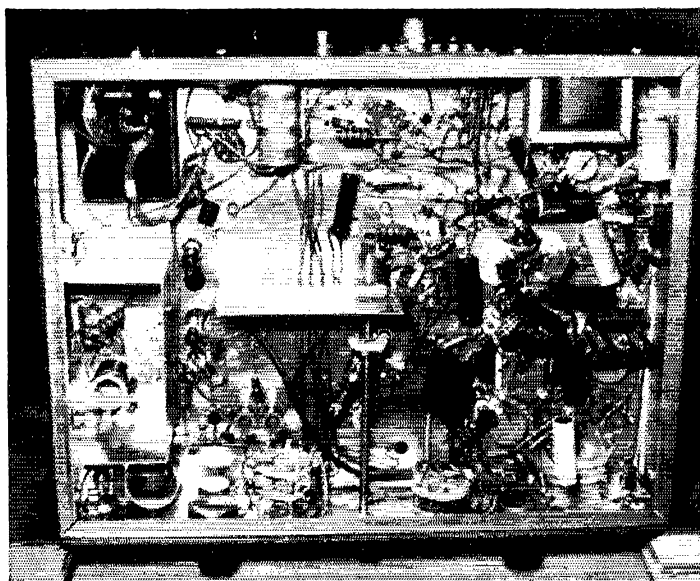
S<sub>1</sub>—Four-pole 5-position rotary switch (see Figs. 2, 3 and 4 for other poles; see box for functions).

S<sub>2</sub>—D.p.d.t. rotary switch.

T<sub>1</sub>—Tube-to-line transformer (Thordarson 22S91, Triad A-53X).

Z<sub>1</sub>—Audio phase-shift network (B & W type 350).

DECIMAL VALUES OF CAPACITANCE ARE IN  $\mu$ f.  
OTHERS ARE IN  $\mu\mu$ f. EXCEPT AS INDICATED.



Bottom view showing the v.f.o. coil and trimmers in the shielding compartment in the lower left-hand corner. The loosely coupled coils between the two converters are just above the mode switch. The driver tuning capacitor is mounted on the bracket at the center of the chassis.

Referring to the photographs, the left-hand side of the chassis is devoted to the sideband generator. The two VR tubes, a filter capacitor and the voltage-divider resistor  $R_9$  (Fig. 3) are mounted at the rear. Immediately in front of the resistor are the 12AT7, 6AU6 and relay of the VOX system. (The transformer in front of the relay is the audio output transformer,  $T_4$ .)

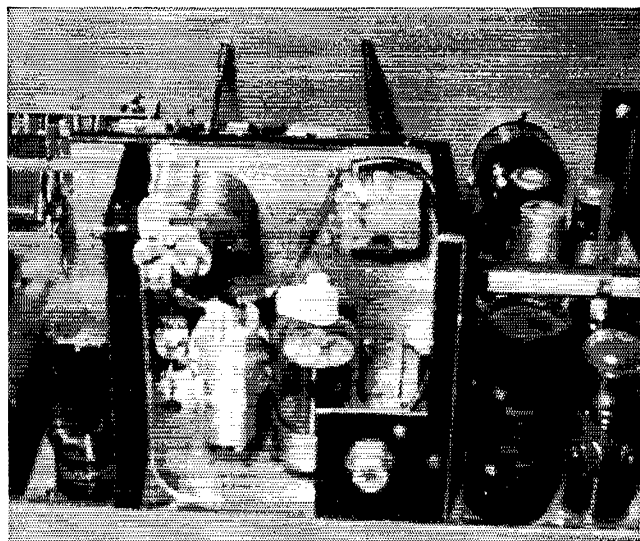
In the audio section, strung out along the left-hand edge of the chassis are the 12AT7, 12AU7 (crystal alongside),  $T_1$ , and the plug-in audio phase-shift network with the 12AT7 audio output tube to the right.

The r.f. section occupies the right-hand half of the chassis. The three-section v.f.o./first-converter tuning capacitor, mounted against the right-hand end of the panel, is one found in the

3-6-Mc. ARC-5 Command receiver. The ceramic-form v.f.o. coil and trimmer capacitors are below deck in a shielding box. The 6AH6 is to the rear of the tuning capacitor, near the right-hand edge of the chassis.

The 6CB6 crystal-oscillator, second-converter, and driver circuits are in individual shielding boxes near the center of the chassis. The boxes were salvaged from a surplus unit. They have feedthrough insulators in the bottoms which extend below the chassis, making connections convenient. The slug-tuned coils associated with each stage are mounted in the top of the box in each case, where they are readily accessible for adjustment.

The crystal-oscillator box is the one nearest the panel, with the 6CB6 mounted in front. Two



Close-up shot of the 6146 final amplifier. The pi-network coil is mounted vertically alongside the tube. Tuning and loading capacitors are above on the front wall of the enclosure. The tube to the left is the power rectifier. VR tubes are to the right.

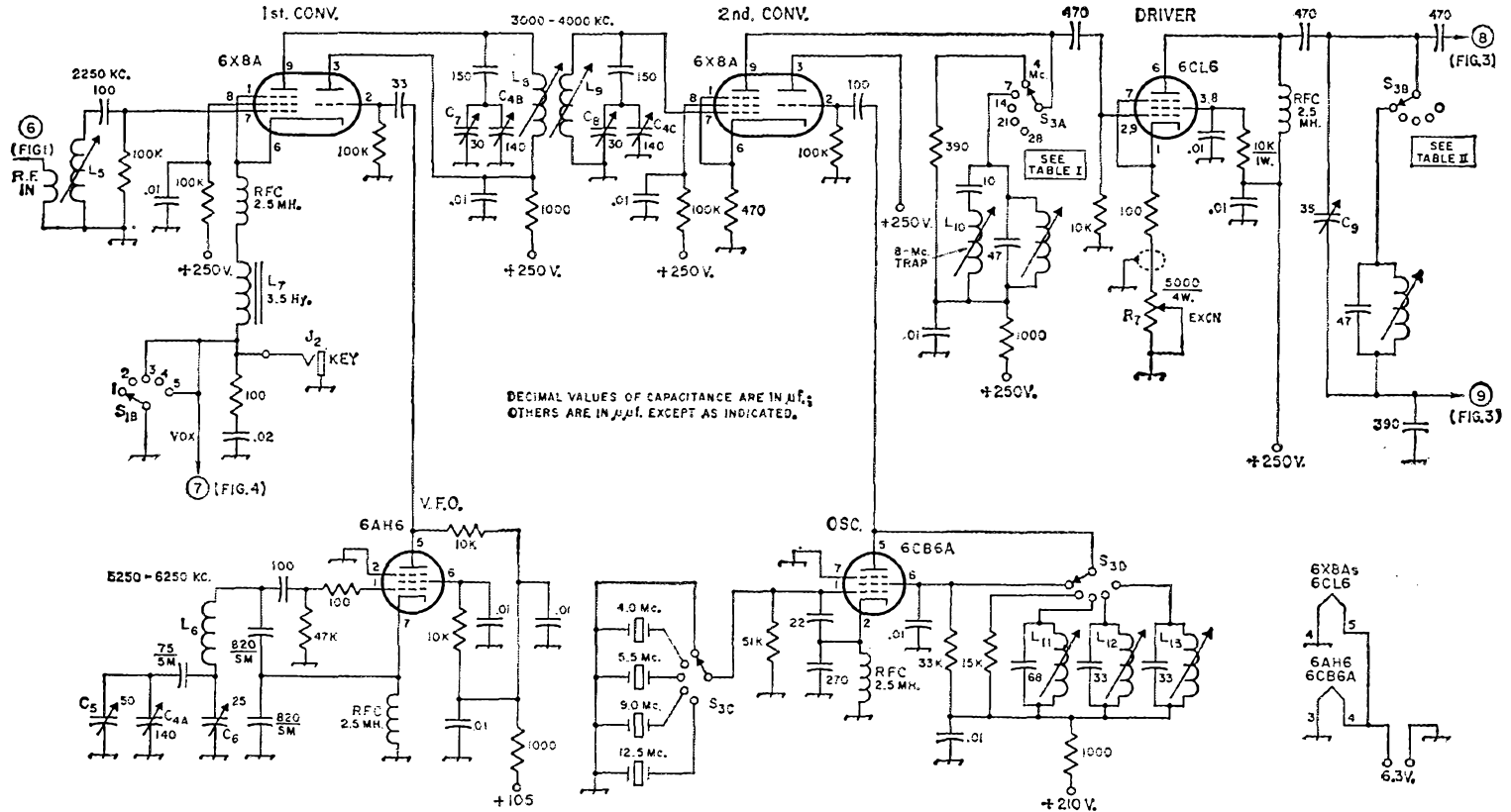
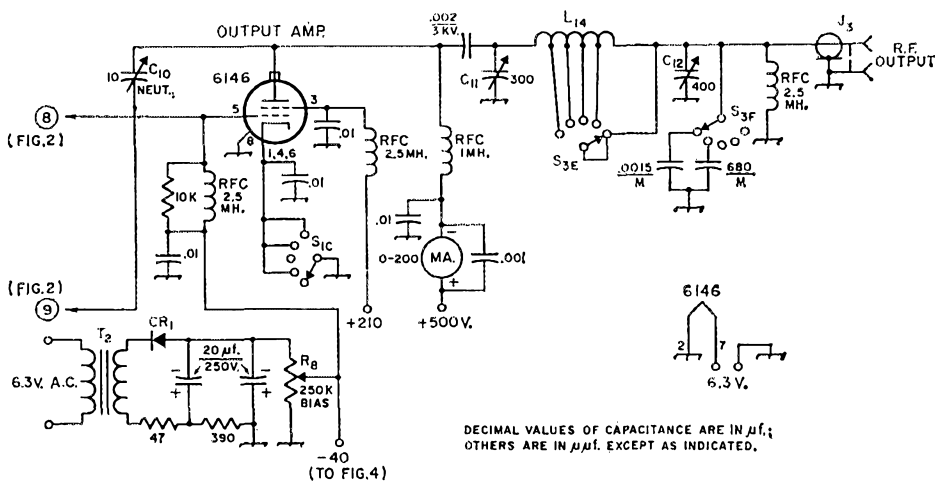


Fig. 2—Band-converter and driver circuits. Resistances are in ohms and resistors are 1/2 watt unless indicated otherwise. Fixed capacitors of less than 0.001  $\mu\text{f}$ . are silver mica (SM), mica or stable ceramic; others may be disk ceramic except those marked with polarity which are electrolytic.

- C<sub>1</sub>—Triple-gang air variable (Bud MC889).
- C<sub>2</sub>—10-50- $\mu\text{f}$ . zero-temp. trimmer (CRL 823-BZ).
- C<sub>3</sub>—4-25- $\mu\text{f}$ . neg.-temp. trimmer (CRL 822-CN).
- C<sub>7</sub>, C<sub>8</sub>—3-30- $\mu\text{f}$ . mica trimmer.
- C<sub>9</sub>—Variable air capacitor (Johnson 35R12/149-2).
- J<sub>2</sub>—Open-circuit jack.
- L<sub>5</sub>—Same as L<sub>4</sub>.
- L<sub>6</sub>—Approx. 20  $\mu\text{h}$ .; 30 turns No. 26, 1-inch diam., 1 inch long (National XR-60 ceramic form with slug removed).
- L<sub>7</sub>—3.5-hy. filter choke (Stancor C-1080).
- L<sub>8</sub>, L<sub>9</sub>—40 turns No. 34 enam., close-wound, on 1/2-inch iron-slug form (National XR-50 form). Forms are mounted parallel, spaced 3/4 inch center to center.
- L<sub>10</sub>—Approx. 40- $\mu\text{h}$ . iron-slug coil; used on 7 Mc. only.
- L<sub>11</sub>—Approx. 2.5- $\mu\text{h}$ . iron-slug coil (11 Mc.).
- L<sub>12</sub>—Approx. 1.8- $\mu\text{h}$ . iron-slug coil (18 Mc.).
- L<sub>13</sub>—Approx. 1- $\mu\text{h}$ . iron-slug coil (25 Mc.).
- R<sub>7</sub>—Wire-wound control.
- S<sub>1</sub>—See Fig. 1.
- S<sub>3</sub>—Six-pole 5-position ceramic rotary switch (see Fig. 3 for other sections).



DECIMAL VALUES OF CAPACITANCE ARE IN  $\mu\text{f}$ ;  
OTHERS ARE IN  $\mu\text{m}$ f. EXCEPT AS INDICATED.

(TO FIG. 4)

POWER SUPPLY

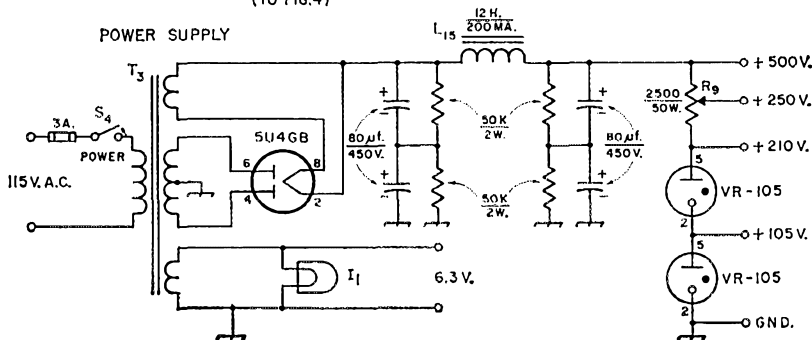


Fig. 3—Circuits of the output amplifier and power supply. Resistances are in ohms, and resistors are 1/2 watt unless indicated otherwise. Fixed capacitors marked with polarity are electrolytic; others are disk ceramic except those marked M which are mica.

C10—Neutralizing capacitor (Bud NC-853, Hammarlund NZ-10).

C11—Air variable, 1000-volt rating (National TMS-300).

C12—Air variable, broadcast-replacement type.

CR1—130-volt 20-ma. selenium rectifier.

I1—6.3-volt lamp.

J3—Chassis-mounting coaxial connector.

L14—34 turns No. 18, 1-inch diam., 14 turns at 10 t.p.i.

(C11 end), plus 20 turns at 20 t.p.i. (Illuminetics Pi-Dux 820-D-10) tapped at 7, 11, 14, and 21

turns from C11 end.

L15—Filter choke (Chicago RC-12200).

R8—Linear-taper control.

R9—Slider adjustable.

S1—See Fig. 1.

S3—See Fig. 2.

S4—S.p.s.f. toggle switch.

T2—6.3-volt 1-amp. filament transformer.

T3—Power transformer: 800 volts c.t., 200 ma.; 5 volts, 3 amp.; 6.3 volts, 5 amp. (Stancor PC8412).

TABLE I

Second-Converter Coils

Band (Mc.)	C ( $\mu\text{m}$ f.)	L ( $\mu\text{h}$ .)
7	47	8
14	47	2
21	22	1.5
28	22	0.8

octal tube sockets set in the left-hand end of the compartment serve as receptacles for the four crystals. The 6X8 first-converter tube is mounted near the right-hand end of this box.

The central box contains the second-converter output circuits, with the second 6X8 mounted near the left-hand end. The output circuits of the driver stage are in the third box, and the 6CL6 is mounted close to the left-hand end.

The final-amplifier components are mounted in a larger enclosure at the rear of the chassis. The pi-network coil is mounted with its axis parallel to the 6146. The tuning and loading capacitors are mounted above on the front wall of the compartment. Long shafts extend to the controls on the panel.

The individual ceramic wafers of the band switch are mounted within the compartment of the circuit with which each is associated. There are two wafers in the 6CB6 oscillator box, and two in the final-amplifier compartment. The two remaining enclosures have one wafer each. The wafers are mounted so that the shaft holes will line up accurately when the compartments are mounted on the chassis. Instead of the usual pointer for indicating the switch positions, the switch shaft is fitted with a dial whose band markings appear through a small hole drilled in the panel.



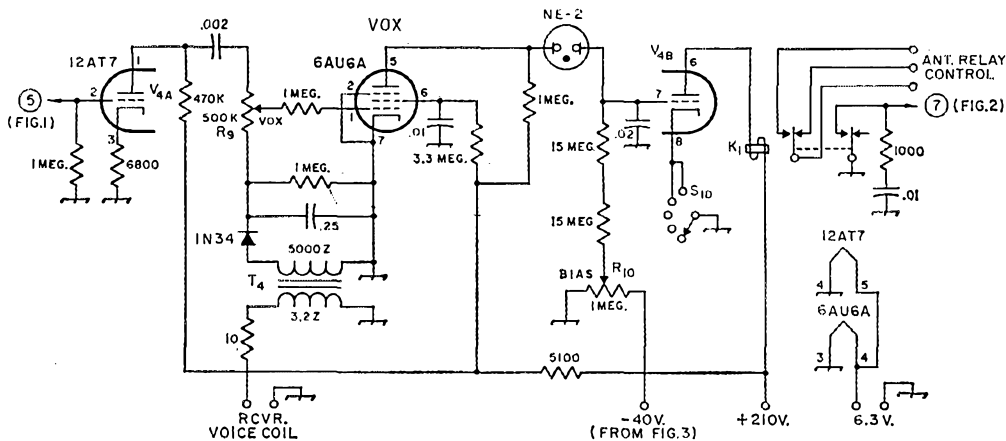


Fig. 4—VOX control circuit. Capacitances are in  $\mu\text{f}$ . Resistances are in ohms and resistors are  $\frac{1}{2}$  watt unless indicated otherwise. Capacitors are paper or ceramic.

K1—5000-ohm d.p.d.t. relay.  
R<sub>9</sub>, R<sub>10</sub>—Linear control.

S<sub>1</sub>—See Fig. 1.  
T<sub>4</sub>—Output transformer: 5000 ohms to voice coil.

The cabinet is homemade of aluminum angle and perforated sheets fastened together with rivets.

#### Adjustment

Alignment and adjustment procedures are covered in the articles previously mentioned and also in the single-sideband chapter of the ARRL *Handbook*. Carrier and unwanted-sideband suppression were easily obtained and appear to be entirely adequate, although no actual measurements have been made. Initial on-the-air results have been most gratifying and signal reports have been universally good. My thanks

Band (Mc.)	C ( $\mu\text{f.}$ )	L ( $\mu\text{h.}$ )
3.5	.47	19
7	.68	4
14	.33	1.5
21	.22	0.7
28	.47	0.3

to the authors of the reference texts for their ideas and assistance.

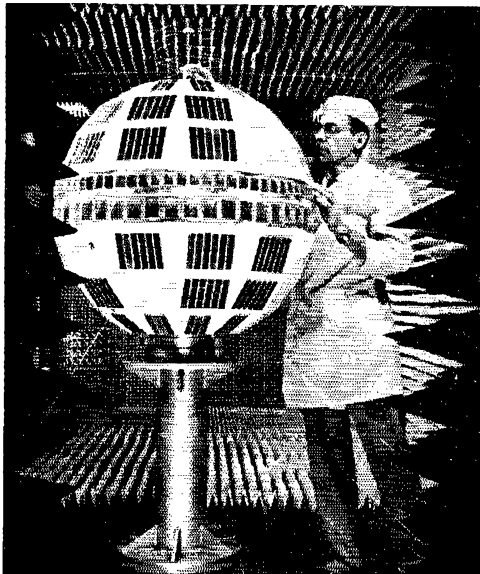
QST

## Strays

In the midst of international acclaim for Telstar, G5CV comes forward to claim that he was the first to receive direct transatlantic TV from the United States, on Sept. 17, 1930. He says that what he saw were "secret" transmissions from New York to a receiving station operated by the German government.

Oldest ham? W9YSZ points out that just a year ago we recorded that W9OBD renewed his ham ticket at the age of 92, and now must be 93 years old.

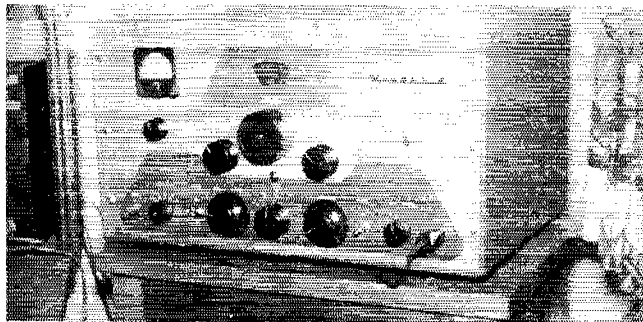
You must have heard about it, but have you seen it? This is a model of the Telstar experimental communications satellite. The chamber is lined with pyramids of foam plastic that absorbs radio energy and simulates the radio environment of space so that engineers can test the antennas. Broadband transmitting and receiving antennas girdle the satellite, while a beacon antenna is at the top. Patches of solar cells on the shell of the satellite convert sunlight into electricity to provide power. Designed and built by the Bell Telephone Laboratories, and launched into orbit on July 10, 1962, the first Telstar appears to have been an outstanding success.



# DX-100 Modifications

*Some Old, Some New*

BY GILBERT L. COUNTRYMAN,\* W4JA



A "new look" for the DX-100. The v.f.o. shaft has been provided with a vernier drive, as described in the text. Other knobs have been replaced with military surplus items. A new 100B cabinet makes it unnecessary to remove the chassis for minor adjustments.

ONE of the most popular transmitters a couple of years ago was the Heath DX-100, and thousands remain in use, doing an outstanding job on the air. The transmitter is excellent for c.w. and A3 phone, but the efficiency and operating ease can be improved by several modifications which fall naturally into three classifications — those considered necessary, those desirable and those that are optional, depending on individual preferences. Not all of the modifications to be described are original with the author, and some have been previously reported. However, it was felt that readers might like to have the information assembled in one spot.

## *Necessary*

Foremost is replacement of the cabinet — which the author considers essential, as changing a couple of dozen bolts and wrestling with a 100-pound chassis every time you want to change a tube or touch up the v.f.o. calibration is for the birds. Heath will furnish their standard DX-100B cabinet with a hinged door on top (part number 90-10), price \$27.00). After ten minutes' work on the rear with a rat-tail file, the DX-100 will fit perfectly. In addition to increasing the convenience, it makes the transmitter considerably more compact and attractive looking.

The grid-block keying modification recommended by Heath is necessary if good c.w. characteristics are desired, and they will send their modification instructions free upon request. The installation is easy to make and the cost is negligible. Their instructions show one capacitor designated "CX" and the text suggests a 0.15- $\mu$ f. unit. The author has found that a 0.22- $\mu$ f. capacitor gives better characteristics confirmed by on-the-air reports and by checking with an oscilloscope.

The 27K  $\frac{1}{2}$ -watt resistor in the 5763 grid circuit must be replaced with a 2-watt job, otherwise the resistor heats up and the grid drive will gradually fall off. Substituting a 2-watt resistor solves the problem nicely.

\*75 East Bay St., Charleston 1, South Carolina.

Terminal 7 of the 5763 socket and Terminal 1 of the r.f. 12BY7 socket both should be bypassed to ground with 0.005- $\mu$ f. capacitors for smoother operation on all bands.

## *Desirable*

For some reason, perhaps due to slight differences in wiring techniques, some DX-100s require neutralization of the final amplifier while others do not. To check yours, tune up the rig on the highest frequency normally used, turn the meter switch to read grid current and slightly detune the final plate tuning capacitor in both directions. WARNING: Only a slight detuning is necessary; don't let the plate current run over 350 ma., and that for only a second or so. If this detuning produces marked changes in grid current, higher in one direction and lower when the plate is detuned in the other direction, neutralization is indicated and is easy.

First, remove the 6146 nearest the shield, and then remove the nuts and bolts fastening the shield to the spade bolts on top of the chassis. Don't try to remove the spade bolts themselves or you will run into trouble.

Note that the left rear terminal of the 75- $\mu$ f. driver plate-tuning capacitor has no connection to it. Measure its position and drill a  $\frac{3}{8}$ -inch hole through the shield opposite this terminal. Either put an insulated feedthrough or a rubber grommet in the hole, and replace the shield. It's a little trickier to replace the shield than to remove it, but it can be done. Connect a short piece of stiff wire — No. 12 or so — to the unused capacitor terminal and bring it through the hole. On the 6146 side of the shield, bend the wire to follow roughly the contour of the shield and the adjacent transformer, halfway between the transformer and the nearest 6146 tube. A length of  $2\frac{1}{4}$  inches should project into the 6146 compartment.

Now make the grid current check again. The chances are that the grid current will vary only slightly as the 6146 plate capacitor is tuned through resonance. It may be necessary to bend

the wire slightly toward or away from the closest 6146. When there is a minimum change in grid current, your final is neutralized.

The clamper-tube wiring should be modified so that grid-current indication on the meter will not fall below zero while tuning up. It is necessary only to mount a single lug strip on the machine screw adjacent to the clamp-circuit potentiometer and change the connection from the potentiometer to the other side of the 5.4- (or 5.55, depending on kit) ohm meter resistor, as shown in Fig. 1.

The Heath output loading modification is a big help in smooth and accurate loading and will eliminate one of the so-called coaxial controls. This modification comes in kit form (No. MK-3, price \$4.95) and is easy to install.

Many hams use a Monitone type of monitor requiring r.f. carrier pickup. This can be easily accomplished, as explained below, with a shielded line (RG-58/U or RG-59 U coax) from the DX-100 to the monitor. Shielded line is necessary to avoid TVI as any carrier rectifier is an efficient harmonic generator. The system works perfectly with either a commercial Monitone, such as the Gonset, or any of the home-brew monitors that have been described in *QST* or *The Radio Amateur's Handbook*. The slight amount of r.f. swiped from the output is insignificant and does not affect transmitting characteristics. By using type BNC quick-connect coax fittings, it is easy to disengage the line from the rear of the cabinet. No connection is made to the chassis or to any part of the transmitter proper.

The procedure is as follows:

- 1) Install a BNC panel receptacle on the rear of the cabinet, centered  $4\frac{1}{2}$  inches down and  $7\frac{3}{4}$  inches from the right end (viewed from the rear).

- 2) Solder the ends of a four-turn coil, about  $2\frac{1}{4}$  inches in diameter, to the receptacle terminals inside the cabinet (one end goes to a soldering lug attached to one of the machine screws holding the receptacle).

- 3) Position the coil parallel to and as close as possible to the cabinet without touching it and make the bottom of the coil level with the top of the output coil of the DX-100. B & W coil stock or an old B & W antenna link work fine, or the coil may be homemade. The coil is easily self-supported by its soldered ends.

A vernier knob on the v.f.o. frequency control is a big help in rapid zero beating of a received signal, and one can be substituted for the regular knob if you can use hand tools accurately. Use the Jackson ball-drive dial described on page 37, January, 1962, *QST*. Remove the dial from the knob, and the knob and the three brass standoffs from the mechanism. The dial is not used. The mounting screw furnished cannot be used without disassembling the DX-100 dial, so we won't use it. Instead, use your  $7/64$ -inch or No. 35 drill and go through the panel at a point  $\frac{5}{8}$  inch from the center of the v.f.o. shaft. To avoid damaging the components back of the panel, you can make a sleeve to fit freely over the drill, permitting the drill to penetrate the panel but going no farther.

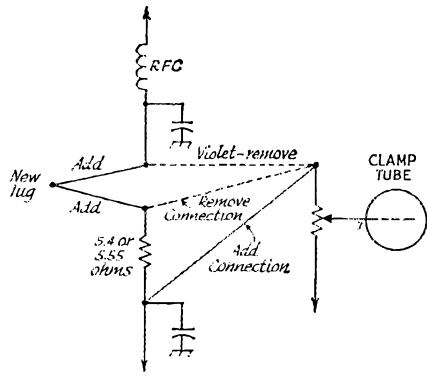


Fig. 1—Changing connections as shown prevents a reverse grid-current reading while tuning up.

Thread the panel hole carefully with your 6-32 tap, again taking care not to go behind the panel. Cut the head off a 6-32 machine screw, making it  $\frac{3}{8}$  inch long. Screw this into the panel, but not beyond. Slip a thin No. 6 lock washer over the bolt and tighten a 6-32 nut, fastening the bolt securely to the panel. Don't use too much pressure on the nut or the panel threads may be stripped. Put the mechanism on the shaft, at the same time slipping the 6-32 bolt into the anchor-lug slot. Tighten the set screws on the shaft, secure the knob to the mechanism and you are in business. The v.f.o. control is increased by a 6-to-1 ratio without detracting from the appearance of the panel. The black knob matches nicely the black meter case, push-button switch, and trade-mark.

### Optional

Most DX-100 owners are aware of the fact that the switched a.c. output from the auxiliary socket can be used to control a receiver-input shorting relay as well as an antenna change-over relay. Keep the lead from the relay contacts to the receiver input terminals short.

The d.p.s.t. plate toggle switch supplied with the kit is a little light for repeated use. If you plan to use this switch for operation, it should be replaced with a heavy-duty type. The author uses an external heavy-duty d.p.s.t. switch connected to the remote socket of the DX-100, so there was no advantage to be gained by changing the switch originally furnished, which is left in the off position.

While you are at it, watch the *QST* bargain ads and pick up a spare pair of 1625 modulator tubes, just in case. All other tubes are readily available at your local store, but the 1625s may be hard to come by in an emergency and it seems foolish to install new sockets and rewire the modulator for 807s.

Completion of any or all of these modifications is sure to increase your operating convenience and efficiency. None of the modifications should affect the trade-in value of the transmitter, but in any event, the rig can be restored to its original condition in an hour or so.

**QST**

# • Beginner and Novice

## 6GJ5s on 6 Meters

Linear or Class C Amplifier for up to 150 Watts Input

BY LEWIS G. McCOY,\* W1ICP

THE unit shown in Fig. 1 and the photographs is a 6-meter amplifier with self-contained power supply that is capable of about 150 watts input on c.w. and 100 to 120 watts input as a plate-modulated amplifier. The unit can also be used as a Class AB<sub>1</sub> linear either for s.s.b. or to amplify a low-powered a.m. signal. Peak envelope power of about 140 watts input can be used for s.s.b. and about 55 watts input as an a.m. linear.

The amplifier tubes are 6GJ5s, a new variety of TV sweep tube. The 6GJ5s worked so well at 28 Mc. in a recently described<sup>1</sup> low-frequency transmitter that it appeared they should also do a good job on 6. Also, they use the new Novar basing, which reduces lead length and should be an advantage for v.h.f. work.

If you happen to have an exciter that has no provisions for c.w., but would like to try your hand at it, the amplifier is ideal. No modifications are required in your existing exciter in order to put the combination on c.w., since the keying can be done in the amplifier.

Also, if your exciter only has a couple of watts output on phone, you can use the amplifier as an a.m. linear. It will increase your carrier output to about 20 watts without requiring any additional modulation equipment. Of course, if you want a "fat" a.m. signal, it is a simple matter to add a plate modulator to the amplifier and get a fully modulated input of 100 to 120 watts.

### Circuit Details

Before coming up with the design shown in Fig. 1, we tried the tubes in parallel with a pi-network tank circuit. However, parasitic and

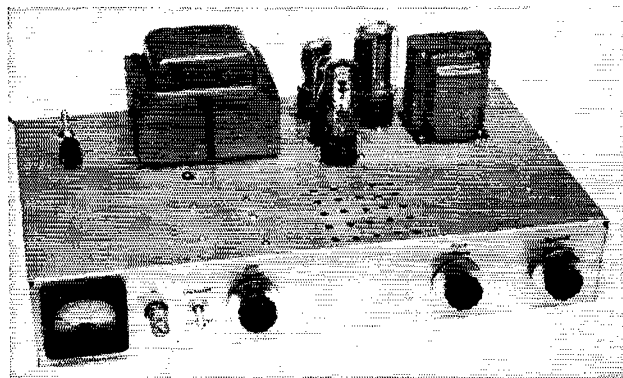
neutralizing problems were so bad — and almost impossible to cure — that it was decided to go push-pull, as shown in Fig. 1. This type of operation provided a simple means for neutralizing the tubes, and some experimenting with suppressors in the plate leads cleaned up the parasites.

The input circuit consists of  $L_1$ ,  $L_2$  and  $C_1$ . In both c.w. and plate-modulated phone operation, the grid leak is returned to ground via  $S_3$ . When using the amplifier as a linear, the grid is supplied with fixed bias by switching  $S_3$  to the arm of  $R_1$  on the negative supply. On the plate side of the amplifier the tank circuit consists of  $C_4$  and  $L_3$ .  $L_4$  is the coupling link and the output can be adjusted by  $C_5$ , which is in series with the link line and ground.

The screens of the 6GJ5s are wired to the arm of  $K_1$ , a 6.3-volt a.c. relay. For c.w. operation, the screens are keyed by  $K_1$ . In the key-up position a negative voltage, approximately 125 volts, is applied to the screens to cut off the amplifier. In the key-down position the relay closes and 150 volts positive is fed to the screens, permitting the amplifier to operate.  $S_2$ , connected across the keying line, can be used instead of a key as a standby/operate switch.

In both c.w. and linear operation the positive screen voltage is regulated at 150 volts by using a VR150 regulator tube. For plate-modulated a.m. the screen voltage is obtained through a dropping resistor from the +B line, so the screens will be modulated along with the plates.

A 0-25 milliammeter is used to measure either the grid or plate current by switching it across appropriate shunts. In the grid position the meter reads its normal scale. For plate current the meter scale is multiplied by 20, providing a 500-ma. full-scale reading.



The power-supply components are mounted along the rear of the chassis.  $S_1$  is at the rear left corner of the chassis, with  $S_3$  in front of it. To provide adequate ventilation for the 6GJ5s, the top of the chassis immediately over them is perforated with  $\frac{1}{4}$ -inch diameter holes. The controls along the front, from the left, are the meter switch, stand by switch, grid tuning, plate tuning, and loading.

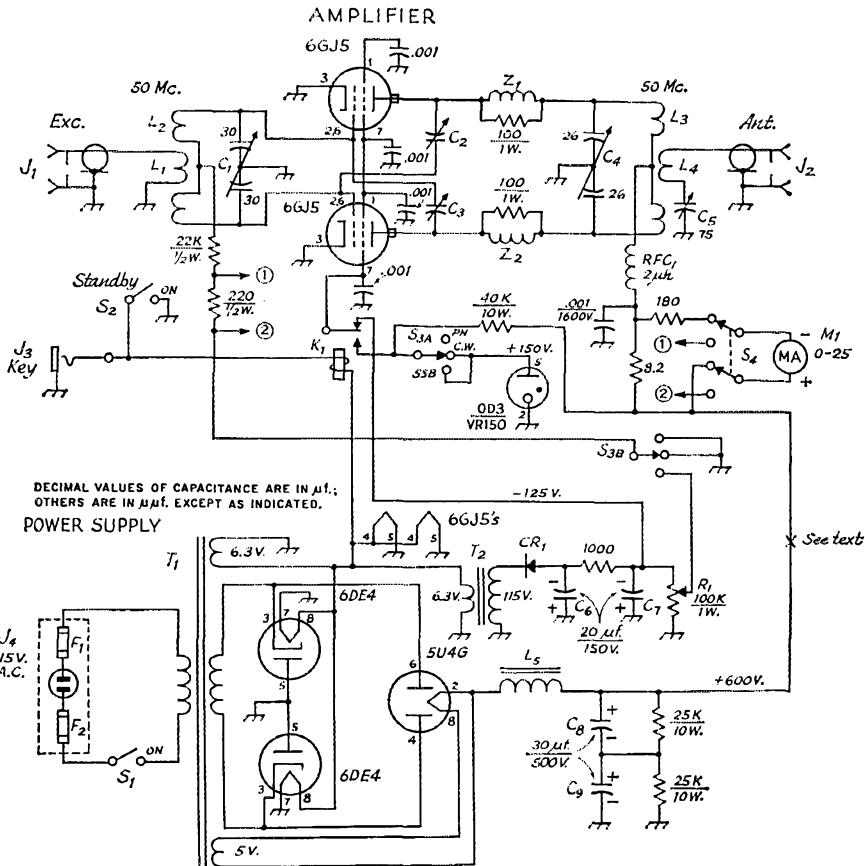


Fig. 1—Circuit diagram of the 6-meter amplifier. Resistances are in ohms, resistors are 1 watt unless specified.

$C_1$ —Split stator, 30- $\mu$ f. per section (Hammarlund HFD-30X).  
 $C_2, C_3$ —Neutralizing capacitor. See text.  
 $C_4$ —Split stator, 26- $\mu$ f. per section (E. F. Johnson 167-22).  
 $C_5$ —75- $\mu$ f. variable (Hammarlund MC-75-S).  
 $C_6, C_7$ —20- $\mu$ f. 150-volt electrolytic.  
 $C_8, C_9$ —30- $\mu$ f. 500-volt electrolytic.  
 $CR_1$ —Silicon rectifier, 400 volts p.i.v., 200 ma. (International Rectifier 2E4).  
 $F_1, F_2$ —4-amp. fuses, type 3AG.  
 $J_1, J_2$ —Coax chassis connector, type SO-239  
 $J_3$ —Key jack, open-circuit type.  
 $J_4$ —Line plug, fuse-in-plug type.  
 $K_1$ —Single-pole, double-throw, 6.3-volt a.c. relay Potter & Brumfield KA5AY).

$L_1, L_2$ —See Fig. 2.  
 $L_3$ —6 turns No. 12, 1¼-inch dia., turns spaced so that complete coil is 2 inches long.  
 $L_4$ —2 turns No. 12, 1¼-inch diam., turns close-spaced and coil placed at center of  $L_3$ .  
 $L_5$ —Choke from TV set, approx. 2 hy., 300 ma.  
 $M_1$ —0-25-ma. milliammeter.  
 $R_1$ —10,000-ohm control, 1 watt.  
 $S_1, S_2$ —S.p.s.t. toggle switch.  
 $S_3, S_4$ —Two-pole, three-position wafer switch (Centralab type 1472).  
 $T_1$ —TV power transformer. See text.  
 $T_2$ —Filament transformer, 6.3 volts, 1 amp.  
 $RFC_1$ —2- $\mu$ h. (National R-60).  
 $Z_1, Z_2$ —4 turns No. 18 wound on a 100-ohm 1-watt carbon resistor

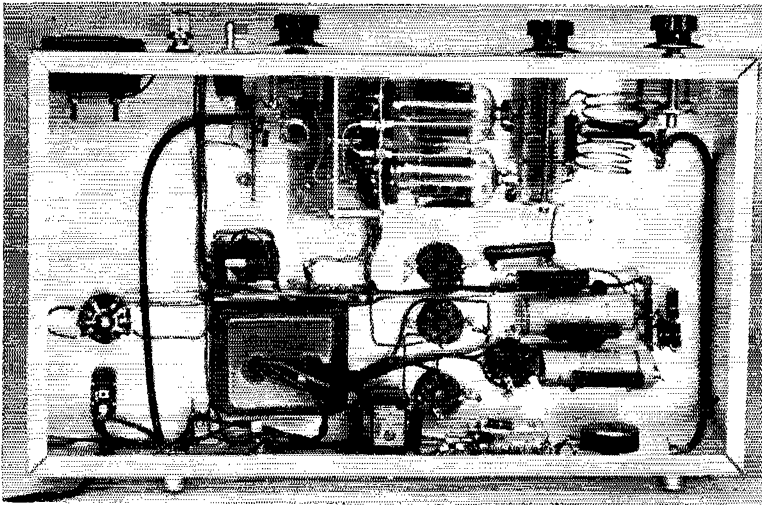
### Power Supply

To reduce the over-all cost of the unit, the power transformer,  $T_1$ , was obtained from an old TV set. The transformer is used in a bridge supply utilizing a pair of 6DE4s and a 5U4G. D.c. voltage out of the filter at a load of 250 ma. is approximately 600 volts. The filter choke,  $L_5$ , was also obtained from the TV set. A 6.3-volt filament transformer is connected "back-to-back" to the 6.3-volt winding on  $T_1$  to furnish the voltage for the negative supply. The rectifier/filter for the negative supply consists of  $CR_1, C_6, C_7$  and a

1000-ohm 1-watt resistor. Adjustable bias for the 6GJ5s is obtained from the control,  $R_1$ .

### Construction Information

The amplifier and power supply are built in and on a 3 × 12 × 17-inch aluminum chassis. A look at the bottom-view photograph will show that all the r.f. components are mounted below deck and along the front of the chassis. The 6GJ5 sockets are mounted on an aluminum piece measuring 2 by 3½ inches, which in turn is



This photograph shows the arrangement below deck. The power-supply layout is not critical, but the r.f. layout should be followed as closely as possible. The r.f. components are along the top in this view, with the grid circuit at the left and the plate circuit at the right.

mounted on a bracket which measures  $2\frac{1}{2}$  by  $3\frac{3}{4}$  inches with a 1-inch lip for securing it to the chassis. Note in the photograph of the socket plate how the bypassing and grounding of the various socket terminals are handled. The cathode terminals are bent over and soldered directly to the tube-socket mounting ring. There are two screen terminals on each tube and each of these leads is bypassed with a 0.001 disk ceramic capacitor. The capacitor leads must be kept as short as possible. Also, when soldering, hold the lead being soldered with a pair of long-nose pliers or a metal clip close to the body of the capacitor. This will prevent excessive heat from reaching the capacitor and destroying it.

The grid and plate coils,  $L_2$  and  $L_3$ , are both mounted on the stator tie points of their respective capacitors,  $C_1$  and  $C_4$ . The neutralizing capacitors consist of two leads of No. 12 wire, connected to the grid terminals of the tube sockets and arranged so they parallel the tube envelopes. They run through the mounting plate in Millen type 32150 feedthroughs. Although Fig. 1 shows both  $C_2$  and  $C_3$  connected directly to the plate leads of the 6GJ5s, there is no soldered or mechanical connection at the plate side of the tubes. The wires themselves provide capacitive coupling to the plates.  $Z_1$  and  $Z_2$  are parasitic suppressors mounted between the  $C_4$  stators and the plates of the tubes.

All power-supply components below deck are mounted along the rear of the chassis.  $T_2$  is mounted on the back wall. There is a single mounting screw on the keying relay. In order to minimize relay noise, the relay is mounted with the screw through a rubber grommet on the chassis top.

#### *Tune-Up and Adjustment*

Before turning on the plate power, the amplifier needs to be neutralized. Disconnect the d.c. plate and screen lead at the power supply where the lead leaves the  $L_5C_8$  point. Turn on the supply and let the heaters warm up. Set the meter

switch to read grid current and turn on your exciter. Adjust  $C_1$  and your exciter for a grid current of about 5 ma. Slowly tune  $C_4$  through its range while observing the meter. At one point you should get a slight "kick" in the meter reading. Move the neutralizing wires closer to or farther from the tubes, working for a setting that will produce the least change in meter reading when  $C_4$  is tuned. Actually, the setting of the wires is very broad and we found that getting the amplifier neutralized was not critical. When finished, turn off the power, reconnect the  $+B$  lead and you are ready to use the amplifier.

For c.w. or plate-modulated a.m., the tune-up procedure is quite simple. Put  $S_3$  in the c.w. position and set the meter switch to read grid current. You'll only need about 4 or 5 ma. of grid drive. Put a dummy load on the output: a 100-watt light bulb will serve this purpose. Next, switch the meter to read plate current and then close either  $S_2$  or the key, if you have one plugged into  $J_3$ . Quickly resonate the tank circuit by tuning  $C_4$  for a plate-current dip. The lamp load should light up, and the loading can be increased or decreased by adjusting  $C_5$ , always keeping the amplifier in resonance with  $C_4$ . With 600 volts on the plates of the 6GJ5s, you can load the amplifier to 250 ma. on c.w.

Tuning up for plate-modulated a.m. is similar except that  $S_3$  is switched to the phone position and the amplifier should not be loaded to more than 200 ma. — or to 120 watts input, depending on your plate voltage.

#### *Linear-Amplifier Operation*

The first step in tuning up the amplifier as an a.m. linear is to set the grid-bias voltage. Turn  $S_3$  to the position that puts the arm of  $R_1$  in series with the grids and adjust  $R_1$  so that the arm is at the top end of the control (the end farthest from ground). Turn on the power and let the rig warm up. Switch the meter to read plate current and then gradually move the arm of  $R_1$  while watching the meter. With no drive from the

exciter, set  $R_1$  so the "resting" plate current is below the rated plate dissipation of the tubes. The rated plate dissipation is 35 watts for the two tubes, and with a plate voltage of 600 this amounts to a maximum idling plate current of 58 ma. Somewhere between 40 and 50 ma. is a good figure to use.

Next, switch the meter to read grid current and turn on your exciter. The grid drive (which should be unmodulated at this stage) should be adjusted to the point where the meter begins to show grid current. Then back off on the drive until the grid current just disappears. Switch the meter to read plate current and resonate the tank circuit. What you are shooting for now is loading that results in a plate current of 180 ma., the tank circuit being exactly in resonance, with the grid drive just below the grid-current point. After each change in loading adjustment, check the grid drive to keep it just below grid current until you reach 180-ma. loading with the tank circuit in resonance.

Now leave the amplifier tuning controls set and reduce the drive from the exciter so that the plate current drops to 90 ma. It is important that you don't change the controls on the amplifier — only the exciter should be adjusted for this step. If you cannot reduce the drive by the exciter tuning controls alone, you will have to modify the exciter either by loosening the antenna coupling in its output stage or by reducing the screen voltage on its final-amplifier tube.

Once the plate current of the 6GJ5s is set to 90 ma., as outlined above, you are ready to apply audio. (Incidentally, if you happen to have an output indicator that reads in watts, the output power registered at the 180-ma. plate reading should drop to one fourth at the 90-ma. reading.) With a plate voltage of 600 this amounts to 54

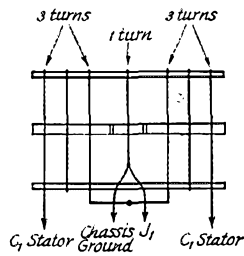


Fig. 2—Method for making the  $L_1L_2$  coil assembly. The assembly consists of 9 turns of Miniductor (type 3006) coil stock,  $\frac{3}{8}$ -inch diameter, 8 turns per inch, No. 18. The 4th and 5th turns are removed, leaving a coil consisting of 6 turns ( $L_2$ ) and 1 turn ( $L_1$ ).

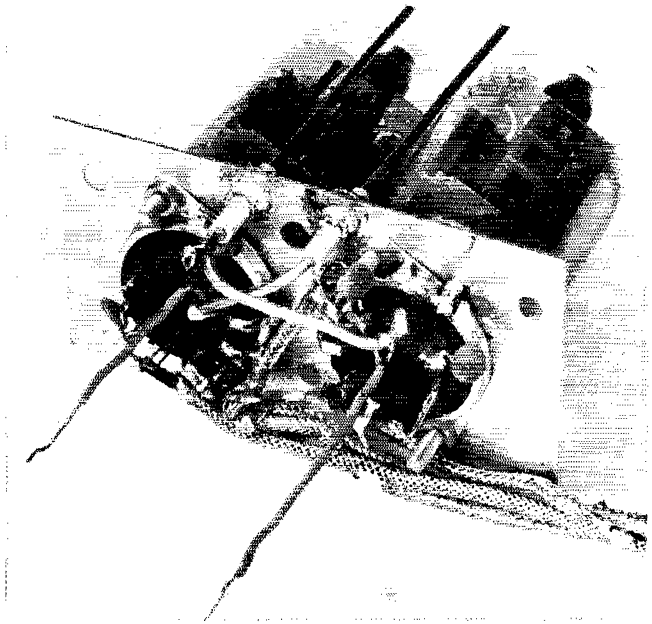
watts input with about 25 watts being dissipated in the tubes and a carrier output of almost 20 watts.

Turn up your audio gain control and watch the plate current of the amplifier as you talk. It is very important that the plate-current reading stay steady with speech. If it changes, you'll have splatter and distortion on your signal. Try to get some honest on-the-air checks from other hams. Explain to them what you are trying to do and have them check your signal for distortion and also check the band on both sides of the signal for splatter. If the plate current changes with modulation, either the setup isn't adjusted correctly or you're overmodulating.

For s.s.b. operation, tune-up is similar to that for the a.m. linear. The idling plate current (no excitation) should be 40 to 50 ma. With unmodulated carrier excitation from an s.s.b. exciter, the amplifier should be loaded to 230 ma. when the drive is just below the grid-current

(Continued on page 152)

The method of mounting the sockets and neutralizing capacitors,  $C_2$  and  $C_3$ . The two insulated leads extending out are the connections to the  $C_1$  stators. As an added precaution for keeping the area near the tubes "cold," the screen and heater leads are run out in shielded leads to the tie points (see the bottom view).





# Armed Forces Day—1962

## Results of Communications Tests

ON 19 May 1962 the Army, Navy and Air Force joined in sponsoring the annual military-to-amateur cross-band communication tests. This year the three Washington, D. C., service stations of WAR, AIR, and NSS had a combined total of 4161 QSOs for the thirteen hours and forty-five minutes which were devoted to this phase of the program. This averages out to better than five contacts per minute for the sustained operations and is a tribute to those who maintained their patience and proficiency throughout the QRM and QRN that existed during most of the allotted operating period. QSL cards have been mailed to all contacts that could be identified in the Summer 1962 issue of the *Callbook Magazine*. If you have not received your card, you should request confirmation from the Armed Forces Day Contest, Room 5B960, the Pentagon, Washington, 25, D. C.

Another phase of the day's activities was the transmission of messages from the Secretary of Defense on c.w. and RTTY. There were 575 perfect c.w. copies of the message, and 329 on RTTY. The gang in California took top honors by turning in 78 perfect c.w. copies and 61 on RTTY.

The following is the complete text of the c.w. message, and a listing of the award winners for this 25 test:

IN THIS EARLY DAWN OF THE SPACE AGE CMM WHEN PROGRESS IN ALL AREAS OF HUMAN ENDEAVOR IS OCCURRING AT AN EVER ACCELERATING PACE CMM IT IS HEARTENING TO THE COMMUNICATIONS SERVICES OF THE DEPARTMENT OF DEFENSE TO KNOW THAT AMATEUR RADIO ENTHUSIASTS

ARE STILL IN THE FOREFRONT OF CONTRIBUTORS TO MANS RAPIDLY INCREASING WEALTH OF TECHNICAL KNOWLEDGE PD AN OUTSTANDING DYNAMIC DEMONSTRATION OF AMATEUR RADIO PROGRESS AND ACCOMPLISHMENT WAS EMBODIED IN OSCAR CMM THE ORBITAL SATELLITE CARRYING AMATEUR RADIO CMM SUCCESSFULLY LAUNCHED INTO SPACE LAST DECEMBER PD THE COOPERATIVE PLANNING CMM DEVELOPMENT AND ACTION REQUIRED TO ADVANCE OSCAR FROM CONCEPTION TO SUCCESSFUL COMPLETION BY RADIO AMATEUR MEMBERS OF THE PROJECT OSCAR ASSOCIATION IS CHARACTERISTIC OF THE INGENUOUSLY PROGRESSIVE SPIRIT OF RADIO AMATEURS EVERYWHERE PD FROM THE DAY OF OUR PIONEER ANCESTORS TO THE PRESENT CMM THE SPIRIT OF SPONTANEOUSLY INDEPENDENT BUT COOPERATIVE ACTION HAS MADE THE UNITED STATES A GREAT NATION PD THIS SPIRIT WILL KEEP US STRONG PD IT IS THE FOUNDATION OF OUR NATIONAL STRENGTH CMM ENDEAVOR AND HOPE FOR A LASTING AND PEACEFUL EXISTENCE FOR ALL PEOPLES OF THE WORLD PD I COMMEND YOU FOR YOUR PAST ACCOMPLISHMENTS AND WISH YOU SUCCESS IN ALL YOUR FUTURE PURSUITS SGD ROBERT S. MCNAMARA CMM SECRETARY OF DEFENSE BT

### C.W. Certificate Winners:

W1BAN, W1BB, W1BDI, W1BMW, W1CX, K1HKK, W1IB, W1KE, W1ZL, W1JBV, W1JNA, K1KBH, K1KCN, K1KCO, W1MCG, K1MDP, W1MEG, W1MIP, K1QZV, K1RPZ, K1RYP, W1SGU, W1SRM, K1TBB, W1UBC, KN1VVF, W1WPR, W1WSN, W1ZYO, K2AT, WA2BQK, W2BVE, W2BXW, K2CIP, W2CLQ, W2COG, W2DRV, K2ECL, K2EEA/VOI, WA2FQW, W2GKZ, W2GQN, WA2GWS, W2HX, K2IIV, WA2IMH, WA2KIP, W2KLD, W2KZM, W2LRW, W2LYH, W2MFB, W2MITA, W2MZB, W2NVB, K2ODG,

This crew was photographed at NSS at about 0200, May 20, after a rather full day of operating. Most of these volunteer operators had been present at NSS all day, and most of them were or are Navy men of one sort or another. In the usual order, standing, are Chief Blackwell, W1KE, WA4BGD, W4ABY, Capt. Hutchinson (Commanding Officer, NSS), W3PYW, K2ECQ, K3GIF, W2JAV, WA2FQS, K4BOB, W3AX, W4JXD, Cdr. Kunz (Naval Reserve and Amateur Radio Liaison), W2RUI, RM3 Rickenback, and K4EF (editor, *All Hands*). Kneeling are Chief Anderson, W4BWJ, W4GF, K4MXF, W3BD, RM2 Margo, W4OTN, K3JAL, W6ICM, W8PRA and W5OFH. Some of those present for the operating stints but absent when the photo was taken were K1RUX, W3JHR, W3YBV, K4DJW, and about a dozen members of the U. S. Naval Academy Radio Club.



WA2OEY, WA2OKK, K2PXM, K2QCY, K2ROM, K2SAV, K2SMC, K2SSX, W2SWC, W2TUK, K2UBG, K2UGZ, WA2UNO, K2USN, WA2WEE, W2WEI, K2YQK, W2ZDN, W2ZMK, WA2ZPR, K2ZQW, W2ZUX, W2ZYU, W3ADE, W3AEA, W3BFI, W3BHK, W3BKE, W3BUR, W3CA, W3DZL, W3ECP, W3EEK, W3EHO, W3ENU, W3GJY, K3GOH, K3HNY, K3HTZ, K3IMR, W3IPO, K3IZP, W3JHR, W3JIV, K3KOJ, W3MCG, K3MNR, W3MYE, K3NGB, W3NGL, K3NLU, W3NQA, W3OBU, W3PYW, K3QFJ, K3RHH, W3SSL/Vol.1, W3UIU, W3VD, W3WZC, W4AIL, W4ALX, W4ANK, W4AO, K4AWY, K4BAI, K4BSS/1, W4CTD, W4CVO, W4DDQ, K4EID, K4EJJ, K4EKQ, W4FAA, K4FJH, K4GFL, W4GHU, K4GLD, W4GNU, K4HOE, W4HOS/4, W4IBI, W4IFZ, W4IHG, W4IMC, K4IVZ, W4JFX, W4JLA, W4JRA, W4JXD, W4KPY, W4KLT, W4KR, W4KVO, W4LYV, K4MTL, W4NTE, W4ONC, K4QFK, W4RHZ, W4RKQ, W4RRP, K4SIQ, W4SR, W4TAI, W4UHA, W4UMO, W4USA, W4VHX, K4VJD, W4VYZ, W4ZCA, W4ZGE, K4ZSX, W5AJG, W5ANR, K5AVX, K5BHX, W5BFR, W5BMI, K5BSZ, W5BW, W5BXP, K5CAT, K5CCF, W5CCK, W5CKY, W5CME, W5CSN, W5EGX, W5EPJ, W5FCZ, W5GJH, W5GKY, W5GOG, W5GPS/6, W5HFN, W5HPL, W5HXW, K5JGZ, K5JNA, W5LNU, W5NDV, W5OWL, K5PAW, W5PBE, K5PXM, W5QVZ, W5RCF, K5SOI, W5SQB, W5USA, W5UY, K5UYL, W5VLW, K5VJT, W5WEU, W5ZSX, W6AAQ, W6AEL, W6AWP, W6AXV, W6AYI, W6BHG, K6BPI, K6CB, W6CFA, W6CG, W6CKU, W6CLB, W6CLY, K6DCF, W6DHO, K6DV, K6DX, K6EBK, K6EEZ, W6ELT, W6EMO, K6EPT, W6EY, W6FHI, W6FVA, W6FYN, W6FYW, W6FZC, W6GKZ, W6GGRG, W6GYH, K6GYP, W6HIK, W6HTS, W6ISX, K6JWQ, K6JZR, W6KFN, W6KHS, WA6LPG/7, K6MRR, K6MSL, K6MTX, W6MXO, W6MYP, W6NRK, W6NXG, W6ODX, W6OFK, K6OGE, W6OWP, W6PBC, W6PCP, W6PTF, W6QIE, W6QIL, W6QIS, W6QQ, W6RXT, W6RZL, K6SHZ, K6SXX, K6TKU, W6ATTY, W6AULM, K6VVA, W6WAW, K6VAH, K6WDV, W6WLI, W6WPF, W6VTK, W6WUL, W6YDK, W6YJU, K6YKG, W6ZLF, W6ZPX, W7BHI, K7BPR, K7BVZ, W7EBS, W7EWD, K7EZW, K7EXT, W7EYF, W7FBP, W7FEN, W7FIX, W7FKK, W7FOS, W7FWA, W7FYR, K7GXO, W7HLU, W7HRM, W7JMH, K7JQK, K7KYG, W7NGW, K7NIJ, K7NRU, K7NWA, W7OCX, W7ODS, K7OGF, K7QBI, W7RBE, W7REZ, W7RWI, K7SEW, W7SMR, W7TQC, WA8BAG/4, W8BKM, W8BNF, W8CJN, W8CX5, W8DAE, K8EQN, W8FFK, W8FVP, W8GGK, W8GMX, K8HKU, K8HLR, W8IBB, W8JIV, W8ILC, K8JIC, K8JZL, W8LBI, W8LbX, K8LOU, W8MHP, W8PEI, W8PHM, W8QLI, W8RLR, W8SG, W8SQU, W8STX, W8TEK, W8TLN, W8TZO, K8VKV, K8TWW, K8UQW, W8VMP, W8WBC, W8ZEP, K9AJU, K9ARW, K9BFK, W9BMJ, W9CHD, WA9DHI, K9DMQ, W9ERW, W9EUR, K9EWQ, K9FC, W9FKI, W9GCX, K9GDF, W9HOA, W9HPC, W9IDO, W9IHN, W9IPJ, W9ITV, K9IYC, W9JAM, K9JSM, W9KCR, W9Lfk, W9LRV, W9MAK, W9MIW, W9OKN, K9QBF, W9QWI, W9REC, K9RSC/1, W9SFM, W9SZR, W9TGB, W9TI, W9TUK, K9UTQ, K9UUT, W9VID, K9VPL, W9YEX, W9YGG, W9YNK, W9ZEN, W9ZFA, W9ZMP, WN0AAL, K0BRS, W0CDP, K0CVA, W0DFP, K0DGW, K0DJQ, W0DLJ, W0DZU, W0NDJ, W0PEO, K0PFW, W0JHS, W0JHY, W0JZN, W0LOE, W0NHZ, W0NYU, K0OAL, W0OKH, K0ONO, K0OTH, W0RGS, W0TUT, W0UQI, K0VPH, K0VUM, W0VWI, DL4EB, KA2KS, KH6AO, KH6RGW, KH6BLT, KH6DNL, KH6DVD, KH6DVG, KH6ECX, KH6ELR, KH6EUO, KH6EUV, KH6FX, KH6UK, KL7AKD, KL7AL, KL7EEA, KZ5TD, VE2AGM, VE3LA.

Ashford, J. Roderick, Baker, S. C., Belanger, Ray, Bergeron, Arthur R., Bonin, Otto C., Brose, Jordell O., Broz, Frank, Burggraf, John, Sr., Byerley, Dewey L., Cason, G. R., Cole, H. H., Cook, A. F., Cumbee, Marvin D., Cunningham, R. L., Curtis, Billy W., Davis, Lurry A., Daze, Sidney J., Degraff, F. E., Jr., Diaz, Luther H., Dolack, Andrew, Jr., Doms, Robert H., Eageron, H. E., Ebright, G. L., Ehrman, Robert G., Elgan, H. C., Elser, Fred J., Erikson, Nathan E., Estes, Warren L., Farenkopf, Sterling, Filipo (N), Fisher, W. D., Fletcher, S. L., Ford, H. T., Fox, Charles E., Franklin, Eugene C., Franz, L. E., Furlong, R. A., Gauvin, R. F., Giovannelli, John A., Glesner, Donald S., Grissom, E. R., Guillet, L. G., Hale, Robert L., Hall, Dennis R., Harper, Curtis, Hiner, W. M., Hinkle, Bill F., Houlihan, J. E., Jankovich, L. J., Jones,



During Armed Forces Day exercises at AA3WCW, U.S. Army Signal Supply Agency, Philadelphia, Miss Barbara Ann Lipsky looked on with awe as Lt. Sissel worked another station. Loudspeakers were set up so that passers-by could hear the QSOs.

Billy, Jones, Roy L., Jose, A. A., Kelly, R. G., Kinzman, J. L., Kramer, Alvin A., Kroll, P. D., Kuberski, Orville C., Kuhn, Raymond T., Langley, L. R., Larmore, Robert A., Laycock, Jack D., Lawson, David A., Lee (N) (N), Lemon, Bill H., Lewis, Earl, Logsdon, James R., Long, Robert R., Martin, A. A., McCall, C. R., McCromick, Roy, Miller, Dan, Monk, A. M., Nichols, Paul M., O'Connor, J. J., Kolen, Oleg, Olivares, Robert, Osburn, D. R., Overho, A. L., Pickard, Edward A., Pope, H. C., Pulvermacher, Ray O., Rock, Charles H., Ryan, John A., Sanders, James W., Scharf, Andrew F., Schroder, Keith E., Seals, James D., Seidler, E. R., Shearer, C. V., Simpson, G. B., Smith, Victor N., Smith, George T., Solomon, Mark, Stafford, Ronald E., Com Center, (USS Taylor DDE-468), Tholer, R. J., Thomas, James P., Thompson, Robert L., Tomer, Marshall A., Tucker, Ronald W., Turner, J. E., Ungari, Jess A., Vanderhoof, J., Wagemans, Jan, Wagner, Thomas J., Vanish, George F., Ware, Murry W., Westney, C. F., Wheeler, Leonard W., White, David J., Wild, John E., Woertendyke, H. D., Yetter, A. W., Zimmerman, R. F.

The Radioteletype message was transmitted at 60 w.p.m. and the text was as follows:

OF THE MANY AND VARIED AREAS OF INTEREST AND ACTIVITY AVAILABLE TO RADIO AMATEURS PERHAPS NONE PRESENTS SUCH A CHALLENGE TO THE ELECTRO DASH MECHANICAL ABILITIES OF A RADIO AMATEUR AS ASSEMBLING AND OPERATING AN AMATEUR RADIO-TELETYPEWRITER STATION PD FROM LEARNING HOW TO TYPE TO FINAL AND DAILY ADJUSTMENT OF HIS EQUIPMENT CMM A RADIO AMATEUR CAN BE JUSTLY PROUD OF HIS ACCOMPLISHMENT UPON COMPLETION OF HIS FIRST SUCCESSFUL RADIOTELETYPEWRITER CONTACT PD NO OTHER TYPE OF RADIO TRANSMISSION CMM GENERALLY AVAILABLE TO RADIO AMATEURS CMM CAN EQUAL THE SPEED AND ACCURACY OF COMMUNICATION BY RADIO-TELETYPE PD IN MASTERING THIS ADVANCED FORM OF AMATEUR RADIO STATION OPERATION AN AMATEUR PROVIDES THE AMATEUR SERVICE A POTENTIAL FOR EMERGENCY PUBLIC SERVICE THAT IS UNEQUALLED BY ANY OTHER SINGLE MEANS OF COMMUNICATION PD THE ARMED FORCES COMMUNICATIONS SERVICES AND THE DEPARTMENT OF DEFENSE RECOGNIZE THIS

(Continued on page 146)

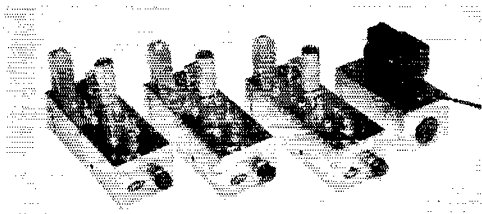
## • Recent Equipment —

### Ameco CN-50, CN-144 and CN-220 Crystal-Controlled Converters

CHOICE of a suitable intermediate frequency is always a problem for the v.h.f. enthusiast who wants to use crystal-controlled converters for reception. The two most popular frequencies for use with general-coverage communications receivers are 7 to 11 and 14 to 18 Mc., the choice here depending mainly on whether a high-grade or inexpensive receiver is to be used. With the better double-conversion receivers either is OK, though the tuning rate on the general-coverage dial is usually a little better at 7 than at 14 Mc. On low-priced or most old receivers (the single-conversion variety) image rejection is usually better on the lower frequency.

These considerations are not important to the fellow with a ham-bands-only communications receiver. He will have to use the 28-Mc. range, unless he happens to have one of the several models that have special tuning ranges for converter use. Most of these start at 30.5 Mc., but at least one has its converter range at 23 Mc. Then, there is the disparity between receivers as to the actual range tuned in the vicinity of the 10-meter band. Some receivers start at 26 Mc. Others start at 27, and some start at 28. We don't need to carry this discussion any further to show that there would be a considerable advantage in a converter design that will let you use any i.f. you wish, with only minor changes and adjustments in the converter.

This is the principal feature of the Ameco Series CN crystal-controlled converters for 50, 144 and 220 Mc. Should you start with, say, a general-coverage receiver, and later you go to one for the amateur bands only, you do not have to sell out your stock of converters if you have the Ameco jobs. Instead, you merely obtain a new crystal at the proper frequency, make some simple wiring changes that are detailed in the instruction sheet, and readjust according to straightforward instruction procedure. Complete step-by-step instructions are provided with every converter.



The Ameco CN Series v.h.f. converters for 220, 144 and 50 Mc., in that order, left to right. The matching PS-1 power supply is at the right.

The tube line-up and basic circuitry in the three converters are similar. Two 6DS4 Nuvisitors are used in the r.f. amplifier stages. These are neutralized amplifiers in cascade (not *cascode*) followed by another 6DS4 as the mixer. The oscillator and multiplier, if used, are the two halves of a 6J6. The 220- and 144-Mc. converters are identical, circuitwise, but the 50-Mc. model is slightly different in two respects. It uses only one half of the 6J6 (no multiplier stage needed) and it has some special circuitry to keep down spurious responses.

Two tuned circuits are inductively coupled in the grid of the first 50-Mc. stage, and the antenna is linked to one of these. Both amplifier stages are link-coupled to their following grid circuits. The 6DS4 provides such a low noise figure at 50 Mc. that some performance in this respect can be sacrificed in the interest of improved attenuation of out-of-band signals. As many v.h.f. men have found, to their sorrow, 50-Mc. converters need all the protection they can get in this respect, particularly in areas where population density and commercial use of the v.h.f. range are high.<sup>1</sup>

In the converters for 144 and 220, double-tuned circuits are used between the r.f. stages, but the antenna lead is tapped directly on the input circuit of the first stage. Low noise figure is more important at these frequencies, so no effort is made to build up r.f. selectivity in the first grid circuit.

Liberal use is made of shielding, r.f. chokes and feedthrough bypasses in all models. As in the crystal-controlled converters in the 1962 *ARRL Handbook*, and described in October, 1961, *QST*, the 50-Mc. job has slug-tuned coils and those for 144 and 220 Mc. are tuned with variable capacitors. Except for the slight mechanical rearrangement needed to take care of these circuit differences, the parts layout is the same in all three converters. Provision is made for controlling the over-all gain in each converter, by varying the cathode resistor in the second r.f. amplifier. This can be used to advantage in preventing cross-modulation in the mixer stage, when very strong local signals are encountered. When this is not a problem, running the two capacitively neutralized stages "wide open" gives high gain and lowest practical noise figure.

The i.f. output coil is tapped, so that a connection can be made at a suitable point for any intermediate frequency. A chart accompanying the converters shows which tap to use, for any

<sup>1</sup> The manufacturer recently improved the characteristics of the converters as to overloading. Information on this, for application to early models, is available from Ameco on request.

i.f. from the broadcast band through 30.5 Mc., in case you find it desirable to change from the frequency you first purchased. Suitable crystals for these frequencies are also given.

The converters are designed to be plugged into the matching Ameco Power Supply, Type PS-1, though they may be operated from any power source that provides 100 to 125 volts d.c. at 25 ma., and 6.3 volts a.c. or d.c. at 0.84 amp. The heater circuit can be rewired for 12-volt operation, for mobile service.

— E. P. T.

### Ameco CN-50, CN-144 and CN-220 Crystal-Controlled Converters

Height: 2½ inches.

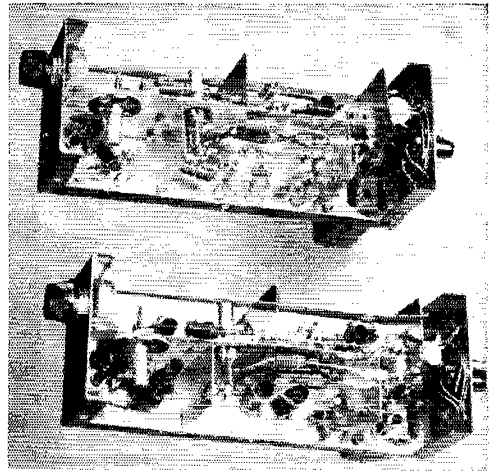
Width: 2 inches.

Depth: 6¾ inches.

Power requirements: 6.3 volts at 0.84 amp., 100 to 125 volts, d.c., at 25 ma. (117 volt a.c. power supply is available).

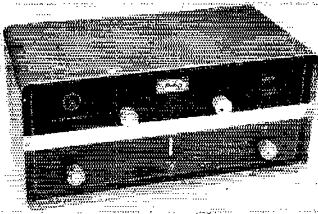
Price class: \$50 wired, \$35 kit. Power supply \$11.50 wired, \$10.50 kit.

Manufacturer: American Electronics Corp., 178 Herricks Road, Mincola, New York.



Interior view of the Ameco converters for 50 and 220 Mc. The 144-Mc. converter is identical to the 220-Mc. one mechanically, so it is not shown in this detail photo. Note that the 50-Mc. converter, bottom of picture, has link-coupled slug-tuned circuits. Extensive shielding and liberal use of r.f. chokes and feedthrough bypass capacitors make for good circuit isolation.

## The Hallicrafters HA-2 Transverter

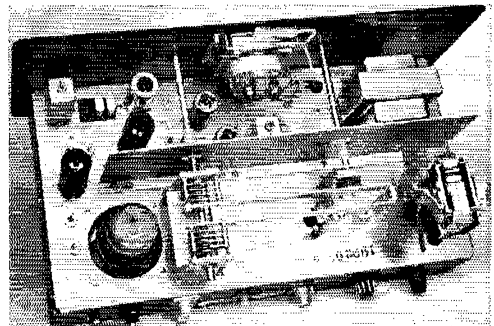


THE Hallicrafters Transverters, HA-2 and HA-6, are usually thought of as s.s.b. devices for the v.h.f. man, since it is in s.s.b. operation that the conversion method of generating a signal is most often used. Actually the transverters work equally well with any type of emission, as they are essentially linear devices. What comes out depends only on what you put in. The HA-2, pictured and described here, makes a 2-meter station out of a 10-meter one. The HA-6 does the same on 6 meters. Though the units are styled for use with other Hallicrafters equipment, they are adaptable to any station capable of operating in the 10-meter band.

It will be seen from the block diagram that the transverter employs two mixers, one for transmitting,  $V_3$ , and one for receiving,  $V_2$ ; both receiving injection from a single oscillator-multiplier system. In receiving, a 6CW4 Nuvistor grounded-grid r.f. amplifier,  $V_1$ , precedes a 6AN4 mixer,  $V_2$ . The 12AT7 Butler oscillator,  $V_6$ , uses crystals on 38.666 or 39.333 Mc. to generate injection on 116 or 118 Mc. It operates at low voltage, to insure stability. Its output is

amplified by a 6AH6,  $V_7$ , which feeds both mixers. The receiver mixer output, 28 to 30 Mc., is fed through coax to the communications receiver to be used as the tunable i.f. system.

In the transmitting portion a 12BY7A mixer has the 116-Mc. injection applied to its control grid. Energy from a 28-Mc. transmitter is fed into the 12BY7A cathode. Low- and high-level input connections are provided, so the power source can be almost any available transmitter or exciter. The low-level input is for exciters of



Interior view of the HA-2 Transverter. The final amplifier stage occupies the rear portion of the chassis. At the upper left are the crystal oscillator-multiplier and amplifier stages. The receiving portion is in the middle of the chassis, in front of the shield. Tubes with black shields are the transmitting mixer and low-level amplifier.

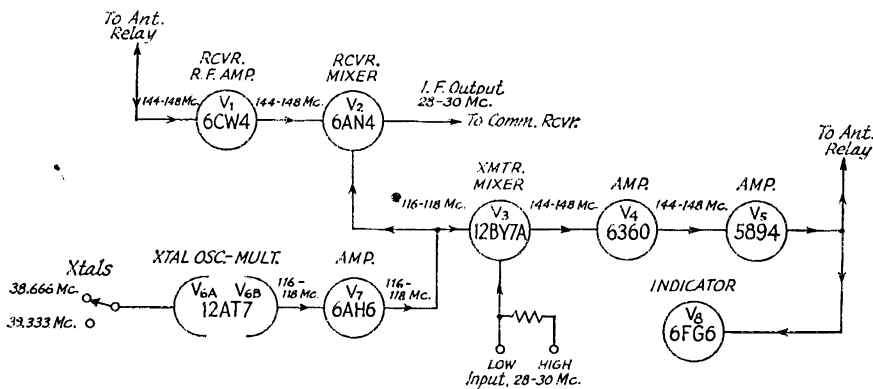


Fig. 1—Block diagram of the HA-2.

up to 2 watts output. Transmitters or exciters capable of 50 to 100 watts output should be connected to the high-level input. Power in between 2 and 50 watts may be used on the low-level input, provided a suitable attenuator is added to hold the level down.

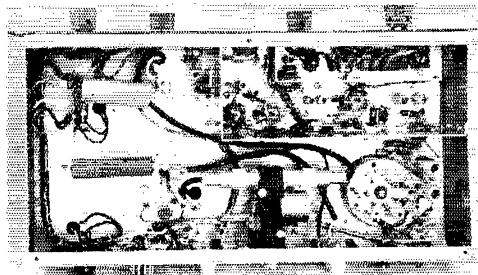
The line to the cathode of  $V_3$  has a low-pass filter, to prevent harmonics in the driver output from reaching the mixer. Following the mixer are 6360 and 5894 amplifier stages,  $V_4$  and  $V_5$ . Interstage coupling is inductive, for maximum attenuation of unwanted frequencies. Transmitter output depends on the mode of operation. For s.s.b., c.w. or f.m. it is approximately 50 watts. On a.m. with carrier the output is 12.5 watts.

Because many transmitters and receivers that would be used with the transverter cover only the 28-Mc. amateur band in the desired tuning range, it is necessary to have two or more crystals in the transverter injection system. The one at 38.666 Mc. provides for operation between 144 and 146 Mc., the higher one for 146 to 148 Mc. when the tuning range is 28 to 30 Mc. Accuracy of frequency indication (assuming that the crystals are on frequency) will depend on the dial accuracy of the transmitter and receiver used for the r.f. power source and i.f. tuning, respectively. In case the receiver or transmitter, or

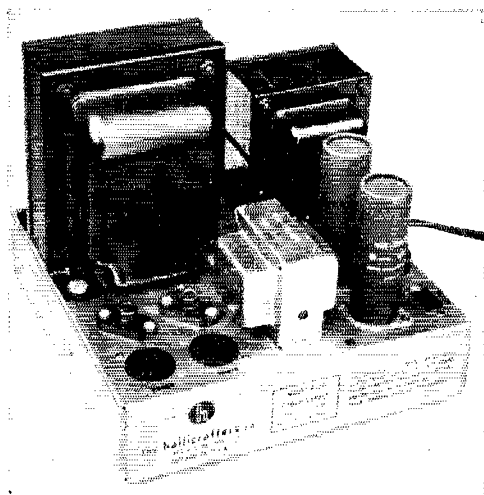
both, tune some frequency range other than 28 to 30 Mc., a third or spare crystal position is provided, to take care of full band coverage. Example: if the tuning range is only 28.0 to 29.7 Mc. a third crystal at 39.5 Mc. will give the following ranges — 144 to 145.7 Mc., 145 to 146.7 Mc. and 146.5 to 148.2 Mc.

The crystal oscillator, multiplier and amplifier in the injection system run all the time that power is on the transverter, so drift cycles with each transmission are eliminated, as far as the transverter is concerned. After initial warm-up, the drift in the transverter should be negligible, and over-all stability of the system will depend principally on the transmitter and receiver used.

Tuning of the transverter is very simple. Controls as seen in the front view are power on-off, lower left; range switch, lower right; loading, upper left; and final plate tuning, upper right. A 200-ma. meter reads final plate current, and a 6FG6 indicator tube shows when the transverter is tuned for maximum output. This is



Bottom view of the Transverter, with the final amplifier at the lower right and antenna relay in the lower center. Injection, receiver and low-level transmitter portions are in the upper right quarter of the chassis.



The P-26 power supply for the Transverter is built as a separate unit.

when the gap between the two shafts of light on the indicator is narrowest. No adjustments are required in receiving, other than those needed in tuning the communications receiver with which the transverter is used. Receiver noise figure is 3 to 5 db., and comparisons made between the transverter and various high-performance v.h.f. converters show that it is capable of doing an adequate job in 2-meter weak-signal reception.

#### Power Supply

To keep down size, weight and heat the power supply is built as a separate unit, which can be installed in any convenient spot nearby. The Hallcrafters P-26 supply uses silicon rectifiers entirely. It delivers approximately 700 volts at the 200-ma. transmitter load, 250 volts at 125 ma., and -60 volts for bias. Since it is built and sold as a separate unit, the user of the transverter

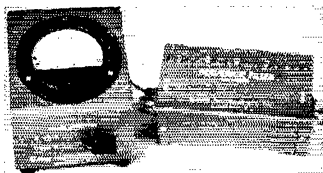
can make power provisions on his own, should he prefer to do so.

— E. P. T.

#### HALLCRAFTERS HA-2 AND HA-6 TRANSVERTERS AND P-26 POWER SUPPLY

	HA-2, HA-6	P-26
Height:	8 inches	9 inches
Width:	17 inches	8 inches
Depth:	9 $\frac{1}{8}$ inches	8 inches
Weight:	22 $\frac{1}{2}$ pounds	26 $\frac{1}{2}$ pounds
Power requirements: (with P-26 power supply)	105 to 125 v. a.c., 290 watts	
Price class:	HA-2, HA-6, \$350, P-26, \$100.	
Manufacturer:	Hallcrafters Co., Chicago 24, Illinois.	

## The Maverick II 6-Meter Filter



**T**he Maverick II is a tunable low-pass filter for use with 50-Mc. transmitters and receivers. When adjusted carefully it will provide high harmonic rejection and maximum signal output at any frequency in the 50-Mc. band. If connected in the line to both transmitter and receiver, it will also be very helpful in preventing receiver overloading due to strong local signals at frequencies above the amateur band. The indicating unit is an r.f. voltmeter calibrated in watts, with scales reading 0 to 50 and 0 to 500 watts.

If the antenna is properly matched to its transmission line (feed-line s.w.r. close to 1 to 1), the filter is capable of handling transmitter power output up to 400 watts. If there is an appreciable s.w.r. on the line the power-handling capability is substantially reduced, and the meter indication becomes useful only for relative power.

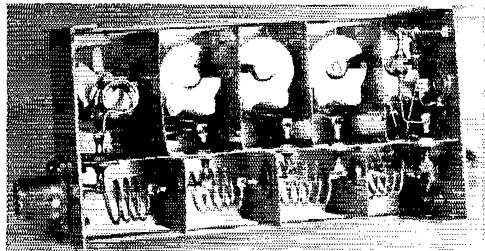
In adjusting the filter, the transmitter is set on a frequency in the middle of the most-used range, and a moderate amount of power is fed to the filter. Beginning at the transmitter end of the filter, each trimmer is adjusted carefully for maximum meter indication. The process is repeated several times over for precise adjustment. This may affect the transmitter tuning,

and the tuning and loading adjustments on the transmitter should be set for maximum output when filter tuning is completed.

— E. P. T.

#### The Maverick II 6-Meter Filter and Power Indicator

	Filter	Indicator
Height:	2 $\frac{1}{8}$ inches	4 inches
Width:	5 $\frac{1}{4}$ inches	4 inches
Depth:	3 inches	4 inches
Power range:	0 to 50 and 0 to 500 watts	
Price class:	\$35	
Manufacturer:	Gavin Instruments, Inc., Depot Square & Division Street, Somerville, New Jersey.	



The Maverick II 6-Meter Filter, with its cover removed, showing the tunable sections and shielding. The transmitter end is at the left. The r.f. voltmeter diode is visible at the upper right. Individual shields bite into the aluminum cover, insuring good isolation between sections and low radiation loss from the filter.

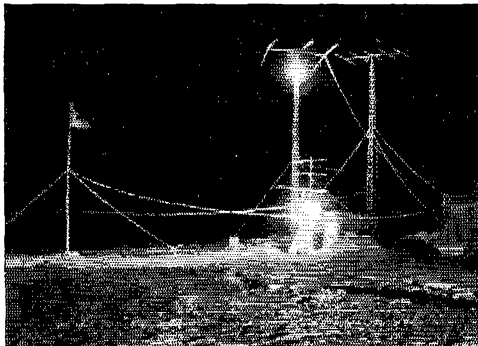
## Strays

Worried about damaging those delicate components when you solder? For \$25 a pound you can buy a special epoxy adhesive which combines

high bond strength and high conductivity. Dunno how many joints per pound you can make with this material.

*The star of amateur radio rose brightly in 1961. Boosted into space aboard a Discoverer research vehicle, the star covered the globe, speaking to amateurs world-wide with a friendly greeting.*

*During the brief life of the star, the international spirit of amateur radio reached a new zenith. From KCAUSB (Antarctica) to KL7DMB (Alaska) and from JAIEC (Japan) to UR2BU (Estonia) radio amateurs of all nations and political beliefs joined hands in an international undertaking that made headlines around the world. This was their star, beckoning them into the exciting new world of space communications. Even as the star faded and died, the radio amateurs were preparing for newer and brighter stars, for this was only the beginning. . . .*



V.h.f. antennas of KL7FLC (Arlis II Ice Island, 77 North) glisten with ice as operators track Oscar's flight over the Polar area. Initial orbits of satellite were logged, and orbit was confirmed on 14-Mc. skeeds to W6EE, Oscar control station. KL7FLC was mainstay of Oscar II tracking network.

## Oscar I: A Summary of the World's First Radio-Amateur Satellite

BY WILLIAM I. ORR,\* W6SAI

ON January 3, 1962, between the hours of 0400 and 1000 GMT, Oscar I, the world's first radio-amateur space satellite, plunged into the earth's atmosphere and was consumed.

Launched on December 12, 1961, at 2042 GMT, the 10-pound 145-Mc. beacon transmitted the friendly c.w. greeting "HI" to radio amateurs in all continents during its trips about the earth. In return, more than 570 amateur tracking stations in 28 countries and 44 states observed Oscar I and reported their results to the Data Reduction Center in Sunnyvale, California. Over 5200 individual observations have been logged, ranging from simple "I heard it." reports to complex and sophisticated observations covering Doppler S-curve data and various orbital parameters.

Designed, built and tested entirely by radio amateurs, the Oscar I amateur-radio satellite was launched aboard the Discoverer XXXVI space vehicle at no cost to the government. Two years of intensive effort on the part of dedicated radio amateurs paid off in an earth-shaking blast as the rocket slowly rose from the Vandenberg, California launch site and headed into a north-south polar orbit. Ejected from the Agena parent satellite, Oscar I went into its own orbit, blazing a new trail into the future of amateur radio.

This unique radio-amateur space experiment

received wide and valuable coverage on press, radio and television. The publicity received by radio amateurs cooperating in this venture was immense and of great value to the hobby as a whole. More directly, the launch and subsequent world-wide observation of the Oscar I beacon proved conclusively that the radio amateur is capable of acquiring and tracking a space satellite, of gaining information from his observations, and of putting this information to use in the form of orbital predictions and parameters.

Response of radio amateurs to Oscar I was immediate and enthusiastic:

"Congratulations to all, signal 30 db. over noise," F3NB (France). . . . "Well done! Thank you for your efforts in regard to amateur radio," K2HHS (U.S.A.). . . . "Signal very strong. Best wishes," HB9WB (Switzerland). . . . "Was a real thrill! Quickly gathered an audience," W9RPF (U.S.A.). . . . "Local papers gave front-page coverage to launch," WA2DAC (U.S.A.). . . . "We think this is a fine first for amateur radio," KL7AEQ (Alaska). . . . "You are to be congratulated on your marvelous achievement for amateur radio!" WA5MPL (U.S.A.). . . . "Congratulations on doing such a fine job," W2GAX (U.S.A.). . . . "The RSGB considers this an excellent demonstration of cooperation between radio amateurs on an international basis," G2UJ (England). . . . "I congratulate you heartily on Oscar I," DJ5HZ (Germany). . . . "Heartiest congratulations," VE5XP (Canada). . . . "Proud to be associated with Oscar," K0YLO (U.S.A.). . . . "A wonderful contribution in modernizing our hobby," K8PMJ (U.S.A.). . . . "Sincere congratulations on a job well done!" W5QVZ (U.S.A.). . . . "Most thrilling thing to happen to ham radio," W0JHS (U.S.A.). . . . "My congratulations to those making this

\*Oscar Association, Box 183, Sunnyvale, California.



dream project a reality!" LU9MA (Argentina). . . "A very big thank you!" ONL-124 (Belgium). . . "Congratulations for Oscar, launched for radio amateurs of the world," YV5BFN (Venezuela). . .

With the congratulatory messages, a continual flood of information into the Oscar Data Reduction Center made the Christmas holiday season meaningless to the group of dedicated amateurs whose burden it was to log, file and analyze the Oscar reports.

Gradually, out of the flood of reports, the story of Oscar unfolded. First reports from KC4USB, KL7DMB, and KH6UK allowed the Data Group to make a preliminary estimate of orbital parameters. By early morning hours of December 13th, a sufficient quantity of reports from the eastern portion of the United States had arrived to permit orbital predictions to be made for key areas of the world. Using parameters derived from radio-amateur observations, the Data Group soon was in full swing, issuing "approach times" of Oscar I for the major cities of the world. Predictions improved as techniques were sharpened, and correction data from amateur tracking groups in other parts of the country were continually used as a prediction check.

First report of reception over Europe was revolution No. 3, heard at 0055 GMT, December 13, 1961 by G3OSS and others, including G3GDR. G3OSS again logged the signal on revolution No. 4 and later was interviewed on the BBC relative to Oscar reception in England. Note: Special permission has been granted to all United Kingdom amateurs by the General Post Office for transmission of Oscar reports to the United States, waiving the provision against third-party traffic in this particular circumstance.

Latest information indicates the last observation of the signal from Oscar I was made at 0924 GMT, January 3, 1962 during revolution No. 339 by G2DQ. At that time, the satellite was estimated to be at 50 degrees north latitude, about 3.6 degrees to the west of G2DQ, travelling in a southbound direction. Thanks are given to the Radio Research Station of the Department of Scientific and Industrial Research, Slough, England for providing tracking data for Oscar I for English radio amateurs.

### Package Temperature

The "HI"-rate of the Oscar I satellite served as an indication of the internal temperature of the package. The ground observer could determine the rate by counting the number of seconds it took for the transmitter to send ten "HIs." The rate can be translated directly into temperature by means of the conversion graph shown in Fig. 1. The emissivity of the case was designed to maintain internal temperatures between 14.5 and 25 degrees centigrade, corresponding to a time rate of 34 to 22 seconds per ten "HIs." During orbit, the recorded temperature was considerably higher than expected, and as a result, the "HI"-rate remained quite fast during the flight. The average interior temperature of the Oscar I package as derived from a large number of re-

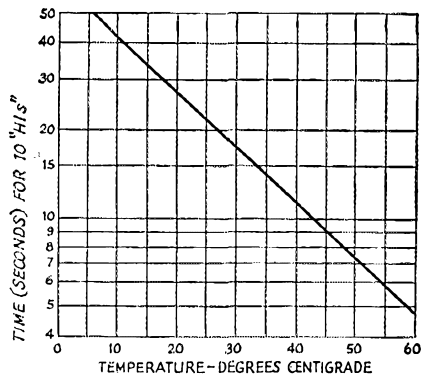


Fig. 1—Oscar Satellite temperature calibration.

ports is shown in Fig. 2 and is representative until about December 26; after that date the curve represents a combination of temperature and low primary battery voltage effect. Temperature data can be extrapolated after this date from the curve quite accurately until at the noted time the telemetering data became erratic.

The internal temperature rise of the satellite package above the mean skin temperature of an unenergized package is assumed to be due entirely to internal power dissipation from the transistors and batteries. When battery voltage dropped to 71 per cent of original value, the internal power dissipation was cut in half. This point was reached on December 29, 1961 at 1200 GMT. This represented 17 days of battery life, including approximately 8 hours used for pre-launch testing. With 29 per cent lower than normal battery voltage, keyer rate was reduced so as to indicate approximately a 16 per cent lower than normal temperature. When battery voltage was 20 per cent low, keyer error was 12 per cent low. End point of battery life was 12 volts.

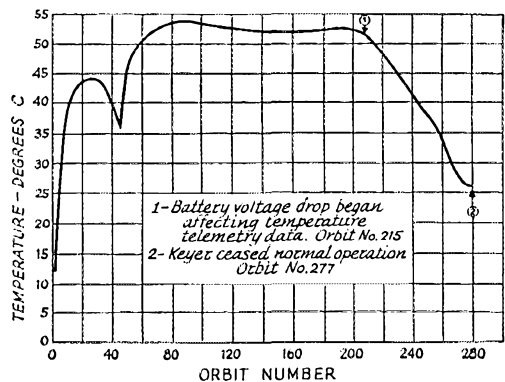
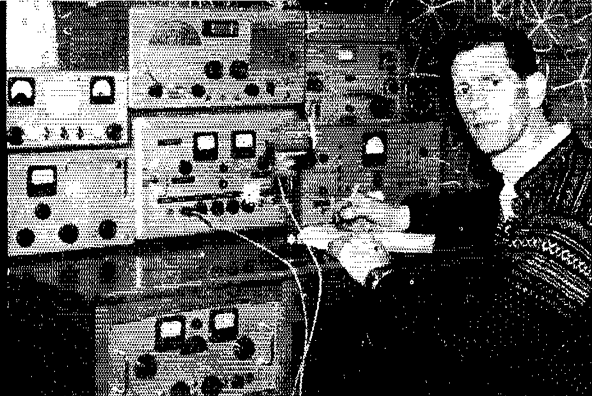


Fig. 2—Oscar satellite package temperature during useful life of equipment. Graph is average of a number of individual observations, and is representative until about orbit No. 215 on December 26, 1962. After that date, curve represents a combination of temperature and low primary battery voltage.



LA4YG near Oslo, Norway, copies Oscar I on home-made 144-Mc. equipment. Henning operates all bands, phone and c.w., in addition to v.h.f. activity.

Reports were received indicating that one of the dots in the "I" was occasionally being dropped, but this phenomenon has not been authenticated. Playback of tape recordings and oscilloscope pictures prove that all dots were present in all data examined to date. If any valid proof of "missing dots" is available, the Association would appreciate receiving the data. (The time period in question is prior to orbit No. 277, 1043Z, December 30, 1961. After that time, battery voltage gradually declined from 17 to 12 volts and keying became intermittent. The keyer ceased operation during orbit No. 280.)

The temperature data revealed a well-defined dip in the smoothed curve, occurring on December 15, 1961, starting about 1200 GMT. Accurate

#### *Oscar I Statistics*

Frequency: Approximately 144.983 Mc.  
 Power output: 100 milliwatts.  
 HI-rate: Function of package temperature; see text and graphs.  
 Apogee of orbit: Approximately 431.1 kilometers (268 miles).  
 Perigee of orbit: Approximately 245.3 kilometers (153 miles).  
 Inclination to equator: 81.2 degrees.  
 Orbital period: 92-89 minutes.  
 Maximum Doppler shift: Approximately 7.5 kc.  
 Distance travelled in orbit: About 20 million miles.  
 Transmitter: Transistor crystal oscillator on 72.5 Mc., transistor amplifier and "Vari-cap" diode doubler to 145 Mc. Keyed by transistor multivibrator and counters with diode logic. Oscillator keyed in base circuit. Useful life was 424 hours (17 days, 6 hours).  
 Battery life: Three weeks.  
 Antenna:  $\frac{1}{4}$ -wave monopole, 19 inches long.  
 Dimensions: 12 inches  $\times$  10 inches  $\times$  8 inches.  
 Weight: 10 pounds.  
 Entire internal structure of package was encapsulated in epoxy foam to serve as thermal insulation.

and painstaking measurements made by I1BBB (Italy), I1BMV (Italy), F3NB (France) and others confirmed this dip, and placed the low temperature point at revolution No. 45 approximately at 1630 GMT, December 15, 1961. More than 30 reports confirm this temperature quirk, so there can be little doubt of its authenticity.

In addition, the package temperature reached a maximum value of 53 degrees centigrade, during December 19, 1961 at approximately 1000 GMT, slowly dropping back to a steady value of 52.5 degrees centigrade by 1200 GMT on December 20, 1961, at which time the temperature held constant until battery decline on December 26, 1961 at 1200 GMT.

It was also noted that temperature indications observed during daylight hours over the U.S.A. average 0.7 degree centigrade cooler than comparable readings taken during the night. This apparent reversal from what commonly may be expected is credited to the fact that the satellite had been in sunlight for only about 18 minutes when it passed over the continental United States, traveling from north to south, after previously having been in the shadow of the earth for about 36 minutes. The outer casing of the package had been heated up by the sun, but because of the thermal lag of the foam insulation, the electronic components remained at a slightly lower temperature.

During the initial development work, the effect of internal power dissipation of about 250 milliwatts (transistor dissipation plus chemical heat of the batteries) was considered to be negligible in view of the over-all heating of the package from solar effects. However, the heat insulation of the foam packaging seems to have been effective in containing a significant amount of this internally generated heat. This partly accounts for the fact that the observed temperatures were much higher than anticipated.

Causes of the well-defined dip in internal temperature of Oscar on December 15, 1961, are obscure. Comments are invited from observers as to their interpretation of this phenomenon. There are several possible explanations, but no firm answers as yet. For example, evaporation of condensation trapped within the package may have had a secondary cooling effect which lasted until the moisture was gone. This portion of the temperature curve surely is open to more study and speculation.

#### *Propagation*

One of the goals of the Oscar I program was to determine if the average radio amateur could receive and track a low-power 2-meter signal at distances of 1000 miles or more. This goal has been emphatically proven by the fact that most of the reporting stations at one time or another observed tracks in excess of 8 minutes' duration. As the velocity of the satellite was about 5 miles per second (18,000 miles per hour), the vehicle traveled 2400 miles during an 8-minute period. Reception during a pass of this duration occurred when the track was overhead, while passes more

distant from the observer were of shorter duration.

A noteworthy feature of the Oscar I signal was the abruptness with which it appeared and disappeared, indicating that the radio range was horizon-limited. This feature was true until the battery voltage near the end of the month dropped the transmitter power to a point where the transmissions became extremely weak. After December 31, 1961, only those stations with better than average equipment and locations were able to copy the feeble, intermittent signal. The last verifiable reports of Oscar were revolution No. 339 (January 3, 1962), heard by G2DQ (England). Last passes audible over the United States and Canada were revolution No. 319, heard by K3CFA, VE2AME and VE3RM; No. 320, heard by VE2UQ and W4ITE; and No. 321, heard by K6GSJ.

Several stations reported a form of diffraction effect. The satellite signal was received initially for 5 to 15 seconds, followed by a quick fadeout, then reappearance of the signal as the satellite came over the horizon. Similar results were observed as Oscar I disappeared over the horizon at the end of the pass. An additional effect was noted by KL7FLC (Ice Island Arlis II, 77.3 degrees north latitude).<sup>1</sup> The operator was normally able to observe and report on several passes in a row. Under normal propagation conditions every overhead pass was heard and observed. However, the Oscar satellite signal was absent when aurora was present. ZS6SW (Union of South Africa) also noted that upon occasion he experienced difficulty copying Oscar's signal during periods of magnetic storms. ZS1B (Union of South Africa) reported only two logged receptions of the satellite in spite of many hours of observations with relatively good 2-meter equipment.

KP4AXX (Puerto Rico) noted a series of fluctuations on the Oscar I signal during the period of December 28-29, the satellite having a gradual, rolling fade as it passed overhead. The National Bureau of Standards confirmed variations in electron density that occurred during the period of observation, and undoubtedly there is correlation between the fading signal and the observed ionospheric disturbances.

It is interesting to note that if Oscar I had been a repeater, record-breaking v.h.f. two-way QSOs would have been possible. Many coincident reception reports were logged at the data center. For example, during revolution No. 46 (north to south over Omaha, Nebraska), W4ZAJ in Alabama could have had a 6-way 2-meter QSO with W6CBE (California), W5TFY (Texas), W5AQS (Texas), K9REE (Kansas) and K9LAD (Kansas)! Revolution No. 164 (south to north over Amarillo, Texas) would have permitted a QSO between W4FWH (Georgia) and K6FB (California), a distance of about 2200 miles. Revolution No. 113 would have permitted a record-breaking European DX QSO among EA4AO (Spain),

<sup>1</sup>"An Unexpected Oscar Dividend," Technical Correspondence, QST, March, 1962.

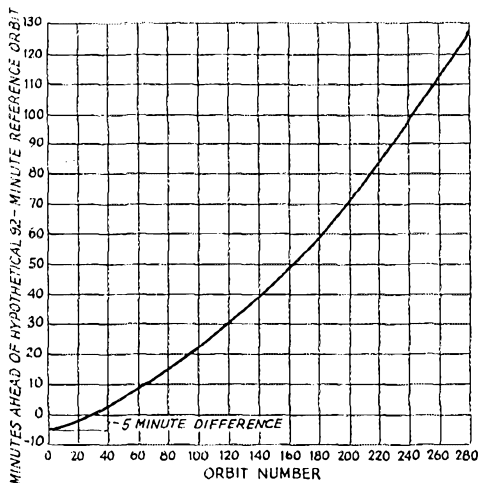


Fig. 3—Comparison of Oscar I orbit time with hypothetical 92-minute orbit. Because Oscar I launch time was different from assumed time, plot does not coincide with zero reference. Graph thus indicates actual launch time was 5 minutes behind assumed time.

SM6PU (Sweden) and I1BBB (Italy)! Revolution No. 117 would have permitted a coast-to-coast QSO between W6SIDE (Coronado, California) and W4MVB (Atlantic Beach, Florida) during the period of 0707 to 0709 GMT on December 20, 1961. Only two minutes of fleeting time in this instance, but enough for two dedicated v.h.f. men to shatter records and establish new targets to shoot at. Over shorter ranges, such as from Midwest U.S.A. to either coast, 7-minute QSOs could have been regularly made *if Oscar I had been a repeater satellite!* A great opportunity for amateur radio thus lies ahead—two-way v.h.f. satellite communication over long-distance paths!

For amateurs having good station equipment, maximum tracking range of Oscar I was about 1400 miles, which agrees well with the theoretical radio horizon of the orbit. Several unexplainable reception reports have been received, however, which demand additional study. W6CQI (California) for example, heard Oscar I during a pass over the South Atlantic Ocean (near the Falkland Islands) and W9WVM (Minnesota) reported reception of a pass well out over the Pacific Ocean.

#### Data Reduction

The trajectory of an orbiting satellite may be monitored by the use of the very simplest tracking data: Namely, the times of acquisition and loss of beacon signals. By a graphic technique an observer can keep track of a satellite and make orbital predictions for 48 hours in advance with an accuracy of better than two minutes.

The orbit of an earth satellite may be defined by stating the time and longitude of a north-bound equatorial crossing; the period, the locations and heights of the perigee and apogee; and the inclination of the plane of orbit with

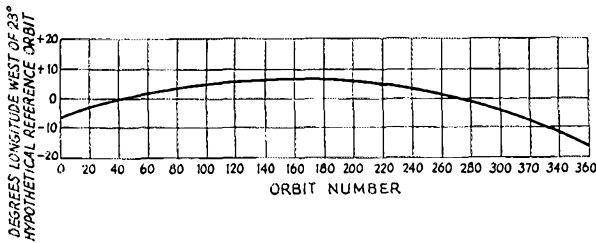


Fig. 4—From processed data (translated from coordinates of observer to the equivalent equatorial crossing point) compared with arbitrary, reference orbit, equatorial crossing longitude. Actual start of reference orbit was at 306 degrees west longitude, thus curve does not start at arbitrary origin, which was chosen to be 312 degrees. Curve was plotted from over 5000 observations and average deviation from nominal curve is less than four degrees.

respect to the equatorial plane of the earth. If it is desired to predict future positions of the satellite, it is also necessary to know the rate of change of the period and the rate of change of advance in equatorial-crossing longitude.<sup>2</sup>

A simple procedure for keeping track of a satellite is to count and log the number of revolutions and their positions about the earth. Orbit No. 1 starts at the time the satellite first crosses the equator in a northbound direction. The orbit number advances by one at each successive northbound equatorial crossing. While the satellite is describing one complete orbit the earth is rotating about its axis, so that the second satellite orbit will begin at a different longitude from that of orbit No. 1. (An exception to this general case is that of high-orbit satellites for which the periods are multiples of a sidereal day.)

Oscar I was a low-altitude satellite having a period of about 91 minutes, with each orbital crossing advancing about 23 degrees as the earth revolves beneath the orbit. The nature of the orbit is determined by the launching vehicle with deviations from the parent orbit due to the velocity of separation of Oscar I from the parent vehicle. Additional deviations are introduced by accumulation of atmospheric drag effects. The spatial position of the plane of orbit was such that all daytime observations occurred with the satellite traveling from north to south and all nighttime observations occurred on south-to-north passages.

A key requirement for establishing the location

<sup>2</sup> Hilton, "Making Your Own Orbital Predictions from Doppler Measurements," *QST*, March, 1962.

of the satellite was the measurement and recording of time. Many observers monitored standard-time broadcasts with a second receiver and recorded time ticks on a tape with the simultaneous reception of the Oscar signal.

Once the satellite signals have been found, tracked, and the appropriate times recorded, the raw information must be processed to put it in usable form. This was the job of the Data Reduction Group of the Oscar Association. Acquisition reports for Oscar I totalled well over 5000, and each report had to be evaluated to determine its quality, to extract the information necessary to determine the path followed by the satellite during its useful life, and to measure some of the orbital parameters.

As a point of reference, the Data Analysis Group assumed normal line-of-sight propagation performance and a normal period of 92 minutes. If the satellite varied from this period, or if abnormal reception instances occurred, the reduced data would not fit the reference data and the anomalies (if any) would be readily identified by lack of agreement with normal observations. The great majority of data reported to the Association by radio amateurs agreed closely with anticipated line-of-sight propagation conditions. Orbital data differed, however, because the period of the satellite was not 92 minutes.

The basic method of data evaluation used in this study was to translate all reception reports to their corresponding equatorial crossing times and longitudes, and to plot the results as functions of orbit numbers. Once the reports had been processed to arrive at this common basis of examination it was necessary to present the data

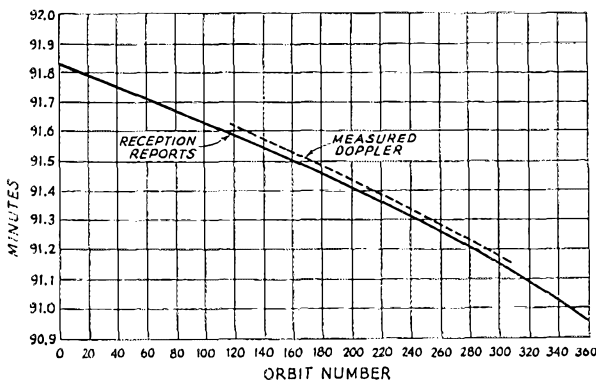


Fig. 5—Decay curve of Oscar I, generated from Fig. 3 by taking tangent slope of curve at several points. Doppler measurements by W6VKP are included to show close comparison of results obtained by separate observation technique.

in a form suitable for easy analysis. The method selected before the flight was to display the information graphically as a difference between the observed values and the normal reference orbit. The hypothetical orbit had a fixed period of 92 minutes and a fixed angle of longitude advance (progression) of 23 degrees. The first reference orbit was chosen to start at 2136 GMT on December 12, 1961 at a west longitude of 312 degrees. Based upon this hypothetical situation, a tabulated reference schedule was constructed by adding 92 minutes successively to the time and 23 degrees to the longitude for each revolution. The processed data (translated from the coordinates of the observer to the equivalent equatorial crossing point) was then compared with the arbitrary, reference orbit as to equatorial crossing time and longitude. The differences between the hypothetical and observed parameters were then added to the table. Thus, as Oscar I spun its skein about the globe, the chart grew, serving to magnify any variations in Oscar's orbit parameters from the hypothetical orbit. The resulting curves of Figs. 3 and 4, generated from the processed data, thus indicated the most probable schedule for Oscar I, and could be used to determine the actual period of the satellite and the rate of change in angle of longitude progression.

It should be noted that slope of the tangent to the time curve of Fig. 3 at any point is equal to the difference between the reference period (92 minutes) and the observed period of Oscar I. Figs. 5 and 6 were generated from Figs. 3 and 4, respectively, by taking the tangent slope of the time curve at several points. The dashed curve of Fig. 5 was derived from Doppler measurements made on the satellite by W6VKP and W6VMH, and is shown as a comparison of results obtained by two independent methods.

It can be seen that the curves of Figs. 3 and 4 do not intercept orbit No. 1 at the origin, indicating that the initial conditions assumed for orbit No. 1 did not agree with the real orbital parameters of the satellite. The actual conditions should have been 2141 GMT on December 12, 1961, at 306 degrees west longitude.

Examination of data provided by observers in all parts of the world show relatively small deviations from the nominal curves. The average deviation of data points for Fig. 3 is 1.04 minutes from the nominal curve. For Fig. 4, the average deviation from the nominal curves is 3.59 degrees. It is thought that the nominal curves are within 20 seconds (time) and one degree (longitude) of the true track of Oscar I. By graphical differentiation of the time curve of Fig. 3, a period curve has been generated which matches smoothly with data gathered independently using Doppler techniques.

These simple methods used in the investigation and study of the Oscar I tracking reports could be duplicated by interested satellite trackers using their own locally generated reports for the purpose of producing acquisition predictions during satellite operations.

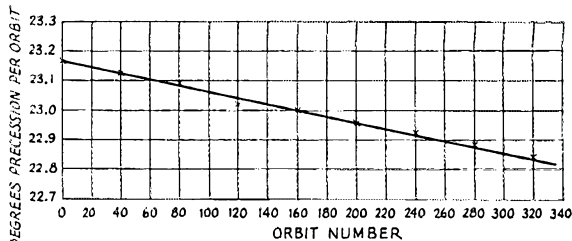


Fig. 6—Longitude progression of Oscar I.

### *Transforming Reception Reports to Equatorial Crossing Data*

In order to achieve a common basis for investigation, all reception reports were transformed to equatorial-crossing information at the beginning of an orbit in the following manner (to simplify this explanation, it will be assumed that the tracking station supplying the data is located in the northern hemisphere):

The information needed in the transformation is the time of closest approach (t.c.a.) of the satellite. This is the approximate time that the satellite crosses the latitude of the tracking station and is roughly the midpoint in time between the acquisition and loss time of the beacon signal. A close nighttime approximation to the desired equatorial crossing time may be made by subtracting Oscar I's northbound travel time from equator to observer's latitude from the midpoint (t.c.a.) of the observation time. For most purposes, Oscar I's travel time may be calculated on the basis of one minute for each four degrees of latitude traversed. If the pass under consideration is a daytime pass, the satellite is southbound after just having passed over the polar region. In this situation, the travel time from the observer to the equator to his south may be added to the t.c.a. to arrive at the midpoint in time of this orbit. One half a period is then subtracted from this figure to obtain the equatorial crossing time for the beginning of the orbit (see Fig. 7). Comparable computations may be performed for tracking stations located in the southern hemisphere.

Equatorial crossing times derived from these approximations will contain a systematic error of zero to five minutes in any individual observation. The magnitude of this error is a function of the latitude of the observer and the distance the satellite passes to the east or west of the observer.<sup>2</sup> Errors due to latitude will be smallest at the equator, increasing toward the poles. A direct overhead pass will have a minimum error for a given latitude, while passes more distant from the observer will have an error increasing with slant range.

As an example, a northbound pass traveling to the east of the observer will have its t.c.a. to the south of the observer's latitude, while a northbound pass to the west of the observer will have its t.c.a. north of the observer's latitude. For southbound passes, the t.c.a. of easterly passes will be north of; and westerly passes will

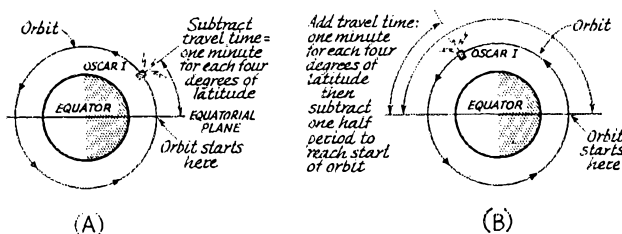


Fig. 7—Reception reports must be translated, to equatorial crossing time at start of orbit. Night-time orbital crossing (A) is approximated by subtracting travel time of satellite from equator to observer. Day-time orbital crossing (B) is approximated by adding travel time satellite requires to reach equator, then subtracting one-half period, as shown.

be south of the observer's latitude. The net result, therefore, of averaging a succession of passes in one location will be to reduce this error significantly in the final evaluation.

### How Many Successive Passes Can You Hear?

Oscar I crossed each latitude twice during one orbit, or about 32 times a day. This does not mean that any single observer can hear the satellite 32 times a day!<sup>3</sup> In order to be heard, the satellite must pass the observer's latitude in the vicinity of the observer's longitude. Successive orbits are widely separated at the equator but they cross each other near the latitude which is equal to the inclination angle of the orbit. As a result, the farther away from the equator a station is located, the better opportunity the observer has of hearing several successive orbits.

The sub-satellite tracks ("shadow" of the orbit on the earth) are separated by about 1530 miles (great-circle distance) at the equator. During each orbit of Oscar I, its sub-satellite track approached to within about 600 miles of each pole, based upon an orbit inclination angle of 81.2 degrees. At a nominal satellite altitude of 220 miles, the radio line-of-sight is about 1510 statute miles (1465 miles, great-circle distance) as measured from the sub-satellite point to the radio horizon. Thus, an observer within 865 miles of either pole would be within line-of-sight range of Oscar I once during every orbit. The observer at the equator, however, would be within line-of-sight range for only one or two successive orbits and no more. Under these orbital conditions, an observer at 20 degrees latitude (north or south) could hear a maximum of three successive passes; at 50 degrees latitude, four successive passes; and at 58 degrees latitude, five successive passes. Since the orbit of Oscar I was not a true circle with a radius of 220 miles, the actual number of successive observations varied from the calculated number given herewith.

### Is the Satellite Pass to the East or West of the Observer?

Suppose that an observer on the equator attempts to hear three successive northbound orbits during one evening. He fails to hear the first and third orbits, but gets an 8-minute track during the second pass. From these results he can conclude that the 8-minute pass was almost directly

overhead and that the first and third passes were outside of his radio range to the east and west, respectively. The observer also realizes that if daytime passes were being considered, the longitude of the station would have to be translated to the far side of the earth one-half period earlier to arrive at the true equatorial-crossing longitude. Contrariwise, his longitude is the equatorial-crossing longitude for the nighttime passes.

As direct overhead passes are not the common rule, imagine that on the following evening two orbits are heard, the first for 4 minutes and the second for 7 minutes. Our observer on the equator can conclude that he was between the two orbits and closer to the second one. He might reasonably guess that the second pass was 8 degrees to the west of his location!

Observers located up to 60 degrees latitude (north or south) may use this technique to estimate crossing longitudes with allowance for the fact that they may be able to hear up to five successive orbits in succession. Stations at greater latitudes are well situated to determine the satellite period because of the large number of observations they are able to make, but they may have difficulty obtaining an accurate determination of the longitude of equatorial crossing.

### Latitude Correction Factor

Observers at intermediate latitudes must take the effects of orbit inclination and rotation of the earth into effect in determining equatorial crossing longitude. These effects may be compensated for by the use of an orbit computer.<sup>4</sup> If such a device is not available, the correction factor for the observer's latitude may be determined from Table I. Determine the correction

Latitude of Observer							
		0°	10°	20°	30°	40°	50°
Northern Hemisphere	Day	168.5	167	166	165	163	161
	Night	0	1	2	3	4	7
Southern Hemisphere	Day	168.5	170	171	172	173	175
	Night	-23	-24	-25	-26	-27	-28

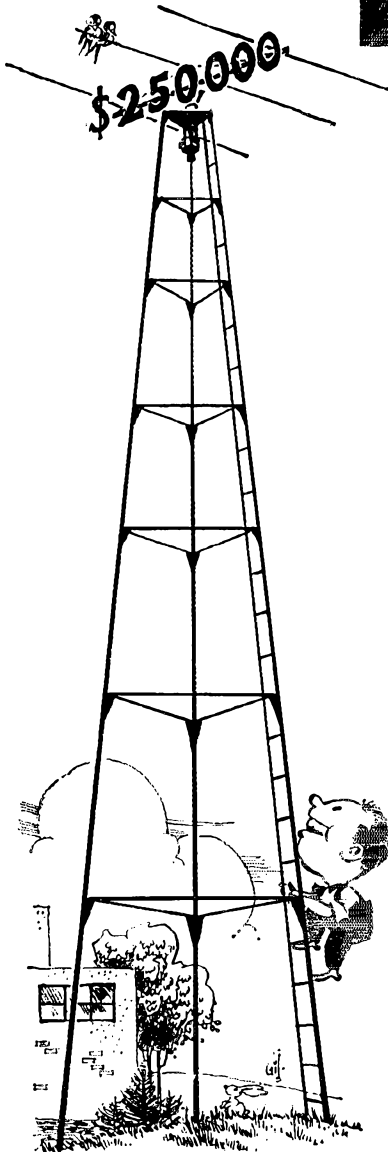
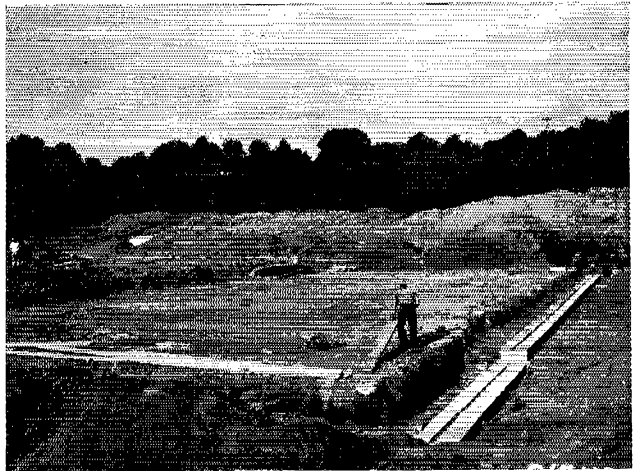
angle that applies to your latitude and add (subtract if number given is negative) it to the observed satellite longitude to obtain the

(Continued on page 140)

<sup>3</sup> Burhans and Rankins, "Keeping Track of Oscar," *QST*, May, 1962.

<sup>4</sup> Walters, Wells, Hillesland, "Project Oscar Measurements and Tracking," *QST*, July, 1961.

As with Building Funds, the initial stages of construction are always slow. This photo, taken on August 3, shows the footings in place. Work is proceeding on the foundation walls, and so the little man in red climbing the tower will now have to hurry to keep ahead of the contractor.



## Building Fund Progress

SUMMER is still with us, and it shows in the progress of the ham climbing our Building Fund tower — that is, he is still moving, but not especially fast. At the end of July, 2800 amateurs and clubs had contributed \$37,000, with individual amounts ranging from less than a dollar well into the four-figure bracket.

Requests for building-fund forms have held up well, and there are probably a good many amateurs on the verge of "buying a brick or two." Several clubs have been conducting projects of several types during the summer, and now that the autumn club season is in sight, the proceeds from these events will be reaching headquarters in considerable numbers.

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We started mailing certificates of appreciation for Building Fund contributions late in July. By the time you read this, the backlog should have been whittled down to nothing, and our mailing of the certificates should be on a current basis. If you were an early contributor, and you haven't received a certificate, please let us know.

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At long last, all of the preliminaries are over with and construction of the new building is underway. As we write in early August, the site has been cleared and graded, and concrete footings have been poured. Power shovels, bulldozers, draglines, mixers have been at work. There are stacks of lumber for forms, piles of steel rods for reinforcement. Progress should be rapid and visible from here out — now the new building feels like more than a dream.

Q57

## September V.H.F. QSO Party

**C**Q CONTEST" on the v.h.f. bands the week end of September 15-16 will mark another popular ARRL V.H.F. QSO Party. This contest which gets under way at 2 P.M. (1400) your local standard (not daylight) time Saturday, September 15, and runs through 10 P.M. Sunday, September 16, is open to all amateurs in the 72 ARRL sections who can work 50 Mc. or above. For purposes of the contest Yukon-N.W.T. (VE8) will count as a separate section. Contacts count only when the contest is in progress at both ends of the QSO.

Just exchange ARRL section (see page 6, this QST) and count one point for completed exchanges on either 50 or 144 Mc.; two points for contacts on 220 or 420 Mc.; and three points for contacts on higher bands. The sum of these points multiplied by the number of different ARRL Sections worked per band gives you your final score. Therefore, it pays to contact the same stations on different bands to increase both contact points and multiplier.

A rules change now permits foreign stations contacted, such as XEs and COs, to count for score. All foreign contacts count for QSO points, but *only once* for section multiplier per band, even if in different countries. See rule 4b.

A certificate goes to the highest single-op scorer in each section, as well as a certificate to the highest scoring Novice and multiple-operator station in each section from which at least three entries in that special category are submitted.

Send to ARRL Communications Dept., 38 LaSalle Road, West Hartford 7, Conn., for free log forms as shown on page 60 of June, 1962, QST. Either follow that log format, or send for the log forms. Reports should include your call and ARRL section, as well as times, calls, and sections of stations worked. To report the results in December QST (so you'll know how you did before the V.H.F. SS starts), we must have the logs in before the deadline. Logs must be postmarked by October 8. Good luck!

### Rules

1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, Sept. 15, and ends at 10:00 P.M. Local Standard Time, Sunday, Sept. 16. All claimed contacts must fall within this period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation. Contacts between stations in different time zones can be counted only when the contest period is in progress in both of the time zones concerned.

2) Name-of-section exchanges must be acknowledged by both operators before either may claim contact point(s). A one-way exchange, confirmed, does not count; there is no fractional breakdown of the 1-, 2-, or 3-point units.

3) Fixed-, portable- or mobile-station operation under one call, from one location only, is permitted. A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest.

4a) Scoring: 1 point for completed two-way section exchanges on 50 or 144 Mc.; 2 points for such exchanges on

220 or 420 Mc.; 3 points for such exchanges on the higher bands. The sum of these points will be multiplied by the number of *different* ARRL sections worked per band; i.e., those with which at least one point has been earned. Re-working sections on additional bands for extra section credits is permitted. Cross-band work does not count. Contacts with aircraft mobile stations cannot be counted for section multipliers.

4b) Foreign entries: All contacts with foreign countries (such as Mexico and Cuba) count for score. All foreign countries are grouped together as one, and a section multiplier of *no more than one* (per band) may be claimed for contacts with all foreign stations contacted. Foreign stations may only work stations in ARRL sections for contest credit. Foreign stations will give their country name in the exchange.

5) A contact per band may be counted for each station worked. Example: W1FZJ (E. Mass.) works W1HDQ (Conn.) on 50, 144 and 220 Mc. for complete exchanges. This gives W1FZJ 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W1FZJ contacts other Connecticut stations on these bands, they do not add to his section multiplier but they do pay off in additional contact points.)

6) Each section multiplier requires completed exchange with *at least one station*. The same section can provide another multiplier point only when contacted on a new v.h.f. band.

7) Awards: A certificate will be awarded to the high-scoring single-operator station in each ARRL section. In addition, the high-scoring multi-operator station will receive a certificate in each section from which three or more valid multiple-operator entries are received. Certificates will also be given to the top Novice in each section where three or more such licensees submit logs. Award Committee decisions will be final. Foreign entries will be grouped under a separate QST listing.

8) Reports must be postmarked no later than Oct. 8, 1962, to be eligible for awards. Follow the sample log for correct form, or a message to Headquarters will bring printed blanks for your convenience. QST

## Strays

Summer madness again — WA2BBK, WA2LKW, and W2SCI wish to have it recorded that they conducted an 80-hour marathon on 15 meters during early July.

— . . . —

K1OPQ claims a different kind of record. In his 2½ years as a ham he has owned 15 different transmitters, four different receivers, and 23 antennas. Despite this shuffle of equipment, he has made 3296 QSOs. And he's 16 years old. Ah, the energy of youth!

— . . . —

W6EUM points out one of our April goofs. Seems that on page 32 (in the article by Soifer) we printed "The launch . . . from the Pacific Missile Range (Vandenberg to you)." The Vandenberg AFB has nothing to do with the Pacific Missile Range, says W6EUM. The Pacific Missile Range is owned, operated, financed and administered by the U. S. Navy. Any missile or satellite launched from an Air Force installation and taking advantage of the Pacific Missile Range is doing so in the role of a *user* only. Sorry, Navy!



# Magnetic-Tape Second Operator

## Automatic Calling for Contests and Schedules

BY WILLIAM L. SMITH,\* W3GKP/A3GKP

*This automatic caller or "CQ machine" makes use of magnetic tape and a playback head. Tapes are easily made by tone recordings on a tape recorder, making it unnecessary to cut or punch holes.*

ONE thing which never fails to intrigue visitors to this station is the magnetic-tape keyer. I have never regarded this as a unique device — it was simply built to do a job and it does it. But there has been so much favorable comment that I have decided to tell about it.

But first I had better tell you what it does. Simply stated, it makes repetitive calls — the same old calls over and over as long as it runs. It does this with rather more flexibility than a cam-operated "CQ wheel" or "V wheel," because the call can be changed in a matter of seconds. In addition, it cannot stop or be stopped in a key-down or "on" condition.

You may wonder who wants this, and what good it will do him, and I must admit that not every operator will have a use for it. In the first place, it is strictly a c.w. device. Any c.w. operator can use it for calling CQ. Traffic handlers can use it for directional calls, and net-control stations can use it for calling the net. Official Relay Stations and those broadcasting code practice can use it to alert listeners with a five-minute run before broadcasts. V.h.f. operators keeping schedules, operating beacons, or attempting meteor-scatter contacts can put it to work frequently and will find it a great labor saver. RTTY operators could also use it to solve their dual identification problem.

### Station Control System

Fig. 1 shows how the keyer is wired into my station. The heart of the system is the tape deck, and more details of this will be given later.

\* Spencerville, Maryland.

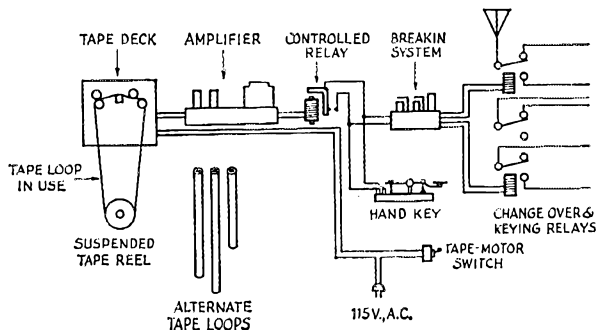
The deck is mounted in a relay rack, with the panel vertical. The tape loop in use is threaded on the deck and is kept in tension by a standard 3- or 5-inch diameter tape reel suspended on the loop. When the tape deck runs and the loop goes around, the reel seems to turn on an "invisible bearing." The tape loop has recorded on it an audio tone, keyed to form the desired call. Alternate loops containing other calls are stored on pegs near the deck.

In the deck, the tape is drawn over a "reproduce" or "playback" head. The output of the head is a keyed low-level audio signal, and it is fed to the input terminals of the amplifier. The output of the amplifier actuates the controlled relay, the contacts of which are connected in parallel with the hand key.

At this station there is in use a break-in system which makes the hand key the only transmitter control for c.w. operation. When the key is closed, the break-in system disables the receiver, switches the antenna, and turns on the transmitter high voltage, all in rapid sequence and without ear-splitting crashes. As the transmitter is keyed, all of these relays remain operated, and a monitoring tone is delivered to the headset. If the key is released for a few seconds (the exact period is adjustable) the transmitter is disabled, the antenna switched, and the receiver activated, again without clicks or crashes.

The only control used for the magnetic-tape keyer is a switch for the a.c. power to the motor in the tape deck. When this switch is turned on, the tape is set in motion, the tone signals are reproduced and amplified, and the controlled relay follows the keying. Operation of the relay is equivalent to operation of the hand key, and the radio equipment is switched to the transmitting condition. When the tape motor is turned off, the tone signals cease. If the hand key is not operated, the equipment switches to receive in a few seconds. On the other hand, it is no trick at all to pick up with the hand key where the tape leaves off, and continue the transmission if desired.

Fig. 1—Over-all control system used by W3GKP. The tape caller drives a relay in parallel with the hand key. The antenna-change-over system is of the automatic type that switches to transmit when the key is actuated and shifts to receive when the key is open for a short interval.



By now you may have the idea that building a tape keyer is a big job, perhaps the equal of building your own tape recorder. This is not the case.

Certainly anyone who has attempted to design, build, test, adjust or repair a tape recorder knows that there are a number of complex factors to be considered. These include handling the tape without breaking it, obtaining truly constant-speed drive for the tape, reducing hum pickup in the head, equalizing for proper frequency response, and amplifying the signal with low noise and distortion. Let the faint-hearted note that none of these are serious problems in the construction of a tape keyer, and most of them are nonexistent.

In the first place, in a keyer we are concerned only with a simple tape loop, driven in one direction at a single speed. Since the tape contains only a single frequency, there is no need to worry about frequency response or equalization. Distortion is no problem, and the tone signal may be recorded at the highest level the tape will accommodate. Hum and noise can almost be neglected, because the relay will follow a signal-to-noise ratio of 10 db. or so. Lastly, wow and flutter resulting from eccentric shafts in the tape drive system might play hob with speech or music, but they have no noticeable effect on the code signals.

The electronics for a tape keyer will pose no problems for the average ham, and I will not devote much time to it. At the front end of the system, almost any old recording or playback head can be used. A head which is worn much too much to perform properly in a recorder will work beautifully in a keyer, and that is how I came by the one I used. Alternatively, the cheapest type of replacement head will do.

Most heads are high-impedance devices, but deliver a pretty feeble signal — somewhat lower than that from a crystal microphone. The amplifier input stage may look just like one made for a crystal microphone, and the head should be connected with shielded wire. However, it may be

necessary to provide another stage or two of gain over what would be used for a microphone. If the head has more than two wires, try all combinations and use the one delivering the strongest signal.

I first connected the head to a low-power amplifier-modulator (6V6 output stage) formerly used with a crystal microphone for screen modulation. The gain was not quite sufficient for reliable keying. Next, I connected between the head and the modulator a small commercially-made self-powered preamplifier made for use with a magnetic phono cartridge and employing a 6SC7 double-triode tube. Once the main amplifier gain was set properly, this worked fine, and it has not been touched (even the gain control) in several years.

The output of the amplifier must actuate the controlled relay. In my case the output transformer of the little modulator had a variety of impedances available. I selected a winding of about 500 ohms, rectified the output with a junction diode, filtered it with a capacitor, and applied it to the coil of a d.c. relay. It worked fine. If you use this system, try to choose a relay which has a d.c. resistance about twice the impedance of the transformer winding, and one which is fairly sensitive and will follow fast keying. Experiment a bit with the capacitor shunting the relay coil until you find the value which results in the snappiest operation.

There are other methods of controlling the relay with the amplifier output, and one is to change the last stage to a "detector." The simplest type might be the "infinite-impedance" configuration with B+ applied directly to the plate and a high-resistance relay inserted between cathode and ground. Again, shunt the relay with a capacitor and experiment with its value.

### Tape Drive

Now for the mechanical department; that is, the tape deck. Let me emphasize that many of the details are shown "for information only" and need not be copied. Any other arrangement which meets the basic requirements should be satisfactory.

The basic requirements of the tape drive are shown in Fig. 2. The tape must be drawn over the head (2) at a reasonably constant speed, and must remain in firm contact with the surface of the head at all times. The tape is pinched between the capstan (5) and the pressure roller (6). The capstan (5) is simply a metal shaft driven by a speed-reduction system. The pressure roller (6) is faced with rubber so that the tape will not slip. It rotates freely on a supporting post (7), and it is pressed against the capstan by a spring arrangement (8, 9, 10, 11). The route of the tape before passing over the head is controlled by two guides (3, 4). Both of these are fixed, not rotating, and one (4) has filed in it a slot or groove  $\frac{1}{4}$  inch wide which just fits the tape. This fixes the distance between the tape and the supporting panel to prevent the tape from wandering laterally over the surface of the head. Note in Fig. 2 that the path

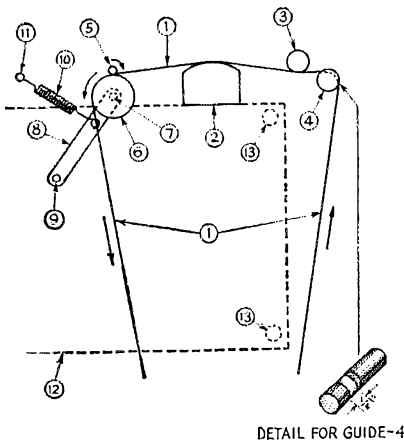


Fig. 2—Sketch showing details of the tape deck. Capstan (5) is driven by mechanism shown in Figs. 3 and 4.

of the tape curves slightly as it passes over the head. The purpose of this is to keep the tape in firm contact with the head. Some tape recorders use spring-loaded felt pressure pads to push the tape against the head, but in a keyer such pads would have to be pushed out of the way each time a new tape was threaded on the deck. For this reason I wanted to avoid them. The curvature in the tape will result in good tape-to-head contact if sufficient tension is applied to the tape. I tried a lot of schemes (all unsuccessful) for keeping the tape under tension before I was shown the suspended-reel arrangement shown in Fig. 1. This arrangement was suggested by Mr. M. C. Sprinkle, who hung a 7-inch reel on the tape as soon as he saw my problem. I have since found that a 3-inch reel works satisfactorily and is easier to change in a hurry.

When changing tape loops, the tape is lifted out of the slot in guide (4) with the right hand. The arm (8) is then pulled down slightly so that the pressure roller does not contact the capstan, and the entire loop is withdrawn. The suspended reel is removed and placed on the new loop, which is then installed. I can do it a lot more quickly than I can tell about it.

### Capstan Drive

The only other basic requirement concerns getting the right tape speed. If you have a tape recorder, or have access to one at some friend's shack, you will want to select a compatible tape speed. (It's best not to call CQ at 60 w.p.m. if you QSO at 13, or vice versa.) Of course, the tape speed will depend upon both the diameter and the rotation speed of the capstan (5). The formula for this is shown at the top of Table I, where *r.p.m.* is the capstan rotational speed in revolutions per minute, *D* is the capstan diameter in inches, *S* is the tape speed in inches per second, and  $\pi$  is, as usual, about 3. (For our purposes we can forget the .1416.) Table I shows capstan speeds for a variety of capstan diameters and standard tape speeds.

Table I

Capstan Speed in r.p.m.				
For various tape speeds and capstan diameters				
	$r.p.m. = \frac{60S}{\pi D}$			
	Capstan Speed (r.p.m.)			
Capstan Diam. Tape Speed	$\frac{1}{8}$ in.	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	$\frac{3}{4}$ in.
$1\frac{1}{8}$ in. per sec.	286	143	72	36
$1\frac{1}{2}$	573	286	143	72
$3\frac{1}{2}$	1146	573	286	143
$7\frac{1}{2}$	2292	1146	573	286
15	4584	2292	1146	573

If a high-speed motor is used, the smaller capstan diameters require less speed reduction. Diameters around  $\frac{1}{8}$  inch are a bit risky, as slippage may occur, and the effects of eccentricities become magnified. In addition, it is easy to bend a

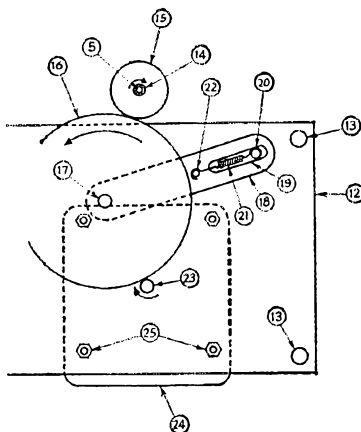


Fig. 3—Parts mounted on subpanel (12). Motor shaft (23) drives idler wheel (16) which, in turn, drives capstan drive wheel (15) mounted on capstan shaft (14). Turned-down end (5) of capstan shaft bears against spring-loaded pressure idler (6) in Fig. 2 to drive the tape.

$\frac{1}{16}$ -inch capstan with an accidental bump.

My deck uses a high-speed motor and a  $\frac{1}{8}$ -inch capstan, and moves the tape at about  $3\frac{3}{4}$  inches per second. From Table I, the capstan speed must be just under 600 r.p.m. The total speed reduction is 4:1, so the motor must be running at about 2300 r.p.m. Details of the speed reduction and the rest of the deck are shown in Figs. 3 and 4, and the parts illustrated are identified in Table II.

The dotted lines in Fig. 2 show the subpanel and the posts which support it behind the main panel. All of the rest of the works are supported from the subpanel, as shown in Fig. 3. The brass capstan-drive wheel (15) is attached to the capstan shaft with a setscrew. The rubber-tired idler wheel (16) is supported by pivot (17) on arm (18), and the whole assembly is pulled to the right by spring (21) so that the idler (16) is jammed between the capstan drive wheel (15) and the motor shaft (23). The idler wheel and some of the other parts were salvaged from a defunct record player. If you study this a while, you will see that the diameter of the idler wheel has nothing to do with the speed-reduction ratio; this ratio is determined entirely by the diameters of the motor shaft (23) and the capstan drive wheel (15).

Fig. 4 is a top view of the tape deck, and it may help in understanding how the parts fit together. One thing not shown is the capstan-shaft support bearing which supports the capstan shaft (14) only at the front panel (26). The one I used is a twin-row ball bearing which permits very little wobble. If a plain bearing such as a panel bushing, is used, it might be smart to extend the capstan shaft back to the subpanel (12) and support it at two points. Shaft collars in front and back of the subpanel could control end play in the capstan shaft without getting in the way of the parts up front.

The important thing about the tape-deck mechanism is to get a feel for what it does and how it works, so that you can build your own out

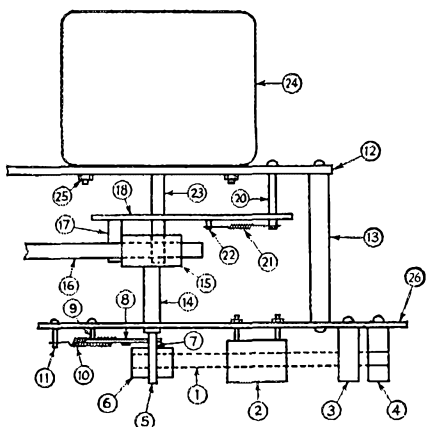


Fig. 4—Top view of complete tape-driving mechanism. Tape pressure wheel (6) turns on shaft (7) (hidden by capstan (5) in this view) which is mounted on spring-loaded arm (8).

of what you have or can get. Record-player parts fit naturally in many places; if you don't collect old players, a variety of the rubber-tired wheels can be found in radio-parts stores. There also exists the possibility that the whole works could be put together from Erector-set parts if the kids will let you get away with it.

#### Head Adjustment

To get the strongest signal out of the head, the slot or gap in the head core (it is nearly invisible) should be at right angles to the direction of tape motion. This is called "azimuth" and most recorders have an adjustment for it. You can get the same effect by putting compression springs or rubber bushings (like grommets) under one or more of the screws which attach the head to the panel. As the screws are tightened and loosened, the head will rock slightly from side to side. Adjust it for maximum output while running a tape recorded on the same machine you will use for making the rest of your tapes.

#### Making the Tapes

Making tape loops is no problem if you can get a tape recorder. Almost any sort of audio oscillator or tone generator can be rigged up for keying and connected to the recorder input. I key my transmitter (with the final off) and tune it in on the receiver and feed the receiver output to the recorder. The recorder gain should be set so that the tone is recorded "full blast" while keeping the spaces between dots and dashes reasonably quiet. It may pay to experiment some with the pitch of the tone; the higher frequencies (up to 3000 or 4000 cycles) will result in more output on playback unless the head is badly worn or the azimuth adjustment way off.

When making a tape loop, record it at the beginning of a reel, and play it back a few times to make certain that the keying is good and the level high. Then cut out the section of tape containing the desired keying, leaving a dead zone of a few

inches at each end. Splice the tape section into a loop, using regular splicing tape and the usual diagonal splice. Try it on the keyer to make sure it keys properly and see how the dead zone sounds. I snip my loops down until the break-in system does not drop out during the dead zone.

The keyer can save lots of fatiguing work on a meteor-scatter schedule. One can not only make up tape loops calling various stations, but also several tapes for the same station, each with a different report included. Since the loops can be changed rapidly, the one with the appropriate report can be put on the air in a hurry.

For a scatter tape, you can make either a short tape which goes around several times during your 15-second or 30-second transmitting period, or a longer tape which goes around only once. When using the short-tape method, it is well to practice the call a bit while watching a clock, so as to result in a loop period which will permit some integral number of calls to be made in 15 or 30 seconds. With a break-in system like mine, you can cut the motor switch and put in a "BK" after the last time around.

For fast tape changing, it is good to mount the tape deck in such a position and height that it can be reached from the operating position. This may limit the maximum tape length, as the suspended reel may touch the floor, resulting in a loss of tape tension. Longer loops may be run

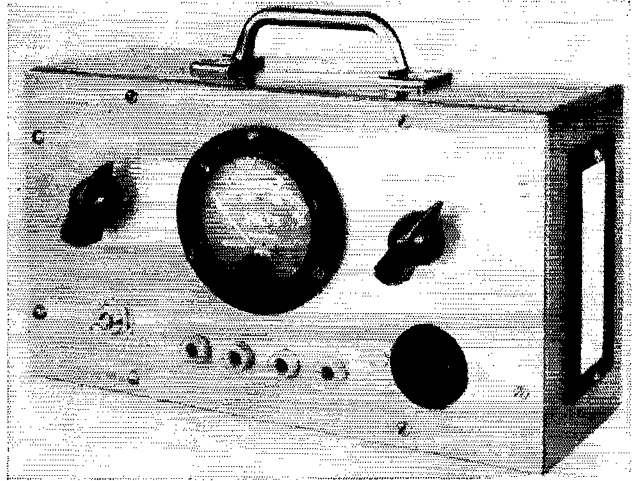
(Continued on page 150)

Table II

#### Parts Identification for Figs. 2, 3 and 4

- 1) Magnetic tape 1/4-inch wide, in endless loop, prerecorded with tone telegraph signals.
- 2) Playback head.
- 3) Fixed guide; 3/8 x 1-inch ceramic post insulator.
- 4) Fixed guide; 3/8 x 1-inch phenolic post insulator with 1/4-inch groove (see detail, Fig. 2).
- 5) Metal capstan; 1/8-inch diameter, turned-down end of the capstan shaft (14).
- 6) Pressure roller with soft rubber facing, rotating freely on shaft (7).
- 7) Pressure-roller shaft attached to arm (8) (shown in Fig. 2; hidden by capstan (5) in Fig. 4).
- 8) Pressure-roller arm.
- 9) Pivot for pressure-roller arm, attached to panel (26).
- 10) Pressure-roller tension spring.
- 11) Anchor post for spring (10).
- 12) Subpanel.
- 13) Subpanel support post (two more, at the left of the panel, in Figs. 2, 3, and 4, are not shown).
- 14) Capstan shaft, 1/4-inch diameter, supported from panel (26) by bearing not shown (see text). One end turned down to form capstan (5).
- 15) Capstan drive wheel, 1-inch diameter, brass.
- 16) Rubber-tired idler wheel, rotating freely on post (17).
- 17) Idler support post.
- 18) Idler arm.
- 19) Slot in arm.
- 20) Arm support post.
- 21) Arm tension spring.
- 22) Spring attachment post.
- 23) Motor shaft, 1/4-inch diameter.
- 24) Motor.
- 25) Motor attachment nuts.
- 26) Front panel.

VE3BWL's outboard metering unit is built in a 7 × 5 × 3-inch aluminum chassis, the bottom cover plate serving as the panel on which the components are mounted. The range-selector switch  $S_2$  is to the left of the meter. The knob to the right controls variable resistor  $R_1$ . From the consideration of safety, the octal connector should be of the male type, so that the connector on the cable from the transmitter, which may be carrying dangerous voltages, will have no exposed contacts.



## A Transmitter Metering Unit

*Versatile Instrument for Initial Adjustment and Servicing*

BY RONALD M. BROWN,\* VE3BWL

It is customary these days to provide metering in a transmitter only to the extent required for operating adjustment. However, when trouble develops, additional metering will usually be helpful. In this article, VE3BWL describes a system that makes it unnecessary to up-end the chassis and trace out wiring to make these checks.

COMPLETE metering of all circuits in a multistage transmitter is seldom provided, not only because such detail is not required in normal operation, but also because it leads either to an impractical number of meters or to a multitude of switch positions too confusing for everyday use. In portable and mobile gear, limited space often restricts metering to the bare minimum needed for tune-up or, in fact, to no internal metering at all, dependence being placed on a field-strength meter, or other output indicator, for all adjustments. However, the ability to check all circuits, or most of them, is a distinct advantage when trouble shooting becomes necessary, and the external unit shown in the photograph was designed to fill this need.

In this article, the basic system will be stressed, with the unit pictured serving as an illustrative example. The basic system may be extended as desired. Such a unit should be of particular value to the technician or experimenter, and an invaluable aid to clubs working on projects similar to the "Club Saver Two-Meter Portable,"<sup>1</sup> which

appeared in *QST* several years ago. One or two of these metering units could be built up for testing the rigs initially, and made available to club

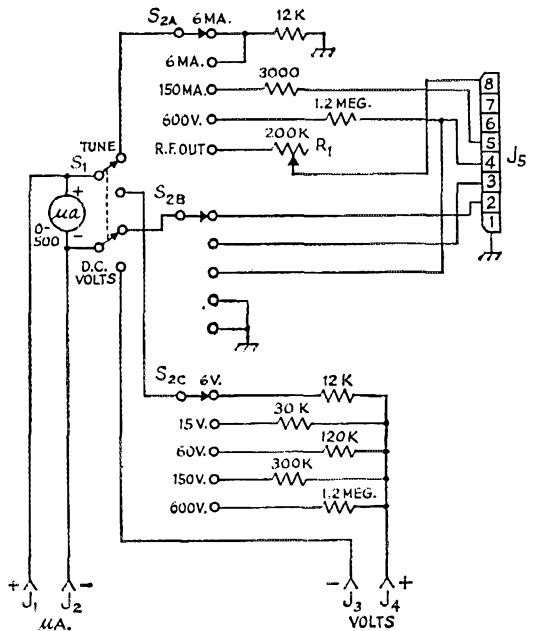


Fig. 1—Circuit of the metering unit shown in the photograph. Resistances are in ohms and resistors are ½ watt. See text for suggested resistance values for 1-ma. meter.  $J_1, J_2, J_3, J_4$ —Banana jack.  $J_5$ —Octal male chassis-mounting connector.  $R_1$ —Linear control, 50,000 to 200,000 ohms (not critical).  $S_1$ —D.p.d.t. toggle switch (rotary for over 600 volts).  $S_2$ —Three-pole five-position rotary switch.

\* 192 Santa Monica Blvd., Scarborough, Ontario, Canada.  
<sup>1</sup> Tschannen, "The 'Club Saver' 2-Meter Portable," *QST*, October, 1957; feedback, December 1957.

members for tuning up their completed units at home. In its expanded form, such a metering unit will facilitate the servicing of larger equipment.

### Basic Arrangement

The basic idea is not original, although I have never seen it described in any ham publication. I learned of it when trouble developed in the commercial mobile rig that I use in the pursuit of my daily bread. When I brought the rig into a service shop, out came this device, and the defect was spotted almost immediately.

Essentially, the arrangement consists of bringing metering leads out from circuits which are not normally metered to a connector at the rear of the chassis where connection may be made to an external metering unit when desired. The switch of the metering unit is wired so that it selects the proper voltage or current range for each circuit. If a metering connector is installed in various pieces of equipment with connections to match those of the metering unit, the latter may be used interchangeably as needed.

The metering circuit that I use is shown in Fig. 1, but it may be modified as desired to suit other meters, or expanded to include more circuits. Dual (or 3-gang) rotary switches and "octal"-type connectors are available with up to 11 contacts.

### Current Measurement

Although the meter dial calibration will be in terms of milliamperes, current is actually measured indirectly from the voltage drop across a resistor inserted in the lead to be monitored, as described in the measurements chapter of the *ARRL Handbook*. This system permits the use of standard-value resistors, making critically-

adjusted multiplying shunts unnecessary. Fig. 2 shows how these "shunt" resistors should be connected in typical circuits.

The meter used in the author's metering unit was taken from a surplus No. 19 tank transceiver. It has a 500-microampere movement and the dial has two printed scales, one 0-15 and the other 0-600. Therefore, to provide direct reading, I chose resistor values that would give full-scale readings in multiples of 15 and 6. With the resistance values shown in Fig. 1, and  $S_1$  in the TUNE position, the full-scale readings are 6 ma. for the first two positions of  $S_2$ , 150 ma. for the third position, and 600 volts for the fourth position. The shunt resistors installed in the transmitter for current measurement are 1000 ohms for the 6-ma. ranges and 10 ohms for the 150-ma. range. I use the 6-ma. ranges for checking driver and final grid currents in the Club Saver portable, and the 150-ma. range for the final plate current.

If the proverbial 1-ma. meter is used as a substitute for the 500- $\mu$ a. meter, shunting-resistor values of 1000, 100 and 10 ohms, combined with series-resistor values of 10,000 ohms each, will give full-scale readings of 10, 100 and 1000 ma., respectively. These ranges will usually be adequate for all service work.

### Checking Voltage

The fourth position of  $S_2$  provides a voltmeter circuit with a maximum scale reading of 600 volts. This is used to check the final plate voltage. If a 1-ma. meter is used, series resistors of 10,000, 100,000 ohms or 1 megohm will provide full-scale readings of 10, 100 or 1000 volts, respectively.

The fifth switch position is used to connect the meter into a relative-power output-indicator

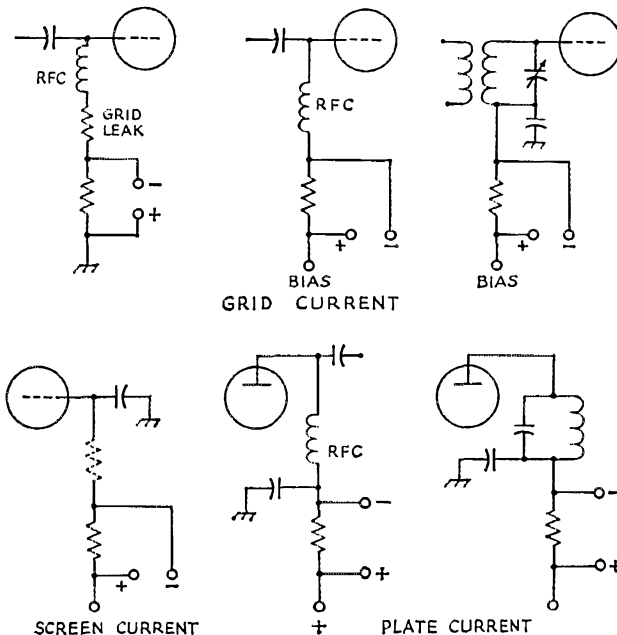


Fig. 2—Diagrams showing placement of shunt metering resistors for current measurements in circuits of various types. Resistance values are determined as described in the text. Wattage ratings may be determined by calculation from resistance values and maximum current to be expected ( $P=I^2R$ ). The resistor terminals shown are brought out to the connector at the rear of the chassis as mentioned in the text, with pin connections corresponding to those of the desired current ranges in the metering unit.

circuit built into the transmitter. This circuit is shown in Fig. 3. Components were assembled and wired on a 5-terminal (one ground) soldering-lug strip placed close to the coax output receptacle of the transmitter. Variable resistor  $R_1$  should first be adjusted to maximum resistance. With the transmitter operating, the resistor should then be adjusted as required to prevent driving the meter off scale.

#### Other Functions

A pair of banana jacks ( $J_1$  and  $J_2$ ) is provided so that the meter alone may be used for other purposes. For example, I use these jacks to patch the meter into a version of the "Mickey Match" s.w.r. meter.<sup>2</sup> Another pair of similar jacks ( $J_3$  and  $J_4$ ) permits external connection to a voltmeter circuit having maximum-scale readings of 6, 15, 60, 150 and 600 volts, when  $S_1$  is in the VOLTS position.

This unit was originally built to meter the two-meter rig occasionally when changing frequency.

<sup>2</sup> Bunce, "The 'Mickey-Match,'" *QST*, November, 1958.

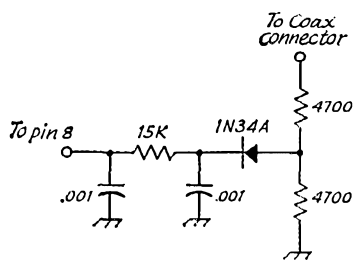


Fig. 3—Circuit of the relative-power output indicator. Resistances are in ohms and resistors are 1/2 watt. Capacitances are in  $\mu\text{f}$ . and capacitors are disk ceramic.

Since that time, it has been adapted to a similar six-meter rig and, in the very near future, it will be used to meter an 80- and 40-meter rig. With a unit such as this attached to your portable or mobile rig, you will no longer have to search for the glow of a neon bulb in bright sunlight. I hope that others will find this little device as useful an addition to the ham shack as I have. QST

## Strays MOJO

The *Ham Phone Directory*, published by K4DJW, will make its second edition appearance about the first of December. If you live in Dade, Broward, or Monroe Counties, please send your call, name, address, and phone number to K4DJW, Morris Stabin, 1136 S. W. 74th Court, Miami 44, Florida. There's no charge for the listing, but if you want a copy of the directory, include a dollar bill. All proceeds from this venture go to the Variety Children's Hospital in the Miami area.

— . . . —

Ahoy, all Sigma Alpha Epsilons. Get in touch with K8MMZ, 4383 Keeler Drive, Columbus 13, Ohio.

— . . . —

The Radio Amateurs of Greater Syracuse (RAGS) will have a display and operate a station at the New York State Exposition, August 28 through September 5. The station, operating 80 through 10 on a.m., sideband, and c.w., will be located in the Farm Machinery Building. Visitors welcome. The call K2NYS has been assigned.

— . . . —

HMS *Bounty*, the three-masted sailing vessel built expressly for the film *Mutiny on the Bounty*, has left Vancouver, British Columbia, and is proceeding to the east coast of the United States via the Panama Canal, with stops along the way. After a trip across the Atlantic to England, she will return to the States in November. VEØMO is operating aboard, on 20-, 15-, and 10-meter sideband and c.w. If you work the *Bounty*, send your QSL to the Metro-Goldwyn-Mayer Studios Amateur Radio Club, Culver City, California. "Spud" Roscoe is the operator.



When the FCC recently moved its license-issuing facilities to Gettysburg, Pa., the Adams County ARS rightly thought that it would be a nice gesture to have some of the FCC staff see a ham station in operation. After a talk by K3EUE, K3EYL got on the rig and raised W4SLA, who is assistant chief of the licensing bureau in Washington. Among those who took part in the evening's activities were those seen in the photo above. (The information in the parenthesis following each name indicates the call area taken care of by the individual.) Standing (l. to r.), Darlene Wagaman (5), Marilyn Moore (3, 7, KL7), Clara Roberts (Ø), Sophia Matthews (supervisor), Dot Shindledecker (4, KP4), and Elaine Hess (9). Kneeling (l. to r.), Richard Ziegler (8), Sterling Cole (6 and Pacific Islands), Clara McDannel (2) and Ann Bean (1). The young fellow is the son of Mrs. Roberts, and that's K3EYL seated at the mike. (Photo by W3KGN)



# Hints and Kinks

For the Experimenters



## INCREASING THE HEATHKIT "SHAWNEE" SPOTTING SIGNAL

SOME Shawnee owners have found that, due to the extensive shielding incorporated in the units, the spotting signal is rather weak. More spotting signal can be achieved by connecting the doubler stage to the spot switch. The necessary changes are as follows:

- 1) Disconnect the blue lead coming from BO No. 2 at lug 5 on terminal strip BB.
- 2) Remove the red lead between lugs 5 and 2 of terminal strip BB.
- 3) Connect the blue lead from BO No. 2 to lug 2 of terminal strip BB.
- 4) Connect a short length of insulated wire between lug 5 of terminal strip BB and lug 5 of terminal strip AA. — *Robert B. Halton, K3RBH*

## SPEAKER REPAIR SOLUTION

"CORRECTION compound," designed to cover mistakes in typed mimeographed stencils, can also be used for repair of small tears and holes in speaker cones. The solution is inexpensive and can be purchased in small quantities from most any of the office-supply houses.

— *Bill Whitten, K4KIV/3*

## CONVENIENT PANEL MARKER

THE Taperaser blockout typewriting correction tape made by Dixon Co., Jersey City, New Jersey, serves also as a way to put panel markings on a black panel. Just write through the tape on the panel with a ball-point pen and it leaves a white mark that is not easily rubbed off. A bit of clear lacquer spray or varnish over the lettering will make for a neat and permanent job.

— *Rev. William P. Hall, jr., W4NHX*

## LEVER FOR ELECTRONIC KEYS

THE popularity of building electronic keys has given rise to the necessity for electronic keyer actuators. An old 6- or 12-volt vibrator

should not be overlooked as an excellent source of a set of contacts. In some cases, the armature from the vibrator can also be used.

— *James T. Lawyer*

## USING THE MONIMATCH ON 6 AND 2 METERS

MY Monimatch, Mark II (February, 1957, *QST*, page 38) works well on 50 and 144 Mc. with feed-through bypasses in place of the .001- $\mu$ f. disk ceramics used in the original. This scheme eliminated the need for tie points for mounting the diodes.

— *Fernando Cordova Solo, XE1CT*

## AN INEXPENSIVE 40- AND 80-METER ANTENNA

THE antenna shown in the sketch in Fig. 1 is only slightly longer than a 40-meter doublet, yet it performs well on both 80 and 40 meters. The dimensions given are the result of several trials of various lengths on both the 40- and 80-meter sections.

The loading coils are made from two lengths of ordinary  $\frac{3}{4}$ -inch plastic water pipe (outside diameter  $1\frac{1}{16}$  inches) 10 inches long, close-wound with 197 turns of No. 18 Nyclad copper wire.

The center insulator was sawed from  $\frac{1}{4}$  inch thick Plexiglas to the dimensions shown in Fig. 1. The top hole in the insulator supports the center of the antenna which is "hung" from the center post about 20 to 22 feet above the ground.

When fed with 50-ohm coax cable, my antenna had an s.w.r. of less than 2 to 1 over the entire 40-meter band and less than 2 to 1 over any 80-ke. segment of the 80-meter band. With the dimensions shown, the antenna will resonate at about 3850 kc. The change in frequency is approximately 50 kc. for each 5 inches on 40 meters and 50 kc. for each 1 inch on 80 meters. Changing one section has very little effect on the other.

— *John Buchanan, K7CRO*  
(in "Solid Copy")

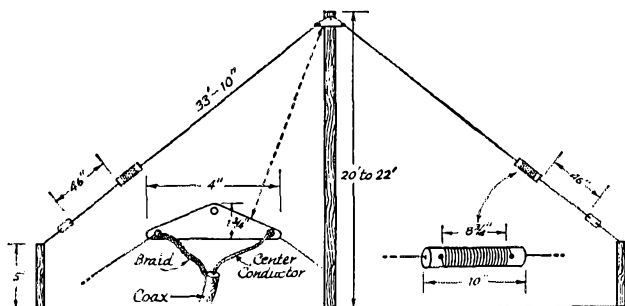


Fig. 1—K7CRO's 40- and 80-meter antenna. Details of the center insulator and the loading coils are also shown.



## ENGINE IDLING TIP FOR MOBILE OPERATORS

MOBILE operation while "standing still" usually necessitates an increase in the engine's idling speed in order to keep the car's charging system in operation. Doing this by holding the accelerator pedal with one's foot is tiring after awhile or setting the carburetor idling control for high idle r.p.m. causes cars with automatic transmissions to "creep".

Since the carburetor jets on most cars are adjusted for optimum fuel-air mixture at higher than idle speeds, the mixture is usually too rich for efficient idling. If your car has vacuum windshield wipers, simply detach one end of the vacuum hose that runs to the windshield wiper motor. This leans the mixture and results in an increase in engine idling speed without using additional fuel. If this type of mobile operation is commonplace, install a "Tee" fitting in the vacuum line, and connect the third leg to a control valve of some sort. If your car doesn't have vacuum operated windshield wipers, there is usually a vacuum line running to the distributor.

— Paul R. Buckwalter, WA2EHD

## DUAL TUNING EYE FOR RTTY

Most RTTY terminal units use an oscilloscope or a zero center meter as a tuning indicator. A less expensive approach is to use a 6AL7 electron ray tube. This "magic eye" tube has two "eyes" so that both the mark and space filter operations can be monitored simultaneously.

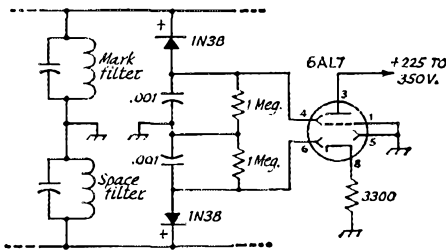


Fig. 2—W7PVF's dual tuning-eye circuit.

The circuit in Fig. 2 shows a typical circuit using the 6AL7 tube. The tube is inserted between the limiter and keyer sections of the terminal unit. To use the indicator, tune for equal deflection of both eyes.

—Neil Iverson, W7PVF

## BETTER TONE FOR LITTLE OSKEY

I BUILT the "Little Oskey"<sup>1</sup> strictly according to the article in *QST* and it worked fine, performing all its duties. However, the tone generated in the audio oscillator was far from being a sine wave and had an annoying rough sound.

I changed the original 0.51-megohm grid resistor to a 500,000-ohm potentiometer,  $R_1$  in

<sup>1</sup>"Little Oskey" *QST*, October, 1955.

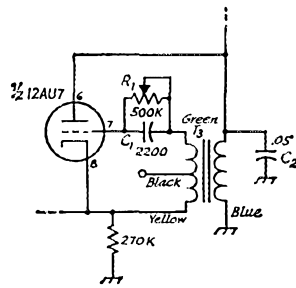


Fig. 3—The quality of Little Oskey's side tone can be improved by substituting the above values at  $R_1$  and  $C_2$ .

Fig. 3. Also, I bypassed the red transformer lead with a .05  $\mu$ f. capacitor,  $C_2$ . Now the tone is clean and pure and can be varied over the frequency range of about 500 to 1200 cycles by adjusting the position of the potentiometer,  $R_1$ .

— Dr. Benjamin H. Sullivan, K4DKD

## A TIP FOR EX-BUG USERS

HERE is an idea for the c.w. man who has acquired an electronic keyer and has an "old fashioned" semi-automatic key. Before going out and purchasing a deluxe key designed for electronic keyers, try this modification on your present key. Tighten the dot contact screws enough to make the contacts stay closed whenever the dot lever is struck. Disconnect the metal strap that runs from the dot contact to the binding post (the one that is not connected to the metal base of the bug), and attach a new binding post to it. You now have a three-terminal key that can be used to actuate the electronic keyer. If you want to restore the bug to its original condition, just reconnect the metal strap to its original terminal.

— John Dalrymple, K7QER

## INEXPENSIVE FLEXIBLE SHAFTING

I FOUND that an old discarded automobile speedometer cable can double as a short length of light-duty flexible shafting for remote tuning applications. Cut the cable to the proper size and solder the necessary fittings to each end. It is also a good idea to clean the cable assembly before using it, and an application of graphite will help to lubricate it.

The use of speedometer cables is not recommended for long runs since the shafting becomes somewhat "springy", resulting in unwanted backlash.

— John F. Micsak, W2PRR

## CRAYON THERMOMETERS

THE Hint & Kink, "Paper Thermometers", in *QST* for June, 1962, interested many *QST* readers. Another item, called Thermochrom, which does the same job as the paper thermometers, is a crayon whose mark changes color when a calibrated temperature is reached. The crayons are made by the Air Reduction Co., and are probably available from welding supply houses.

## Election Notice

### Techs On Ten Denied

### Conelrad Ends for Hams

### Phone Expansion Denied

#### ELECTION NOTICE

To All Full Members of The American Radio Relay League Residing in the Central, Hudson, New England, Northwestern Roanoke, Rocky Mountain, Southwestern, and West Gulf Divisions:

An election is about to be held in each of the above-mentioned divisions to choose both a director and a vice-director for the 1963-1964 terms. These elections constitute an important part of the machinery of self-government of ARRL. They provide the constitutional opportunity for members to put the direction of their association in the hands of representatives of their own choosing. The election procedures are specified in the By-Laws. A copy of the Articles of Association and By-Laws will be mailed to any member upon request.

Nomination is by petition, which must reach the Headquarters by noon of September 20. Nominating petitions are hereby solicited. Ten or more Full Members of the League residing in any one of the above-named divisions may join in nominating any eligible Full Member residing in that division as a candidate for director therefrom, or as a candidate for vice-director therefrom. No person may simultaneously be a candidate for both offices, if petitions are received naming the same candidate for both offices, his nomination will be deemed for director only and his nomination for vice-director will be void. Inasmuch as all the powers of the director are transferred to the vice-director in the event of director's resignation or death or inability to perform his duties, it is of as great importance to name a candidate for vice-director as it is for director. The following form for nomination is suggested:

*Executive Committee  
The American Radio Relay League  
West Hartford 7, Conn.*

*We, the undersigned Full Members of the ARRL, residing in the.....Division hereby nominate.....of.....as a candidate for director; and we also nominate.....of.....as a candidate for vice-director; from this division or the 1963-1964 term.  
(Signatures and addresses)*

The signers must be Full Members in good standing. The nominee must be a Full Member and the holder of at least a General Class amateur license, or a Canadian Advanced Amateur Certificate and must have been a member of the League for a continuous term of at least four years at the time of his election. No person is eligible who is commercially engaged in the manufacture, sale or rental of

radio apparatus capable of being used in radio communications, or is commercially engaged in the publication of radio literature intended in whole or in part for consumption by radio amateurs.

All such petitions must be filed at the headquarters office of the League in West Hartford, Conn., by noon EDST of the 20th day of September, 1962. There is no limit to the number of petitions that may be filed on behalf of a given candidate but no member shall append his signature to more than one petition for the office of director and one petition for the office of vice-director. To be valid, a petition must have the signature of at least ten Full Members in good standing; that is to say, ten or more Full Members must join in executing a single document; a candidate is not nominated by one petition bearing six valid signatures and another bearing four. Petitioners are urged to have an ample number of signatures, since nominators are occasionally found not to be Full Members in good standing. It is not necessary that a petition name candidates both for director and for vice-director but members are urged to interest themselves equally in the two offices.

League members are classified as Full Members and Associate Members. Only those possessing Full Membership may nominate candidates or stand as candidates; members holding Associate Membership are not eligible to either function.

Voting by ballots mailed to each Full Member will take place between October 1 and November 20, except that if on September 20 only one eligible candidate has been nominated, he will be declared elected.

Present directors and vice-directors for these divisions are: *Central:* John G. Doyle, W9GPI, and Philip E. Haller, W9HPG. *Hudson:* Morton B. Kahn, W2KR, and Harry J. Dannels, W2TIK. *New England:* Milton E. Chaffee, W1EFW, and Bigelow Green, W1EAE. *Northwestern:* R. Rex Roberts, W7CPY, and Robert B. Thurston, W7PGY. *Roanoke:* P. Lanier Anderson, jr., W4MWII, and Joseph F. Abernethy, W4AKC. *Rocky Mountain:* Carl L. Smith, W0BWJ, and John H. Sampson, jr., W7OCX. *Southwestern:* Raymond E. Meyers, W6MLZ, and Howard F. Shepherd, jr., W6QJW. *West Gulf:* Roemer O. Best, W5QKF and Ray K. Bryan, W5UYQ.

Full Members are urged to take the initiative and to file nominating petitions immediately.

For the Board of Directors:

July 1, 1962

JOHN HUNTOON  
Secretary

#### CANADIAN ASSOCIATE COUNSEL

The Executive Committee at its July meeting appointed Arthur K. Meen, VE3RX, to the new post of Associate Counsel for Canada. Mr. Meen graduated from the University of Toronto in 1946 with a degree in electrical engineering and from the Osgoode Hall Law School in 1949. A member of the League since 1943, Mr. Meen was licensed in 1948 as VE3DAR and held that call until this year when he was assigned VE3RX. He is a past president of the Nortown Amateur Radio Club, a charter member, past secretary and present president of the Ontario Amateur Radio Federation, Inc.

As associate counsel, VE3RX will assist the ARRL General Counsel, Robert M. Booth,

W3PS, in providing advice to Canadian amateurs and their attorneys in legal problems involving amateur radio. Mr. Meen maintains law offices at Suite 405, 19 Richmond Street West, Toronto 1, Ontario.

## LICENSE PLATES

British Columbia will begin the issuance of call letter license plates to those VE7s who have mobile equipment in their cars in 1963. The legislative fight for the privilege, which has covered the past six years, was led by Stan Carnell, VE7GE, a member of the Legislative Assembly.

We have previously reported that New York Amateurs will be able to get call letter license plates for 1963 (details on page 23, August *QST*). Please do not write the Capitol about the plates. Invitations will be mailed to virtually all N. Y. amateurs in October. Late information will be circulated to all affiliated clubs by the amateur license plate committee as necessary. If you are in doubt about any part of the program, therefore, keep in touch with your local club.

## TECHS ON TEN DENIED

As a result of widespread interest among Technician Class amateurs in getting operating privileges on ten meters, the League's Board of Directors undertook a study of the possibilities. While this study was in progress, however, an individual amateur, Joseph L. Kolenic, W8ESZ, filed a petition directly with FCC, asking that the rules be changed to permit Technician use of 28.0-29.7 Mc. The FCC has now denied OM Kolenic's petition on the grounds that the Technician Class license had been created expressly for serious-minded experimenters to air-test their equipment, that it was not intended as a communications service, and that it should not be regarded as a stepping-stone between the Novice and General Class licenses. Simultaneously, FCC denied a petition for rulemaking filed by Chester L. Smith, K1CCL, which would have made additional changes in the license structure. The text of the Commission action follows:

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington 25, D. C.

In the Matter of  
Amendment of Part 12 of the Commission's  
Rules governing the Amateur Radio Service to  
permit Technician Class amateur operators to  
operate in the 28.0 to 29.7 Mc/s band. } RM-273  
RM-319

### MEMORANDUM OPINION AND ORDER

By the Commission: Commissioner Cross absent.

1. The Commission has before it for consideration (1) a petition for institution of rule-making filed by Chester L. Smith, Bedford, Massachusetts, (RM-273) and (2) a petition for institution of rule making filed by Joseph L. Kolenic, Grand Haven, Michigan (RM-319). Since both petitions request that Technician Class operator privileges be extended to include the 28.0 to 29.7 Mc/s band, it appears appropriate to consider them together.

2. In addition to the above, RM-273 proposes to amend Part 12 of the Commission's Rules to permit:

- (a) All amateur privileges for Amateur Extra Class operators;
- (b) Reinstate Amateur Advanced Class with operating privileges reduced to the amateur frequency bands between 1800 kc/s to 148 Mc/s;
- (c) Reduce General and Conditional Class operating privileges to the amateur frequency bands between 1800 kc/s and 148 Mc/s; and
- (d) Institute an examination in microwave techniques to permit successful applicants to operate on amateur frequencies above 220 Mc/s.

3. The Technician Class of amateur operator license was established in Docket No. 9295, adopted January 29, 1951. This class was established expressly for serious minded experimenters who needed spectrum space in which to air-test their equipment. It was not established as a communicators service and should not be regarded as a stepping stone between the Novice and General operator classes. The Commission's policy has not changed in this regard although there appears to have been considerable misunderstanding of the role of the Technician Class in the past. The Technician Class of amateur license still has as its purpose the provision for serious amateur experimenters to explore the higher frequencies and otherwise contribute to the art. Further, the 28.0-29.7 Mc/s band is of limited use for communications because of the sun spot cycle. While it is, of course, possible that meritorious experimentation could be conducted in this band, the resulting additional congestion would cause undue detriment to those amateurs now endeavoring to communicate on these frequencies.

4. Mr. Smith's proposal to grant all amateur privileges to holders of an Extra Class license is in accord with present rules and requires no discussion. Adoption of the remaining proposals would necessitate a rollback of present operating privileges for the operator classes mentioned. This is not considered to be feasible for the following reasons:

(1) The bulk of the licensed amateurs, excluding Novice and Technician classes, are now authorized all amateur operating privileges. Many have a considerable investment in equipment for operation, not only in the 220-225 Mc/s band, but also in the higher bands. Such a restriction would, in many cases, result in an unwarranted financial loss on this equipment as well as diminution of operating privileges.

(2) Many General Class amateurs, as well as the former Class A and Advanced Class holders, have held their licenses for many years, and it does not appear reasonable now to require them to be examined in order to use privileges which they have previously been authorized to use.

(3) With the constant increase in the number of amateurs using the long distance communication bands (28.0 Mc/s and below), restriction of the use of the higher frequencies would only serve to further congest these bands.

5. Accordingly, in view of the above, IT IS ORDERED, This 3rd day of July, 1962, That the petitions filed by Chester L. Smith and Joseph L. Kolenic, ARE DENIED.

FEDERAL COMMUNICATIONS COMMISSION

BEN F. WAPLE

Acting Secretary

Released: July 6, 1962

## CONELRAD ENDS FOR HAMS

For some time, the FCC has had regulations requiring most non-Government stations to close down in the event of pending or actual enemy attack, so as to prevent signals from these stations being used as a navigational aid by an enemy. Early last year, upon the recommendation of the National Industry Advisory Committee (NIAC), FCC asked the Defense Department to reevaluate its needs for the Conelrad program. The Defense Department has now notified the Commission that, with a few exceptions, the navigational provisions of Conelrad are no longer required. Accordingly the Commission adopted an Order on July 13, cancelling Conelrad rules for several radio services, including the amateur service. Specifically, sections 12.190-12.196 of the amateur regulations were

deleted entirely, thus relieving amateurs of any Council responsibility.

The NIAC, which initiated the above action, advises the FCC on a wide range of questions. Southwestern Division Director Ray Meyers, W6MLZ, General Manager John Huntoon, W1LVQ, and Communications Manager F. E. Handy, W1BDI, are members of the group, Mr. Huntoon also serving as chairman of the Amateur Radio Services Committee.

### JOBS OPEN AT KC4-LAND

The National Bureau of Standards, Central Radio Propagation Laboratory located at Boulder, Colorado is urgently looking for Electrical Engineers (or amateurs with qualifying engineering experience) for a one-year tour of duty, starting this November, as Radio Propagation Station Engineers at either Byrd or South Pole Stations in the Antarctic. Appointees will receive two months of training at Boulder, Colorado. Here is your opportunity to get in some amateur operation from KC4 land. The amateur equipment is there ready to operate. If interested, send a brief resume immediately to H. S. Sellery, W0TQF, National Bureau of Standards, Boulder, Colorado.

### MINUTES OF EXECUTIVE COMMITTEE MEETING

No. 287

July 9, 1962

Pursuant to due notice, the Executive Committee of The American Radio Relay League, Inc., met in West Hartford, Connecticut, at 10:03 A.M., July 9, 1962. Present: President Herbert Hoover, jr., in the Chair; Vice President W. M. Groves; Directors Robert W. Denniston, John G. Doyle, Noel B. Eaton, Morton B. Kahn; General Manager John Huntoon; Communications Manager F. E. Handy and Treasurer David H. Houghton. Also present were General Counsel Robert M. Booth, jr. and Assistant Secretary Perry F. Williams.

The Committee examined closely the subjects of technical operation of amateur equipment and current operating practices on the amateur bands. After extended discussion, during which Technical Director George Grammer joined the meeting at the invitation of the Committee, on motion of Mr. Doyle, the following resolution was unanimously ADOPTED:

RESOLVED, that with the continuing growth in the number of amateurs and the resultant increased crowding of amateur bands, the League considers that proper technical operation of equipment is more vital than ever to continued successful operation and efficient usage of amateur frequency assignments, and that the Headquarters staff, especially the technical and communications departments, are directed to institute a program to bring about a better understanding of technical capabilities and limitations of equipment, and of operating techniques.

The Committee heard reports on the status of construction of the new Headquarters building and of the progress of the Building Fund. During this discussion the meeting was joined by Director Milton E. Chaffee.

In accordance with Minute 67 of the 1962 Board Meeting, the Committee next discussed the matter of an associate counsel for Canada, to assist Canadian amateurs and their attorneys in solving legal problems which might arise. On motion of Mr. Eaton, unanimously VOTED that A. K. Meen, VE3RX, is appointed Associate Counsel for Canada at an initial retainer of \$100 per year.

Detailed implementation of the new pension plan adopted by the Board at its May meeting was discussed, and on motion of Mr. Doyle, the following resolution was unanimously ADOPTED:

- (1) That the Second Amendment to the League's Retirement Income Plan and Trust heretofore considered

### LAST CHANCE—50-YEAR HAMS

Hams who were first licensed in 1912, when the Government first started issuing amateur licenses, and who still have tickets today will be honored at the Golden Anniversary Banquet in New York City on October 13. Qualified fifty-year amateurs will receive a commemorative souvenir whether or not they can actually attend the banquet.

Applications should be made to the League so as to arrive in West Hartford not later than September 15, 1962. Applicants should submit their original license, or a certified photocopy of it, with their application. If the original license is no longer available, a listing in the 1913 Government call book will be accepted, a copy is available at headquarters for checking purposes.

The banquet, sponsored jointly by ARRL, QCWA, IRE, AFCEA, SSBARA, Radio Club of America and Hudson Amateur Radio Council, is being held in conjunction with the Hudson Division Convention at the Statler-Hilton Hotel. Convention details will be in the October issue.

and discussed, be, and the same hereby is, adopted, with such changes as may be required by the Treasury Department in order to meet the requirements of Section 401 of the Internal Revenue Code, such Amendment to be dated as of the third day of June, 1962, and that the Secretary and the Treasurer of the League be, and they hereby are, authorized and instructed to execute said Amendment for and on behalf of American Radio Relay League, Incorporated.

- (2) That the League enter into Group Annuity Contract #GR 1180 with Connecticut General Life Insurance Company, and that the Secretary and the Treasurer of the League be, and they hereby are, authorized and instructed to execute said Contract.
- (3) That, in connection with the change to a Group Annuity Contract the League amend its Group Life Policy No. 21179-01 in accordance with the attached specifications.
- (4) To authorize the President and Secretary of the League, on behalf of the League, to execute a Power of Attorney to John H. Riege and/or Raymond J. Payne, permitting either of them to deal with the Treasury Department in connection with the obtaining of approval of said Amendment.
- (5) That the Secretary and the Treasurer of the League be, and they hereby are, authorized and directed to take such action and execute such documents as shall be necessary to carry out this resolution.

The Committee recessed for luncheon at 12:35 P.M., resuming its meeting at 1:38 P.M.

On motion of Mr. Denniston, unanimously VOTED to ratify the Committee's previous mail action approving the holding of a Kentucky State Convention at Lexington on September 15, 1962.

On motion of Mr. Kahn, affiliation was unanimously GRANTED to the following societies:

Big Thunder Amateur Radio Club . . . . . Belvidere, Ill.  
Bloomington Amateur Radio Club, Inc. . . . .  
Bloomington, Ind.  
Florida DX Club . . . . . Lake Placid, Fla.  
Lexington High School Radio Club . . . . . Lexington, Mass.  
Massasoit Amateur Radio Association . . . . . Massachusetts

National City Amateur Radio Club, National City, Calif.  
 Richardson Amateur Radio Club, Richardson, Texas  
 United Radio Amateur Club, Wilmington, Calif.  
 Volunteer Emergency Signal Service —  
 "Signaleers" ..... Tinley Park, Ill.  
 Englewood Amateur Radio Assn. .... Englewood, N. J.

On motion of Mr. Denniston, unanimously VOTED that Assistant Secretary Raymond T. Higgs is authorized to sign League checks on behalf of the General Manager, in lieu of Assistant Secretary George Stevens who has resigned effective July 13.

Without formal action, the Executive Committee heard the report of General Manager Huntoon on his visit to International Telecommunications Union headquarters in Geneva and to the headquarters of several European amateur societies. A proposed program of technical assistance to amateurs in new and developing countries was also discussed.

General Counsel Booth and General Manager Huntoon reported on the present status of various proposals before the FCC and concerning progress of the reciprocal licensing bill. During the course of these reports, Vice President Groves left the meeting, at 2:35 P.M.

On motion of Mr. Doyle, unanimously VOTED that General Manager Huntoon accept an invitation to serve on the National Industry Advisory Committee.

On motion of Mr. Kahn, unanimously VOTED that the League reimburse the Project Oscar Association for out-of-pocket expenses during the period from March through June, in the amount of \$464.94.

On motion of Mr. Denniston, unanimously VOTED that the League continue and intensify its reporting of non-amateur stations heard in the amateur bands to the Department of State and Federal Communications Commission.

On motion of Mr. Doyle, unanimously VOTED that the Committee proposes the date of the 1963 annual meeting be changed to May 3, 1963, and that a mail vote of directors be taken in accordance with Bylaw 20.

The Executive Committee also discussed, without formal action, the shared status of the u.h.f. bands; the situation regarding third-party communications between the U. S. and the Congo (9Q5); the petition of W2BIB for expansion of the 20-meter phone band; proposals of other groups for organized anticommunist activities by amateurs; the license-fee proposal, Docket 14,507; RTTY identification procedures; Conclrad; the proposed v.h.f. handbook; the proposed cumulative index to QST; membership development; and the 12th National Convention in Portland.

There being no further business, the meeting adjourned at 5:00 P.M.

JOHN HUNTOON  
*Secretary*

**PHONE EXPANSION DENIED**

On July 27 the Federal Communications Commission denied a petition for rulemaking, RM-341, filed by Maxwell Meyers, W2BIB. Mr. Meyers had asked that the A-3 subband in the 14-Mc. band be expanded from the present 14,200-14,350 kc. to 14,150-14,350 kc. The Commission pointed out the objections which had been filed in Docket 12,780,<sup>1</sup> the most recent FCC examination of 20-meter phone allocations, and said that the conditions mentioned in opposing comment would be aggravated, and that therefore, FCC did not feel a further expansion of phone privileges was in the public interest at this time. The text follows:

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
 Washington 25, D. C.

In the Matter of  
 Amendment of Part 12 of the Commission's  
 Rules governing the Amateur Radio Service to  
 extend the sub-allocation for A-3 emission in the  
 14 Mc/s amateur band. } RM-341

<sup>1</sup> Docket 12,780 was adopted in January 1960, and expanded the phone band from the former 14,200-14,300 kc. to the present 14,200-14,350 kc.

By the Commission:

1. The Commission has before it for consideration a petition for the institution of rule making filed by Maxwell Meyers, Chauncey, New York.

2. Petitioner asks that the A-3 sub-allocation in the 14 Mc/s amateur band be extended from the present 14,200-14,350 kc/s to 14,150-14,350 kc/s.

3. On February 18, 1959, the Commission issued a Notice of Proposed Rule Making, Docket 12780, proposing an additional 50 kc/s for radiotelephone amateur operation to the then 14 Mc/s band. The specific sub-band involved in this proceeding was between 14,300-14,350 kc/s.

4. Many comments were received both favoring and opposing the proposal. The opponents stressed the point that foreign amateurs would be forced to move to the lower portion of the band; this, in turn, would create more interference to the United States radiotelegraph amateurs and, quite possibly, reduce the ability of United States radiotelephone amateurs to communicate with foreign amateurs. The point also was raised by the opponents that many of the personnel of foreign-based U. S. military bases rely on amateur radio for personal communication.

5. The proponents pointed out, among other things, that the increase in radiotelephone usage had resulted in undue congestion in the radiotelephone sub-allocation in the 14 Mc/s band.

6. After weighing these comments, the Commission on January 27, 1960, extended the A-3 (radiotelephony) sub-allocation in the 14 Mc/s band from 14,200-14,300 kc/s to 14,200-14,350 kc/s. It was recognized that foreign amateurs who operated almost exclusively in the 14,300-14,350 sub-band would surely be driven to the low end of the band; i.e., between 14,010-14,200 kc/s. While this would add to the interference to United States amateurs operating with A-1 (radiotelegraphy) emission in this lower portion of the band, the Commission determined that the increase in A-3 operation in the 14 Mc/s band warranted an additional 50 kc/s for such operation.

7. The instant petition would crowd even further those employing A-1 emission in this band, resulting in additional interference. Communication needs of radiotelegraphy operators and of those located in foreign countries have not diminished in the past two years. Expansion of the radiotelephone sub-allocation in this band at the expense of these groups does not appear to be in the public interest at this time.

8. Accordingly, IT IS ORDERED, This 25th day of July, 1962, That the petition filed by Maxwell Meyers to further extend the frequency space for 14 Mc/s A-3 operation, be DENIED.

FEDERAL COMMUNICATIONS COMMISSION  
 BEN F. WAPLE  
*Acting Secretary*

Released: July 27, 1962



A girl skin-diving in Salem, Mass., was stricken with acute appendicitis. W1ZPU was one of the frogman party, and fortunately he had a 10-meter rig with him. His distress call at 1453 was picked up by KITYB at the Cardinal Cushing Academy for Boys in West Newbury, who called the Coast Guard. The Coast Guard dispatched a helicopter, and at 1510 the girl was admitted to Salem Hospital. A fine-business operation all the way.

— . . . —

A Novice whose handle was Kip  
 Took a notion to lengthen his skip.  
 He tried with caprice  
 His antenna to grease  
 So his sigs through the static could slip.

— W1HAK

# 1962 VE/W Contest Announcement

September 29-30

**T**HE Montreal Amateur Radio Club again invites all W and VE stations to participate in the 1962 VE/W Contest to be held from 2300 GMT Saturday, September 29, to 0459 GMT, October 1.

A "CQ VE" by a U. S. station alerts the VEs, while VEs try to raise Ws with a "CQ W." Exchange contact serial number, RS(T) report, and ARRL section. Yukon-N.W.T. (VE8) counts as a separate section. *Example:* W4SVJ called VE7EH, who sends "W4SVJ de VE7EH NR 5 579 BC K," and W4SVJ replies with "VE7EH de W4SVJ R HR NR 7 589 GA K."

Follow the log sample shown below. Please don't write to ARRL or MARC for log forms, as they are not available.

The over-all contest winner earns a handsome trophy, with certificates going to the top scorer in each ARRL section.

Check the rules which follow very carefully. To be eligible your log must be in the hands of the MARC Contest Committee by November 5. Mail logs to Mr. John Varsaneux, VE2OC, 3020 Kirkfield Ave., Town of Mount Royal, Montreal, Quebec, Canada.

## Rules

1) Any single-operator station in the 72 ARRL Sections may participate. Yukon-N.W.T. (VE8) also counts as a separate section. An amateur may enter as mobile, portable, or fixed, but in only *one* category. Multiple-operator stations are not eligible to compete.

2) All contacts must be made during the period from 2300 GMT Sept. 29 to 0459 GMT Oct. 1, with a total operating time of no more than 20 hours for each entry. Times on and off the air must be clearly shown in the log.

3) Canadians will work only amateurs in the U. S. and Possessions, and vice versa. VE/VO-to-VE/VO and U.S.-to-U. S. contacts do not count. A station may be worked once on phone and once on c.w. on each frequency-band.

4) The exchange consists of a QSO number, RS or RST report, and ARRL Section. Example of W4SVJ's message to VE2NI: "VE2NI de W4SVJ NR1 579 Ga."

5) *Scoring:* Count two points for a complete exchange of information; incomplete contacts do not count (no fractional breakdown of the two points per QSO). For final score, VE/VO stations will multiply their total contact points by the number of ARRL sections worked in the U. S. and Possessions, and then by the appropriate power multiplier listed below. For final score, W/K amateurs will multiply their total contact points by the number of Canadian areas (maximum of 9: VE1-VE8 plus VO), then by 7.22 (ratio of U. S.-to-Canadian Sections), then by the appropriate power multiplier, and then by a 2.5 provisional multiplier (based on the ratio of U. S.-to-Canadian log entries received in previous contests). All stations using power inputs of 30 watts or less receive a power multiplier of 2, those using from 31 through 100 watts receive a power multiplier of 1.5, and those using over 100 watts receive a power multiplier of 1.

6) Each entry must be accompanied by the following signed declaration: "I hereby state that my station was operated strictly in accordance with the rules of the contest and governmental regulations, and I agree that the decision of the contest committee of the Montreal Amateur Radio Club, Inc., shall be final in all cases of dispute."

7) To be deemed valid, all entries must follow the form shown in the sample log and must be received no later than midnight, November 5, 1962. They should be sent to Mr. John Varsaneux, VE2OC, 3020 Kirkfield Ave., Town of Mount Royal, Montreal, Quebec, Canada. QST

## LOG, 1962 VE/W CONTEST

W4SVJ		C.W.								Ga.				
Call.....		C.W., Phone, or Both.....								ARRL Section.....				
Date/Time On or Off Air (GMT)	Time of QSO	NR Sct	My Stn.	RST Sct	My Sect.	Freq. Band	Emis- sion	Power Input	NR Recd.	His Stn.	RST Recd.	His Sct.	New Sects. Wkd.	QSO Pts.
Sept. 29 On 2300	2300	1	W4SVJ	579	Ga.	3555	A1	75	1	VE2NI	599	QUE	1	2
"	2301	2	"	569	"	"	"	"	2	VE3BFF	579	ONT	2	2
"	2302	3	"	579	"	"	"	"	1	VE2OC	579	QUE	-	2
"	2313	4	"	559	"	7010	"	"	3	VE1EK	579	MAR	3	2
Off 2315														

Total operating time: 15 min.

Bands used: 3.5 & 7 Mc.

3 sects., 8 pts.

Claimed score: 4 QSOs × 2 (points per contact) × 3 (different sections worked) × 7.22 (section-balancing multiplier for all W/K stations) × 1.5 (power multiplier for 75 watts input) × 2.5 (provisional multiplier for all W/K stations based on ratio of U. S.-to-Canadian logs previously entered) = 650 (rounded).

I hereby state that my station was operated strictly in accordance with the rules of the contest and governmental regulations, and I agree that the decision of the contest committee of the Montreal Amateur Radio Club, Inc. shall be final in all cases of dispute.

Signature..... Call.....

# The Friendly Philosopher

BY JOHN G. TROSTER\*, W6ISQ

A SERIES of 16 stamps was issued in May of 1893 in Chicago to commemorate the World's Columbian Exposition being held in that city. Values of this issue varied from one cent up to \$5. The lower values are fairly common and easily obtainable by most collectors. However, the higher value stamps are now quite expensive and . . ."

"John, old boy . . ."

". . . it is not unusual to pay over \$100 for a \$5 Columbian in mint . . ."

"I say, John, old boy. This is a radio magazine. What's with this Columbian issue business?"

"You tried fighting through the tail-ending wolf-pack on the low end of twenty lately?"

"No, I've been . . ."

"Well then, have you tried to squeeze into the top end of twenty lately?"

"Well, no, I've been away and . . ."

"Have you heard what passes for the friendly, resourceful ham spirit on any of the bands lately? I doubt it. So, the Columbian series was . . ."

"But, John, ham radio is only a hobby; a spare-time pleasure . . ."

"Tried a QSO on 40-meter phone lately?"

"But it's part of the game — some you work, some you don't."

"OK, what have you been working on ten lately — and what do you expect to work on ten next year — or the rest of the century for that matter?"

"Not too much to be sure, but we'll find a way. You don't have the old ham spirit, John, old boy. Remember 200 meters and below before the hams broke the meter barrier?"

"All right, so we invent an ion generator and scatter clouds of ions around and about in space and what do we get? Twenty-four-hour-a-day worldwide communication for ten million hams all jabbering at once. That's progress? It's bad enough when you can hear half the world only half the time. What would it be like if we had worldwide communications all the time? Phooey."

\* 45 Laurel Street, Atherton, Calif.

Now look. I can turn on the hi-fi and listen to inspiring music calmly and with pleasure and satisfaction. Beethoven, Brahms, Verdi, the great masters — it's relaxing, yet exhilarating. Then I can open my stamp album — any page will do. Those little pieces of paper picture the history of that country, its proud citizens and historic background, its natural resources, interesting insights into the life of its people. I get books and study these countries. I learn to appreciate my fellow man, understand his fears and aspirations."

"Oh I say, Friendly Philosopher — John, old boy, you're losing . . ."

"Look at the hams. Don't care where the country is or what its people are like, what they do for a living, how they live. In short, they don't know or care a thing about the country they're calling or talking with. All the hams care about is 'what's the bearing on that DX sig?', then crank up the power, zero beat and join the wolf pack."

"John, old man."

"No, sir, I'll take my Beethoven and pretty pieces of paper. Now as I was saying, the perforations on the Columbian issue . . ."

"John, old man, that ZC7 is back on again."

"Go away. The perforations in the Columbian . . ."

"He's calling CQ DX."

"The Columbian issue — what's his call?"

"ZC7ZZ."

"What's his bearing?"

"88 degrees."

"Lucky I leave the receiver on. Some of those foreign broadcast stations have good music, you know. What's his frequency?"

"14,009."

"How's he coming in?"

"448"

"Anyone calling him?"

"Only the lower half of the band."

"Ahhhh yes, there's the pack. He's calling that W5 who's still signing. Never fails! Swing the 6-element Yagi to 88 degrees. Haaa — maybe \$5 here. Lucky I turned on the old Pulverizer-Paralyser to keep the shack warmed up. Will ya listen to that pack tonite?"

"John, old boy — about the Columbian issue . . ."

"Noooo, not Columbia. If you're pointed at HK-land you're in the wrong direction. You'll have to swing your beam about 30 degrees to the north. He's more toward ZS — there he is again. Listen to that pack. Swing your beam toward South Africa, man, swing your beam. And you'd better kick on your big supply if you're gonna jam through this pack tonight. There he goes now, man, there he goes . . . Tally Hooooooo! ZC7ZZ ZC7ZZ ZC7ZZ de W6ISQ W6ISQ W6ISQ . . ."

QST



# The World Above 50 Mc.

1215-1300

2300-2450

3300-3350

5650-5925

10,000-10,500

21,000-22,000

30,000-31

CONDUCTED BY SAM HARRIS,\* W1FZJ

## MOONBOUNCE

USING the moon as a passive reflector to provide world wide communication on our v.h.f./u.h.f. bands has been the goal of a small dedicated group of people for the past several years. The number of active "tryers" has been steadily growing and now numbers over 100. Last year K1HMM and K6DNG had a near miss on a continent-spanning 144-Mc. contact. Encouraged by these first positive results, Ned is preparing an installation which belittles the imagination of most of us. Using a home-made railroad track and mounting at least 16 wide-spaced multi-element bi-polar yagis, he is getting ready for contacts with California and Alaska as a minimum. Details on the K6DNG effort are not available but it can be assumed that his will be no little effort. In Texas W5SDA has been building in anticipation of the new power limit of 432 Mc. Ed has a complete 432-Mc. moonbounce set-up ready to go. His 31-foot parabolic reflector is a thing of beauty. (See photo.)

Many other groups are awaiting the anticipated power restriction change before starting actual construction. The greatest concentration of activity at present is on 1296 Mc. KH6UK and W1BU are presently active with signals going both ways every day. Tommy first received the

1296-Mc. signals from W1BU on July 24 at 1330Z. On the 25th and 26th signals were again exchanged. Tommy reported W1BU signal as 8 db. over the noise in Hawaii. KH6UK's signals at W1BU run an average about 15 to 18 db. over the noise in 30 c.p.s. filter. This type of signal is not what you would call "good copy." However, on a pen recorder (see Fig. 1) there is no mistaking the signal.

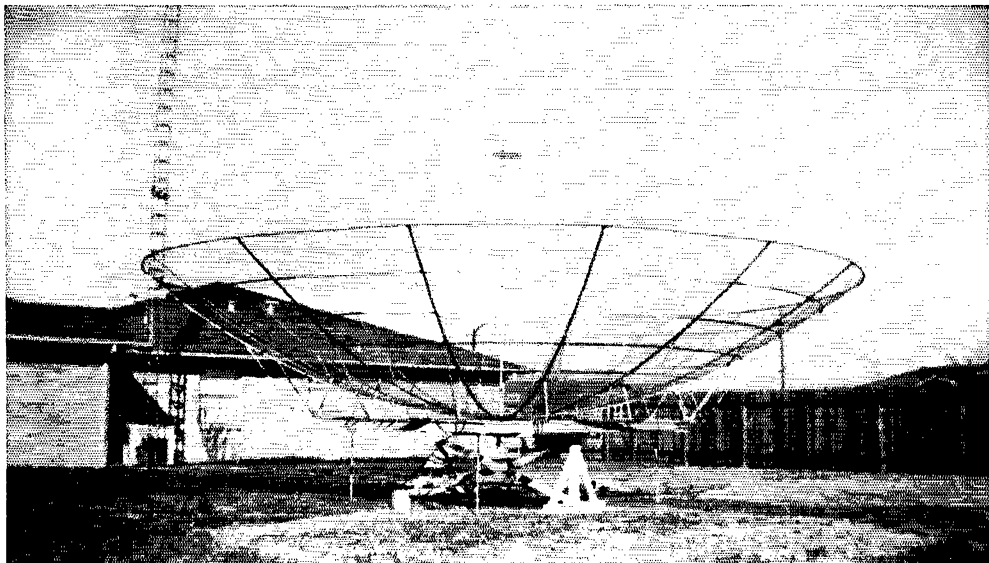
W8HRV of New Waterford, Ohio, was at the controls of W1BU when KH6UK first reported receiving our signals. Please note that these exchanges were made on 1296 Mc. without the aid of any other type of liaison. Also on the "ready-to-go" list for 1296 moonbounce are WA6JZN, W2CXY, HB9RG, DL3FM, KX6CN and W8LIO. Building are W6NLZ, W4HHK, W6MMU, K9KEH and others too bashful to admit it. The only bands not known to have active moonbouncers are 50 and 220 Mc.

## 50 Mc. in Australia

Recently a letter was received from VK3QV, David Rankin, who had noted our previous references to VK v.h.f. doings (May, 1962), and decided our readers might be interested in VK v.h.f. records, as indeed we are. "The distances have been computed accurately using latitude and longitude and have been adopted as official by the Wireless Institute of Australia."

50 Mc. — VK3ALZ to XE1FU—8418 miles on May 1,

\*P.O. Box 324, Medfield, Mass.



31-foot dish (home brew) at W5SDA. Folded dipole is for 432 Mc.



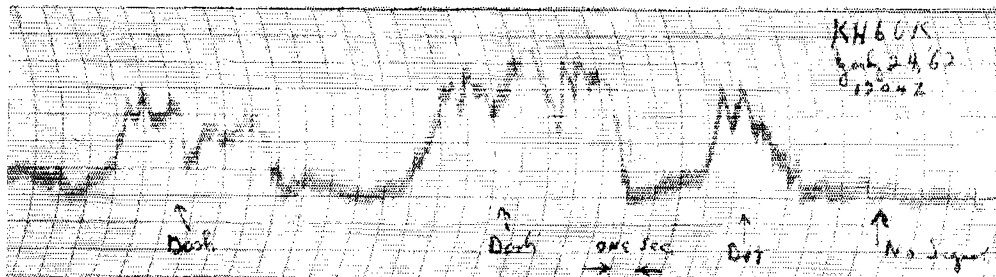


Fig. 1 — Pen recording of KH6UK signals via the moon on 1296 Mc., as received at W1BU.

1959. VK6BE to JA8BP—5490 miles on October 30, 1958. VK5KL to W7ACS KH6—5361 miles on August 26, 1947. Other interesting contacts made by VK stations include ones to VK9, Papua; VK9, New Guinea; VR2, 9M2, VS6, KG6, KR6, KX6, W and LU. The allocation in Australia is now 52–54 Mc. with the 50–52 Mc. portion available on a temporary basis until the end of this year. The band 56–60 Mc. which has been available for some years has been withdrawn from the Amateur Service as of July 1.

144 Mc. — VK2ASZ/2 to ZL3AQ—1342 miles on December 31, 1961; VK5GL to VK6BO—1322 miles on December 30, 1951; VK5QR to VK6BO—1319 miles on February 9, 1952. Other contacts over 1000 miles have been made but at the time of writing no confirmed details are at hand. I believe the VK2ASZ/2 to ZL3AQ contact is the best contact made on 144 Mc. in the world outside of the W/KH6 contact.

288 Mc. — VK3ALZ to VK7LZ—282 miles on January 10, 1960; VK3ZCG to VK5AW—262 miles on January 23, 1961; VK5RO/5 to VK5SMIT/5—108 miles on April 13, 1952.

576 Mc.—VK3ANW to VK3AKE—80.1 miles on December 11, 1949. 2300 Mc.—VK3ANW to VK3XA—9.0 miles on February 18, 1950. The 420–450 Mc. band will not be available in Australia until January 1, 1964, and the 288–296-Mc. band will be withdrawn on June 30, 1963.

The maximum power permitted in Australia is 150 watts and this will apply to the 420-Mc. band. Many VKs are interested in this band and, provided the stateside gang don't start running 1 kw. on this band, the VK gang may be able to crack the world record. I wonder if there will ever be two types of record — one with the aid of a satellite and one without."

Thanks, Dave, we greatly appreciate your efforts in sending us the foregoing information. Mighty interesting to see that there are such records established in VK-land, and to know the frequencies which will be withdrawn and those which will soon be opened up to the Australian amateurs.

### 50 Mc.

As is usual during this season of the year 50 Mc. is still up and comin'. Reports of skip are still arriving and the six-meter gang is making hay while it can. W8MBH reports that on June 9 he was copying and working 1's, 4's, 5's, 6's, and 8's, all with Q5 S9 (and over) signals; and that on June 28, WA8DOR worked KL7YDO and KL7CEE and on the 25th CO2DS. Down in "little Rhody" Andy, W1AJR worked XE1OE and XE1CT on May 13, and on the 15th he caught a double-hop opening and had contacts with VE6OH in Lethbridge, Alberta; W7EGN, Montana and W7VTB in Casper, Wyoming. Wyoming was the first new state for Andy in years and gives him forty-seven states confirmed. He's still watching all openings for that North Dakota contact.

From Georgia, Walt, W4FWH, tells that the band has been unusually good with more tropo openings observed, and all districts, Mexico and South America being heard during the month of June. Down in Virginia, Roger, K4IMF sez that sporadic E has been heard almost every afternoon and very good temperature inversion on June 22. On that date he worked W3EBB, WA2HYQ and WA2RBS in Delaware and New Jersey. Roger also mentions that there are now eighty-five stations checking in to the 6-meter net, or — there are that many on the roster. F.m. net on 52.525 is making progress slowly. Panama City, Florida and WA4FIJ give us the information that on June 3 an unidentified station was heard on 50.82 at 0415–0445Z with

Spanish music being heard; and a very faint c.w. signal heard on 50.745 with beam to the southeast. On the same day Dick worked W5SFW in Amarillo. On the 4th he heard New York, Massachusetts, Maine, Vermont, Missouri, Nebraska and South Dakota, all within a period of an hour and a quarter.

During the v.h.f. contest on June 9 and 10 a total of 264 contacts in 41 sections and including 31 states were racked up by WA4FIJ; rare states were Montana and Wyoming. Ten other openings were listed by Dick for the month of June with COs and VE3s included along with just about all other call areas in this country and a great many states. Al, W1ZGO in Connecticut, sez that groundwave was good on June 4 and June 14 to the Philadelphia, southern New Jersey and Boston areas; on June 17 he worked WA6JKI on double hop; and that sporadic E was very good a number of other occasions during the month.

Another report from Panama City, Florida and from another one of the Ackermans (Ellen) notes that six skip sessions and 18 states were heard during the month of June. Ellen, WA4FJF is among the many who wonder what happens to all the c.w. stations during the openings. Seems there are six-meter operators all over the country wondering about this and seems odd that they don't manage to have c.w. contacts during the openings when so many are apparently looking for 'em. Ellen monitors 50.17 and will sked anyone. W4ZGS comments that 50 Mc. was very good during the early part of June, but during the latter half the skip was "spotty, short and inconsistent".

Out Indiana way, Jim, K9TFJ, tells us that there are several hundred six-meter operators in the Indianapolis area and that the ranks of s.s.b. rigs are growing. Probably the first to get going in that area on s.s.b. was K9Y1A and he now has the company of K9PED, K9YTG, K9CGQ, K9CGR, K9K6J and K9IC1. Among those getting ready for sideband are K9YPG and K9TFJ. From the big city of New York, Norm, WA2TQT, writes that conditions on six meters during the month of June were excellent, with a good deal of E skip as well as extended ground wave being heard and worked. All call areas were worked except the 6 and 7 areas, plus VE's, VP's, CO's and YV's.

WA2GFP reports openings which he operated on seven different days during June; Geoff sez that although he cannot operate all of the openings "18 states in 18 days is OK by me". Yup, I'd say that was somewhat satisfactory. Geoff is pretty unhappy about the QSLing habits of 50-Mc. operators; after sending out 250 QSLs only about 20 were received in return. (Don't give up or be too impatient, Geoff. I received a much-wanted QSL the other day and the contact was two years ago. — W7HOY).

K1OZI reports almost daily openings during the month of June. Another YL from Florida reports her activity at Lake Worth; Kay, K4TBG has been on 50 Mc. for one year and during that time has worked 41 states and has heard KL7AUV. Since April 28, 1962, she has worked 745 stations and has received QSLs from 442. K3LLR is another of the gang who sez that the band has been open in almost all directions almost every day during the month. Although he did not operate many of the openings, it was an excellent opportunity for testing different antennas which had been laid out in the yard.

Down in Alabama, Paul, K4SFH, enjoyed the openings during June on 18 different days and during the v.h.f. contest heard all call areas except 7's and 9's. Another Alabama station reporting good conditions is Jerry, W4UAR, in Anniston who worked Cuba several times during the month. K8PBE reports "activity good on six,

but band very weird", never know what's going to happen next." Mike is interested in a.s.b. on six and hopes to get going soon.

In Philadelphia - John, K3MLL, is building a kw. peak linear for 50 Mc.; will run a.m., and d.s.b., and hopes to be on the air with it by August 1. Pennsylvania really seems to be sending in those reports this month; another received from W3ZR who worked XE1PY on June 29. Ray also found the band in excellent condition during the month. K3ADS heard several double-hop openings into California and Wyoming; sez that sporadic E was heard on more days

than not during June, and that VO1AE was heard during the contest.

Another station hearing both California and Cuba during the good sessions is K3KPA. John also worked Indiana, Illinois, Missouri, Florida. Out in Iowa the band was open mostly into the south with Texas being the most common one heard according to John, W0DRE. During the contest he worked W7LHK and heard a VE6, and again on the 13th he worked W7LHK in Montana. Openings were also observed in Iowa on June 17 when the band was open to New York, New Jersey, Maryland and Pennsylvania; and on the 18th with Kentucky being worked. On the 23rd John worked W5FCD on c.w. and sez that he (W0DRE) can usually be found on 50.016 on c.w.

Jim, W0PEP, in Ames, Iowa, reports that due to a shortage of time he observed openings on only fifteen days; also that the local net alternate frequency is 51.780. W0BAM sez that stations in his area are working (in June) KP's, XE's and XE2's, and that ground wave is also quite good. One report Charlie received was that he was the first Iowa station heard in three years by K9TTU. He is now running about 300 watts and having better luck with skip contacts.

On June 29, Les, K4RNG broke into a contact between YV5AGM and a Cuban station, making the first U.S.A. contact for Carlos, YV5AGM, on 50 Mc. Les is certainly a busy boy when six meters is open; he sent a list of the openings during the month of June and the time the band opened in his area (Miami, Florida) and the time it closed. What with at least one opening every day, he was kept busy with his pencil and don't know where he found the time to do any operating. Among the interesting things Les

(Continued on page 164)

### 2-METER STANDINGS

W1AZK...	28	8	1300	W5Y YO...	7	4	1330
W1KCS...	24	7	1150	W5UNH...	6	3	1200
W1RUF...	23	7	1130	W6W8Q...	15	5	1390
W1AJR...	23	7	1130	W6NLZ...	12	5	2540
W1MMN...	22	8	1200	W6DNG...	9	5	1040
W1HDO...	22	6	1020	W6AJF...	6	3	800
W1IZY...	20	7	1180	W6ZL...	5	3	1400
K1CRQ...	19	6	800	K6HFM...	4	3	850
W1ARQ...	18	8	980	K6GFM...	4	2	800
K1AFR...	17	5	450	W6MTU...	3	2	950
W1NLY...	37	8	1300	K7EKD...	13	5	1130
W2CXY...	37	8	1360	W7JRG...	12	4	1040
W2ORL...	37	8	1320	W7LEL...	5	3	1050
W2BLV...	36	8	1020	W7CFM...	5	2	870
K2CGI...	35	8	1365	W7JIP...	4	2	900
W2LZL...	29	8	1050	W7JU...	4	2	235
K2LMG...	27	8	1160	W8KAY...	38	8	1245
K2IEJ...	27	8	1060	W8PT...	38	9	1260
K2CFH...	25	8	1200	W8SDJ...	37	8	1240
W2AMJ...	25	6	960	W8FEM...	35	8	1080
W2AIR...	24	8	1100	W8SFG...	34	8	1040
W2RXG...	23	8	1200	W8LFO...	33	8	1060
W2NIX...	23	7	1090	W8RMH...	32	6	910
K2HOD...	23	7	950	W8GGH...	32	8	1180
W2DWJ...	23	6	860	W8BAK...	32	8	960
W2PAU...	23	6	753	W8NGL...	31	8	1090
W2RGL...	21	8	750	W8SVI...	30	8	1080
K2KIB...	21	5	700	W8EVE...	30	8	860
W2ESX...	21	6	750	K8AXU...	29	10	1050
W2UTP...	20	7	880	W9LPD...	29	8	850
W2VZR...	19	7	1040	W8WRN...	28	8	680
W2RCV...	19	8	720	W8DZ...	28	8	720
W2RGL...	18	8	980	W8LTC...	25	8	800
K2JVT...	16	6	550	W8JVV...	25	8	940
W3RUE...	33	8	1100	W8WNM...	25	8	900
W3GKP...	31	7	1180	W8GPN...	23	8	540
W38GA...	31	8	1070	W8LCY...	21	7	680
W3TDF...	30	8	1125	W8LGN...	21	7	610
W3KCA...	30	8	1110	W8GTR...	17	7	550
W3BYF...	28	8	1070	W8NRM...	17	7	550
W3EPH...	32	8	1000	W9KLR...	41	9	1160
W3LNA...	21	7	720	W9WOK...	40	9	1170
W3LFP...	21	6	800	W9GAB...	34	9	1075
W3NKM...	20	7	730	W9JAG...	34	8	1050
W3ZJA...	18	6	610	K9AAJ...	31	8	1070
K3HDW...	12	6	1015	W9REM...	31	8	850
W4HJQ...	38	8	1150	W9ZTH...	30	8	830
W4HHK...	37	9	1280	W9BPH...	28	8	820
W4LTU...	34	8	1160	W9LYG...	28	8	950
W4XLI...	32	8	950	W9OJI...	27	8	910
W4MKJ...	33	8	1149	W9ZHL...	25	8	700
W4AO...	30	8	1120	W9BIV...	25	7	1030
W4VNH...	28	8	850	K9NED...	24	7	1100
W4LVA...	26	8	1000	K9AQF...	24	7	900
K4EUB...	26	7	1130	W9IF...	22	7	825
W4EQM...	25	8	1040	W9KFS...	22	7	690
W4IIB...	25	8	900	W9CUX...	21	7	800
W4CJ...	23	6	725	W9ALU...	18	7	800
W4VVE...	23	6	724	W0BPB...	37	9	1350
W4RMU...	21	7	1080	W0EED...	31	8	1030
W4TFL...	20	7	1000	W0SZJ...	29	9	1075
W4IRK...	20	6	720	W0LFE...	28	7	1050
W4OLK...	20	6	720	W0QDH...	27	9	1300
W4LNG...	19	7	1080	W0RUF...	23	7	900
W4RRF...	18	9	820	W0IC...	22	7	1360
K4YUX...	18	8	830	W0OX...	21	6	1150
W4CFZ...	18	6	650	W0INI...	21	6	830
K4WEH...	18	6	590	W0TGC...	21	7	870
W4MDA...	17	6	757	W0RYG...	20	8	925
W5RCL...	37	9	1215	W0ENC...	20	6	1100
W5AJG...	32	9	1360	W0AZT...	18	7	1100
W5FYZ...	30	9	1275	W0AS...	18	6	1130
W5JWL...	29	7	1150	K0JAS...	18	6	120
W5DQU...	28	9	1340	W0EFS...	16	6	1100
W5PZ...	27	8	1300	YE3DIR...	10	8	1330
W5LPG...	25	7	1000	VE3AIB...	28	8	1340
W5KTD...	23	8	1200	VE3BQN...	19	7	790
W5SVW...	20	5	960	VE3AQJ...	18	8	1300
W5AL...	16	6	700	W8RQI...	19	6	120
W5KUL...	13	4	1300	VE3HW...	17	7	1350
W5ESC...	12	5	1390	VE3BPB...	14	6	715
W5HIZ...	12	5	1250	VE2ABF...	10	4	580
W5CVW...	11	5	1180	VE7FJ...	2	1	365
W5NDE...	11	5	820	KH6UK...	22	2	2540
W5VY...	10	5	1200				
W5EDZ...	8	5					

The figures after each call refer to states, call areas and mileage of best DX.

### 220- and 420-Mc. STANDINGS

W1AJR...	11	4	480	W9JEP...	9	4	540
W1AZK...	9	3	412	W9OVL...	6	3	475
W1HDO...	11	5	450	W9UED...	4	4	605
K1JIN...	10	3	400	W9ZTH...	10	5	500
W1OOP...	12	4	480	K9DGU...	5	3	425
W1RUF...	15	6	385	K9ITE...	6	3	515
W1UHE...	11	4	385	KH6UK...	1	1	2540
W2AOC...	13	5	450	VE3AIB...	7	4	450
K2AXQ...	9	3	240				
W2BAH...	4	2	167				
K2CBA...	13	6	650				
K2DID...	4	3	140	W1AJR...	11	4	40
W2DWJ...	15	6	740	W1HDO...	8	3	210
W2DZA...	12	5	410	W1MET...	8	3	170
K2ITP...	11	5	265	W1OOP...	11	3	390
K2ITQ...	11	5	265	W1QWD...	9	3	410
K2JWT...	6	2	244	W1RUF...	7	4	410
K2KIB...	12	4	300	W1UHE...	6	4	430
W2LRJ...	10	4	250	W2AOD...	6	4	290
W2LWI...	12	4	300	W2BLV...	12	5	360
W2NTY...	12	5	400	K2CBA...	5	3	225
K2IFZ...	11	4	490	W2DPT...	6	3	200
K2PQ...	13	5	340	W2DWJ...	10	4	198
W2SEU...	4	2	105	W2DZA...	5	3	130
K2UUR...	4	3	105	K2KIB...	4	2	100
W3AHQ...	4	3	180	W2NTY...	3	2	100
W3FEY...	15	5	350	W2OTA...	10	4	300
W3JYL...	8	3	295	K2UUR...	7	3	175
W3JZI...	4	3	250				
W3KKN...	10	4	255	K3CLK...	9	4	250
W3LCC...	9	5	300	K3EFC...	6	3	296
W3LZD...	15	5	425	W3FEY...	7	3	206
W3RUF...	9	5	450	W3LCC...	2	2	96
W3UJG...	13	5	400	W3RUE...	2	2	96
W3ZIF...	5	4	112	W3UVG...	6	6	4
K4TFU...	8	4	400	W4HHK...	6	4	550
W4TLC...	5	1	315	W4VVE...	7	4	430
W4UYB...	7	5	320	W5HTZ...	5	3	440
W5AJG...	3	2	1050	W5RCL...	10	3	600
W5RCL...	8	5	700	W6GTG...	1	1	180
K6GTC...	2	1	240	W7LHL...	2	1	180
W6MMU...	2	2	225	W8ECC...	3	2	355
W6NLZ...	2	2	2540	W8HRC...	3	2	250
K7LCW...	1	1	250	W8JLO...	4	2	275
K8AXU...	10	5	1050	W8NRM...	3	2	390
W8JLG...	9	5	475	W8PT...	6	3	310
W8LPD...	6	4	480	W8RQI...	4	2	270
W8RNM...	8	4	390	W8TYT...	9	5	580
W8PT...	10	5	660	W8UST...	3	2	225
W8SVI...	6	4	520	W9AAG...	5	3	375
W9AAG...	9	4	680	K9AAJ...	4	3	425
W9EQC...	11	5	740	W9GAB...	4	4	608
W9JCS...	6	2	340	W9OJI...	6	3	330

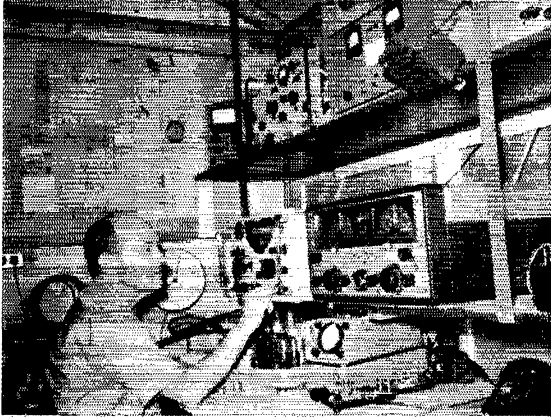
The figures after each call refer to states, call areas and mileage of best DX.

# Hawaii to Massachusetts on 1296 Mc.!

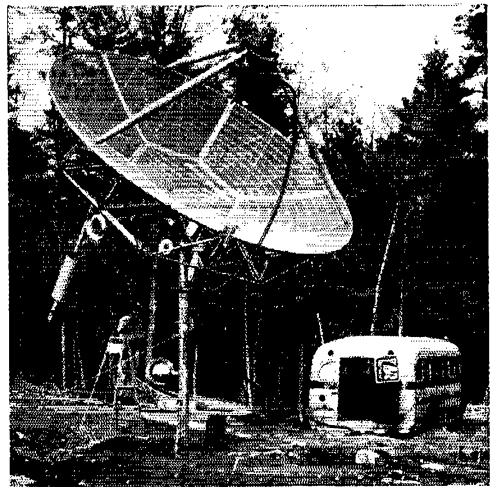
## Two Pioneers Succeed Again

ON August 9, 0148 GMT, after what seemed like a never-ending series of "almosts," KH6UK and W1BU (W1FZJ) managed a successful two-way exchange on 1296 Mc. via moon-bounce. For weeks they had copied fragments of each other's signals. Both were blessed with work schedules which permitted them to follow the

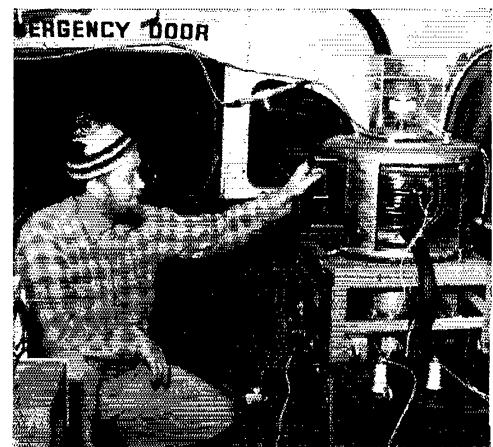
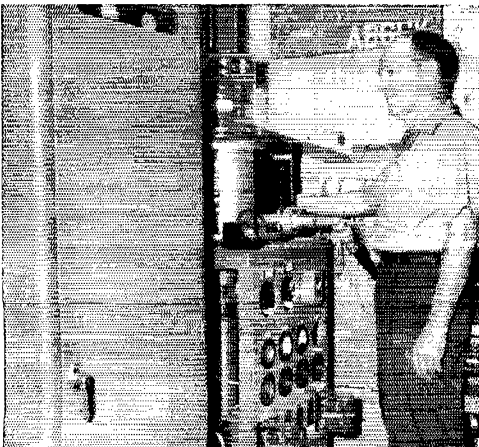
moon as its orbit caused its optimum target time to be advanced day by day. Both were blessed with plenty of technical know-how. But most of all, both were blessed with that wonderful persistence which caused them to stick with this project through days and days of tantalizing near-misses. FB, OMs!

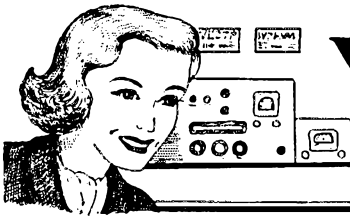


The operators—KH6UK and W1FZJ. Tommy is shown in his shack, which houses the whole setup. Sam's 1296 gear is in a school bus up on the hill a couple hundred feet away, and the receiver i.f. is fed down to the house.



Above, the antennas at KH6UK and W1BU. KH6UK got his 28-foot Kennedy through MARS, while the eighteen-footer at W1BU came from surplus. Sam's dish tracks automatically. Below, the transmitters. Both used one-kw. kylstrons by Eimac.





# YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,\* W1QON

It is always a pleasure to tell tales about YLs who serve their community through ham radio. The deeds of two YLs have recently come to our attention, and we are happy to recount them.

Mr. J. M. DeBardeleben of the Bureau of Public Roads, U.S. Dept. of Commerce, Ft. Worth, Texas, submitted the following information concerning a fellow employee, Mrs. Marie O. Sparks, K5VWJ. As an "inactive old ham" (and, incidentally, brother of W4FE, OM of Ethel Smith, K4LMB, founder of the YLRL.) Mr. DeBardeleben "incited" Marie onto her ham ticket a couple of years ago, and he and other Bureau of Public Roads employees were very proud to see Marie receive a cash award (\$100) for her special service beyond the call of duty as a licensed amateur.

During Hurricane Carla, K5VWJ operated her ham station almost continuously Sept. 8-13, 1961, having been granted administrative leave because of the importance of radio communications in the hurricane area.

Quoting directly from a U.S. Government (Dept. of Commerce, Bureau of Public Roads) Memorandum:

"One of the most important and urgent needs during and immediately after the storm was to find refuge for the thousands of people evacuating the disaster area. Small towns out of the disaster area had stored civil defense stockpiles of supplies. Authority was obtained for these cities to open reserve supplies for emergency use. As these towns were able to care for the people, the information was relayed to sheriff's offices and the information was relayed on to the victims. Many families became separated and displaced

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

K5VWJ operated her station almost continuously for six days and nights.

during the storm. Messages were relayed from town to town, looking for family members and getting them together again.

Mrs. Sparks helped service an area where approximately one-half million people were victimized by a major disaster and where her services and the services of others in her type of service were of tremendous help not only in finding refuge for people but in transmitting death messages, and assuring families that loved ones had escaped and were alive. Forty-four formal messages and several hundred informal messages were handled through Mrs. Sparks station."

The community service of Fran McCullough, W7DRU, of Tucson, Arizona, is of another type. This past Spring Fran and her OM, George, W7SQX, donated their "day of rest" twice in March, twice in April, and twice in June to the Polio Prevention Sundays campaign, the history-making voluntary mass inoculation program conducted by the Pima County Medical Society of Arizona. A publicity release on this effort said in part as follows:

"The aim of the program is to wipe out polio in Pima County by the administration of the Sabin oral vaccine to a majority of the population. While the McCulloughs are but two of the thousands of civic-minded volunteers who assisted with the program, the role they played as a husband and wife team is unique.

"Mrs. McCullough was in charge of a base station set up each Sunday at a wholesale drug warehouse. From her post, Mrs. McCullough directed the radio-equipped cars of her husband. Two Sundays for Type I vaccine, two Sundays for Type II, and two Sundays for Type III—this was the time spent by W7DRU.





Here's visual proof that W4EJQ is a YL and not an OM, as her name might suggest. C.w. operator Deane Lindsay, of Lenoir, N. C., laments that her first name provoked confusion in the YL-OM contest. Never mind, Deane, we like unusual names—besides, it's fun to shake things up a bit once in a while.

and other ham volunteers who shuttled the prepared vaccine between clinics with an excess and those which were running short. There were some 38 centrally-located sites throughout the county where the vaccine was dispensed each Sunday.

"Tucson hams who assisted with the project were William McCaughey, Jim McClanhan, Leonard Jackson, Joe McCormick, Walter Flewelling, Ron Merkel, Barry Joseph, Jerry Flewelling, John Buchanan, Thane Higgs, Cecil Buchanan, Robert McCullough, Howard Lumpff, Howard Douglas, and Dick Farman. (Sorry, we don't have the calls — *W1QON*.) Like the McCulloughs, all are members of the Search and Rescue Communications Staff, which became a permanent part of the Pima County Sheriff's rescue operations after hams participated in the search for three lost Boy Scouts in the Santa Rita Mountains several years ago. The radio operators decided to form a permanent group to be called in on such emergencies. As a permanent organization, the group continues to study and refine its role in rescue operations."



New Hampshire YL K1PCZ, Barbara Roberts, is happy to oblige with a YL contact from the Granite State. From her Manchester QTH Barbara works all bands 10 thru 80.



Custodian of the Puget Sound YL Coffee Net Certificate is Laurie Hansen, W7HTD, of Woodinville, Washington. The certificate is for OMs only who work 7 regular members of the net; OM DX stations need work only 3 members. W7HTD has been spending her free time assisting operations at World's Fair station K7USA.

### NOTABLE YL

On the air Dot Saunders of Englewood, Florida, is known as W4UF — in the second edition of *Who's Who in American Women*, Dot is listed as Mrs. Dorothy Chapman Saunders, Marine Biologist. For the past 13 years Dr. Saunders has worked on the problem of whether or not some fish serve as reservoirs of human parasites. Her work has taken her to various parts of the world, supported by grants and scholarships from different foundations.

Dot got her first amateur license in 1927 when she was a high school sophomore at Ridgewood, New Jersey. Her call was NU2BY. She held her license continuously through World War II, but when the license expired, she was out of the country. When she returned to the U. S. in 1951 she took the license exam again and became W4UF, and until recently also held the call W4ZKD.

A graduate of Syracuse University, Dot took her M.S. and Ph.D. in Biology at the University of Michigan. She has held a pilot's license since 1935 and in 1938-39 she was governor of the middle-eastern section of the U. S. for the 99'ers and editor of their newsletter. She taught four years at a girl's college in Pennsylvania, and has been a research agriculturist with the U. S. Dept. of Agriculture in Peru, Ecuador, El Salvador, Cuba, and Guatemala. In 1947 she married Dr. George Saunders, a research biologist with the U. S. Fish and Wildlife Service, and together they did field research in Mexico for several years. In 1953-54 she was assistant professor of biology at the University of Florida, and in 1955-56 she worked on a Fulbright post-doctoral research scholarship in Egypt. Since 1955 she has worked primarily at the Cape Haze Marine Laboratory in Florida.



Dorothy Saunders, W4UF



The new Upper Peninsula YL Club has 26 members, 14 of whom are shown here in the photo. Front row, left to right: K8YEE, W8HAV, K8TGX, K8SUP, K8KIT, W8QOM; standing, W8JXJ, KN8YXG, K8PNA, K8CZO, W0ATO, K8SRO, K8IFC, and K8ILN. Next June 23 the UPYLs will hostess the 13th Midwest YL Convention at Newberry, Michigan.

A charter member of the Florida YLs and Georgia Peaches (and president of the former in 1959-60), Dot is now on s.s.b. and c.w. with Collins 8-line equipment. She was recently appointed c.d. communications officer for Englewood, Florida.

Surely Dorothy Saunders is one of our most outstanding YLs, and it should be added that Dot's many accomplishments are exceeded only by her charm and graciousness.

Mrs. K5FOC, not a ham but obviously a gal who knows how to keep hubby happy at home, suggests the construction of a love-seat type bench in the bottom section of an A frame mast is ideal for moonwatching when the chief operator is not on the air.

### HOWDY DAYS

Sponsored by the YLRL, HOWDY DAYS kick off the fall and winter season of YL activity. Chat with old friends, make new ones. Extend an invitation to join the YLRL. Acquaint new amateurs with YL nets and other YLRL activities.

The following rules were received from YLRL Vice President Lillian Byrne, K2JYZ.

Start: Tuesday, Sept. 25, 1962, 1200 EST

End: Thursday, Sept. 27, 1962, 1200 EST

Score will be based on licensed YL contacts only. All bands and all modes of emission may be used. Only one contact with each station will be counted. Net contacts will not be counted. Score 2 points for each YLRL member worked and 1 point for each non-YLRL member worked (no multipliers). Logs are not required—submit a list stating date, time, call, name, QTH, and whether YLRL member or not to Lillian Byrne, K2JYZ, 24 Stillwell Place,

Freeport, Long Island, N. Y. Score sheet must be received by K2JYZ by Oct. 14, 1962. The top-scoring YLRL member will have a choice of a pin, charm, or YLRL stationery. The top-scoring non-YLRL winner will receive one-year paid membership in YLRL.

### YL Certificate Hunters Club

Bertha Roylance, K7CHA, secretary of the YL Certificate Hunters Club Chapter 4, submits the following net schedule for interested YLs:

Day of Month	Band	Freq. Mc.	Time	Mode	NCS
1st Sunday	20	14.275-80	1900	phone	K5OPT
1st Friday	15	21.335	1900	phone	W5JCY
1st Friday	20	14.044	2200	c.w.	VE7BBB
1st Tuesday	40	7.250	1900	phone	W5JCY

Membership Rules: Full membership requires that a feminine amateur radio operator hold a Certificate Hunters Club Membership and a valid amateur radio license. Associate membership shall be granted to a feminine licensed amateur radio operator if she holds 15 certificates toward her goal of CHC membership. Dues are \$1.00 per year. (No dues for DX YLs.)

As of June 1, the Chapter had 50 members in 22 states and 7 countries.

### COMING EVENTS

HOWDY DAYS—Sept. 25-27. Sponsored by the YLRL.

See rules, at the left.  
YLRL ANNIVERSARY PARTY—the 23rd annual. C.w. section Oct. 24-25; phone section Nov. 7-8. Complete rules next month.

## Strays



### FEEDBACK

The transistors in W9YVZ's 12-volt d.c. to 110-volt a.c. inverter (page 18, QST, August, 1962) should be type 2N176 instead of 2N167.

Dave Blaschke (right), W5WZQ, here accepts the Ev "Pappy" Mayer (KP4KD) Memorial Award given to the highest score in the ARRL Sweepstakes Contest. Brad Beard (left), W5ADZ, W5 QSL Manager makes the presentation for W3GJY, trophy donor, at a local DX meeting in Texas. Dave set a new SS record in the 1961 Sweepstakes 1576 contacts in all sections for 285,521 points. Looking on is Charlotte, proud YL of the new Sweepstakes champ. (Photo by W5FJ).

# How's DX?

CONDUCTED BY ROD NEWKIRK,\* W9BRD

## Wherefrom:

Ramifications of Telstar leave the imagination breathless. Those dramatic DXperiments actually began centuries ago, for there is no new scientific departure that does not owe its take-off to smudgy footprints in the sands of time. Radio amateurs made some of those tracks; of this we may be proud.

In a recent dialog Grommethead Schultz and Sunspot Sam McSquegg discussed scientific trail-blazing by pioneers Sam Morse and Joe Henry. This drew further interesting comment from W2ITQ, a staunch member of the Morse Telegraph Club, Inc., Joseph Henry Chapter, Albany, N. Y. Omer writes:

I liked your rather humorous story in the April issue of QST in which you indicated that Prof. Joseph Henry was indeed the basic originator of the magnetic telegraph. Very few people, including hams, recognize the fact that if it were not for Henry, Morse in all probability could not have invented the magnetic method of telegraphy. It was at the Albany Boys' Academy that Henry demonstrated the feasibility of such a system by stringing a mile of insulated wire around a classroom, powering it from a galvanic cell and causing it to ring a small bell when the magnet was energized. This bell and magnet are on display at the museum in the State Educational Building in Albany.

My Chapter of the Morse Telegraph Club, Inc., is named for Henry in recognition of the very valuable assistance he rendered to Morse. It is historically true that Morse's line from Washington to Baltimore would not have been successful if Henry had not suggested that the wire be supported from insulators instead of putting it underground in a pipe.

We have many ex-telegraphers in the Chapter who are hams, including myself. All members have had at least one year's experience as Morse operators. The Club is nation wide with about sixty Chapters, our purpose being to perpetuate the memory of the art of telegraphy, a technique now superseded by newer methods.

Once each year, as near to April 27th as possible, all Chapters meet and celebrate the birthday of Morse. Every Chapter is hooked up on a "round robin" telegraph wire by courtesy of Western Union. Greetings are exchanged and speeches are made by the Grand Chapter officers. This April our Chapter met with others, elected officers and attended a banquet. Our retiring president was WN2AIJ. The Chapter historian is W2ONE, a collector of antique Morse instruments who also delves into the origins of the many expressions and terms used by landline telegraph operators such as "73", "lid", etc. Bill also is a past president of the Albany Amateur Radio Association. Our membership comes from Western Union, the railroads, telephone companies, stock brokerages, press associations, pipeline firms and other organizations that formerly used Morse.

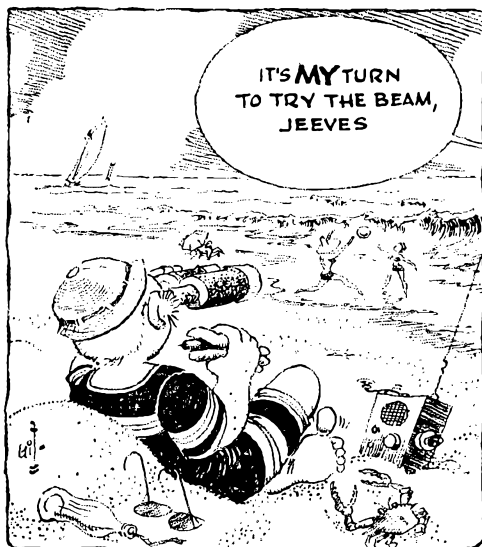
Ah, they were giants in those days. Thanks for the entertaining briefing, OM, and best wishes to all of the MTC gang.

## What:

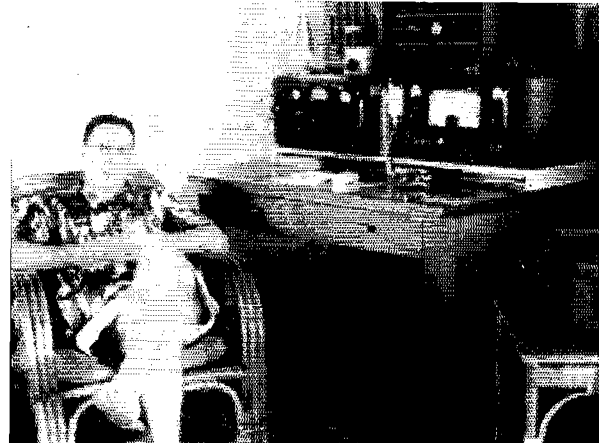
In its way, Telstar is an answer to the late K. B. Warner's epic plea for a second spectrum. Ultimately it may mean a \*7862-B West Lawrence Ave., Chicago 31, Ill.

lessening of congestion pressure on our old-fashioned ionospheric system. But we shall see. . . Here it is the end of another summer. How DX time flies! Let's see what the faithful "How's" gang has been working and hearing over the past few weeks. . .

**20** c.w. really carries the DX ball at this time of year. Correspondents Ws 2MFS 6RCV 7DUJ 7LZF 7POU (91/76 countries worked/confirmed), 8KML (314 on c.w.), SKX (224/213), 8YGR; Ks 1BVI 1MLI (ex-W6LER, 232/213), 1AOD 2TDI 2UYG 3CNN (77/42), 3MISN, 4IEX 4MYO 5FNW 5JBW 5YFU 6MQG (164/131), 6QPG 6TZX 6VTC 7AGJ 7KBN 7RVI 9BHR 9SID (13/8), 9JIR, 6JPL 6VSH (99/81), 6YRC; WAs 21JR 2KSD, (158/117), 21.0R 21UA (33/20), 2PND 2RQZ 6JSA/KM6 6ORS 6PDE 6ZUU, HL9KR and VE7BBB specify the 14-Mc. code activity of AC55Q (78) 11, AP5s AH (82) 15, CP (68) 12, BY1PK (40) 12, CN8s UV VII, COs 2EV 7AH 0, CPs 3CN (39) 0, 6EJ (62) 19, 5EZ, CRs 6CA (77) 22, 8AB (111) 15 of Timor, CTS ICB 2A1 (45) 9, DL8s BL CH CM FR, DMs 2ADL 2ANG 3LMD DUs 1FM (11) 14, 1OR (40) 10, 7SV (49) 14, EA8s BF CI CP (56) 23, DO, FP2BB, ETUS (15) 3, FA8 2GL 3OA, FB8s XX (40) 11, ZZ (40) 11, FG7s XK (56) 9, XO (45) 20, FK8AH (20) 8, FO8AN (80) 2-3, HA8 1KSA 3KMF 8CC, HB4FF, HH2CE, HI3PC, HK0AI (45) 20, HL9s KB (38) 10, KJ 9, KN (68) 13, KR (50) 11-14, HPIE 1H HR3R, HZ1AB (75) 20, IIZCN/MK1 (89) 0, IT1s AGA TAI, JA8EN (78) and other JAs, JT1KAA (50) 6, roving Ks 2QGC/KG6 3GAD/KJ6 (27) 7, 5FOQ/KS6 5KOR, KS6 6CQV/KS6 7SEW/KJ6 (50) 6, 9ACJ YP9, KA2s AB KS MA, KC6BD, KGs IBO 1FD 6ALB, KJ6s BV (45) 3, GU, KM6s CE CI (12) 5, KR6s AF (57) 7, LJ (82) 10, LY MA (58) 22, MO NG (57) 16, OD (13) 17, KS6Am (49) 4, KY4A (81) 20, KX6s AJ (15) 10-13, BQ DX (29) 8, LJ2S (78) 11 or Norway, LXs 2XG (10) 21, 3KP (60) 22, OXs BZ DL 4, 3I KC 0, KW, OY7ML (20) 19, PI1KM, PK1YR (92) 21, ST2AR (39) 23-4, SVs 1AM (43) 23, 1AO (98) 22, 9WI (89) 0, 0WN (45) 20, 0WT, TAAs RN (42) 33, RZ (56) 0, TF3s AE KG, TG9AD (1) 5, TAAs 1KED of Franz Josef Land, 2KAH (23) 0, 9BZ 9DB 91N (20) 3, 9DT 9FL (15) 2, 9FV 2, 9WJ 4, 9CE (31) 7, 0EQ (38) 11, 0EV (82) 8, 0FF (41) 6, 0FR (12) 7, 0JW, 0KCA (69) 21, 0KCC 0KFM (39) 6, 0KPG (46), 0KIA (41) 7, 0KKB (75), 0KQB (45) 7, 0LU (50) 9, 0RB (17), UB5s galore, 1U2s AA, AX, BB BS KAA, UD6s AM (34) 3, AX, BV (60) 3-4, GF (23) 22, UF6s KPB KPE (78) 18, BE (60) 5, UC6KAA (40) 20, UH8s AA (40), BI BO (58) 2, 1A KBC (15) 2, UL7s FA (10) 2, KAA (42) 12, NB (67) 2, UM8KAB (12) 17, AP (42) 12, UO5s PK SD (49) 6, UP2s AY KNG NB, 1UQs AS (40) 6, AN BA (40), BP (60) 5, KDD (1) 6, UR2s DZ EAN, UT5s CC EW, UWs 3AO 3ME (7) 4, 0P's (37) 9, 0H (93) 12, VE8RG, VKs 1ATR (32) 12, 9LA (50) 16, 9RO 9XO, VP's 2KJ (78)







VR1B of Tarawa scored more than 2500 contacts during his two-year stay in the Gilberts with an SX-28, 10B (courtesy W6UOU) and 100-watt c.w. rig. Charles formerly signed VKs 1AO and ØAB. He should be back at his home station, VK3IB, by this time with an HT-37 and SX-111 combo. (Photo via K2UYG)

3, 2MIV (56) 22, 2SH (45) 0, 2SQ, 5BL 5XG (56), 6PJ 7NQ 8GU 9EP 9EU 9C, VRs 1L 1M (30) 9, 2BZ 2DK (3) 10, 3H 3L (13) 21, 3P (52) 0, 4CV (40) 7, 6TC, VO's 1DR (56) 19, 2IE 4IT (1) 5, 8AI (56) 3, VS's 1FJ (57) 13, 1LD (43) 16, 1LF (68) 15, 4RM 12, 6FC (85), 9AAC (67) 22, 9MB (23) 1, roming Ws 1MIV KP6 4LCV KMG 5HTM, VR3 (38) 7, 6VUN/KW6 6YCW/KJ6 ØVH/VP9 15, XZ2TH (40) 11, YJ1RH (120) 6, ZAs 1GB (90) 13, 2BAK (40), ZB1s HC NZE, ZDRRN (60) 22, ZP5OG (49) 1, ZS3EW (25), 4S7CE (49) 16, 4X4s BS (34) 21, DH (56) 23, HC (67) 20, HT (45) 22, IO (67) 19, KK, 4UHTU, 5A3CJ, 5U7AD (44) 19, 9G1s CW (41) 23, DT, 9M2s FP (20), GJ (32) 16, UF (81) 15 and 9Q5AAA. By the way, the numbers in parentheses are kc. above the lower band edge; numbers outside parentheses are GMT.

**20** phone enabled Ws 2MES 3LE 8KML; Ks 1MOD (216), 2TDI 5JBW 6QPG 7RVI (ex-K5QPG), 9JJR, WAs 2RQZ and 6ORS to catch up with BV1s US 23-0, USA 12, CO8CO, DU's 6IV\* 7SV 12-13, 4As 8CD (178) 23, 9AZ (298) 8, ELGA (271) 20, FK8AU 11, FM7WQ (304) 11, F08AN (334) 7, GD3NJK (200) 6, HH2JH, HL9KT 13, HP1JF (340) 23, HZ1AB (295) 23, JAs 1LZ 12, 1MJ\* 6MR\*. Ks 3GAD/KB6 18-19, 4PDI/VP9 6CQV/KS6 (262) 6, 6SKU/KS6 12, 7SEW/KJ6 (272) 20, KA2JL 11, KGs 1BX 4BG (245) 6, 6ALD 12, 6FAE 6JL 12, KM6CE 10, KR6s DI 12, SB (120) 17-18, KV4AA, KX6BQ (266) 8, MP4s QBB TAO, OX3KC, SV1AM\*, TG8CW (320) 4, UAs 4HP 3, ØEH 12, VEs 3BQL/SU\* (200) 0, 6MC, VK9s CP NT YT\* (150) 12, VP's 2AD 23, 2KJ 22, 9EZ, VRs 2BZ 3H 3L\* 3P 3S (300) 7, 4CB\* 10-11, VS9APH (342) 20, Ws 6EHP/VR3 8CAU/CN8 (189) 0, WA6s 1FV7/VR3 QVQ KP6, YNACWH, YJ1RH (120) 6, YS1MS, ZB2AD 23, ZC4AK, ZD7SA, 4X4s CW (278) 21, HT (205) 22, 5A4TF, 9G1EB, 9Q5US, 9Q5US, the asterisks representing lonely non-s.s.b.ers.

**15** c.w. usually draws a DX blank in midsummer but this is no usual year. A flash bulletin from 1.8-Mc. specialist WIBB reveals that VP8CQ scored a two-way with VE3GP on July 1st, a really rare 160-meter breakthrough. EI9J, Ws 1BB 2KQT 3GGF and VE3QU swung into action the following night to add VP8CQ to their top-band totals. Like we've always been saying, 1.8-Mc. summertime trans-equatorial skip possibilities bear more extensive DX exploitation. Are you all set for the 1962-63 160-meter season? Don't miss the fun!

**15** phone should be entering a lively period right now, just as old ten used to do at this time of year, but summer wasn't too slow for Ws 1BPM 8KML; Ks 1MOD 3CNN 5JBW 6MQG 7KBN 7RVI 9BHR 9GSD 9JJR 9QMJ; WAs 2FQG 2KSD 2MUA 6ORS and 9BRC. They collectively collected CE1AGI, CO2JL, CPs 5FC 6FC, CTIPK, EL5A 17, ET2US, FA2VX\*, HCHJL, HH2s BC RS, H18MV, HP's 1MN 3RL, HRL1B, ITIAG, Ks 1A2A/KP6\* 2, 4PDI/VP9 (300), 6CKD/KP6 4, KB6CL, KG4s AA AF, KX6BU 2, LX1DC, MP4TAC\*, OAs 4AR 5G 0, ON5KY, PJ3AD, PZ1s AW CI (234) 17, TG9BM, TIs 3CL 5RV, VP's 2UAG 2KJ (230) 23, 2LS 3FM 5LR 5VL 1, 7NB 7NY 9EZ, VO4s FF (256) 19, IF, VR3s 2, VSs IGC (200) 13, 9APH\*. Ws 3HOR/KP6 5BKT/VR3 8CAU/CN8 (243) 0, WA6HLP/KJ6 23-0, YN1CA, ZB1A\*, ZC4TJ, ZD1JWC (240) 19, ZP5s CN\* OG\* 4X4s HT (245) 21, IX, 5A3BC, 5N2BRG, 9U5s JF (245) 18 and JH (245) 20. In this paragraph lonesome s.s.b.ers bear the stars.

**15** Novice diggers persist successfully as the 21-Mc. DX tide slips out. KNs 1TZQ (36/23), 7PFU, WV2s

TOA (25/10), ZEZ and WV6TNC will be decorating their shacks with QSLs from CE3EF, DM3s SBM RD, a flock of DJ/DLs, EAs 1GZ 5FP, Fs 2RL 2WL 8VO 9QG, GC2CNC, plenty of Gs, GM3s PIP XO, HAFX, JAs 1E2P 1ISA 5FQ 8ZO, KH6GP, KI7EEA, KP4BBN, KR6QW, KZ5TG, OH2GU, OZs 3GB 4WR, PA6WDW, PY1s AXP BIL, PZ1BH, SMs 2COL/mm 6CAW 7BUE, SPs 8KAR 9RF, UA6KOD, UBS5FG, a helping of VKs, VP4LQ, VR3L, VO5IG, YU20B, ZB1JF and YU20B.

**40** c.w., slowed down by summer thunderstorm attacks in our hemisphere, nevertheless enabled Ws 3ONS 6RCV 7DJU 9NN (173 on 7 Mc.); Ks 1MLI 1MOD 2JJR 3CNN 4MIYO 7RVI ØVGA; WAs 2KSD 6ORS 6SLU and EL4A to capture DM3s DKN (3) 1, LKN (21) 2, RD (5) 1, ZKM (1) 23, FA8RJ, FG7XK (10) 2, HAs 1KSA (16) 1, ØKDA (6) 2, HC1DC, H13PC, ITIAGA (18) 1, JAs ICBF 1C1D 1CQQ 1DWE 1DWS 1ESS 1FNR 1FOP 1GNX 1HP1 1IHE 1IHT 1IHL 1ITX 1JEH 1KFN 1YBS 1YP 2BHG 2BLG 2CLK 2CMO 3AZW 3BCJ 3BDO 3BQH 3DAZ 3DDG 3DMJ 40E 7AZN 8AJS 8DH 8LN 9XC all around breakfast time, K5KOR/KS6, KX6DK (14) 10, rarish LUIY, LX1DB, LZ1KSD 21, OE3BP (22) 2, OKs 1BY 3KOA, SL6s BH 2, ZK (18) 1, SV1AY (5) 23, UAØZG, a hatful of VKs and ZIs, VP's 4TK 8GQ (2) 0, 9BO 9DL 9EP 9EU, VO8BX, VRs 1M (17) 11, 3P, XEs 1WL 2FA 2JS, YOs 4ZF 7DO (15) 2, 9CN (1) 1, YV5BLZ 2, ZA2SP (4), 3A2CD and 9G1EB . . . . . WV6USQ keeps the 7-Mc. Novice situation solvent by crossing the border to XE2UR.

**10** phone squeaked through the hot spells for WAs 2KSD 2MUA 6PDE and 8ADII who managed HP1DC, KP4s AXU BY, KZ5s JW SH TD, LU8DBA, VP6GN and ZL2MU. Let's watch for some autumnal DX action in this range, even though possibilities aren't promising at this stage of the sunspot cycle. The north-south paths frequently are interesting regardless of over-all conditions on 10.

Here's a good spot to apologize for lax acknowledgment by mail of the many generous DX-info contributions that poured into Jeesvie's mailbox this summer. We like the personal-type thank-you when possible but we've had to forgo this approach temporarily. Please continue to keep the DX ball bouncing in QST — your kind support is sincerely appreciated.

**Where:** Asia — "Speaking of QSLs," writes ex-EP2BK, "when I finally arrived in Springfield, Mo., after having spent a couple of months on the trip home, there were hundreds of cards waiting to be answered. I had 1000 new ones printed just before leaving Iran so I was well prepared. These were ordered from a printer in Tehran, 500 miles north of my location near Abadan, three weeks before I closed down. It was time for the Iranian new year and the printer was so swamped with orders for greeting cards he kept procrastinating on my QSLs. With only two days left before I was to hop the plane, no cards had arrived. So I sent a message to the printer to forget the whole thing if he couldn't deliver within 48 hours. We were scheduled to leave for the airport at 0400 March 28th; at 0100 the doorbell rang. There were the cards! But what a job — cheap grade of stock, crooked printing, wrong format and design.



Worst of all, the ink was horribly smeared on most of them. Anyway, for some of the fellows who need EP for DXCC I guess they still look pretty good." Wishful thinkers still abound in the pile-ups. Bob's statistics show that five of every 100 QSLs received came from stations he did not work. Award sponsors should bear this in mind when they consider dispensing with QSL proof of contact. . . . Ex-XW8AS-HS50SQ contends, "I sent a QSL for each card received. If some went astray, cards with self-addressed stamped envelopes or International Reply Coupons to W5ZG will get speedy replies." . . . VS1LF (K4HHW) answers via bureaus if the log checks. . . . Juvenile delinquents broke into club station ZC4AK and did away with a flock of QSLs, according to VERON's DXpress. ZC4s are supposed to become 5B4s. . . . "It will be some time before ex-JT1s AA and YL get around to sending me log data on their activities in Ulan Bator," writes W3LE. "They may decide not to furnish the data, in which case their cards will have to come from Czechoslovakia. It will be announced when Mla and Ludvik get settled and operating." . . . KR8AK tells W8KX he doesn't work 15 meters despite receipt of QSLs indicating the contrary. CN8AK? . . . "We have a new batch of cards and we QSL 100 per cent," says K2LSX of the H19KT staff. "Once in a while a batch seems to get lost in the mails but this doesn't happen often." Thank goodness!

**Africa** — "After nine years in Morocco, the XYL and myself are returning Stateside. I've been CN8EU since 1953 and still hold all logs for my activity. Anyone still deserving a card can reach me at my W6EDU QTH — stamped self-addressed envelopes or IRCs, please." And welcome back, OM. . . . W1BPM recently received ZS80's QSL for a 1958 QSO. Patience is golden. . . . EL4A voices the universal plea for adherence to Greenwich Mean Time and spelled-out dates. "The more time a DX operator has to spend deciphering incoming QSLs, the less time he has available to dish out QSOs." Ken also urges all DX-inclined W/K/VE/VOs to keep an adequate supply of s.a.s.e. on file with their call area QSL bureaus. EL4A feels that the surest approach to a desired pasteborder is the inclusion of self-addressed envelope bearing a mint stamp of the country concerned [such as available from W2SAW]. Nothing like a friendly letter and some photos, too, to clinch the deal. . . . ZELJE writes, "I have always QSLd 100 per cent via bureaus but W6YMV's kind offer of QSL-managerial assistance will mean quicker confirmations." . . . WGDXC has it that K9ECE no longer undertakes EL2Q QSL responsibilities. Inadequate liaison from the DX end. . . . The Gulf gang also is informed that 9G1DP will respond to XT2Z-5T5AH QSL inquiries via bureaus. Lou contemplates return to Switzerland early next year. . . . W8EX finds that VQ8A1 enjoys receipt of correspondence in English, French or Spanish. . . . VQ9A, VQ9C and VQ9AA logs had to reach QSL aide W1ECI via Bombay. No air service in the Seychelles, just a monthly slowboat.

**Oceania** — Happy QSL coincidence for 14-Mc. buff W6JSA/KM6: "My father is a painter, so I expect to QSL 100 per cent. I'll use bureaus for DX, also for W/Ks who do not supply s.a.s.e." . . . Lots of QSL confusion on the Pacific bomb range. For example, your QSLs for VR3S go to the home QTHs of W1AHQ, W6EFH, WA6s MAZ MFY, K9USL, K1H6EJN, etc., depending on who was at the key or mike. . . . KH6AAJ allirms his lack of KP6 QSL connections. . . . WA6ORS observed many brethren working K5FOQ-KS6 as "KH6" on e.w. They'll be pleasantly surprised when they wise up. Virgil promises through QSLing from home from his Pago Pago percolations. . . . W1MV/KP6 opines, "After hunting through five logbooks for some contacts mentioned on incoming QSLs I come to the conclusion that many hams don't know what time it is. Some don't even know the date. All cards received have been answered, direct in response to those

with s.a.s.e. and/or IRCs, others via bureaus." . . . KW6s DF and DG, getting back home to K6s TFP and SLD, respectively, launched over 5000 QSLs from Wake. This cost more than the price of a high-class rig but Bob and Layne were determined to do things right. "We most certainly appreciate the courtesy of s.a.s.e. and IRCs. See you all from Colorado!" . . . From W3LE: "VK9CP of Kavieng ran out of QSLs, so I promised to have a batch made up for him just as soon as he sends me a sample."

**Europe** — OH2s BAD and BR promise complete confirmation of August QSOs as OH2s BAD/4 and BR/4. Finnish fours are rather rare. . . . ZB2AD tells K1BVI that QSL manager W3AYD is equipped to take care of all Jan's April and May '62 QSOs. . . . All F7FI QSOs have been QSLd," declares W2ZVS/2, now back at Grilliss AFB, N.Y. "I've received cards for QSOs dated after my QRT there, March 8, 1961. Can't confirm these, of course. Someone else must be signing F7FI now." . . . Operator Jeno promises thorough QSLing for his share of club station HA5KFZ activity. He tells NNRC's Roy Waite that the W/Ks are really rolling through on 3.5 and 7 Mc. . . . WGDXC's DX Bulletin relays W1OPM's reasonable insistence on s.a.s.e. or IRCs for his DL4FC/DL8 QSL cooperation. . . . According to W8KX, s.a.s.e.s get speedy QSL attention at SV8WN. . . . NCDXC hears indirectly from ZA1GB that ZAs 1KFA 1KFF and 2BAK are workable but that QSL exchange is frowned upon by Albanian authorities.

**Hereabouts** — Another helping of commendable "QSLers of the Month" is nominated by Ws 1BPM 8YGR, Ks 1BVI 1M01 4M1O 6TZX, Ws 2KSD 6ORS, KN1T7Q, VE7BBB and EP2BK; DL9PF, EP2BK, FG7XK, Gs 3POG 4CP, HMIAP, ITI1GA, KIAZA, KP6, WA6WQM/VR3, W1AIV/KP6, KB6BZ, KM6BI, OE7FW, QZ7KV, SM6UG, TF2WBG, UL7FA, UM8KAB, VP2s NIV VI, VQ8A1, VRs 1M 3S, Vrs 1FZ 4RS and 9A2UF. May the QSLs of these colleagues long shine forth from the walls of hamshacks 'round the world. . . . Ks 4M1O 10GV 5FNV 7KBN 9GSD and WA2HTQ volunteer service as QSL managers for overseas ops in bona-fide need. . . . W4SSU announces, "Be advised that I am QSL manager for VP2KJ's contacts dating after June 1, 1962. S.a.s.e. or IRCs, please." . . . WGDXC indicates that W1DQS has accounted for all HK0AB/KS1BF DX-peditionary QSLs but welcomes further inquiry on the subject. . . . WAGORS calls attention to the new address of ARRL's Sixland QSL Bureau where the San Diego DX Club is proper proprietor. . . . FPRBX (W1RAN) has issued confirmations to all contacts for his late-winter St. Pierre stand. Ned is QRX with spares just in case. . . . FG7XII assures W4UF of an attentive QSL policy. Andre says he wants to help compensate for others on the island notably lax in this respect. . . . VP8BG expresses thanks to QSL manager W5QK whom he schedules for log liaison. Dave's remote Deception Isle QTH makes such an arrangement invaluable. . . . Now let's see what the mailbag spills out in the way of specific suggestions:

- AP5JA (via AP5CP)
- CE3SB, NAsA, U. S. Embassy, Santiago, Chile
- ex-CN8EU (to W6EDU)
- GO2JL, J. Martinez, Box 906, Vibora, Havana, Cuba
- GP1DA (via K0PFF)
- DL4FC/DL8 (via W4OPM)
- DL5SL (via REF)
- FA2GL (to F3GL)
- FG7XK, G. Gonnudadin, 5 Cite, Deboivieux, Pointe-a-Pitre, Guadeloupe
- FG7XO, Box 521, Point-a-Pitre, Guadeloupe
- FK8AH (via W2CTN)
- HA5KFZ, J. Matzon, Vegvar No. 4, 1 em. 73, Budapest 3, Hungary
- ex-1B9AW-FP8AW (to WA6QAU)

VS4RS, while managing to placate W/K/VE pursuers, reached the 150-country mark in his first seven months in Sarawak. Ron enjoys antenna experimentation; a new 2Q-meter beam soon will join his Europe-oriented Vee and homebrew rotary (Photo via W8KX)



**HI8MV**, Box 157, Santo Domingo, D.R.  
**HL9KN**, APO 358, San Francisco, Calif. (or via W3MVK)  
**HL9KT**, Co. B, 304th Sig. Bn., APO 310, San Francisco, Calif.  
**ex-HS2M**, M. Pioso, 4110 Gallatin St., Hyattsville, Md.  
**ex-HS5OSO** (to W5ZG)  
**K1AZA/KP6** (to K1AZA)  
**K5KOR/KS6** (via K5SEK)  
**K7SEW/KJ6** (to K7SEW)  
**K0DMU/KB6** (to K0DMU)  
**KG1BO**, A/1c E. Simmons (K8NFC), P.O. Box 318, 4683rd Air Base Sqdn., APO 23, New York, N.Y.  
**M1DFE** (to 11DFE)  
**O4AM** (via RCP)  
**OH2AD/B** (via OH3NS)  
**cz-PA0FM-PK4DA**, A. Bles, VK2AVA, 33 Plateau Rd., Springwood, NSW, Australia  
**PY4RT/B** (via PY4TK)  
**PZ1AW**, Box 811, Paramaribo, Surinam  
**PZ1BJ**, A. Hing, Box 32, Paramaribo, Surinam  
**TA3AT** (via W8PQQ)  
**TA4RZ**, Box 124 or 132, Izmir, Turkey (or via K4WIS)  
**TF2WGB**, 667th ACWRON (H13), Box 12, Navy 568, FPO, New York, N.Y.  
**TC8CW**, C. Castillo, P.O. Box 852, Guatemala City, Guatemala  
**TC9GZ**, J. Glarbo, P.O. Box 25A, Guatemala City, Guatemala  
**TC9UP**, U. Polanco, Box 115, Guatemala City, Guatemala  
**TY2MY** (via KV4AA)  
**VK9AD** (via VK3CX)  
**VK9MP** (via W2CTN)  
**VK9NT** (via W2CTN)  
**VP2AL** (via K4LRA)  
**VP2KJ** (via W4SSU)  
**VP7NS** (via W2CTN)  
**VQ9AA/7** (via W4ECI)  
**VQ9C** (via W4ECI)  
**VR3B** (via W3FSF)  
**VR3P** (via W5HTM or W5BKT)  
**VR3S** (see preceding text)  
**VR4CV** (via K6EC)  
**VR5AA**, Box 36, Nukualofa, Tonga Islands  
**VS1LF**, R. McDonough (K4HHW), U.S. Embassy, RCH, APO 928, San Francisco, Calif.  
**VS9MB**, via ISWL, 86 Barringer Rd., London N.10, England  
**WSLQ/mm**, H. Teass, jr., USS *Cambria* (APA-36), FPO, New York, N.Y.  
**W5BKT/VR3** (to W5BKT)  
**W5FLO/KJ6** (to W5FLO)  
**W8CAU/CN8**, P. Eade, Box 1224, APO 113, New York, N.Y.  
**WOMLY/Africa** (via KV4AA)  
**WA6CJL/KP6** (via W6AFI)  
**WA6HLP** (to WA6HLP)  
**WA6JSA/KM6** (to WA6JSA)  
**XTZ-5TSAH** (to 9(H1DP))  
**ex-XW8AS** (to W5ZG)  
**YJ1RH** (via W4ANE)  
**YV1GE**, Box 1019, Maracaibo, Venezuela  
**YV4EW**, Box 419, Valencia, Venezuela  
**YV6AV/2** (to YV2DW)  
**ZA2SP** (via PZK, attn. SP8HH)

**ZDJWC**, J. Collins, Freetown, Sierra Leone, c/o State Dept., Washington, D.C.  
**ZDR8N**, Ascension Island via PAA, Box 4187, Patrick AFB, Fla.  
**ZE1JE** (via W6YMV)  
**ex-ZM6AS**, F. Fenton, 5 Blake St., Waitara, N.Z.  
**ZP5CN**, U.S. Mission to Paraguay, U.S. Embassy, Asuncion, Paraguay  
**ZP9AY** (via W3CTN)  
**ZS3s AH/9 NZ/9** (to ZS3s AH NZ)  
**ZS3EW**, B. Connolly, P.O. Box 131, Swakopmund, South-west Africa  
**3A2CD** (via W6VSS)  
**3A2CZ** (via ON4QN)  
**6O1ND** (via W1W1Q)  
**9G1EB**, L. Hodges, P.O. Box 1633, Accra, Ghana (or via K2MIV)  
**9U5JH** (via W4YWX)

This rundown results from generous contributions of data by Ws 1DGI, 1MV 1TQS 2MES 3LE 4UF 7LZF 7MHI 8XN 8YGR, Ks 1BVI 1MLT 1MOD 2JIR 2LSX 2TDI 2UYG 3GNN 4EX 5JBW 6MQG 6TZX 7KBN 9JJR 8GVA 8VSH, Was 2PQG 2KSD 2LOR 6ORS 6PMK, VE7BBB and L. Waite, as well as club groups DARC D X-MB (DLs 3RK 9PF), Far East Auxiliary Radio League News (KAs 2s AB LL), Florida DX Club DX Report (WICKB), International Short Wave League Monitor (B. Brown, 196 Abbey St., Derby, England), Japan DX Radio Club *Bulletin* (JA1DM), Newark News Radio Club *Bulletin* (L. Waite, 39 Hannum St., Ballston Spa, N.Y.), North Eastern DX Association *Bulletin* (W2DGY), Northern California DX Club *DXer* (K6CQM), Okinawa Amateur Radio Club *Keystone Kurrier*, Polar Bears Radio Club *DXer* (8L3Z), Universal Radio DX Club *Universalist* (109 Mesa St., Vallejo, Calif.), VERON *DXpress* (PA3s FX LOU VDV WWP) and West Gulf DX Club *DX Bulletin* (K5ADQ). Call again!

**Whence:**

**Europe** — EDR (Denmark) invites your indulgence in the 4th Scandinavian Activity Contest, a DX affair in which non-Scandinavians will share up as many LA LA/p OH OH OX OY OZ and SM/SL colleagues as possible and, of course, vice versa. The c.w. session commences 1500 GMT, September 15th, and winds up at 1800 the 16th; phone men take over on September 22nd-23rd, same times. On c.w. we call CQ SAC, on phone "CQ Scandinavia", and the serial exchange is the usual RST001, RST002, etc., the "T" naturally omitted on phone. Scores are figured at one point per completed QSO, this total multiplied by the number of Scandinavian band-prefixes collected. With operation permitted on 3.5 through 28 Mc., a maximum of 40 multipliers is possible. Your log transcript, listing date, GMT, station worked, serial sent, serial received, band, and note of each new multiplier claimed should be submitted with a summary sheet to EDR Traffic Dept., P.O. Box 335, Aalborg, Denmark, no later than October 15, 1962, to qualify as a candidate for certificates of merit. Good chance to accumulate credits toward OHA, OZCCA, WASM and WAA sheepskins, too. *Skoll*, . . . . . RSGB adds a 7-Mc. DX Contest to this year's international activities calendar, October 27th-28th and November 3rd-4th are the dates. We'll have participation procedures next month. . . . . W2SLC/mm expects to keep his IIT-37, SX-111 and ground-plane warm on 20 sideband from the Mediterranean aboard USS *Cambria* for a few more months. . . . . K7KBN welcomed SM5WI back from military service where he used the call SL5ZL DXtensively. . . . . W0CVU garnered the first all-sideband RSGB Empire DX Certificate. . . . . From K1M0D: CT2AI, prominent Azores contester, has a three-year DX total of 148 countries on only about 30 watts of phone and c.w. Alb also likes to tune for BCB DX and expects to have a 200-watt rig going shortly. . . . . ON4CF tried his 40- and 80-meter DX luck as LX3CF in June with QRP. . . . . OH2BR's 2220 QSOs are spread among 101 countries. His brother, 13-year-old OH2BAD, has a Novice record of 1310 QSOs with 77 countries. The boys like 21 Mc. with 50 and 15 watts respectively. Jukka and Miika have a 2-element beam on 15, a ground-plane on 20, and they receive with a Finnish RP-65A. . . . . NCDXC records G3KGB's DXcursion to the Outer Hebrides this summer with a B-2 portable.

**Asia** — MP4BDC offers local Bahrain color: "Conditions have not been too good of late and most bands are noisy. I normally work the States on 21 Mc. between 1300 and 1500 GMT with good reports. Ten meters opens up around 1600 with South American and African stations breaking through. Every Friday we hold the 'Persian Gulf Natter Net' on 7-Mc. phone with MIP4B-1)-AL-T EP 9K2 and various 'mm' members. Last week W4PUR/mm joined us. Rag-chewing is the favorite pastime at MIP4BDC but the DXCC score stands at 138/125 nevertheless. There is still quite a lot of ham activity from this area. Most of the MIP4 regions have operators now although some are not very active." . . . . . K4FXT heard 193 countries while stationed in Turkey but had to knock off for home without obtaining TA transmitting authorization. Several TAs are intermittently active right now — perhaps the worm is



VU2US/AC5's contingent goes on trek in Nepal. Fourth, fifth and sixth from the left are VU2s BK US and PS; VU2TN is at far right. Others in the party are officials and prominent citizens of the region. (Photo via W4IEN)

turning . . . . . Amateur radio still booms in Korea. W4WNY of HL9KR writes, "Activity really is picking up here. I expect to be on the air almost every evening, 1100 to 1400 GMT, using 14,050-kc. c.w., but will have departed for the U.S. by September. We've established contact with HM1AP, KARL DX editor, QSL manager, and a devoted ham, with frequent personal visits." As for HL9KT, K2LSX advises that he, Ws 6GNX and 0EYZ come back home this month. K6TZX's friend WA6OAO leaves HL9KN this summer and should soon resume activity as W3NIVK . . . . . HM1AP writes K6QPG of his quest for crystals to complete an s.s.b. transmitter. "We have nine new HM amateurs resulting from April examinations, one an XYL. Lots of new HL9 activity, too. I am active regularly on 14,050 kc., 1400-1600 GMT, and am modifying a surplus BC-779 receiver for DX." . . . . . According to K7KBN, 4X4NJ (ex-K7ADD) has a new Israeli XYL . . . . . "The amateur radio situation here is rather quiet," pens HS2M just before Stateside return. "HSs 1A 1B 1JN 1W and 2A were quite active but now most of them have closed up shop." . . . . . Ex-EP2BK hopes to have his W0NJB call going by this time but expects to leave Missouri again for another overseas assignment soon. "The XYL and I visited Greece and England on the way home and then spent several weeks driving from Boston south to Florida and west to Missouri. We met a great many hams all along the route, mostly fellows I contacted on 160 and 80 meters. While visiting W4DQS in Cocoa Beach we saw Scott Carpenter blast off." . . . . . "AC5SQ apparently is back on the air since his mid-1961 QRT," observes K2UYG . . . . . Asian items courtesy NEDXA, OARC PBRC and VERON: KV4CI/mm keeps close touch with home from the waters of AP5 FL7 487, etc., mainly on 14- and 21-Mc. c.w. . . . . UA9s CM DT OI VN, UA0s BP EH EK RQ VQ, UL7JA and UW9CC use sideband from rare Russian areas. . . . . AC4AX says ham radio still is taboo in Tibet. . . . . KR6s LJ LD GP and IM lead the Okinawa DX parade with 149/110, 146/97, 139/60 and 118/113 countries tallies respectively.

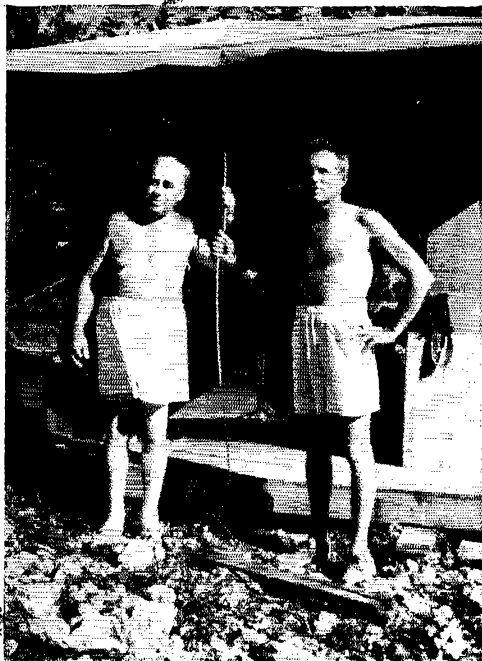
**Africa** — ZS3EW writes from his isolated lighthouse at remote Pelican Point: "DX conditions could be a lot better. Twenty-meter W/Ks come through between 1300 and 1600 GMT but the path seems to be deteriorating with a high static level. I'm contemplating a full-size wire beam for the U.S.A. When conditions are more favorable I can manage about 40 W/K QSOs daily. An Instructograph is peeping up my c.w. here so I'll be ready for those pile-ups. Twenty's my usual band but I try 7 Mc. in the contests." . . . . . WIDGL of ARRL Hq. hears that VQ8BM and XYL entertained VQ8s AD AH AM AP AR AV AZ BA BB BO and HS with a gala open-house last February. Miltonsoon goes back to G3GVQ and he's already planning participation in the 1963 ARRL DX Test. K1MOD finds VQ8AI, VQ8BI's OM, very active on 20 with a homebrew hundred-watter, Lafayette HE-30 receiver and 132-foot wire . . . . . EL4s A and YL collected a thousand DX contacts in May, then knocked off for a breather pending licensing clarification . . . . . Club African notes: Cosmoledo isle, near the Aldabras, was unexpectedly invaded by W4BPD & Co. as VQ9C in midsummer. Gus continues to scout about for good ones although he encounters license difficulties here and there. . . . . ZD8RN's 20-c.w. appearance spiced up our summer DX menu. . . . . After a few kiloQSOs as W0MLY/TJ8, Cameroons, Mac tried his Dahomey DX luck as TY2MY. Poor choice of phone working frequencies created difficulties.

**Oceania** — Enlightenment from W7ZAS via W1WPO of the ARRL DXCC Desk: "ZK1BS took a June trip into the northern island group installing new equipment. The only band he operated was 7 Mc. Bill couldn't even listen to 20 meters because his receiver goes only to 12.3 Mc. He made about 75 contacts on two-way a.m. with a few a.m.- and c.w.-to-s.s.b. QSOs. ZK1BS operated from Manihiki, Puka Puka and Rakahanga. He may try Penrhyn later." . . . . . WA6JSA/KM6 writes, "W4LCY/KM6 and I are about the only c.w. hounds on Midway. I use 50 watts to a 14-Mc. dipole, receiving with an R-390-A. Twenty is the band here. Some 40-meter operation goes on but very little is heard on 15 and 80." . . . . . WA6ORS and K6QPG report the QRT of KW6 DF DG CS and CU. Ex-KW6DG (K0SLD) remarks, "Future plans call for settling down near Colorado Springs or Denver. Big job coming up — unpacking household effects and building up an antenna farm — but I'll be ready to start the next contest season. It's hard to express how grateful ex-KW6DF (K0TFP) and myself are to the many who stuck with us in the pile-ups. We pulled through everyone we could, using 'hi-bye' QSOs to give everybody a chance at Wake. Really enjoyed some leisurely rag-chewing here in the States as KW6DG/5 briefly. We scored some 15,000 contacts among about 200 countries, our final QSO being with W7QEU." . . . . . W1MV/KP6 and K1AZA/KP6 amassed around 3000 c.w. and s.s.b. contacts from Palmyra this summer with a jointly operated KWM-2 . . . . . Pacific scoop from the club groups: ZL3DX may show up in VR1-land this month if not sooner. . . . . VS1DO/VS5DO expects to get back to ZC5DO shortly. . . . . Commercial skeds continue to tie up ZL4JF of the Campbells but he tries to appear on 14-Mc. single-sideband around 0500-0530 GMT.



VP4NC expects to cart some of this gear to Tobago island around this time. A coconut-tree dipole will help stir things up on 20 and 40 meters.

**South America** — Encouraged by W9GFF, VP8GB writes at length of his South Shetlands environment. "I operated at Port Stanley, Falklands, for a year and then was appointed radio mechanic/operator for the flying unit on Deception island. We have two Otter aircraft based here during the winter which fly south in the summer to support shipping activities. There are thirteen men on base and our hut is quite large. We are located on the site of a whaling factory that ceased operation some 300 years ago. I have two RCA ET-4336-II transmitters, two Eddystone 750 receivers and various long-wire antennas. The skywire used most extensively is cut for 7.5 Mc. My ham activity usually starts after 2:00 GMT, mainly crystal-controlled on 14,060. When I go up into the phone band for a little voice work I find my v.f.o. unstable but I'll soon correct this. By the way, when I say on the air I must QRT for a commercial schedule I really mean it; can't answer one or two more callers. I do not hold a ham license in England." . . . . . W4NJF finds  
(Continued on page 160)



W1MV/KP6 and K1AZA/KP6 contribute a photo typical of Pacific goings-on this summer. In addition to "going native," Leo and Frank knocked off some 3000 QSOs from Palmyra isle with a KWM-2, using c.w. and s.s.b. respectively.



# Correspondence From Members -

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

## HAMS COMMENDED

¶ The Commission wishes to call attention to another instance in which American amateurs have rendered meritorious service to the United States Government in time of need.

In the recent and recurrent crises in the Congo, when ordinary channels of communication were not always adequate to meet the needs of the United States Government for our embassy in Leopoldville, certain amateur operators, at the request of the State Department, provided assistance in maintaining a channel of communication with the United States embassy at a time of urgent need. The Department of State has stated its gratitude for this assistance by these American amateurs which was of the greatest value to the Department.

The Commission is informed that considerable improvement in radio communications through official channels has been attained and that there will probably not be need to use these channels again unless similar emergency situations should arise in the future.

The Commission wishes to express publicly its commendation to these amateurs for their assistance in this regard in the interests of the United States Government and in the best tradition of American "hams." — *Ben F. Waple, Acting Secretary, Federal Communications Commission*

## SPACE SAVER

¶ I want to call attention to an old problem which, I feel, could profitably be discussed in the pages of *QST* at an early date.

I am amazed to hear the large number of operators on the air who are, by their own admission, running a v.f.o., but who do not appear to know how to properly zero-beat the station they are working. Let's use only one frequency per conversation, per roundtable, and — especially — per net. . . . More efficient use of the available radio spectrum will result. Let's zero-beat, gang! — *Donald P. Relyea, W1VVA South Norwalk, Conn.*

## "LOCAL" QSOs ON TEN

¶ For the past several years, prophecies of the blackout of ten-, fifteen- and twenty-meter bands during the winter spot minimum have been prevalent. As a result, thousands of amateurs have deserted 10 and 15 meters, in particular, and have moved to the lower frequency bands.

The tremendous amount of activity on 20 meters certainly proves these predictions wrong, insofar as this band is concerned. In the case of 15 meters, operations are spotty but when the band is hot, it is as good as ever.

A number of sidebanders along the eastern seaboard who generally operate on 3999 kc. found, with changing skip conditions on 75 meters, that they could no longer get together in the usual round-table during the winter months.

A group in the New York-Eastern Pennsylvania area decided to see what could be done with 10-meter ground wave s.s.b. communication. The results have been surprising, to say the least. With medium power and 75-meter antennas, 50- to 75-mile communication is commonplace. In high locations, with kw. rigs and beam antennas, 150-mile communication is feasible. Best of all, it is QRM-, QRN- and heterodyne-free.

There is still DX on 10 meters on occasion, particularly during the summer months. Operating on 28,640 kc. we found, to our surprise, a similar group in Kansas City operating on the same frequency. We have talked to them a number of times with 20 to 40 db. over S9 signal levels.

The north-south path is generally the best with plenty of openings to W4, W5, KZ5, YV, HK, TI, etc. The most interesting DX contact to date was when VK3UZ broke in

on a ragchew between W2ESO and the writer around 0130 GMT in mid-June.

Things would be much more interesting on ten meters if amateurs would break the bad habit of just listening on 10 without transmitting. Obviously, the band will be "dead" if no one transmits.

When you listen, put out a few CQ's as well. You may be surprised by the results over a reasonable period of time. The experts still do not have all the answers on ionospheric or tropospheric propagation. — *D. A. Griffin, W2AOE, Elizabeth, N.J.*

## PUT UP, OR . . .

¶ In response to KN1TZN's letter in July *QST*, why doesn't he invent a negative resistor? Hi! — *Danny Blackburn, K5ZCO, Dallas 25, Texas*

## WHERE IS IT?

¶ Amateur radio is a very wonderful and worthwhile hobby. Not only has it helped to further advances in electronics, but through its world-wide handshakes many people have become friends through its unconfined reaches.

Unfortunately I am not a member of the "elite"; rather I belong to that oft-ignored group known as SWLs. In my endeavors to further my knowledge in radio and electronics I have spent many captivated and enjoyable hours reading the mail on others who have made the grade. With a spirit of camaraderie and a close feeling of kinship I have sent SWL cards containing the required information and identification of the stations that I listen to; not once have they been answered.

I have noted the heralded articles of how amateur operators have helped others become amateur radio operators and how they have helped others in projects. Where is that helping hand so readily offered to others? Could not it be offered to us also? — *Edward O. Page, A.P.O., New York, N.Y.*

## QUO VADIS?

¶ As I sit here in vain trying to tune in a single phone station on 40 meters with my 5-tube receiver, I am trying to visualize amateur radio 10 years from now. Will it exist? All indications say yes, but great problems exist today: c.w. vs. phone, DX vs. ragchewing, s.s.b. vs. a.m., high power vs. low power, Novice vs. General, and amateur vs. commercial. I believe it can be boiled down to one big problem — an overcrowded spectrum. With already 235,000 amateurs and hundreds more every day, what is going to happen in a very short time when there will be 500,000, then 1,000,000? Must the FCC reorganize amateur radio, making it extra hard to get a license? Or will we fight it out like dogs on the band? Is there an answer? *Lindsey Coleman, K8TQS, Williamson, W.Va.*

[Editor's Note: One approach to some questions raised by K8TQS is discussed on page 9 of this issue.]

## IMPORTANT NOTICE

### Change of Address

Important postal changes in handling second-class mail matter are now in effect. Please advise us direct of any change of address. Four weeks notice is required to effect change of address. When notifying, please give old as well as new address. Your promptness will help you, the postal service and us. Thanks.



# Operating News



F. E. HANDY, WIBDI, Communications Mgr.  
GEORGE HART, WINJM, Natl. Emerg. Coordinator  
JOHN F. LINDHOLM, WIDGL, Ass't. Comm. Mgr., C.W.

ROBERT L. WHITE, W1WPO, DXCC Awards  
LILLIAN M. SALTER, W1ZJE, Administrative Aide  
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

**Technician Participation.** This month let's discuss how Technicians fit into organized amateur work. ARRL's OES appointment, open to every technician and Novice member actively working v.h.f. and reporting to his SCM, has been the fastest growing appointment in the field organization for the past couple of years. Technician licensees hold some 40% of our OES positions. Also take a look at the Techs work in such a major activity as the popular ARRL V.H.F. Sweepstakes. The January logs show participation as follows: 50% Techs, 32% General/Conditional, 12% Advanced/Extra, and 6% Novice licensees. We're pleased to see all this. All v.h.f. workers should aspire to become an OES. Besides ventures like tracking Oscar and the coming A-12 project, there's a tremendously growing interest in v.h.f. nets. There seems to be considerable weight of opinion too that with more nets on v.h.f., it might be wise to broaden its name from OES to OVS, *Official V.H.F. Station*. Perhaps this would give better recognition for outstanding, dependable work in both operational and experimental categories. Let's hear from you appointment holders and Technicians, what you think about this.

**Other ARRL Fields for Techs.** V.h.f.'ers and Technicians especially, since they are constantly on 2- and 6-meters, are needed in AREC. Of the hundreds of AREC and RACES groups in the nation, some have a good percentage of Techs, others relatively few. We invite Techs and any amateurs not already in AREC to accept the opportunity to get registered with his Emergency Coordinator. This is the best way to get in on local plans and radio tests to identify you with a group engaged in vital preparedness and self-training for radio use in an emergency. Technician operators and others in AREC groups are eligible to be named *Assistant EC* too, where the plan involved calls for such a post. ECs and SECs have the registration forms to use in joining AREC. They will be happy to provide free copies of the Emergency Communications Manual for registrants; also an AREC decal when it has been earned. See your EC today.

## More Appointments for Technicians Un-

The winner of the first Texas RACES Contest (TRACON) was K5ZSC (right) shown here receiving his certificate from State Radio Officer K5TRY. The contest was the climax of Amateur Radio Week, proclaimed by the governor on June 6.

**der Study.** With the expansion in the number of Technicians and growth in v.h.f. activity, the eligibility of Techs for some posts normally reserved to licensees that can work all amateur bands is being reviewed. We're collecting the opinions of the 72 SCMs. A chief handicap in operational posts for the Technician is, of course, his FCC limitation in use of all the amateur frequencies. Up to now a lot of amateurs have but grudgingly given the Technician his due. He has been regarded as a fellow who hasn't yet won his spurs to have the right to use and enjoy the privileges of all the bands. But the progress picture is bright, as his wide participation in ARRL activities that take place on his bands indicate. He's on his way; the reasoning goes that as he gets his ultimate higher FCC license, making all bands available to him, he will add his strength of numbers to the principle of holding all bands for all amateurs. Special incentives, they say, shouldn't give too much too soon to cause a Tech to want to *stay* a Tech.

But as we see it, and have brought to the attention of all SCMs in an April SCM Bulletin, there's no reason in the world a Technician shouldn't have all the appointment responsibility his individual capacity and bands will allow. Every amateur should have a chance to pull his full weight within his specialty, and let's face it, there certainly are Techs that want to keep right on building up amateur radio and their accomplishments as *Techs* on v.h.f. We want to see all those with top qualifications taking part. Like other appointees, SCMs want the Tech to demonstrate knowledge, equipment, and activity qualifications, as well as show exemplary operation to non-appointees. The duties, of course, have to be limited to the bands one can work. We have asked SCMs to consider such positions as VHF PAM, OO, and OBS for Techs. Pres-



ently, we're still receiving and consolidating the opinions of SCMs. We hope in a few months to announce in *QST* if Techs can, in addition to the many things they already do, apply to SCMs for one or more of the mentioned posts.

**All ARRL Appointments, an Objective Look.** There's been misunderstanding on the part of some about the scope of field appointments by SCMs, so a brief word about them. Three of the Official Station posts of the League can be regarded as basic. SCM customarily issue such appointments for one of the three, recognizing one's major interest. ORS and OPS are mainly identified with h.f., not v.h.f. activity. These two separate appointments are directed to the army of h.f. traffic handlers. The OBS, on the other hand, is the basic v.h.f. station recognition to single out outstanding v.h.f. men.

The other ARRL field organization appointments are in the nature of specialty assignments of SCMs. Such appointments work "of, by and for" the amateur has the purpose of providing different kinds of services to all amateurs: (1) OBS for dissemination of radio bulletins to amateurs for reliable over-the-air information ahead of any printed word; (2) Route Managers to manage, promote and maintain c.w. nets; (3) Phone Activity Managers for similar organization with phone nets; (4) VHF-PAMs for management of v.h.f. nets; (5) SECs and ECs to sponsor emergency communications recruiting, operation, organization, and planning at appropriate levels; (6) Official Observers to watch over the bands and send alerting notices to keep operators with defective signals from getting into FCC difficulty.

It becomes apparent that in these special service categories SCMs must use good sense and select just the best qualified and needed numbers of OBS, PAMs, RMs, OOs, and ECs for adequate and proper section coverage. For example, the applicant for OBS who can offer more bulletin schedules per week, better antennas or power for more bands to reach amateurs otherwise not getting radio attention, will necessarily meet the SCMs approval for action as there are vacancies. But an SCM can't always be accommodating; he's not elected for as narrow responsibilities as that. Recognition to active amateurs probably plays a bigger part in an SCM's action to appoint you OBS, ORS, or OPS, if you meet the qualifications detailed in *Operating an Amateur Radio Station*, than it can in the service categories. But in his section plans for organizing fine operating groups, his emphasis, as with the OBS and OO for example, has to be on the best "service to the membership" and not as an accommodation to the applicant. In conclusion, let us sum up that we shortly do expect to have some announcement of interest to Technicians in the way of authorizing at least one new appointment. But we have first to assimilate the comments from SCMs which are still coming in. To those SCMs who haven't returned the response sheet, can we please have your opinions soon?

**High Speed C.W. Anyone?** Some three years or so ago, the Connecticut Wireless Assn., Inc., decided to go ahead with a high speed code program, for all amateurs taking up where W1AW left off and extending the speed above the 35 w.p.m. mark. Code practice once per week and "qualifying runs" semi-annually were the best they could manage; nevertheless, a small but very enthusiastic (and somewhat select, from the standpoint of code proficiency) group of c.w. addicts have followed the program and participated in it.

In March this year club-member station WINJM and two honorary CWA members on the west coast (K6DYX and W6EOT) transmitted the club's seventh regular semi-annual code test on four frequencies simultaneously on two bands. Nominal speeds of transmission were 40, 45, 50, 55 and 60 w.p.m. (as it turned out, actual speeds were a slight bit lower in most cases). Seventeen of about 30 applicants qualified. They have been sent special CWA certificates: making 86 certificates that have been issued so far in this program. We thought you might like to know the identity of the speedsters in our ranks. We list them herewith (asterisks on those qualifying March 12, 1962).

At 60 w. p. m.: W5JPC, W6EAR, W8RMH, K9AUB, W9YZO, VE7CQ. (Man, that's copying!)

At 55 w. p. m.: W1KYK, W4DLA, W4LYV, W5JPC, WA6QIH, W9BRD, W9VES, K8ILM.

At 50 w. p. m.: K2BZ, W3GJY, W3GAU, W4ZKU, KN4VUR, W4ORB, W4RBZ\*, K6VYJ, W6OAZ, K6SST, K6GZ\*, K7PWK\*, K7BVZ\*, W8LEX\*, K8IJV\*, W9EDO, W0KCG, VE7CQ, D. W. Cramer\* (such a s.w.l.l.)

At 45 w. p. m.: K1BPJ, W1WPR, K2KIR, W2CVW, W2LYH, W2UAP, W4KFC, W5OXO, W6OZ, W6RIL, K6GZ, K7NHG\*, W8ZCW, W8ARL, W9YZO, W9DJAI, W9DJN, W9LHM, W9QW\*, K8ILM, KH6IJ.

At 40 w. p. m.: W1WPR, K2ACP, W2LYH, W2ZVW, K2QBW, W2JCA, W2MZB, W2TPV, K2NME\*, W3GAU, K3KMO\*, K4CA, W4LYV, W4ORB, W4YE, W4CCC\*2, K4AKP\*, W4KR\*, W6INH, W6FFN, W6HVB, W6JKD\*, W6GULM\*, W6WAW\*, W7LVU, W8APL, W8DQG, W8BYD, W9PNE, K9PTL, W8TDH, VE3IA.

Note that some operators have been listed at more than one speed. This shows progress from one code test to the next: operators qualify at *only one speed per test*. Practice is transmitted by club station W1EIA or some member station each week at speeds varying from 15 through 65 w.p.m. in increments of 10 w.p.m. in that order or the reverse order. Frequencies are 3637 and 7120 kc.; in winter the former frequency is primary, in summer the latter; time is 0130 GMT (call-up starts at 0115 GMT). Next official code test (qualifying run) is set for Sept. 10 (Sept. 9 by local time) and will probably again be carried by West Coast stations. If you hold a 30 or 35 w.p.m. ARRL Code Proficiency Certificate, you might like to have a whack at this. It's about the most fun there is! — F. E. H.

#### CONTEST NOTE

Two club scores reported recently in *QST* were incorrect. In the 1961 Sweepstakes Contest the score of the Frankford Radio Club was 5,437,565 points, with no phone club winner. In the 1962 V.H.F. Sweepstakes the Mt. Airy V.H.F. Club scored 707,552 points.

## DXCC NOTES

Announcement is hereby made of three additions and one deletion to the ARRL Countries List. The additions to the list are (1) Ruanda, (2) Urundi, and (3) Guam. The deletion is Ruanda-Urundi.

*RUANDA* and *URUNDI*: On July 1, 1962, the former U.N. Trust Territory of Ruanda-Urundi, under the administration of Belgium, became two completely separate and

independent countries. Therefore, contacts with either *RUANDA* or *URUNDI* made July 1, 1962 and after will be considered as separate and different from the listing of the U.N. Trust Territory of Ruanda-Urundi. DXCC credit claims for these two new listings may be made starting November 1, 1962. DXCC credit claims on either of these two new listings received before November 1, 1962, will be returned without credit.

*RUANDA-URUNDI*: DXCC credit claims for the listing



# DX CENTURY CLUB AWARDS



## Honor Roll

The DXCC Honor Roll consists of the top ten numerical totals in the DXCC. Position in the Honor Roll is determined by the first number shown. The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total DXCC credits given, including deleted countries. Positions in cases of ties are determined by date of receipt. All totals shown represent submissions received as of the end of the last day of the month of June, 1962.

PY2CK...308/320	W3JNN...305/317	W9YFV...304/316	G2PL...302/314	W8KML...300/311
W2HUO...307/319	W9RBI...305/318	G3AAM...304/316	W2BXA...302/314	W8JBI...300/310
W4DQH...307/319	W3K...305/317	W6AM...304/317	W7PHO...302/312	CX2CO...300/312
W6GUO...307/320	W1ME...305/317	W5ASG...304/316	W7GBW...302/314	W2LPE...299/311
W2AGW...307/319	W8BKP...305/316	CE3AG...304/316	W1CLX...301/312	W9LNM...299/312
W3GHD...307/319	W8DMD...304/315	W8KIA...304/316	W5MMK...301/312	W4TM...299/311
KV4AA...307/320	W8BF...304/315	W0VZ...303/313	W9WU...301/312	W3LMA...299/310
W8BRA...307/319	W5ADZ...304/315	W6BBG...303/316	4X4DK...301/311	W1JYH...299/311
W1GKK...307/320	W8UAS...304/315	L16DJX...302/314	W1BHH...301/313	VZ7M...299/310
W8JIN...306/319	W7GUV...304/316	W2HMJ...302/313	W9NDA...300/313	W4QGW...299/309
				W0ELA...299/310

## Radiotelephone

PY2CK...308/320	VQ4ERR...303/315	W8POO...301/311	CX2CO...299/311	W8KML...297/308
W8GZ...305/316	W9RBI...302/313	W4DQH...300/310	4X4DK...299/309	W6KY...297/308
W8BF...303/314	W7PHO...301/310		W3JNN...298/309	W6AM...294/306

From June 1, to July 1, 1962, DXCC Certificates and Endorsements based on contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

## New Members

W4PAA...211	W4BNQ...112	D19RG...104	V81AEC...102	K4UVT...101	W4FW...100
W3HOG...146	W8WR...112	OZ1RO...104	HA5BT...102	K9IFL...101	W4ZVQ...100
VQ2JN...143	F2IU...112	K8GJD...103	SM6AJN...102	K0ZEC...101	K6PFI...100
W1WHQ...138	K3DNU...109	K8YEK...103	ZC4AB...102	K1JFF...100	K8BZT...100
VQ2WM...127	W2MZV...108	ZL4MD...103	W1UUK...101	W4ZDES...100	W9RZZ...100
SP8MJ...123	K40EL...105	W4HWR...102	K2UFM...101	K2DQI...100	UA2AB...100
IT1ZDA...113	W5AJY...105	W9HW...102	K3CYX...101	W2RSJ...100	

## Radiotelephone

W4PAA...200	U43CG...123	IT1ZDA...111	K3DNU...105	5R8CO...103	W7BTH...100
W2DGW...152	YV5AXQ...121	G3MOCV...110	K40EL...104	W9SRJ...101	K8JGM...100
W0PNU...139	5R8CM...116	W4LJV...109	W5AJY...104	K6JMJ...101	W9LAA...100
W4ZELS...132	V89APH...112	W4BXG...107	W5HZH...104	W3QGD...100	OA4AI...100
					V2AB...100

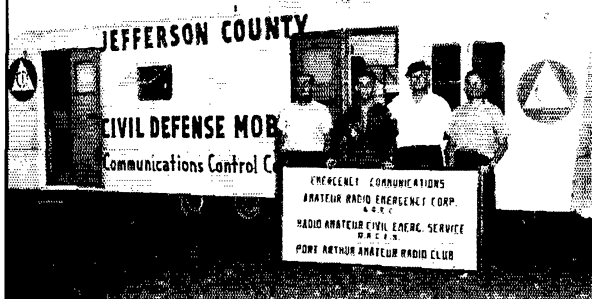
## Endorsements

W3ECR...304	W9WFS...250	K2XXY...210	W8DWP...188	W8KSR...161	K9OYD...130
W4NL...301	D16PN...245	K4DRO...210	CR9AR...187	W3GDG...160	5U7AC...130
D13HL...300	W7CMO...242	W7ABO...210	CR8A...184	KH6ACT...160	W3AFM...127
W3KDP...290	W2ZKQ...241	G2TYT...210	OA4FM...182	W9TCH...160	W3AFM...125
W6WVQ...290	W4UKA...240	G2GM...206	K6CTV...181	KP4CL...160	K4HYL...124
W6WVQ...290	W6MVL...240	K4JFY...203	W2AEL...180	D17BK...160	K5IZM...124
W9FKC...290	G6VQ...236	W3BVL...202	W2IQH...180	W8QNW...152	K0JPL...123
W1HA...281	V6XO...235	OH2YV...202	K2UPD...180	W4NJF...151	W3LC...122
W2AEB...281	K2KJ...231	W5JCY...201	K3CDD...180	W2P...150	K6OHJ...122
W6WJU...280	W4NCM...232	K8DYX...201	W3YZI...180	K2OUS...150	W6RFQ...121
K6UYC...273	K2QHL...230	V63HB...201	W4AVY...180	W6ISQ...150	K4RFR...121
W2NUM...270	W0DEL...228	W2DIG...200	W4BHG...180	K8CVQ...150	K9KFS...121
W4DKP...270	W6CDP...223	K2TQC...200	W4HTV...180	Z838...150	W4MF...120
W1HBD...270	W7BA...222	K2JFV...200	W4LZW...180	G8MIX...146	W5PMK...120
V63RE...270	O8KKT...221	K4EDF...200	K4WB...180	G2MO...142	HANN...120
ZLZHP...270	W9TKD...221	W6ABA...200	K8MTI...180	W8RQE...140	W4DM...119
W5BK...264	W4ZRZ...220	W6SLB...200	KP4AQ...180	KRVSL...140	W41EN...118
W5BK...263	K6VA...220	G3KJ...200	SM5AJR...177	K0MAS...140	W5CME...114
VO1DX...261	W9HQF...220	N2FTL...200	W9BQQ...171	D2AJJ...140	W6RGF...114
PA1LOU...261	VY5BZ...220	K8HG...197	D40P...171	K5DQ...135	W2Y8...113
W1TS...260	K8ONY...216	W6GRX...197	E73V...171	WR8AFV...135	D19YC...113
KARW...260	D1LYA...216	W9RPT...195	W4ZCB...170	W5EJV...134	K4DNV...112
W6SQP...260	W6CPM...214	CX1BZ...194	W4YMG...170	V63PV...134	W8CJN...112
W2RMW...250	W6OF...213	W1KMY...192	K5UXP...170	W8ZDF...132	W5PMK...111
W4LRN...250	K6BHM...212	W2LNB...190	K9HOL...169	W5DVP...130	G3JBR...111
K6BY...250	W4HBS...211	W4HBS...190	K6TQO...164	K6TQO...130	K2OXN...110
W9FQA...250	W9IRH...211	W9AZP...189	W7BPS...162	K8ORC...130	W2TKZ...110
					W46GFE...110

## Radiotelephone

D13LL...282	W2TP...220	W5JCY...200	W2PTM...160	K1JNE...141	W2ODO...124
W9KNX...280	W1YDO...215	W9ILW...200	K8LSG...160	W4NJF...141	V63PV...122
W3ECR...273	W6CPM...212	N2FTL...196	W8CUO...159	E4ZEL...141	K4HYL...121
W2FXN...265	W3HIX...212	W3BVL...184	W5DA...154	W4CWO...140	W42BQ...120
W8PUD...251	W9HP...211	W4MS...184	W9BQQ...154	W9WCE...140	K9LIX...120
K8RTW...245	VY5AJK...206	W2CPL...179	K6VA...151	K6VA...136	PY7FC...120
W2BQM...230	D16EN...203	W1EAB...173	W7BPS...151	K9MAS...133	W8QRT...120
YV5AFF...229	W2UWH...202	W4UWC...173	K1BDP...150	L16AL...133	K4DRO...112
K1LXC...225	W3VSV...201	K1JMV...169	K8ONV...149	W3LFF...131	W5CME...112
W421ZS...225	K4BVQ...201	K4STY...166	VK4RQ...149	K9WUR...130	DJ4OP...112
W1WDD...223	K3LW...201	K11DV...162	W4HUE...144	W5DVP...129	W3OBD...110
W4CWW...223	W2RGV...200	W1WKO...160			





The Port Arthur (Texas) Amateur Radio Club operated the Jefferson County C.D. trailer for a period of 24 hours at a recent Boy Scout Jamboree. Shown in the picture in front of the trailer are (l. to r.) K5TAX, WA5ANF, W5OCN and W5ZAT.

of Ruanda-Urundi may be made only for contacts with Ruanda Urundi between the dates of June 30, 1960, and July 1, 1962. The DXCC Honor Roll listings will show the adjustment of totals where Ruanda-Urundi credits are concerned in the October issue.

**GUAM:** Concerning the addition of Guam to the Countries List: A re-examination and factual evaluation of the question of Guam, with relation to the rest of the Mariana Islands group, shows definite and substantial reasons for not only the addition of Guam to the Countries List but also a re-evaluation of the credits that have previously been given toward the Mariana Islands listing. The reallocation of credits previously given will be made in the following manner. If the credit that has been given toward the Mariana Islands listing was for contact with a station operating from Guam, then Guam credit will automatically be given upon submission of a confirmation for a contact with any of the other islands in the Mariana Islands group. Conversely, if the credit that has been given for the Mariana Islands listing was for a contact with one of the other islands in the Mariana Islands group other than Guam, then a confirmation for a contact with a station operating on Guam must be submitted for Guam credit. No great problem should be posed to anyone in evaluating their KG6 credits or confirmations. For the most part call signs issued for use in both Guam and the other islands in the Mariana Group are distinctive and readily recognizable inasmuch as the first letter of the call following the prefix is indicative of the location of the station. For example, in the case of stations licensed for operation from Guam, the first letter of the call following the prefix presently runs from A through H. Call signs issued for use in the Mariana Trust Territory islands of Rota, Saipan and Tinian have R, S, and T, respectively, as the first letter following the prefix.

If DXCC credit has already been given toward the Mariana Islands listing, then a credit claim for either Guam or Mariana Islands may not be submitted until November 1, 1962. Such credit claims received before November 1, 1962, will be returned without credit.

In order that there will be a reasonable chance for all DXCC participants throughout the world to have the same opportunity to submit their credits on an equal basis with regard to time, it is necessary to publish the information on the changes in QST and allow time for distribution of the magazine to the overseas members. The two months delay in giving credits on any new additions does allow ample time for all but a very small percentage of the DXCC participants to get the necessary information and be able to submit any new additions on an equal basis with those DXCC participants in the U. S. A.

### FREQUENCY MEASURING TEST SEPTEMBER 13

ARRL invites every amateur to try his hand at frequency measuring when W1AW transmits signals for this purpose starting at 0130 GMT, Sept. 13. **CAUTION:** Note that since the date is given in Greenwich Mean Time, the early run of the frequency measuring test actually falls on the evening previous to the date given. *Example:* In converting, 0130 GMT Sept. 13 becomes 2130 EDT Sept. 12. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the signals before the measurement transmission starts. The approximate frequencies used will be 3567, 7125, and 14,090 kc. About 4½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 0136. It is suggested that fre-

quencies be measured in the order listed. Transmission will be found within 5 or 10 kc. of the suggested frequencies.

At 0430 GMT, September 13 W1AW will transmit a second series of signals for the Frequency Measuring Test. Approximate frequencies will be 3613, 7100, and 14,113 kc.

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

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

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

### A.R.R.L. ACTIVITIES CALENDAR

(Dates shown are per GMT)

- Sept. 2: CP Qualifying Run — W6OWP
- Sept. 13: Frequency Measuring Test
- Sept. 15-16: V.H.F. QSO Party
- Sept. 20: CP Qualifying Run — W1AW
- Oct. 4: CP Qualifying Run — W6OWP
- Oct. 6-7: Simulated Emergency Test
- Oct. 13-15: CD Party (c.w.)
- Oct. 19: CP Qualifying Run — W1AW
- Oct. 20-22: CD Party (phone)
- Nov. 2: CP Qualifying Run — W6OWP
- Nov. 17: CP Qualifying Run — W1AW
- Nov. 10-12, 17-19: Sweepstakes Contest

### OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of QST issue in which more details appear.

- Sept. 8-9: Ohio Worldwide Contest, Cleveland Convention (p. 112, last month).
- Sept. 10: W1EIA High Speed Code Test, C. W. A. (p. 84, this issue).
- Sept. 15-16: Scandinavian C.W. Activity Contest, EDR (p. 80, this issue).
- Sept. 22-23: Scandinavian Phone Activity Contest, EDR (p. 80, this issue).
- Sept. 22-24: VE/W Contest, Montreal Amateur Radio Club (p. 68, this issue).
- Oct. 6-7: VK/ZL Phone DX Contest, NZART (next issue).
- Oct. 13-14: VK/ZL C.W. DX Contest, NZART (next issue).
- Oct. 12-22: Goose Bay QSO Party, GBARC (next issue).
- Oct. 20-22: Second World-Wide RTTY Sweepstakes RTTY, Inc., (next issue).
- Oct. 27-28: R.S.G.B. 7 Mc. DX Contest (phone) (next issue).
- Nov. 3-4: R.S.G.B. 7 Mc. DX Contest (c.w.) (next issue).





Once in a while we get summaries of activities, along with some general philosophy, from some of our SECs or ECs. We never know quite what to do with them, and usually file them away somewhere in the hope that they will serve a future useful purpose. It must be admitted that some are lost in oblivion.

We used to complain about not getting enough material for this column, but right now we have more than we can use. We want all concerned to know that everything sent in is carefully considered, and nothing is thrown out until or unless it becomes too old to have any significance. This makes for quite a clutter sometimes, but we hate to overlook any bets and we certainly don't want to slight anybody.

Getting back to the activity summaries mentioned above, we thought we would summarize briefly some of those we have on file, to give you an idea of what kind of drills and other events are being conducted by some of our more active leaders and their AREC groups.

The Cuyahoga County (Cleveland), Ohio, AREC, under EC W8VFU, has for some time been conducting a "Ham Patrol" in cooperation with the Cleveland Police Department, for increased public service. Operation is on a regular basis, using RACES equipment already installed in the central police station, on 10, 6 and 2 meters. Mobiles are furnished with a list of stolen and missing cars and rove assigned areas of the city in research of them. The operation is entirely under AREC direction, in close cooperation with the police department. Other groups who might wish to set up such a patrol are cautioned that this can and should be done *only* in closest cooperation with the police department; otherwise, it can be a mighty touchy operation that could do more harm than good. We think that most police departments will drag their feet at putting the amateurs to work in this way, and that the Cleveland police cooperate only because they have such a well-organized and thoroughly disciplined AREC group to work with under W8VFU.

In order to get his AREC people together on the air, Alabama SEC W4FQQ conducts section "CD Parties," open to all ARRL appointees and all AREC members during certain specified week ends of the year. Such parties were held in early March and May, and are scheduled for the week ends of Sept. 1-3, Nov. 3-5 and Dec. 1-3 (coinciding with the ARRL LO Parties). Sorry, space does not permit reproduction of all the rules, but probably W4FQQ will be glad to send you a copy if you'd like to look at same.

Indiana SEC W9SNQ last Spring came out with a statewide AREC plan for the section. Although he admits it is not as elaborate as the Florida plan, after which it is fashioned, it is felt to be a good starting point. In a letter of transmittal to all Indiana ECs, Len states that 70 of 92 counties are now covered, with others in the works.

We held South Texas SEC W5AIR's March report out of file (then forgot to report it as received) so we could mention the activities conducted throughout the section during a typical month. For example, in the West Gulf Emergency Net, NCS tries to stimulate interest in check-ins by calling the net from various different locations, setting up problems (with W5AIR) in relaying. This sets net members to wondering where NCS will be next time, and they report in to find out. W5AIR does a lot of visiting around the section.

Incidentally, if you would like to have a visit from your SEC or SCM, let him know. These officials are authorized certain travel expenses, and although sometimes a busy man can't get away for a particular shindig, they will find it considerably easier to do so if you set up something especially for them. — *WINJM*.

On Feb. 9, Mt. Vernon High School club station WA9DNL heard an SOS call from HC10W in Quito, Ecuador. Contacting him, they were informed that a family in Ecuador had been poisoned and a certain antidote, not available in Ecuador, was needed to save their lives. The appeal for help was from the Ecuador Red Cross to American National Red Cross in Washington, WA9DNL took the message, but

before they could relay it the receiver went dead, so they called Washington by telephone. K9SOF tried to contact the HC station from home, but by this time conditions had changed and he was gone. However, the Red Cross shipped the antidote to Ecuador by jet plane and the entire family was saved. — *K9SOF*.

On May 12, W4JVM, EC for Hamilton County, Tenn., alerted the Chattanooga Amateur Radio Emergency Net on 50.4 Mc. to search for a missing girl. Mobiles tied the searching together for constant communication. The net secured on May 13, after finding the girl dead. Participating amateurs were W4s OYG LNB DIJ BIR EJV ITEX JVM, K4s CMY MDA IXN YET VGV.

On May 29, high winds and rain disrupted all regular telephone and wire services out of Selma, Ala., and so overlaid all other facilities that amateurs came into the picture in an emergency role. W4BFX, after being contacted by the city editor of the Selma *Times-Journal* who appealed to him to get through to Montgomery with some important election returns, finally succeeded in contacting W4BFM, K4APG and K4ZNK and not only assisted the Associated Press with news dispatches, but also handled some traffic for Western Union. Wire communication was restored the following morning. — *W4FQQ, SEC Alabama*.

On June 9, under the direction of K4KPN, who is director of emergency service, Civil Air Patrol, a group of mobiles from Atlanta, Ga., participated in a search and rescue mission for a missing Navy plane on a training flight from Cherry Point, N. C. Mobiles assisting were K4s PQY YMR WRS, W4s LG and VIM. Fixed relay stations were K4YID at Atlanta and K4MNY at the Griffin, Ga., airport. The mobiles were assigned to defined areas along the possible route of the missing aircraft to make inquiries of residents, and information obtained was communicated back to the fixed stations. In this way the possible route of the missing aircraft was covered very thoroughly, but with negative results. — *W4LG, SCM Georgia*.

On June 17 at about 1300 local, a seven-year-old boy became lost in the mountains near Mt. Hood, Ore. An organized search was started in which amateur radio operators supplied communications. Mobile on the mountain were K7s MMK (with K7PMG) LLC CBA, W7s UFR ZB JP UFR. Coordinating things in Portland were K7s OPI PED PHP ADI. W7s PJO (with K7CBE) TOV RVN. On duty with the rescue coordinator were mobiles K7s KWL ROY, W7RVN. Handling traffic were K7s HFV/mobile JPI JAD and AMI. Participating in other ways were K7s CJC DZI MIQ, W7s PRC BZC GXI SYF. Communications conducted consisted of arranging for men, equipment and food for the search, arranging for transportation, for teams of bloodhounds and a helicopter, handling of personal messages to families and employers of searchers, command communications during which decisions concerning search strategy were made, and handling of communications for the sheriff's office and other agencies. K7PMG climbed two trees to a height of 80 feet to string an antenna across the highway at one point while state police stopped traffic; this antenna was used successively by several mobiles and greatly extended their coverage. Amateurs from all over Oregon and Washington responded to the call, or assisted in maintaining a clear channel. Those who participated were highly complimented by all for the most excellent service rendered. — *W7RVN, EC Multnomah County, Ore*.

Field Day activities of the "Signalers," a CD-RACES group at Tinley Park, Ill., were interrupted Saturday afternoon at about 1500 local when a Tinley Park fire truck pulled into camp with the news that a tornado had just ripped through Oak Forest. One of the generators was loaded into the truck and the "Signalers" disaster unit, manned by K9LEI, was dispatched to the scene. K9GSK followed in his mobile, and they arrived at the scene of the disaster about 1715, setting up in the driveway of emergency headquarters. It soon became apparent that additional help was needed, and the other two mobile units at the Field Day camp were called in. W9MQX, on his way to the camp, heard the call and came instead to emergency headquarters.

During the long night that followed, the amateurs were busy assisting in communications concerned with crowd

control and property protection. Units were established at road blocks and at Red Cross installations. At 2030 local, the Chicago Red Cross Chapter asked the "Signalers" to man the base station at Mary Hospital. W9MQX was dispatched and handled Red Cross disaster traffic from 2130 until about 0200, with the assistance of K9TOK.

By midnight, help of various kinds had arrived from all over the county and the four amateurs still at the scene were released and returned to the Field Day camp to resume operation. The final score of the "Signalers" was somewhat lower than anticipated, but in our book they received a thousand-contact bonus.

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About twenty minutes before the start of Field Day of the Miami County AREC group in Mexico, Ind., the fire whistle in the town of Mexico was heard; K9IOO and Miami County EC K9LTV jumped into the former's mobile and took off to investigate. On their arrival, they found that the fire was located in a large barn filled with hay and the telephone line had been burned out. The fire chief asked them to call additional fire-fighting help from surrounding towns, and this information was relayed to K9LZC who was standing by at the Field Day site. A few minutes later two firemen were overcome by smoke, and W9QXL, a doctor, was summoned from the FD site. After treatment, an ambulance was called via K9IOO/mobile to K9ZEV/9, the club call being used at FD. Later, one of the fire trucks had difficulty and a wrecker had to be called from Peru. Also, police had to be called to control the traffic that had developed from the jamming of the road by fire apparatus and the influx of sightseers.

The result was a late start in Field Day, but a good feeling by all concerned for a job of real emergency communications to get things started. Not mentioned above but also in there pitching were K9s FUJ and SSH. — K9LTV, EC Miami County, Ind.

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On April 30 at 1800 hours a storm and high wind warning was received in the Sarnia, Ont., area. SEC VE3AML advised the Ontario Phone Net, stations were alerted in Toronto and the channel was kept clear. All conditions indicated a hard time to come. VE3AML prepared to move to the underground installation of the Emergency Measures Organization headquarters; VE3EO was advised to make his mobile ready; several stations stood by in the St. Thomas area. Conditions were very poor, with high winds and terrific static. However, the emergency never developed and the warning was cleared at 2130. — VE3AML, SEC Ontario.

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The first severe weather of the 1962 season hit the Cleveland (Ohio) area on April 30. The Weather Bureau issued its first warning at 1830 local and the Cuyahoga County AREC Thunderhead Nets began to assemble on a stand-by basis. W8OXS set up at the Weather Bureau and the alert was officially on at 2000. The "front" was closely tracked by the net as it passed over and through the area for a distance of some 100 miles, the brunt of it missing Cleveland so that very little damage was done and no emergency communication was involved. But the sixty stations alerted on ten, six and two meters had a good workout and were ready to go into action had any communications emergency developed. — W8YFU, EC Cuyahoga County, Ohio.

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An eight alarm fire in Brooklyn, N. Y., alerted eleven amateurs of the Kings County AREC on May 10. W2VYE advised EC K2OVN, and at the same time 2-meter EC K2LOE called his net together and prepared to send mobiles to the scene of the emergency. Police, fire and civil defense officials were contacted, but they stated no assistance from the amateurs was needed, and mobiles were instructed not to enter the disaster area. The net was secured at 1930 EST when the fire was declared under control. — K2OVN, EC Kings County, N. Y.

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The Scott County, Iowa, AREC, set up a patrol of the county on July 4. Three mobiles and two fixed stations participated in surveillance of several areas of heavy traffic. Operations began at 1930 and ended at 2130 local time. Observations by the mobiles were relayed to the net control stations and any assistance needed was dispatched. During the exercise, assistance was given a motorist with a flat tire, a truck was reported with disabled rear wheels and a number of minor violations and irregularities were observed and reported. — K0EXN, SEC Iowa.

Three new sections were among the SEC reports received for May, making a total of *thirty-two* heard from, representing 15,707 AREC members. This beats last May by three reports and a couple of thousand AREC members. Five sections are now reporting over 1,000 AREC members and three others are getting mighty close to it. These are *active* AREC members working with *active* ECs, otherwise they wouldn't be reported. Section ECs reporting for May: S. Texas, W. Fla., E. Mass., Ohio, Alberta, Ala., NYC-LI, Mich., N.N.J., Los A., S. Dak., Wash., Colo., Tenn., E. Bay, N.C., Ind., Ariz., N. Mex., Ore., N. Tex., Nev., E. Fla., Iowa, S.C.V., W. Pa., Utah, Ga., Sac.V., E. Pa., Okla., Kans.

We apologize to the SEC for S. Tex., who was left out of the previous two SEC report summaries; we now have both these reports on file, where they should have been all along.

### RACES News

So many of our amateur emergency groups have embraced both the AREC and RACES that it becomes increasingly difficult to distinguish between the two in most cases. That raises the question as to what to put under this subhead. Of course we occasionally get an item which is entirely RACES, and that leaves no doubt; but in most cases the group reporting has worked with c.d. but is also AREC, and sometimes RACES frequencies are used and c.d. equipment employed in an activity not officially invoked by e.d. officials. So is this RACES?

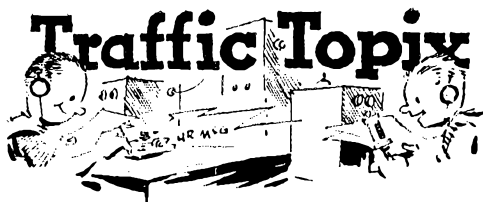
We have decided that in the future, this subhead will include only items which are entirely on the RACES subject, and those which combine RACES and AREC (which we consider *good*, not bad, incidentally) will be placed in the main body of the column above. Whenever we have a month in which there are no RACES items available, if that ever happens, we'll just drop the subhead *for that month only*.

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On May 25 Hillsborough County (Fla.) Civil Defense put on "Operation Hillcamp," a c.d. communications exercise having stated objectives to (1) evaluate communications effectiveness under emergency alert conditions, (2) identify and isolate weak areas or procedures, and (3) test the response of volunteer personnel. Six fixed and six mobile stations participated within the county, handling 36 incoming and 10 outgoing "situation" and "canned" messages. A total of 33 amateurs participated in the exercise, which lasted a little over three hours. It was adjudged a complete success, with outstanding enthusiasm and cooperation throughout. The drill was also monitored statewide and commented on favorably from many places outside the county, as far out as Key West. Nevertheless, the report on it contained many points of adverse criticism which, when corrected, will greatly improve the organization and its effectiveness.



At the Rhode Island State Phone Net picnic on June 17, these amateurs got together for a snapshot. Front row, l. to r.: K1PZY, K1DZX, W1BQH, K1DUH. Back row, K1SXY, W1JFF, WA2YEK, W1TXL (PAM), K1NJT, K1AAV (SCM), K1VEX, W1EFW (Director) and K1GRC.



It seems to us that many traffic men who complain about the content of the messages they handle, not to mention non-traffic men who ridicule this phase of amateur radio, are completely missing the point. The traffic we handle itself is not important; it can't be. If it were, it wouldn't be an amateur circuit. We amateurs are not competing with Western Union and the telephone company. If we did so successfully, there would be a hue and cry from hurt commercial interests and pressure would be put on the government to force us to cease and desist. As it is, commercial communications concerns are among our favorite "customers" for emergency communications.

Nine out of every ten — nay, ninety-nine out of every hundred — traffic men handle traffic primarily because they enjoy it, and only secondarily because of the good they are doing. People enjoy things for different reasons, but in general it is safe to say that one enjoys anything that gives one satisfaction. Just what is it about traffic handling that gives one satisfaction?

Well, it could be a number of things. If we wanted to go around in circles, we could say that doing things for other people is one source of satisfaction. But for the most part, motives are selfish, and — let's face it — most traffic men are in the game for the BPL honors, or the demonstration of skill, or the sense of "belonging," or the feeling of pride in an efficient net operation. Leave us not be pious and overbearing about our phase of amateur radio; we enjoy traffic handling just as the DX man enjoys working DX (and neither can see what fun the other gets out of what he is doing), and the League sponsors activity for both, and for many others, to enhance the enjoyment and interest in all phases of amateur radio.

The service rendered by the traffic man is not so much, (or at least not any more) a free public message service, as it is training of operators in handling record communications. *This* is the point that many operators miss. We don't deny that amateur radio has done some wonderful things in pure, unadulterated service in handling traffic, such as the traffic from GIs overseas and personnel in the far north and far south who have little or no other means of contact with home; yet, comparatively few amateurs have concentrated on such traffic. The rest of us plug along handling whatever routine, sometimes nonsensical, traffic comes our way, and derive our enjoyment from the satisfaction of demonstrating a skill that not everybody has, and the sense of camaraderie with other amateurs doing the same thing. And what we are *all* getting, often without knowing it or appreciating it, is training in ever-increasing efficiency in handling traffic in standard form. Those who have been in the game for some time are participating in the training of the newcomers, just as the newcomers are benefiting from the experience and know-how of the veterans in the field of traffic handling, a great game.

The point we are trying to make is that the world will continue to rotate if a message is garbled, delayed or even lost entirely. From the training standpoint, such things are bad, but not disastrous, so let's not panic. As for the content of the message, this matters not a whit; it's good training no matter who is saying what to whom, or why. — *W1NJM*.

**Net Reports.** The 7290 Traffic Net announces the resignation of W5VW and the election of K5RGT as new net manager; correspondence to W5AFI.

June reports.

Net	Sessions	Check-ins	Traffic
Northeast Area Barnyard	—	916	8
Mike Farad E & P	48	434	893
7290	42	1488	688
All Service	4	22	17
North East Teen	12	44	25
Eastern Area Slow	30	111	54
Earm	21	342	22

**National Traffic System.** In the new CD-24, mentioned under this heading last month, one of the innovations is discussion of net control methods at Section Net level. We have heard a lot of Section NTS Nets in operation, and some of the control methods used are just out of this world, not to mention the lack of order and discipline. Chances are your Section Net can use some new ideas on this subject, and several methods of controlling, on both phone and c.w., are discussed in CD-24.

If your Section Net is having difficulties in this respect (and we'll bet you are!), it might help to get a copy of CD-24 and read up a little. The ultimate choice of method is up to the net management, but let's be orderly about it!

June reports.

Net	Sessions	Traffic	Rate	Average	Representation (%)
EAN	29	1437	.937	46.8	96.6
CAN	30	1124	.632	37.4	95.5
PAN	29	1213	.763	41.8	96.7
1RN	52	400	.320	7.7	67.6
2RN	58	398	.402	6.9	94.7
3RN	60	659	.368	10.9	97.8
4RN	60	640	.333	10.7	88.8
RN5	54	422	.247	7.8	75.9
RN6	46	725	.514	15.8	79.2
RN7	60	391	.219	6.5	71.0
8RN	57	275	.176	4.9	68.3
9RN	57	850	.609	14.9	62.2
TEN	46	416	.386	9.4	19.7
ECN	22	58	.160	2.6	63.7
TWN	30	341	.378	11.3	77.3 <sup>1</sup>
Sections <sup>2</sup>	902	4300		4.8	
TCC Eastern	120 <sup>3</sup>	510			
TCC Central	90 <sup>3</sup>	889			
TCC Pacific	118 <sup>3</sup>	925			

Summary	1592	15973	EAN	8.6	3RN
Record	1865	19944	.886	15.9	100.0
Late Reports:					
RN6 (April)	27	436	.428	16.1	84.5
RN6 (May)	31	360	.482	11.6	81.9

<sup>1</sup> Region Net representation based on one session per night. Others are based on two or more sessions per night.

<sup>2</sup> Section nets reporting (29): MDD5 & MDD (Md.-Del.-D. C.); NUN, SCN, SCVN (Calif.); BUN (Utah); GBN (Ont.); GEM (Idaho); WSB, WIN, WSSN (Wis.); QFN, PPTN (Fla.); AENP Morn. AENP Eve, AENT, AENO, AENM, AENB, AEND (Ala.); SCN (S.C.); Wolverine (Mich.); VN & VSN (Va.); MSN (Minn.); WSN (Wash.); TEX (Texas); CPN & CN (Conn.).

<sup>3</sup> TCC functions reported, not counted as net sessions.

Whee, we broke a record! The previous high June "rate" was .886, a year ago. In June, 1962, EAN achieved a "rate" of .937, and that's the first record we've broken in several months. Other summary figures are considerably down from a year ago. Although traffic is down at all levels, it's the luck of reporting on the part of section-level nets that hurts. Report via your SCM or direct to headquarters on CD-125; we'll be glad to supply the forms on request.

W9DYG, ever the devotee, reported CAN from his vacation QTH. WA6ROF has awarded a PAN certificate to K7JHA and welcomes veteran W6RSY back to the fold. K1PES has received a 1RN certificate. There will be a new manager for 2RN in the works by the time you read this, as W2EZB takes over EAN on Sept. 1. K5LZA has been awarded a RN5 certificate; RN5 is using QNY to 40 meters at times — a good idea! K6KCB kicks in with three RN6 reports — the current one and two back reports. K7JHA is the new manager of RN7, and submits a very complete report, plus his first bulletin. W8DAE says 8RN activity was "fair," despite summer diversions and QRN; four sessions had to be cancelled during Field Day. W0DUA says TEN has fallen apart for the summer; the 2300 session has been suspended. W0FBO strained his back on Field Day and was off TWN for a couple of weeks, but the net functioned very well without him, thanks to K7NWP, W7OCX and W0TVI.

**Transcontinental Corps.** A TCC man has to be really versatile to keep up with band changes these days! The schedules are usually set up for a certain frequency at a certain time, but if that band is not open between the two points concerned at that time, there has to be an alternate frequency on another band. A really good TCC team will

keep an eye on propagation forecast charts and monitor WWV's daily predictions so that some indication will be available beforehand as to which band has the best chance of being open for the schedule. This can save a lot of time and frustration. June reports.

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern.....	120	71.7	1290	510
Central.....	90	87.8	1862	889
Pacific.....	119	91.8	1850	925
Summary...	329	83.3	5202	2324

The TCC roster: Central Area (K4AKP, Acting Dir.) — K4s HHG AKP, K9UGY, W9s JOZ DYG CXY ZYK, K0s ONK IVQ, W0SCA. Pacific Area (W7DZX, Dir.) — W5-ZHN, K0s GID ZYZ, W0s EOT WPF HC, K7s NWP TBB, W7s DZX, GMC, K0s EDH EDK, W0s WHE KQD.

### New Net Registration Procedures

Each year our net registry, like most of the things we do, gets a little bigger — but for the past several years there has been no increase in the personnel or time available to maintain it. So we come face to face with the question of either (1) arbitrarily cutting it down in size or (2) streamlining it so that it can perform the same job with less space and at the expenditure of less time, in the expectation that the time we save in efficiency will be made up for by continued increase in size.

For quite a few years, our practice of listing nets in QST has been under fire. Many have said that the lists, incomplete in detail as they are, serve little purpose except to give each net a little publicity — which is not, of course, the purpose of the listing. The printed, cross-indexed net directory is far superior as a net listing, and it has been free on request to anybody. After deliberation, we are going to delete all QST net lists this season and concentrate on the printed net directory. This will save valuable QST space and give us more time and space for other things.

We also are altering our net registration rules somewhat to prevent the flood of registrations and re-registrations which come pouring in during the fall months. In the future, nets will be dropped from the registry only when their last registration or re-registration was a year or more ago. When they are dropped, the net manager of record will be sent a card notifying him of this. The cross-indexed net directory will be compiled consisting of those nets in our "current" file as of Nov. 1, 1962. With this new system, in subsequent years we may be able to get the directory out earlier.

The current net directory (Nov. 13, 1961) gives the registration date of your net, if your net was registered. If you have re-registered or submitted changes since then, your registration is good for another year from the date the last such re-registration or change was received here. If not, and the date shown on the directory is prior to Nov. 1, 1961, you must re-register before Nov. 1, 1962, if you wish your net to be included in the 1962-63 annual printed net directory.

If you are in doubt about it, the best thing to do is to re-register anyway. Use form CD-85 or facsimile or give us the following information:

- 1) *Full name of net.* Decide on an "official" name for your net and stick to it. We definitely tend to favor nets with short, concise names.
- 2) *Net designation.* You don't have to have one, but if you do, let us in on it. Examples: CIN for "Central Illinois Net," HBN for "Hit & Bounce Net."
- 3) *Frequency, or frequencies, in kc.* If more than one frequency, be sure the times and days for each are clear. Frequency bands or segments are not sufficient.
- 4) *Days.* Tell us which days of the week, not how many, or "all." "Daily" means every day, including Sunday. Make sure your days of operation are in accordance with GMT — or, if not, that the time given is specified as to time zone.
- 5) *Call of Net Manager.* The call letters of the amateur who runs the net, writes correspondence on it, or is in general the one to ask for information.
- 6) *Net starting time(s).* Net ending time(s). Use *Greenwich Mean Time*. If you don't know how (shame on you!), use your local time but be sure to indicate what time this is, other than a "local" time, which means absolutely nothing.
- 7) *Direct Coverage.* The coverage area assigned the net (if part of a system) or the coverage provided by regular

participants. Do not include coverage provided through liaison with other nets.

8) *Purpose of Net.* Only nets with a public service purpose will be registered. Sorry, we don't have space for strictly rag-chew and social nets. Indicate traffic, emergency or other public service purpose. Don't say "training" unless you indicate training in what.

9) *NTS?* Is this net part of the ARRL National Traffic System? Yes or no. If you don't know, it probably isn't.

10) *Liaisons.* Now indicate the nets you conduct regular liaison with which we told you not to list in (7) above. If you are an NTS net, indicate your NTS liaison, of course.

11) *Previously registered?* It will help us out a bit if you can tell us the year you were previously registered, or even just whether you were or not. If you don't know don't worry about it. If you were previously registered under a different name, scribble it across the bottom of the card; this will help us in looking it up in the old files.

12) Call letters of amateur supplying this information. This is for our own information in case we have some question about it.

If you will take the trouble to register your net carefully and completely (and legibly), we'll have a good net directory. January or February QST may have some changes and corrections or some additions to the directory, so watch for them and keep your net directory up to date. — WINJM

## BRASS POUNDERS LEAGUE

Winners of BPL Certificate for June Traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL.....	134	1761	1353	394	3642
K6BPI.....	85	1708	1600	108	3501
W6WPF.....	98	935	900	35	1968
W0JOZ.....	16	880	896	3	1785
W0LGG.....	377	630	597	31	1635
K0ONK.....	183	615	502	22	1322
W0SCA.....	23	604	603	3	1233
W7BA.....	11	508	467	40	1026
K7JEA.....	48	502	457	2	1009
W7DZX.....	6	497	448	17	968
K4AKP.....	12	476	396	80	964
W1PEX.....	41	453	419	25	938
K4SJH.....	112	483	333	10	938
W8UPH.....	13	429	370	58	870
W6FUS.....	7	412	410	2	831
W0DYG.....	42	371	296	32	741
W3BML.....	37	359	318	12	726
W1TXL.....	181	271	267	4	723
K1RYT.....	150	312	206	34	702
W3YYC.....	9	347	335	9	700
W3VR.....	21	330	321	4	676
K4PQL.....	9	329	312	15	665
W4ZGPT.....	37	299	280	8	624
K6EPT.....	10	292	150	142	594
W6EOT.....	3	298	278	15	592
W8DAE.....	39	297	183	65	584
K6LTT.....	209	187	161	28	583
W4PL.....	8	291	265	17	581
K7NWP.....	20	289	230	40	579
K1POS.....	28	275	269	2	574
W3CHT.....	11	291	250	21	573
W4ABMC.....	143	213	201	15	572
K2UBG.....	15	287	262	8	570
K4ZYI.....	25	261	269	5	560
W3WRE.....	43	244	223	22	532
K0FPC.....	57	309	147	11	524
K6KCB.....	11	268	207	18	504

Late Report:

W6FNE (May)...	24	275	268	7	574
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### More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
W6IAB.....	191	1178	1110	68	2547
W6YDK.....	1896	140	122	18	2176
KR6GF.....	666	169	53	116	1004

### BPL for 100 or more originations-plus-deliveries

W2EW.....	247	K6GZ.....	130	K4TBG.....	103
W4SHJ.....	198	W9AKV.....	122	W42CCF.....	102
W5QEG.....	179	W9AQW.....	117	W4NTR.....	102
K0GFA.....	171	W9NZZ.....	116	W0WHE/7.....	101
W6TYX.....	165	K1KSH/4.....	109	Late Reports:	
W42TQT.....	136	W3RY.....	109	K0HGI (May).....	121
W4AKB.....	132	K8ZZW.....	109	K0VTC (May).....	140
W4FOR.....	131	W7AMM.....	106	K8JJC (May).....	103

### More-Than-One-Operator Stations

KR6MB.....	188	KR6MH.....	149
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BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: K1GGG, W42JHQ, K4KWQ, K7NHV.

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

## NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

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.m.* — 3535, 7050, 14,060; *phone* — 3765, 14,160, 28,250 kc.

### SUGGESTED RTTY OPERATING FREQUENCIES

3620, 7040, 14,090, 21,090 kc.

### GMT CONVERSION

*To convert to local times subtract the following hours:*

ADST -3, AST -4, EDST -4, EST -5, CDST -5, CST -6, MDST -6, MST -7, PDST -7, PST -8, Honolulu -10, Central Alaska -10.

### CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from WIAW will be made September 20 at 0130 GMT. Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,700, and 145,800 kc. The next qualifying run from W6OWP only will be transmitted September 2 at 0400 Greenwich Mean Time on 3590 and 7129 kc. **CAUTION:** Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example:* In converting, 0130 GMT September 20 becomes 2130 EDST September 19.

Any person can 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 you initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

WIAW conducts code practice daily at 0130 GMT on all frequencies listed above with speeds of 15, 20, 25, 30, and 35 w.p.m. on Tuesday, Thursday, and Saturday, and at 5, 7½, 10, and 13 w.p.m. on other days. Approximately 10 minutes' practice is given at each speed. To check your copy, the texts used on several transmissions are listed below. The order of words in each line of QST text is sometimes reversed. To improve your list, try to send in step with WIAW.

*Date* Subject of Practice Text from July QST

- Sept. 5: V.H.F. Repeater Problems . . . p. 26
- Sept. 8: Plate Modulation for the 150-Watt, p. 42
- Sept. 11: So You Know the Q-Code?, p. 54
- Sept. 14: Project Boys, p. 51
- Sept. 19: Nuvistor Converter for 220 Mc., p. 38
- Sept. 24: Combination Fundamental . . . p. 37
- Sept. 27: An All-Transistor Keyer . . . p. 33

## WIAW SCHEDULES

(September 1962)

### Operating-Visiting Hours

Monday through Friday: 1 P.M.-1 A.M. EDTST.  
Saturday: 7 P.M.-2:30 A.M. EDST.  
Sunday: 3 P.M.-10:30 P.M. EDST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn., about 4 miles south of West Hartford. A map showing local street detail will be sent on request. The station will be closed September 3, Labor Day.

### Operating Frequencies

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800 kc.

Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000, 50,700, 145,800 kc.

Frequencies may vary slightly from round figures given; they are to assist in finding the WIAW signal, not for exact calibrating purposes. Amateurs are respectfully requested to refrain from transmitting on the above frequencies during WIAW bulletins and code practice.

### Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time.

C.w.: Monday through Saturday 0000; Tuesday through Sunday, 0400.

Voice: Monday through Saturday, 0100; Tuesday through Sunday, 0330.

**Caution.** Note that in the U. S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

## WIAW CONTACT SCHEDULE

Would you like to work WIAW? WIAW welcomes calls from and amateur station in accordance with the following schedule:

<i>Time (GMT)<sup>1</sup></i>	<i>Sunday</i>	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
0000-0030 <sup>1</sup>	.....	14,280	3555 <sup>3</sup>	14,100	14,100	7080 <sup>3</sup>	14,100
0030-0100	.....	14,280	3555	14,100	14,100	7080	.....
0100-0130 <sup>1</sup>	.....	145.8 Mc.	21,330	145.8 Mc.	50.7 Mc.	21,330	.....
0230-0300	.....	.....	.....	1820	.....	1820	.....
0300-0330	.....	.....	.....	3555	.....	3945	.....
0330-0400 <sup>1</sup>	.....	.....	.....	7255	3945	7255	3945
0400-0500 <sup>1</sup>	.....	.....	.....	.....	3945	7080 <sup>3</sup>	.....
1700-1800 <sup>2</sup>	.....	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	21/28 Mc.	.....
1900-2000	.....	7080	14,100	7255	14,100	7080	.....
2000-2100	.....	14,280	7080	14,100	14,280	14,100	.....
2200-2300	.....	14,280	14,280	14,280	14,100	7255	.....
2300-2330	.....	7255	.....	21,075 <sup>3</sup>	.....	14,280	.....
2330-2400	.....	14,100	.....	3555	.....	14,280	.....

<sup>1</sup> Starting time is approximate. General-contact period on stated frequency begins immediately following transmission of Official Bulletin, on c.w. at 0000 and 0400, on phone at 0100 and 0330.

<sup>2</sup> Operation will be on 21,075, 21,330, 28,080 or 29,000, depending on band and other conditions.

<sup>3</sup> WIAW will listen for Novice Class licensees on the Novice portion of this band before looking for other contacts.

• 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, Allen R. Breiner, W3ZRQ—SEC: W3DUI, RM: W3EML, PAM: K3BHU, V.H.F. PAM: W3SAO. New section appointments: K3HNP, K3RSA and K3RYR as OESs. K3CNN is now OBS in the Anthracite region on 2 meters. W3RV was QRT for 16 days but still managed to make the BPL, 80 through 2 meters is now operative from W3FLP. The Professional Freeloaders held their annual Bar-B-Q at Kittatinny Beach. K3HTZ visited VE3EYC during July. Cowans Gap State Park was invaded by the 6-meter operation of W3GJA. 6-meter mobile was operated by K3MDG on a New York State trip. K3NBU plans a 3-week trip to New Mexico. K3s LKJ and LKR were in the Adirondacks with a G-76 in July. K3DSM is camp counselor in New Hampshire. W3IB finished the first 25 years at IRC. (International Resistor Co.) and now is working on the next. W3FLP, Delaware County, and W3AHZ Montgomery County, have been quite active in AREC and invite stations to join on 2 meters. W3NOH switched his OO activities to 20 meters and managed to pick up a few new countries. New Gear Dept.: To K3MTG a Hallcrafters V.F.O.: K3RFH put up a 10-15-20-meter quad; an SB-10 to K3MNT; an HQ-110 receiver for K3NLW. The "CARE" package for W3HNK revealed a new microphone. K3LSC managed contacts with Florida with a Heath Sixer. K3QJV recently dropped the "N" from his call and is now General Class. KN3RDM in the Philadelphia Area, is on with a Lafayette HE-3 and vertical antenna. New club officers: 507 Society—K3LSI, pres.; K3KKU, vice-pres.; K3OJK, sec.; K3KLG, treas. Short Skip RC—W3IAR, pres.; W3WVKU, vice-pres.; W3ZQP, sec.; W3ZPX, treas. The Oxford Circle Radio Club—K3IIE, pres.; K3IIF, vice-pres.; K3PWU, rec. sec.; K3QFF, corr. sec.; K3NGH, treas.; K3OAO, mem. chmn. The newly organized Lancaster County V.H.F. Club—W3JYL, pres.; W3VDY, vice-pres.; K3BKH, sec.; W3IAM, treas. K3CNN is the new secy. of the Schuylkill County ARC. The Lancaster Transmitting Society became incorporated. K3LAU has moved to Wheaton, Ill. The North Penn ARC club bulletin, *Static*, celebrates its third anniversary. K3JLI will be operating from Puerto Rico until September. We acknowledge Field Day messages from the following: W3PDJ, K3GIA, K3MNT, W3NNL, W3EAN, K3MQE, W3BTN, W3YHV, K3EJZ, K3ANI and W3DUT. Traffic: W3CUL 3642, W3EML 726, W3VR 676, W3HNK 251, K3MQE 152, W3RV 140, W3FLP 115, K3XSS 108, W3IUF 96, K3MVO 89, W3ZRQ 86, K3BHU 84, K3HTZ 80, K3MNT 58, K3LC 54, W3JKX 52, K3JHF 42, K3DCR 40, K3NLW 37, W3AXA 36, K3CAE 27, W3ITD 20, W3GJA 17, W3BFF 10, W3BNT 10, W3OY 10, K3MDG 9, W3JFW 8, W3BUR 7, K3NBU 7, K3KQ 5, K3CNN 3, W3IUI 3, W3EEN 3, K3MTG 2, K3RSA 2, K3DSM 1, W3ELI 1, W3ID 1.

**MARYLAND-DELAWARE-DISTRICT OF COLUMBIA**—SCM, Andrew H. Abraham, W3JZY—Asst. SCM Delaware: Skip Nelson, K3GKF, SEC: W3CVE, RM: K3JYZ for MDD Traffic Net, which meets on 3650 kc. at 0015Z daily. MDD (slow) Net meets on 3650 kc. daily at 0130Z. MIEPN meets on 3820 kc. M-W-F at 2300Z on Sat. and Sun. at 1800Z. Del. Emg. Net meets on 3905 kc. at 2330Z Sat. Delaware soon will have separate section status. When this comes to pass we trust that all Delaware stations will continue to QNI MDD and MIEPN nets. Dr. Howard H. Layton, W3AIS, from Delaware, who in the 1930s was SCM for Md.-Del.-D.C., is a Silent Key. K3CNI reports severe thunderstorms during Field Day. W3KET/3 was Field Day station. W3CFA reports that W3KET, K3AZH and W3CFA are on 420 Mc. with transceivers and K3QBD will assist in the Powder Puff Derby. Md.-D.C.: W3AHQ was kept busy

with OSCAR II traffic, receiving on one band and transmitting on 6 and 2 meters. W3BKE observed Field Day at home this year. W3CBW/3 was set up on the Kernan Fair Grounds to demonstrate "ham radio" and "c.d.", operated by W3FSM and K3LEO. By coincidence, K3LEM, K3LEN and K3LEO were in the radio booth at the same time. W3NO finally got his WAS and sends in a fine traffic list. W3CDQ had a wonderful trip down to KP4-Land. K3CYA is an OO and found 23 amateur stations calling NSS-AIR-WAR on their own frequencies outside the amateur bands on Armed Forces Day. Fred has the 5N2 Award #9 for USA. K3DNO has a job with WGMS for the summer. W3HQE reports little activity and still sends in a nice traffic report. W3IVC keeps many skeds for his traffic. K3JLQ is all out for competition in the CD Parties. K3JYZ has added a 75S-1 receiver to the station equipment. Andy reports the following new members checking into the MDD: K3QFG and K3OZM. Andy blew his high-voltage power supply filament transformer and is now running *solid state rectifiers* for high-voltage power in his Valiant. The following MDD members attended the EPA Picnic at Hershey, Pa.: W3IVC, K3CXX, K3GJD, W3GQF and W3UE. K3LLR received his General Class ticket and has jumped into traffic handling. W3MCG is building a three-element beam for 40 meters. K3MTC has a TR-500 on a 32-ft. tower. W3NO has a new trap vertical working 10 through 80 meters. K3OGA has his B&W 5100B working on all bands. W3OIH has installed a 15- and 20-meter pipe dipole in his attic. K3OWX is now Assistant EC for K3KPZ, K3PRN will be on the air with a new transmitter. K3QFG is a new OES and is looking for traffic. K3SFT/3 has moved to Forest Hill, Md. K3WBJ is taking a vacation. W3ZAQ reports lots of violations of Par. 12.282, Improper Identification. W3ZNW is looking for time and energy to do some antenna work. New officers of the Baltimore Amateur Radio Club are W3NO, pres.; K3LEO, vice-pres.; W3UOV, treas.; James E. Moon, jr. (SWL), secy. The Copperhead U.H.F. Associates, operating portable W3JZY at Foxville Fire Tower, Md., had a total of 42,264 points in the June V.H.F. Contest; 383 contacts and 31 sections on 6 meters alone, plus 2 meters, 220 and 420 Mc. W3YXC will be out west for a year operating portable. Traffic: W3YYC 700, W3IVC 133, K3JYZ 103, W3TN 96, W3AHQ 90, W3HJE 54, K3OZM 52, W3CBW/3 47, K3WBJ 42, K3MQP 39, K3QFG 34, W3NO 30, W3ZNW 30, K3QZZ 29, W3BKE 24, W3JFR 22, W3MCG 14, K3DCP 13, W3OIH 10, K3OGA 8, W3EEB 5, K3LLR 5, K3CYA 4, K3NCM 4, W3CFA 2, W3CVC 1.

**SOUTHERN NEW JERSEY**—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY, PAM: W2ZL, RMs: W2HDW, WA2VAT. New appointee: K8SXH/2, Penns Grove, as OES, NJ Phone & Tfc. Net totals for June: QNI 498, sessions 30, traffic 125, W2ZL, net mgr., has just returned from a trip to the World's Fair and Canada. K2OOK, W2RG's son, is a civil engineer in Philadelphia. K2CPR, Peunsaiken, has increased his DXCC total to 272/263. WA2LBJ, Somerdale, is increasing his NJN activities. WA2ARJ, Millville, received the NJ Phone Net certificate. Field Day messages were received from Gloucester Co. ARC, Delaware Valley Radio Assn., South Jersey Radio Assn. and K2BNC. WA2KWB, Yarrville, is off the air until his fractured wrist mends. The SJRA Field Day group did a very fine job in spite of two days of intense QRN and rain. W2YX has a Blue Ridge Mt. trip planned. W2BLV and WA2EMB are pictured on SJRA's June issue of *Harmonies*. Both were greatly interested in Oscar II. WA2GQZ, NJN ngr., reports June totals as 31 sessions, QNI 530 and traffic 305. The net plans a picnic to Starvation Island, Navesink River, Rumson. The Levittown (N.J.) Radio Club held its picnic at WA2QZQ's farm. Mt. Laurel, K2HJY, Medford, Burlington Co. Radio Officer, is recovering from a serious illness. K2OYW, Barrington, is now SJRA's hamfest chairman, replacing WA2KRX, acting chairman. K2BG and his NYL expect to vacation in New Hampshire at the home of KN1VSD. Again we solicit reports from club secretaries. We are in need of ECs for Gloucester and Cape May Counties. Traffic: W2RG 146, K2RXB 61, K2CPR 22, WA2BLV 18, WA2ARJ 10, W2BEI 4, W2BZJ 4, W2ZI 4.

**WESTERN NEW YORK**—SCM, Charles T. Hanson, K2HUK—SEC: W2LXE, RMs: W2RUF, W2EZB, W2PEB, PAM: W2PVL, NYS C.W. meets on 3670 kc. at (Continued on page 100)

## EARNING THE RIGHT TO COMPLAIN

**C**OMPLAINING has always been the prerogative of the soldier, and while it seems to be getting that way on the ham bands, perhaps the right to complain should be an earned privilege, much like the amateur license itself.

**F**OR instance, if you dislike the general run of CW on the bands these days, don't complain out loud until you've done two things:

*First, make a conscious effort to improve your own fist, no matter how good it is.*

*Second, never end a QSO with a poor operator without giving him a true (and diplomatic) report on his sending, even though it might cost you a needed QSL or a favorable RST report. You might even follow this up with more detail on your QSL to him.*

**N**EVER complain about conditions on the Novice bands unless you make it a frequent practice to work new hams, at their speeds, to give them tips on good operating procedures and brass pounding.

**N**OVICES, be violently truthful, particularly with your use of the phrase "solid copy" and in your RST reports.

**C**lub members, don't air your gripes about club operations on the bands if you skip the meetings, or if you sit there with your mouth shut when you do attend.

**C**OMPLAINING is like worrying — you shouldn't have the privilege to indulge until you've made an honest effort to clear up a situation. And once you pitch in, you'll probably be too busy to complain.

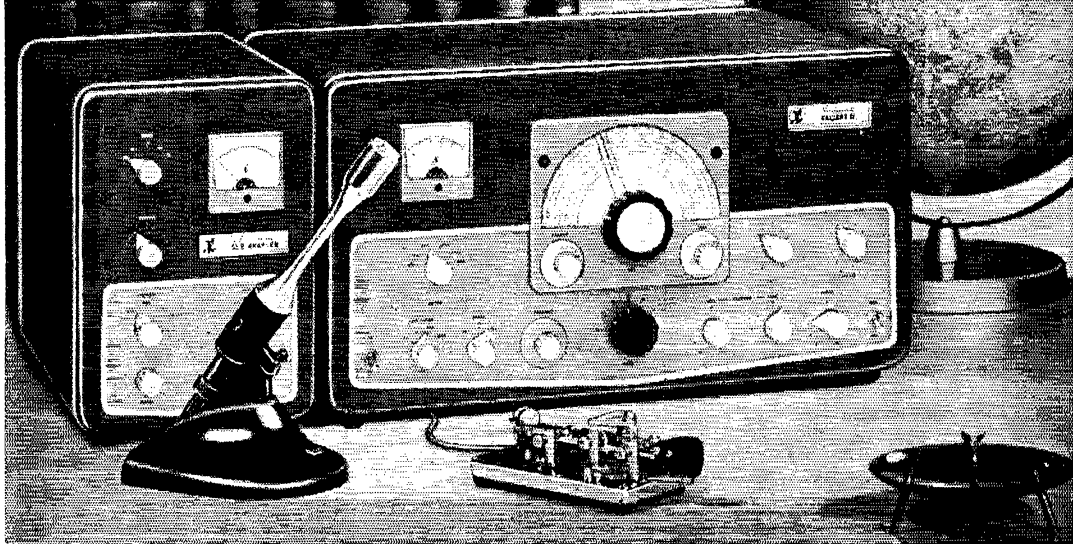
DICK ELLERS, K8JLK  
Warren, Ohio  
(Guest Editor)

*Lewis Marshall K9EBE*

*W. J. Hallegan W9AC*

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SSB, AM and CW!**



## Outstanding performance on SSB, AM and CW with absolutely no compromise on any mode!

**"SSB ADAPTER"**—Here's the filter-type SSB generator amateur operators everywhere have been asking for! Bandswitching 80 through 10 meters . . . more than 50 db sideband suppression . . . more than 45 db carrier suppression! When used with the Viking "Valiant" or "Valiant II" it places 275 watts P.E.P. at your command—gives you the punch and penetration necessary for solid communications on today's crowded bands!

Two compact units and interconnecting cables . . . RF unit is only 8" wide—may be placed on your operating desk—power supply unit may be placed in any convenient location. Unique design features built-in multiplier requiring VFO input only—band-pass interstage couplers require no tuning—design and front panel layout make operation practically "foolproof"! Superb audio fidelity and balanced audio response; excellent sideband, spurious and carrier suppression. Other features: positive VOX and anti-trip circuits with built-in anti-trip matching transformer and adjustable VOX time delay.

Cat. No. 240-305-2—Wired and tested with remote power supply, tubes crystal filter, less microphone. **\$369<sup>50</sup>**  
AMATEUR NET

**"VALIANT II"**—Newly restyled, the "Valiant II" gives you outstanding flexibility and performance in a compact desk-top rig! Bandswitching 160 through 10 meters—delivers a full 275 watts input CW or SSB (with auxiliary SSB exciter or the new Viking SSB Adapter) and 200 watts AM! Low level audio clipping prevents overmodulation and increases modulation level and intelligibility—differentially temperature compensated VFO provides the extreme stability necessary for peak SSB operation! High efficiency pi-network tank circuit—final tank coil is silver-plated. Other features: complete TVI suppression; timed sequence (grid block) keying; high gain push-to-talk audio system built-in low pass audio filter; self-contained power supply; and single control mode switching.

**AS AN EXCITER**—Drives any of the popular kilowatt level tubes, and provides a high quality speech driver system for high powered modulators.

**SSB OPERATION**—Provision for plug-in SSB operation with no internal modification necessary. Rear panel fittings provided for VFO output and SSB input, connections for remote control of final amplifier bias and VFO keying through the VOX control of the SSB adapter.

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Amateur Net

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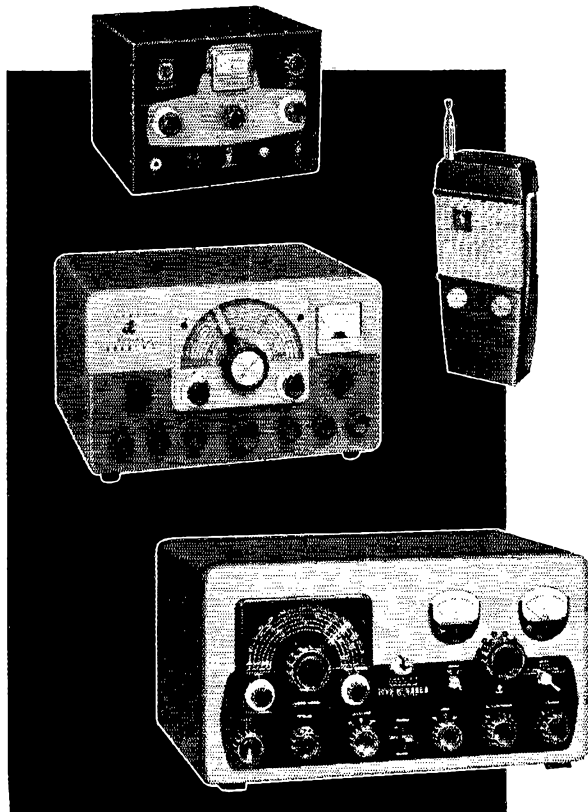
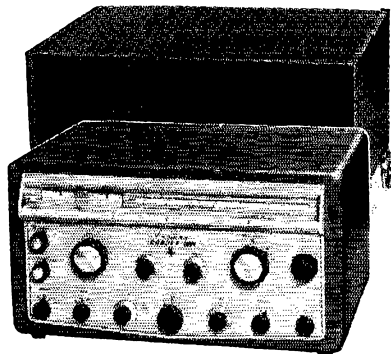
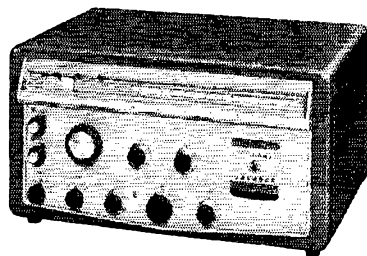
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**10 METER "PERSONAL MESSENGER"**—Two models: 100 milliwatts for short range; 1 watt for extended range—11 transistors and 4 diodes super-heterodyne receiver with tuned RF amplifier gives excellent sensitivity two stage transmitter punches signal home, "Quiet" control silences receiver on standby. With battery compartment for penlight cells (less cells) Rechargeable cadmium battery and other accessories available.

**Cat. No. 242-103 100 milliwatt..... Amateur Net \$109.50**  
**242-104 1 watt..... \$129.50**

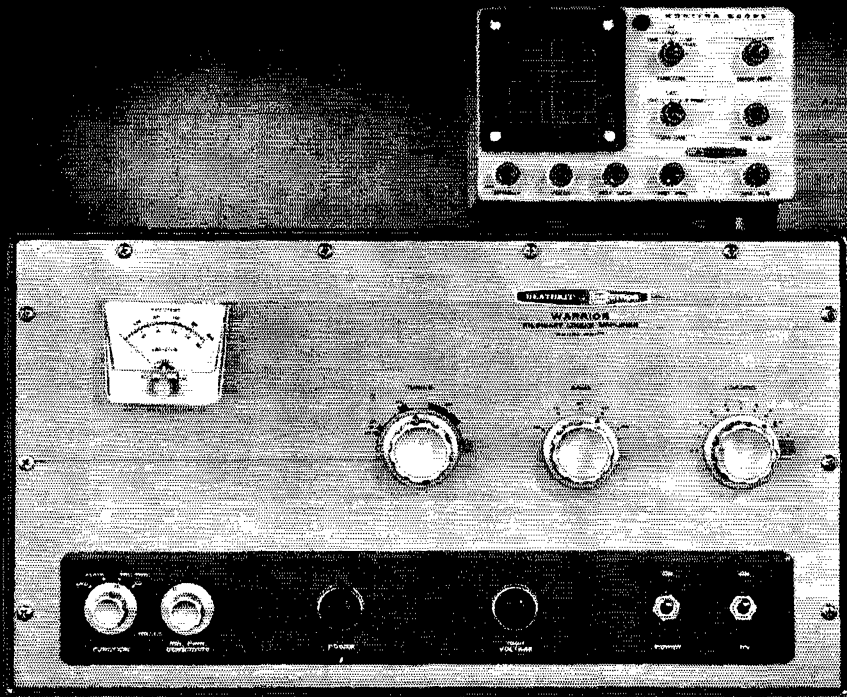
**RANGER II**—Now a new version of the popular 75 watt CW or 65 watt AM "Ranger". The Ranger II transmitter also serves as an RF/audio exciter for high power equipment. Completely self-contained instant bandswitching 160 thru 6 meters! Operates by built-in VFO or crystal keying, TVI suppressed. Pi-network load matching from 50 to 500 ohms. With tubes, less crystals.

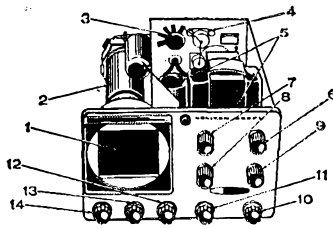
**Cat. No. 240-162-1 Kit..... Amateur Net \$249.50**  
**240-162-2 Wired, tested..... \$359.50**

**FIVE HUNDRED**—Full 600 watts CW—500 watts phone and SSB (P.E.P. with auxiliary SSB exciter). Compact RF unit designed for desk-top operation. All exciter stages ganged to VFO tuning—may also be operated by crystal control. Instant bandswitching 80 thru 10 meters—TVI suppressed—high gain push-to-talk audio system. Wide range pi-network output. With tubes, less crystals.

**Cat. No. 240-500-2 Wired, tested..... Amateur Net \$1050.00**

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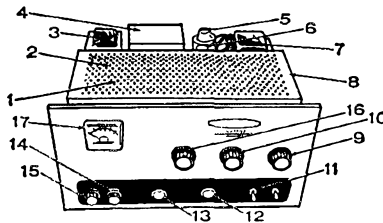


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1. 3" CRT 2. Neckshield minimizes external field effects 3. RF attenuator accommodates 5w to 1 kw power levels 4. Rear panel RF feed-through connectors and input and output jacks 5. Compactrons for space-saving layout 6. Sweep frequency adjust with "clamp" position to prevent CRT burns under SSB no-modulation conditions when using trapezoid function 7. Wave envelope, AF or RF trapezoid selector 8. Built-in single or two tone test generator 9. Horizontal gain 10. Horizontal position 11. Vertical position 12. Vertical gain 13. Focus 14. On/Off/Intensity

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Put this space-saving twosome to work in your shack for a clean KW of single sideband. The "Warrior" in a short time has justly earned a world-wide reputation as the finest watt-per-dollar value anywhere in kilowatt linears. QSO an amateur who has one, there are hundreds on the air. The new Heathkit Monitor 'Scope is especially designed for hams with useful patterns for checking "flattopping" and non-linearity in SSB linear amplifiers, observing modulation characteristics of AM and SSB transmitters, and monitoring the quality of received signals. Send for free specification sheets on these ham-engineered, quality kits from Heath.



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# GOTHAM VERTICALS DELIVER THE CONTACTS

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Judge for yourself! Read his letter and count the DX he has worked— with only 65 watts and a \$16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California  
January 31, 1959

GOTHAM  
1805 Purdy Avenue  
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,  
Thomas G. Gabbert, K6INI (Ex-T12TG)

**OR IS K4ZRA THE NEW  
CHAMP?** Read his letter, and see his diagram of a typical installation and what it achieved:

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Owensboro, Kentucky

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Miami Beach, Florida

Gentlemen:

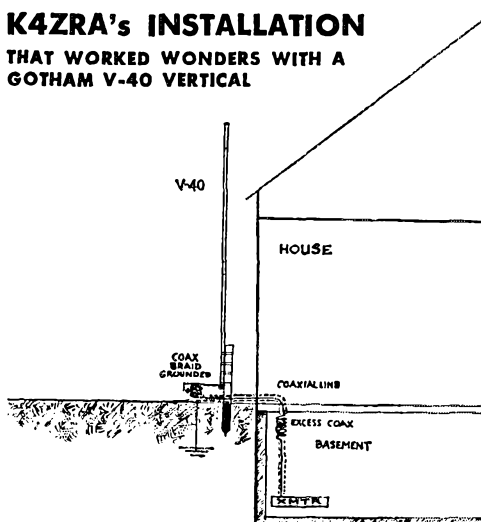
During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (Hallcrafters reboxed SX-28.)

The above mentioned contacts were made with the vertical mounted several inches off the ground, without radials, with only a simple ground connection to the coaxial shield.

Daniel F. Onley, K4ZRA

## K4ZRA's INSTALLATION

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- Radials not required.
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- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Non-corrosive aluminum used exclusively.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. **ONLY \$16.95.**

73  
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V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS..... \$14.95

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## Station Activities

(Continued from page 92)

1900: ESS on 3500 kc. at 1800; NYSPTEN on 3925 kc. at 1800; NYS C.D. on 3610.5 and 3993 kc. at 0900 Sun. and 7102.5 kc. at 1930 Wed.; TCCP 2nd call area on 3970 kc. at 1900; IPN on 3980 kc. at 1600; 2RN on 3690 kc. at 0045 and 2345 GMT. Appointments: K2ZFU as OES. Endorsements: K2SIL and W2EMW as ORSs; WA2GLA and K2QDT as OPSS; K2LJG as OO. This year's Field Day saw more and more groups operating as AREC and RACES organizations in order to test organization and equipment. The RAGS elected W2YRL pres.; W2LBO, 1st vice-pres.; WA2EOJ, 2nd vice-pres.; ZA2PHW, treas. and corr. secy.; WA2QMJ, rec. and asst. corr. secy. WA2OQI has his 30-w.p.m. c.p. By the time you read this WA2VWV should be back from VO2-Land. WA2WEE has a new electronic keyer. W2PEY built an 812A p.a. while convalescing from a recent operation. All amateurs are invited to make monthly reports to the SCM. Form 1 report cards are available from ARRL on request. Traffic: K2RTQ 196. W2OE 191. W2FZB 180. W2MTA/2 138. K2ACA 127. K2SIL 109. WA2HSB 93. W2PVI 69. K2OFV 52. W2HOH 51. K2QDT 29. K2BBJ 15. K2AFE 14. K2RYH 14. WA2WEE 14. W2RQF 11. W2QHH 9. K2QQY 6. K2TGD 6. WA2IXY 5. W2EMW 2. WA2OGI 2.

**WESTERN PENNSYLVANIA—SCM.** Anthony J. Mroczka, W3IHN—SEC; W3WRE, Asst. Secy; W3KUN, RMs; W3KUN and W3NUG. The WPA Traffic Net meets Mon. through Fri. at 2400 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets 2330 GMT on 3585 kc. Mon. through Fri. The Penna. C.D. Net meets every Sun. at 1300 GMT on 3538 kc. KN3PNE visited the World's Fair at Seattle. W3VRC has his brother W3KRJ as a recent visitor. W3PAE has a Heath Warrior. The Steel City ARC reports via *Kilowatt Harmonics*: K3QQQ is busy working 6 meters; W3GQJ graduated from Wheeling College; W3MJC is moving to Baltimore. K3BTQ, the son of W3MNP and W3LJF, has been selected by the American Field Service as an exchange student to spend the coming school year attending school in Berne, Switzerland. W3SYU and W3WZ participated in the recent V.H.F. Contest at Blue Knob. The Cumberland Valley ARC was out in full force during the recent V.H.F. Contest on 2 and 6 meters. W3SMV now has a Model 26 RTTY machine. Up Erie way: New officers of the RAE are K3BOZ, pres.; KN3JSCO, vice-pres.; K3OFA, secy.; K3LTG, treas.; W3KPM and W3NXX, trustees; K3ERK is the new station call at Boy Scout Camp Sequoiah. K3BWI earned the WBE Award. K3OQQ is a new General in Butler. The W3PIE Hamfest at Uniontown will be held Sept. 15. W3NUE has a vertical antenna now. W3KSL and his NYL are recuperating very nicely after their automobile accident. W3WFR is mobiling in Canada. K3JTH won the trophy in the W3UEM Memorial Contest. KN3-TQW is a new Novice handicapped with blindness in the Pittsburgh Area. The South Hills B&M now is editing club paper *De W3PIQ*. The Bedford County ARC reports via *Shorps*: New Novices are KN3TLM and KN3TTN; K3MKX now is on 6 meters; K3PPQ is in the Coast Guard. W3LIV and W3ZVA work the mercy ship *SS Hope*. From all indications it seems the Field Day activities for the section was a huge success, weather-wise and score-wise. This office was pleased to receive so many PD messages. Traffic: (June) W3WRE 532. K3DKE 77. W3KUN 76. W3LSS 76. K3EDO 42. W3NUG 40. W3OEO 18. W3KNQ 12. W3SMV 6. W3LOD 5. K3COT 4. W3IHN 3. K3BWI 2. W3IDO 2. (May) W3SMV 38. K3KMO 32. W3NEM 20.

## CENTRAL DIVISION

**ILLINOIS—SCM.** Edmond A. Metzger, W9PRN—Asst. SCM; Grace V. Ryden, W9MGE, RM; W9ISR, PAM; W9RYU, EC of Cook County; W9TPG, Section net; ILN, 3515 kc. Mon. through Sat at 1900 CDT. The scores that have been coming in of the Annual Field Day operations have been fairly high and again proves the amateurs' desire to be of great worth in time of emergencies. WA9EGA is the new call for the Bogaz High School Radio Club station. W9RQC reports FB contacts on his newly erected fifteen-element 2-meter and six-element 6-meter beams. The Annual SARA Hamfest held in DuQuoin at the State Fair Grounds was well attended and everyone had a good time as usual. K9PKG is sporting a new 70-ft. tower and Hy-Gain antenna. W9SKR reports that the Lake County RACES operation is progressing fine with its drills and Net. Control W9FAL, who operates the Libertyville transmitter, K9QMJ has constructed a nuvistor converter for 2 and 6 meters. W9GFF, K9JTD, K9KRW and W9TZN participated in the recent Frequency Measuring Test conducted by the League. Ex-K3LAI has moved to Wheaton and is awaiting his 9 call. New calls here are WN/WA9CWZ, WN/WA9CXC, WN/WA9CXP, WA9-

CUT, WN9CVC, WN9CVJ, WN9CVT and W99CWV. All were graduated from the Macomb Senior High School class conducted by K9XCC and W9MSO. W9EU's rig was hit by lightning and he lost his 4-400s. W9KZM is now QTHing at the Army Pictorial Center, Long Island City, N. Y., making training films. The Breakfast Club outing was held in Palmyra and members from several states attended the two-day affair. New appointees: K9EIV and K9CCG as OPSS, K9HII as OO, K9VUK and K9PNB as OESs. The North Central Phone Net handled 114 messages during June and the CAEN (Chicago Area Emergency Net) traffic total was 79. A belated traffic count for the CAEN for April was 202. W9MSG, W9-K9-SL Manager, asks that the newer hams who are not familiar with the Bureau's working, please write him at 702 Spring Road, Elmhurst, Ill. for a reprint of a 1959 QST article. W9AKV is the only recipient of the HPL award for June traffic. Traffic: (June) W9AKV 358. K9LGY 275. K9KZB 172. K9TQV 147. W9MAK 91. K9OAD 45. K9DRS 39. W9JXV 39. K9ZOT 33. K9UJT 36. K9CRT 31. K9OEW 22. W9PRN 22. W9BQC 16. W9AZ 15. W9SKR 10. W9DEW 8. W9VPU 5. K9FFR 2. (May) K9UGY 166. K9AED 105. K9VU 13.

**INDIANA—SCM.** Donald L. Holt, W9FWH—Asst. SCM; Clifford A. Singer, W9SWD, SEC; W9SNQ, PAMs; K9KTL, K9CRS, K9GLL, RMs; W9TT, W9VAY, K9WET. Net sheds: (all times in GMT) IPN, 1300 daily and 2300 A1-F on 3910 kc. ISN (s.s.b.), 0300 daily on 3920 kc. QIN (training) 0000 A1-W-F on 3745 kc.; QIN daily at 0300 and RFN 1300 Sun. on 3556 kc. With deep regret the following Silent Key is reported: Charles D. Mills, WA9AFU, Hobart, Ind. New appointments: K9TKC and WA9AOT as OESs, WA9BNW as EC of Jasper Co.; W5WFOQ9 as EC of Tippecanoe Co. Twenty radio clubs sent Field Day messages to the SCM with an average of 16 members per club participating in the activities. About 80 percent of those active were AREC members. There were some clubs active on Field Day for the first time, indicating increased interest in this important phase of amateur radio. The DARA gave 40 exams for Novices and Techs. in June. K9ATV is a new Tech. and WA9AWV a new General in Anderson. QIN Honor Roll: W9TT, K9SQZ, K9ARW and W9VAY. Those making RPT: W9IQZ, W9NZZ, W9AQW. *Amateur radio exists as a hobby because of the service it renders.* June net reports: IFN 296, ISB 380, QIN 267, QIN (training) 4, RFN 63, Hoosier V.H.F. 84, W9ZYK reports the 9th region total as 850 with Indiana represented 100 per cent. Late May report: QIN (training) 7. Traffic: (June) W9IQZ 1795. W9RE/9 366. W9ZYK 301. W9TT 213. W9WIM 191. W9NZZ 179. K9ARW 154. K9SGZ 130. W9AQW 128. K9DNY 122. W9FWH 101. W9QYQ 102. K9OET 101. K9IVG 87. K9RIVG 83. W9HUQ 77. K9CRS 76. W9ELW 69. K9ZLA 67. K9BSL 66. K9YIC 50. W9OQ 48. W9RTH 44. W9DQK 41. W9PMT 41. K9KTL 31. K9GLL 28. K9MVC 28. K9RPZ 27. W9AWH 24. K9WET 24. W9IMU 23. W9DKR 19. W9RTI 18. W9BTZ 16. K9WJW 15. K9LIP 12. W9QLW 11. K9HIV 9. W9SNQ 9. W9VYX 9. K9ILL 7. K9INF 6. K9RAM 6. K9YSW 6. W9RDP 4. K9MAN 2. (May) K9YIC 283. W9VAY 93. W9YYX 10. W9AQW 1.

**WISCONSIN—SCM.** Kenneth A. Ebener, K9GSC—SEC; W9BCC, RMs; W9VIT, W9VHP, PAMs; W9-NGT, W9SAA, Nts.; BEN, 3550 kc., 2300Z daily. W9BN, 3995 kv. 2309Z daily. WIN, 3535 kc., 0115Z daily. W9SN, 3535 kc., 0030Z Tue. through Sat. New appointee: W9DPS as OES. K9PKQ is now active on 6 meters. Oscar II was copied by W9FBC 14 times. K9HBT worked Mexico on 6 meters. NCSS of the year named at the WNA Picnic were W9YT, W9CBE and K9GSC. The W9s defeated the K9s in the baseball game at the WNA Picnic. WA9AUC and WA9BIB have dropped the "N" from their calls. K9OPF received DXCC certificate No. 6146. W9KQB made his DXCC with 119/105 and is NCS on C.A.N. K9GDF had qualified for 36 different awards. MRAC officers: W9QVD, pres.; W9CJO and W9ROV, vice-pres.; K9CJP, treas.; K9WGN, secy. W9NCVX and W9NCWU are new in Milwaukee. W9IQW has a new Navigator and electronic keyer. W9DHL graduated 7 Novices from the class he conducted at SPARK, including his XYL. May FMT results: W4-VRD 9 4. K9GDF 13.6. K6DDO/W9AIW 16.5. W9LFF 35.3. W9VVO 76.7 p.p.m. The Carbonero Amateur Radio Club is new in the Whittenberg Area. The O-kosh Radio Club had a cookout at the home of W9UEB. W9ZB traveled to England on his vacation. A HPL certificate for June traffic went to W9DYG. Traffic: (June) W9DYG 741. W9KQB 189. K9GSC 11. W9VHP 76. K9-LUT 69. W9SAA 57. K9BLN 52. W9DWH 50. K9MIR 42. W9YT 38. K9LGI 29. W9OTL 27. W9WGN 21. W9-HPC 17. K9WIE 16. W9ACG 15. K9DOL 14. W9VIT 14. K9TRB 13. K9GDF 12. W9CBE 9. W9ADHL 8. W9IQW 5. K9OCA 4. W9ONI 4. K9ZMU 3. K9BOJ 2. (May) W9IHN 12. K9ZMI 3.

(Continued on page 102)

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(Continued from page 100)

### DAKOTA DIVISION

**NORTH DAKOTA**—SCM, Harold A. Wenzel, W0HYA—SEC: W0CAQ, PAM: K0TTY, RM: K0QWY. The North Dakota 75 Meter Phone Net reports 12 sessions; a total of 221 check-ins, minimum 12, maximum 26; 47 formal messages handled, 18 informal with 5 relays. NCSs for the summer are W0BHF, W0HSC, W0QQD, K0JNB, K0AJW and K0QYD. Thanks to K0JNB for the traffic reports. Your SCM received 5 Field Day messages. Lightning struck the transmitter of K0ITP on June 18 and she was off the air for several weeks. A new call in Bismarck is W0N0DAR. Marvin who is 13, built his own transmitter using a 6L6 final. K0WNO is building a plate modulator for his DX-40. The new QTH for K0HPG is Jamestown. K0COV is working 6 meters this summer. W0VCQ, who has been off the air since the Fargo Tornado in 1957, is back on with an HT-32A and an SX-101. Traffic: K0IVQ 448, K0JNB 43, K0ITP 30, W0AYL 19, W0GG1 14, W0YCL 14, K0TPK 9, W0CZL 7, K0AJW 4, W0BHF 2, W0MQA 2.

**SOUTH DAKOTA**—SCM, J. W. Sikorski, W0RRN—SEC: W0SCT, W0VTV. Watertown, has retired from FAA after thirty years of service and is moving to California. K0QJB, formerly of Sioux Falls, is now K3TFN, of Pittsburgh, Pa. Forty-eight members of the SFARC operated Field Day from Newton Hills State Park. K0WEM was elected director of the SFARC. A new call from Mitchell is W0N0DOF, operating with an HT-17, and an HQ-110. K0LOW and K0VIZ have purchased an SX-101A. The SMFARC operated three stations from Eureka, S. Dak., during that town's Diamond Jubilee. Traffic: W0SCT 242, K0BMO 70, W0A0Y 34, K0BSW 18, K0ZBJ 12, W0RWM 3, W0FJZ 5, K0JGM 5, W0YVF 4, K0CXL 3, K0KOY 3, W0GWW 2, W0OFP 2, K0SZJ 2, W0ZSJ 1.

**MINNESOTA**—SCM, Mrs. Lydia S. Johnson, W0KJZ—Asst. SCM: Charles Marsh, W0ALW. PAMs: W0GCR K0EPT, RMs: W0A0DX, K0OXQ. Minnesota phone frequencies: 3820 kc. at 1205 and 1800 CDST, S.S.B. on 3805 kc., 3815 kc. at 1130 and 1845 CDST. C.w. nets on 3595 kc. at 1830 and 1900 CDST. TR RACES. "PICO NET" is on 3840 kc. every other Sun, with all modes of operation acceptable. The RTTY "RATS" meet on 3620 kc. at 2000 CDST. The month of June appears to be the lowest traffic month I have experienced since becoming SCM. The sunspot cycles may move our section nets to 160 meters by fall-winter. Twenty-two licensed amateurs attended special meeting at the U. OF M. Campus Club to hear Dick Baldwin, W1IKE, managing editor of QST, speak, and enjoyed the many colored slides of ARRL Headquarters and the many employees, the new building site and the present W1AW radio station. Your SCM had the honor of entertaining W1IKE his wife and children at her QTH as dinner guests prior to the meeting. W0LCN has a 200-watt transmitter on 2-6-20 meters. K0ISV, who finished his second year of college at Nazareth Hall, now has a Heath Comanche receiver and transmitter. K0JYJ has Noel's Valiant set up at his lake cottage. W0WMA has a 5% kc. multivibrator for OO use. K0IDV was home on leave from the Army in time to participate in FD activities at W0RA0 with K0S RCF, ORK, OBP and W0YCR. K0SBB received his confirmation for a two-way RTTY QSO with KR6MF. OES K0VLD received a Webster hand spanner on his birthday. K0IZD passed his 2nd-class radiotelegraph exam and is working as assistant to Chief Engineer W0UMD at KW0A. Director W0BUO and SCM W0KJZ spoke at the New Ulm Radio Club, while Compton's NYL, W0KMP, spoke for a women's group on juvenile problems at New Ulm church. OCS W0KLG and W0WMA participated in the recent FMT with good results. K0ORK, OO class IV, listed a total of eleven violations. FD messages were received from W0RA0, K0ZQT0, W0MXW0, K0ZXE0, W0LUX0 and K0ATW0. KOAKM, ex-RM of MIN, walked seven miles to have a chat with your SCM just prior to his train departure for Great Lakes Naval Center. W0VYI earned his B.S. degree from Beloit College. K0CPW resigned as RO and was succeeded by K0SBB. Newly-licensed YL K0OCRT can be heard on the Novice bands from Oronogo. Be thinking of new candidates for the office of SCM and get your valid petitions to the ARRL because there will be an election before the year ends. Traffic: W0KJZ 480, K0WPK 209, W0HEN 87, W0GCR 50, K0OCR 50, W0QABU 44, W0A0DX 44, W0WMA 37, W0MXX 19, W0THY 19, W0UMX 15, W0ATO 13, K0VPJ 13, K0ZRD 13, W0RA 10, K0SBB 9, W0A0AM 7, W0BUO 7, W0PPG 1.

### DELTA DIVISION

**LOUISIANA**—SCM, Thomas J. Morgavi, W5FMO—

SCMs and SECs from the Delta Division met with Director Teetson, W5MUG, at Crystal Springs, Ark., during the month of June. On the trip up from New Orleans your SCM and SEC attended a special club meeting in Monroe, with old-timers W5EA, W5EB, W5YC, W5IWE and many others in attendance. K5-ESW back home from Ga. Tech. for the summer, now has 200 countries confirmed. The LaFayette Club had a nice Field Day and is starting its summer session of transmitter hunts. The Springhill Club worked FD with seven AREC members. K5W0D has an s.s.b. exciter in the works. W5NDV still is banging away at MARS. The Heart City RC recently was organized in Alexandria. The Metairie ARC now has new quarters in Metairie Playgrounds. W5MXQ, your SEC, is calling for more Emergency Coordinators over the state. W5QEG and W5SKW worked the S.W. Louisiana Boy Scout network at Edgewood, La., handling traffic for the boys. Their traffic count proves they did well. W5KAT worked with W5AVT/5 on FD using the c.d. mobile van with sets on 2, 6, 15, 20, 40 and 75 meters. The 6-meter beam was on a 130-ft tower. Congrats to W5BUIK and W5KC for winning the Sweepstakes Contest on c.w. and phone, respectively, for Louisiana. K5BXX had his OPS appointment renewed and is saving up for a linear. K5-GVE has his 6-meter beam up 35 ft. on his new tower. K5GVD had to fan cool his 6146. K5CHC has W5JGV's old 300-watt linear on 6 meters. K5GVE is working on a 450TH final and is looking for a filament transformer. W5JGV is working on a pair of 4-250As in ABL. An achievement award by the city of New Orleans in the form of a certificate will be issued to any ham who works 5 greater N.O. stations during New Orleans Amateur Radio Week, Aug. 27 through Sept. 3. Foreign hams need work one station to qualify. No QSL cards are necessary. Plan to attend the Delta Division Convention at the Jung in New Orleans Labor Day week end. Address all inquires to P.O. Box 13302. Traffic: W5SKW 225, W5QEG 199, W5CEZ 116, K5LZA 95, W5MXQ 78, W5NDV 36, K5VJT 10, K5OKR 8.

**MISSISSIPPI**—SCM, Floyd C. Teetson, W5MUG—The Biloxi gang put on an FB hairst. Congratulations, gang, it was enjoyed by everyone there. New officers of the Columbia Club are K5TAH, pres.; W5AGU, vice-pres.; W5JCL, secy. Field Day activity in the section was up by a big percentage. Keep up the interest, gang. I'll be looking for the reports in QST. W5NBMC is on the air from Mantachie. Glad to hear from you, David. Plans for the Delta Convention are shaping up nicely. I hope to see you there. New appointments for the section are K5WSY as OBS and EC, K5YPV as EC, K5DGL as OPS. K5MDX reports fine progress on working new DX. Nice going, Dave. OBS K5RRG will be on with bulletins shortly on 40 meters. Look for him. Traffic: K5WSY 31, K5YPV 17, K5GAD 7, K5DGL 4.

**TENNESSEE**—SCM, David C. Goggio, W40GG—SEC: W4WBK, S.S.B. PAM: K4WBK, RM: W40QG. Traffic: TN, 3635 kc. QTC 52, TPN, 3980 kc. QTC 55. ETPN, 3980 kc. QTC 52. Field Day messages were received from Chattanooga, Dresden, Harriman, Kingsport, Knoxville, Mt. Pleasant, Nashville, Oak Ridge, Shelbyville and Whitehaven. New officers of the Roane County Club are K4YKJ pres.; K4YVE, vice-pres.; W4DCK, secy. New appointees: K4AQZ, W4RQG, W4FLW, W4WVG, W4KAT, K4PYH, W4SZE as ORS.; K4JXG, W4MXF as OBS; W4PFP, K4VOP as ORS.; W4LLJ, K4PYH as OBS. OES appointments are available to Technicians so let's hear from you v.h.f. operators. With deep regret we report W4FK as a Silent Key. He was chief engineer for W4ICT (Memphis) and a man with a nationwide reputation. The MARA club graduated 41 students; 30 passed the Novice and 11 the General Class code test. ARRL certificates were issued to all. Newsletters were received from the Oak Ridge, Loudon County, MARA, Delta and Frye ARCs. If the club has no paper, club secretaries should forward monthly news for this report. Congratulations to the Oak Ridge Club on the fine preparations for the Crossville picnic. Reports: ECs—K4AQZ, W4JVM, W4KKR, K4MIL, W4NGK, W4PFP, K4PYH, W4TZG, W4TYV, W4VNU and K4VOP. ORS.—K4AKP, K4JXG, K4JPW, W40QG, K4OUK, W4PL and K4WVG. OPS.—W4PQP, K4TAX, K4WVQ and W4LLJ. OBS—W4SGI, OES.—W4HHK, K4KYL, OOS—W4FFPS, K4KLN and W4ZBQ. Multiple appointment stations are listed only once to conserve space. Thanks, fellows, and keep up the good work. Coming events: The V.H.F. QSO Party Sept. 15-16. V.h.f.-famous W4HHK reports a 225-mile QSO on 432 Mc. with W5JWL giving Paul 7 states on this band. Traffic: (June) K4AKP 964, W4PL 581, K4WUG 165, W40GG 104, K4WVQ 65, W40QG 64, W4PQP 51, W4PFP 31, W4LLJ 28, K4OUK 26, W4GNK 21, W4TZG 15, W4-LIO 13, K4CPC 11, W4JVM 10, K4TAX 10, K4JXG 8.

(Continued on page 104)

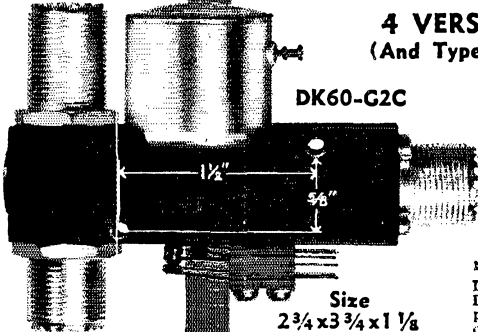


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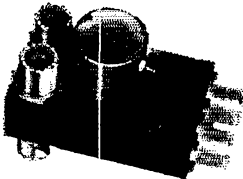
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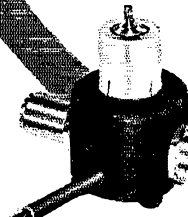
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MINNESOTA**

(Continued from page 102)

K4LPW 8, K4LTA 7, W4TYV 7, K4RQP 5, K4VOP 4, K4WUH 4, W4GGM 3, W4SGI 3, W4PJV 2. (May) W4JVM 8, W4VNU 5.

## GREAT LAKES DIVISION

**KENTUCKY**—SCM, Elmer G. Leachman, W4BEW—SEC: W4RAZ, PAM: W4SZB, RM: W4CDA, V.H.F. PAM: K4LOA. Correction: The new date of the Kentucky State ARRL Convention is Sept. 14 and 15 at Phoenix Hotel, Lexington, Ky. The first copy of *Kentucky Ether Clippings*, published by the Blue Grass Amateur Radio Club, Lexington, Ky., is out. Send news to Jack Lewyn, K4QNO, 427 Henry Clay Blvd., Lexington, Ky. There is now an s.s.b. evening net on 3960 kc. at 0030 GMT; also an early session of MKPN at 1145 GMT (6:45 A.M. EST) for those who can't meet the regular session. Listen for K4CSH, net control. Official Field Day messages were received from W4KVK4, Henderson; W4JHZ4, Brooks; W4HOJ, Kentuckiana Radio Club, Louisville; W4CN, ARTS, Louisville; K4VMF, C.D. Director, Winchester; K4ODQ, Paducah. W4RHZ, OBS for Northern Kentucky, picks up WIWA transmission nightly seven days a week and retransmits simultaneously on 50 and 144.5 Mc.; he also conducts code practice at 0020 GMT daily on four bands simultaneously, 51, 144.5, 220.8, 435 Mc. To top off, Joe made a perfect copy of the Secy. of Defense Armed Forces Day message on c.w. and R'TY. W4SZB reports 31 sessions of the MKPN with 538 call-ins, K4HHG, tops in traffic for June, is contact for TCC, C.A.N. EAN and 9RN. W4A4R, reporting for the Warren County Radio Club, says there is much activity on 6 meters. W44HFJ, Pikeville, has joined the AREC. W4ACQG, our youngest OES, age 13, makes his first report. W4RNF is busy getting the new University of Kentucky Hospital going, but will be back on KYN soon. Traffic: K4HHG 287, K4KWQ 120, K4CSH 105, W4RHZ 84, W4BAZ 19, W4BEW 19, W4SZB 18, W4YYI 16, W4EON 13, K4LOA 13, K4VDO 9, W4KJP 8.

**MICHIGAN**—SCM, Ralph P. Thetman, W8FX—SEC: W8LOX, RMs: W8EGI, W8QQQ, W8FWQ, K8KMQ, PAMs: W8CQU, K8LQA, V.H.F. PAM: W8PT. Appointments: K8AQI, W8MDD, W8RWK, W8ZHB as OES; W8DSE, W8MGO, K8TJDJ as ORSS, K8YDA as OPS. New officers: Amateur V.H.F. Assn. Inc.—K8BJM, pres.; K8BMC, vice-pres.; K8NGR, secy.; W8DX and K8OQN, trustees. V.H.F. Mobile Assn.—K8QPK, pres.; K8OCP, vice-pres.; K8JGF, secy.; W8AOY, treas. Oak Park ARC had a station set up at Northland for Michigan Week. New officers: Ford ARL—K8LIB, pres.; K8JEL, vice-pres.; K8MYH, secy.; K8ZKA, treas.; K8PCD and K8LXP, rec. secy. Michigan 6 Meter Club—K8BOU, pres.; W8MBH, K8ACB, K8TOI and W8MQR, vice-pres.; K8JGF, secy.; K8LUI, treas. W8COW had a stroke but is better. W8CRM had a bad heart attack and recovery is slow. K8PSV was an exchange student in Germany for two months. Hams assisting in the Midland Memorial Parade were K8QIG, W8ABQ, K8AZB, K8AGI, W8AER, K8OXE, K8FAK, K8VXX, K8WMC and W8ZVQ, on 160-Mc. mobile. K8VEN made General Class. W8TQN, W8FJR and K8EDG have new Swan transceivers. K8GOU now lives in Southfield. K8KVV has a Ranger. W8PXA got married. W8AHV has a new tri-band beam up. K8EGU and K8RTG made General. W8VPC's XYL is doing fine after surgery. The Genesee County (Flint) Club did a great job for Goodwill Industries on Boy Scout Good Turn Day, which involved 3 counties, in the distribution and pickup of Good Will bags, 10 and 2 meters were used, both fixed and mobile, and the following did the job: K8ACQ, W88AFU, W88AKI, W88BLS, K8BPQ, W88BVH, K8DSH, W8EEU, W8FFF, K8HNN, K8JWC, K8PMJ, W8RTV, K8SBB, K8SBN, K8COU, K8UJZ, K8VZK, W8VXM and K8YCT. K8TJH has a KVM-2-A. W8SS is touring West this summer and has the new S-Line in his car. W8JTO now lives in Kentucky. K8TJDJ, K8KMQ, K8ZZW and K8JJC made the BPL in May; K8ZZW in June, all on origins plus deliveries. W8DSV is teaching his 5-year old grandson the code! The QAIN Picnic will be held Sept. 9 at W8SCW. Traffic: (June) W8IXJ 201, K8ZZW 129, K8KMQ 108, K8HLR 85, W8EU 65, K8PYW 62, W8WVQ 57, W8DSW 55, K8TFE 50, W8FX 46, K8JJC 41, W8RTN 39, K8KQV 30, K8QLL 29, W8DSE 28, K8GOU 27, W8SFW 27, K8VDA 26, W8HKT 22, W8JTQ 22, W8IHB 21, W8USZ 21, W8AUD 20, K8WQV 20, W8HEZ 16, W8TPB 16, W8EGI 14, W8HK 9, K8GJD 8, W8ZHB 5, K8TJH 4, W8NDXC 2, K8KVV 2. (May) K8JJC 319, W8OCC 115, K8PKU 107, K8VDA 99, K8QKY 70, K8GOU 5, K8LOS 3.

**OHIO**—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, W8DAE, SEC: W8HNP, RMs: W8BZX, W8DAE, W8VTP, K8ONQ, PAMs: W8VZ, K8KSN,

K8UBK. Last month I started to ask for help in finding a museum in Ohio that would display early amateur wireless gear. It is suggested that as soon as we have one lined up, oldtimers will their gear to the museum, for when they join the Silent Keys their families will throw it away as so much junk. So much of this equipment already is on the junk piles. There was so little of this wireless gear here in Ohio, I would like to have the present-day hams see how most of us had to make our own gear as so little was manufactured. The May and June issues of the Canton ARC's *Fecdling* came together with beautiful three-color pictures of K8HUI and W8FSM seated in their stations on the cover pages and containing the following news items: The new Stark County Ham Directory is out; W8NOY is now W4GYYI in Florida; K8MZT has a new KWM-2; K8AGB/4 and W8BFL each have a new son; W8DRT and W8DXI are new hams; K5YTS/8 is now W8BHY; W8USU and W8UJ graduated from college; K8POL left for the Navy; W8ASN has a new SX-115; W8AHD is now W9DEW; W8FMW and W8GAB are fishing and mobiling in Canada. Toledo's *Ham Shack Gossip* names W8BMA as its Ham of the Month and states the Toledo Area amateurs are organized and ready to furnish communications for the Mills Trophy Race; the St. Lawrence Seaway 2-Meter Net hold a family picnic; KN8CGP was in the hospital; W8NS CWF and CZY are new hams, Dayton ARA's *R-F Carrier* states that W8OVG is a Silent Key; W8RKL spoke to the club on Transistor Application As It Applies To Small Counter Circuits; the club held its annual dinner meeting; W8TEK and K8IYW moved to California; W8LP was in the hospital; W8RZH won the YI-OM Contest C.W. Award. Columbus ARA's *Carascope*, the first I've received this year, tells us that W8BAK and K8HRR are working each other at 1296 Mc.; W8IBX is on a tour of Europe with the Capital U. choir. Parma RC's *P.R.C. Bulletin* states a picnic sponsored by the AREC was held and K8ZBL received his General Class license. South East ARC's *Ham Fax* tells of the club's Field Day location. W8OHR and K8SKH are Silent Keys. Findlay RC's *The W8FT News* relates that W8UBC is in the service in Michigan. The Amateur Radio Club of the Ohio State University's *W8LT Log* informs us that on Corps Day the club accepted and sent 143 messages into 28 states. W8DXN is a new Novice using a DX-60 and a G-630. K8UBG received his General Class license and has an Invader 2000 and an HQ-170. Warren ARA's *Q-Match* tells us that W8LQV moved to Illinois; KN8CYI is stationed at McGuire AFB; K8BXT is mobile on 6 and 2 meters and received Cardinal Novice, Cardinal Cities and Cardinal All-County Award Class E Awards; K8ORG is mobile using a G-76 transceiver; K8PEQ has a new HQ-100; W8BND moved to Arizona and is now K7KXS. K8EAR moved to California and K8NCV moved to Akron. In September two large hamfests will be held, Findlay on the 9th and Cincinnati on the 23rd. W8CHT, W8DAE and W8UPH made the BPL in June. W8BZX received his Twin City Award, K8ONQ was re-elected secretary of the Cincinnati section of the American Chemical Society, W8CVS vacationed Texas, K8FBE has a new Drake 2B, K8DDB vacationed on the West Coast and at the Fair. Director W8UPB and your SCM attended the Lancaster Hamfest along with about 500 other amateurs, K8SQK won the big prize. The Northeast Ohio V.H.F. Group held its picnic hamfest with about 500 hams attending and 211 mobiles checking in. W8AJD received his General Class license. Traffic: (June) W8UPH 870, W8DAE 584, W8CHT 573, K8SQK 243, W8BZX 213, W8ZYU 80, W8XCM 75, K8UBK 60, K8ONQ 50, K8DDG 25, K8RYU 25, K8PBE 24, W8AL 18, W8HZL 15, K8HXD 13, W8EW 10, K8PBE 7, W8AJD 6, K8VWN 5, K8AZT 4, K8KXS 4, K8BNL 3, W8WYS 3, K8DDB 2, K8KLA 2, W8BOV 1. (May) K8VWN 41, K8JSQ 20, W8AZL 4, K8WLP 4, W8AGM 2, K8VZZ 2.

## HUDSON DIVISION

**EASTERN NEW YORK**—SCM, George W. Tracy, W2EFU—SEC: W2KGC, RMs: W2PHX and K2QJL, PAM: W2JG. Section nets: NYS on 3870 kc. nightly at 0000 GMT; NYSPTFN on 3925 kc. nightly at 2300 GMT; ESS on 3590 kc. nightly at 2300 GMT; MHT (Novice) on 3716 kc. Sat. at 1800 GMT; Inter-club on 28,690 kc. Mon. at 1030 GMT. Appointment: W2PKY as ORS, Endorsements: K2UTV as ORS and OBS; W2HGB as ORS. K2UTV reports a TCC appointment plus A-1 Operator Award. Congrats. W2DAW and K2YCQ won the hidden transmitter at the Ulster County Club. It's nice to have OT K2IM with us in Mt. Vernon after moving here from Massachusetts. W2URP reports WAC confirmed in eight weeks with the new KWM-2. Schenectady has ten rigs on 2-meter f.m., 146.94 Mc., the national gentlemen's agreement f.m.

(Continued on page 106)



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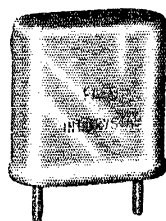
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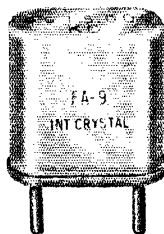
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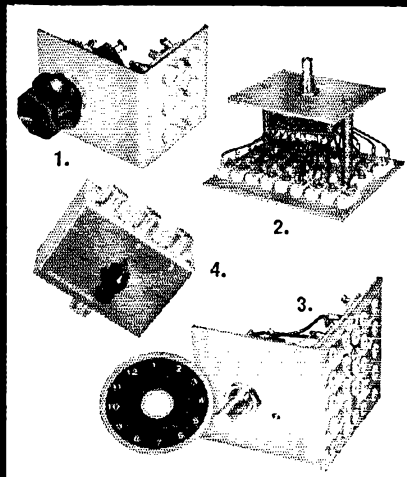


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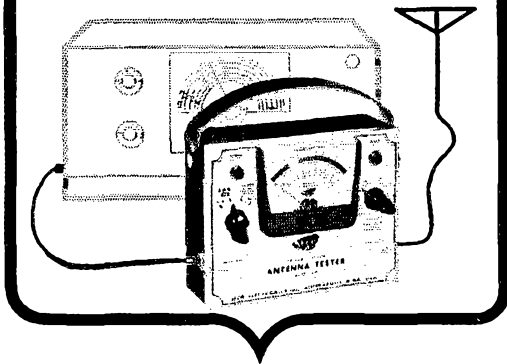
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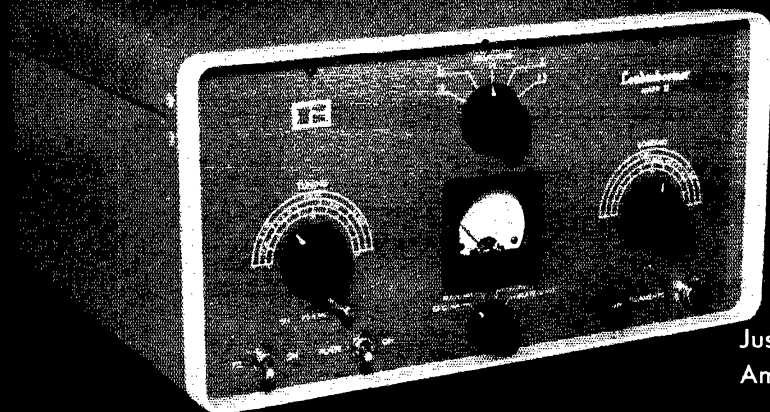
channel. Plans are being made for a repeater station to extend the range. The June meeting was a "Family Nite" with fun and entertainment for all. K2VYN has left our section for 9-Land. We need EC candidates in Greene and Rensselaer Counties. Let's hear from you ARRL members so we can have a strong AREC group in each county. The Red Cross Mutual Aid Nets have suspended operations until October because of changes in AMCROSS wire service leased lines. WA2VJV reports a new eighteen-element beam on 2 meters. KC W2DQW copied all Oscar II bulletins from W1AW and put them on 2 meters with local propagation predictions. K2YLZ, Dick, and K2VXS, Marge, were married on Field Day. The AREC Bronx Net #1 meets each Wed. on 145.35 Mc. at 0030 GMT and would welcome stations with traffic or new outlets. Traffic: W2EFU 121, W2THE 97, WA2HGB 93, K2SJM 93, WA2UZK 87, W2DQW 68, W2URP 64, W2PKY 50, WA2MID 44, WA2DRP 9, K2DEM 5, W2-PHX 4.

## NEW YORK CITY AND LONG ISLAND—SCM.

George V. Cooke, Jr., W2OBU—SEC: W2ADO, RM: W2WFL, PAM: K2HCU, V.H.F. PAM: W2EW. Section nets: NLI, 3830 kc. at 0015 GMT nightly; NYCTIPN, 3908 kc. at 2230 GMT nightly; V.H.F. Net, Tue.-Wed.-Thurs. 145.8 Mc. at 0100 GMT and Fri. through Mon. on 146.25 Mc. at 0000 GMT. Mike Parad Net, 7238 kc. at 1700 GMT. All Service Net at 1800 GMT Sun. on 7270 kc. Traffic is a bit lighter but WA2GPT, K2UBG and W2EW continued their earnest ways by earning BPL certificates at a steady pace. A meeting of all appointees and leaders in our section is scheduled for Sat., Sept. 8, at the SCM's QTH in Commack to start off the new season with a bang. Appointment of permanent officials to fill vacancies in the SEC and RM posts are contemplated. All certificate holders in all appointment classes are urged to attend. W2UAL, EC, requests that more stations report in the North Hempstead AREC Net on 147.210 Mc. Mon. and 146.820 Mc. at 2100 and 2200, respectively. W6VQM/K2ASP received his General Class license and will be heard below 145 Mc. from now on. A new group here is called the East Coast S.S.B. V.H.F. Society, operating at 1500Z Sun. on 50.105 Mc. upper subband. The CCNY ARS, W2HJ, has gone s.s.b. with a pair of 813s. New officers for the coming year are WA2QFB, pres.; WA2GLK, vice-pres.; A. Etkins, secy.-treas. The Bronx AREC, under EC WA2QAO announces the 2-meter group operating on 146.178 Mc. Wed. at 0000Z and the 10-meter net on 29.620 Mc. Mon. at 0100Z, with WA2NDJ as NCS on 2 and WA2FMB as NCS on 10 meters. W2CPS is now an OTC with 30 years of operating behind him. WA2OAX has a new Apache on the air. W2TUK, K2s TAQ, YQX and PWG are all proud owners of the new PolyComm 642ers. K4GG, ex-W2GG, paid an unexpected visit to his sons, W2TUK and W4JQG/2. In the June V.H.F. Contest W2SEU worked 9 states on 220 Mc. and can be found on 220.050 Mc. Sat. around 2100 EST. WA2QUJ received his ORS appointment for reporting into the NLI Net regularly. WA2KKD has been appointed OBS for coverage on the NYCLIPN. K4UKF is the call of ex-W2OMG from back in '53 when he reported into TAN-NYS and 2RN at that time. WB2BOV is the new call of the Rockaway ARC. K2QBW now also holds the call K1WXC, has a new KVM-2, spent the summer with GE in Lynchburg, Va., and taped an interview with W2BAK on the Echo A-12 program for his VOA "Amateur Radio" program. The Long Island Tri-Banders ARC elected the following officers for the coming year: WA2OFY, pres.; K2ASJ, vice-pres.; WA2LPV, secy.; NYL/WA2OFY, treas. The club holds monthly Bunny Hunts on 51.0 Mc. beginning at 2000 DST. Watch for future dates. K2ASP and W2RVU have received Section Net certificates for excellent attendance and participation in the V.H.F. Traffic Net. WA2QAT has changed his QTH to New Hyde Park, leaving a blank in coverage for the Bronx. Volunteers are needed to aid in handling the high volume of traffic for that area. Contact W2EW for particulars. Plans are moving ahead rapidly looking toward the Hudson Division ARRL Convention to be held Oct. 13 at the Statler in Manhattan. W2PF is busy lining up the Golden Anniversary of Amateur Radio Licensing Banquet and your SCM is making preparations to chairman the ARRL Communications Department meeting during the conclave. Hope to see all of you NYCLI members there. Traffic: WA2GPT 624, K2UBG 570, W2EW 477, K2UAT 386, WA2RMP 235, W2WFL 217, WA2TQT 150, WA2QUJ 103, WA2NCE 91, W2GKZ 72, WA2LJS 70, W2VKK 51, WA2IUQ 47, W2DBQ 38, WA2EXP 30, W2RVU 25, K2KYS 22, WA2EEN 21, W2IGY 20, WA2GAB 17, WA2IMH 12, WA2FUL 9, WA2FRW 5, W2PF 5, WA2RAQ 5, K2AAS 4, WA2KER 4, WA2MTB 1, WA2RKK 1, WA2VPJ 1.

**NORTHERN NEW JERSEY—SCM.** Daniel H. Earley, WA2APY—SEC: K2ZFL, RM: WA2GQZ, PAM: (Continued on page 108)

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K2SLG. V.H.F. PAM: K2VNL. The names, times and frequencies of the New Jersey NTS nets: NJN, 2300Z, 3695 kc. daily. The NJPN, 2200Z, 3900 kc. except Sun. at 1200Z. The NJ 6&2, 0300Z Thurs. and Sun. on 51.15 Mc.; 146.70 Mc., 2200Z Tue. and Sat. The net reports (sessions, attendance and traffic): NJN, 30, 540, 305, NJPN, 30, 496, 125, NJ 6&2, 22, 122, 28. Three new ECs are K2BEV, W2KXO and W2CVW. Renewals of appointments for continued activity have been issued to K2MGM as OO, WA2EDG as ORS, WA2CCF as OO and OPS, W2NIY as OO and ORS. W2FZB reports that 2RN certificates have been issued to WA2GQI, WA2GQZ, K2VNL and WA2ITZ. NJ 6&2 certificates have been given to WA2JCO and WA2LUD. The results of the recent frequency measuring test put W2JAE and WA2CCF up to OO Class I. The Webber family has three hams in it now. Pop, WB2BS and the two girls, WA2VZK and WA2VYN. K2TWV got his RCC certificate. WA2CBB/2 will be run by several operators continuously from a hill in Hunterdon Co. (500 watts) for the GSARA QSO Party so all may get a crack at the hard-to-get county. W2CVW says he got a 2-meter inverter converter working. WA2CCF received the A-1 Operators Award. By this time a 100-watt 2-meter rig should be on the air from K2MFX. W2EWZ says he murdered forty on FD. WA2BNF, EC for Belleville, handled a real mayday on FD from W2IMB; someone went through a windshield. W2NIY received WANE 62 sticker; incidentally he has been a ham now for 35 years. WA2ZQH has 30 states confirmed for WAS in only 3 months of hamming. K2SBS is working at the N.J. camp for the blind this summer. W2ABL took a trip to W9-Land. Putting an 80-meter antenna in a 66 ft. lot has been the problem at WA2EJZ. WA2TDM has a 2-meter quad on a clothes rack in the house. WA2KRC hopes to get that new beam soon. WA2OQP wants to know if anyone in New Jersey is interested in 420 Mc. His brother is on the air with WN2CBO. WA2DPT is an SWL on 6 meters since the transmitter broke down. WA2JHQ is in Maine operating from KILMN. W2BYE has gone to 5-Land to direct that camp again. There was only one HPL this month. WA2CCF. The little bit that I wrote about the reports last time seems to have made a difference here in the volume of mail. I hope that this will continue and that we all get in the spirit of things. I wish that some of the appointment holders would take a look at the dates on their certificates and get them renewed if outdated. This will guarantee that you will continue to receive the CD Bulletin and the other benefits that may be available. Traffic: (June) K2UCY 266, WA2APY 176, K2VNL 150, WA2CCF 141, WA2SRK 132, WA2JTZ 125, K2SBS 74, WA2KRC 64, W2QNL 58, WA2JHQ 51, WA2QVC 48, WA2GQZ 43, WA2EDG 37, K2SLG 29, WA2OVK 27, W2TFM 26, W2CVW 20, K2JTU 19, K2EQP 16, WA2HNF 14, W2BYE 6, K2MFX 5, WA2ZQH 5, W2NIY 4, W2ONL 4, WA2UZII 3, W2ABL 2, W2CFB 2, WA2DPT 2, W2EWZ 1. (May) WA2OQP 5.

### MIDWEST DIVISION

**IOWA**—SCM, Dennis Burke, W0NTB—SEC: K0EXN. PAM: W0PZO. RMS: W0DUA, W0SCA. OOs: W0QVZ, K0AZJ, K0WVO, K0YUT. If space permits I'll list the rest of my official family next month. W0NWX reports hearing Oscar with good signal strength. K0KPG, W0PFP and W0III, with the able assistance of Prof. Joseph H. Seine, of Iowa State University, also report great success in tracking Oscar and computing temperature data. The Iowa section is proud of these dedicated men who are helping to put our country back where it belongs, at the head of the procession. Six meters is booming in Iowa, 2 meters and up are quiet. 160 meters remains active in spite of heavy QRN. Our net, which meets daily at 0100Z receives many check-ins from other states. June reports: 160 Meter Net—QNI 627, QTC 40, sessions 30. 75 Meter Phone Net—QNI 1278, QTC 122, sessions 26, av. 4.69. 75-Meter Phone Net report for May: QNI 1197, QTC 187, sessions 27, av. 6.93. Traffic: (June) W0LGG 1635, W0SCA 1233, K0MMS 152, W0PZO 73, W0NTB 64, K0UAA 17, W0BTX 15, W0GQ 13, W0QVZ 12, W0YDV 10, W0FAM 8, K0KAQ 6, K0QKD 6, W9CTJ 5, K0QWZ 5, K0JMA 3. (May) W0PZO 128, W0LJW 80, W0TEY 20.

**KANSAS**—SCM, Raymond E. Baker, W0FNS—SEC: K0BNF. Asst. SEC: K0EMB. RAI: W0SAF. PAM: K0EFL. V.H.F. PAM: W0HAJ. Nets: KPN, 3920 kc. Mon.-Wed.-Fri. 1245Z. Sun. 1400Z; 17 sessions; QNS 371, high 45, low 14, average 21.8; QTC 79, high 17, low 1, average 4.7. QKS, 3610 kc. daily 0030Z. 19 sessions; reported QNS 107, high 9, low 2, average 5.6; QTC 45, high 10, low 0, average 2.7. K0SBN, 3920 kc. Sun. 1330Z; 4 sessions; QNS 66, high 22, low 10, average 16.2; QTC 3, high 2, low 0, average 1.1. K0SWN, 3840 kc. Mon. through Sat. 0001Z, 25 regular sessions, 2 emer-

(Continued on page 110)

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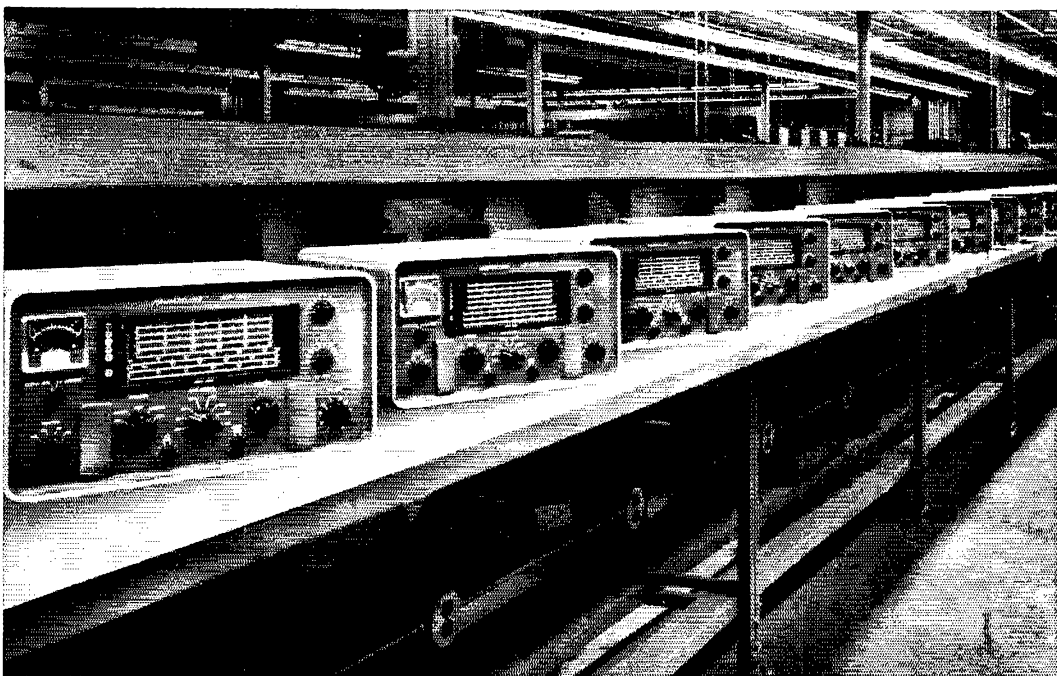
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This ALL-NEW crystal lattice filter-type SSB transmitter has exceeded our fondest expectations in SSB, AM, CW and has passed every rigorous test we have subjected it to with flying colors.

We extend our thanks to the many that have waited patiently for delivery of their HX-50 transmitter. This "waiting time" was not wasted—it

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Look for the Hammarlund ad in the October issue of this magazine. It will give you details on the BIG FEATURES, LOW COST and ready AVAILABILITY of this exciting new unit.



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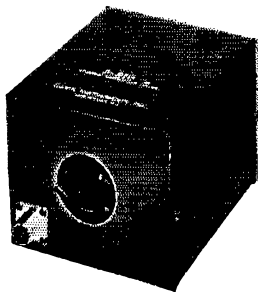
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The only low-pass filter designed expressly for 6 meters. With 9 individually shielded sections and 5 stages tuneable forming a composite filter of unequal performance. Providing the sharpest cutoff with the lowest insertion losses. Less than 1 DB loss. Handles 400 watts plate input. 35 DB rejection.

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### MODEL BP-144

A narrow band-pass filter with 6 mc pass band and 146 mc center frequency. Less than 1 DB insertion loss. At least 35 DB attenuation of harmonics out of pass band. Handles up to 185 watts plate input.

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gency sessions, 528 stations answering. Field Day operations: Emporia Radio Club WOFTB, Jayhawk Amateur Radio WOBFE/O, Newton Amateur Radio Club WOBZN/O, Flint Hills Amateur Radio Club, Benton, Kans. WÖMMR, Ninnescha Radio Club WÖEBL, Wichita Amateur Radio Club WÖHC/O, Lawrence Radio Club KOUNT/O, Ft. Leavenworth Club KOYGV, Kaw Valley Radio Club WÖCET, and individual stations KOYTA/O, WÖDEP/O, WÖUL/O, KÖUNE/O, KÖETC/O, KÖFLZ, KÖYEQ, KÖYWG, KÖGIC reports lightning hit two receivers, the s.s.b. rig, and the beam rotator. WÖZGB has new modulators and a Turner JT-30. KÖVYV has a new home-built scope. WÖMDI is moving to a farm for more antenna room; also so he can use the four 811s, I think. KÖEMB is back East lining up equipment his company has installed. WÖMDI's new Swan sure sounds line on 75 meters. Ex-WÖKAJ is back in Kansas after spending seven years in Texas. Traffic: (June) WÖTOL 63, WÖABJ 53, KÖBFX 43, WÖFNS 41, WÖIFR 41, KÖEFL 27, WÖSAF 25, KÖHVG 15, KÖGII 12, WÖORB 12, KÖEMB 11, KÖYQF 6, WÖPDI 5, KÖRWC 4, KÖJID 3. (May) KÖHGI 230, KÖLHF 8.

**MISSOURI**—SCM, C. O. Gosh, WÖBUL—Net reports (June): PON (Mo.): (3810 kc., 2100 GMT M-F), 21 sessions; QNI 219; QTC 80; NCSs WÖHW 12, WÖTXC 6, KÖIPI 2, KÖVIQ 1. Mo. S.S.B. (3963 kc., 2400 GMT Tu-Th), 8 sessions; QNI 124; QTC 15; NCSs WÖMM 4, WÖPXE 3, WÖTPK 1, MÖN (3580 kc., 0100 GMT Tu-S) 26 sessions; QNI 167; QTC 146; NCSs WÖOD 11, KÖFPC 8, WÖKIK 4, WÖRTW 3, KÖVPH 1, SAIN (3580 kc., 2200 GMT Su) 4 sessions; QNI 15; QTC 8; NCSs WÖOD 4, MSM (3715 kc., 2200 GMT M-F; 3715 kc., 1400 GMT S) 24 sessions; QNI 79; QTC 148; NCSs KÖGFA 8, KÖFPC 5, KÖONK 4, KÖFY 4, KÖVPH 3, MÖN (3885 kc., 2400 GMT MWF) 12 sessions; QNI 293; QTC 148; NCSs, KÖONK 4, WÖTPK 4, KÖVPH 2, KÖWNZ 2, HBN (7280 kc., 1805 GMT M-F; 3880 kc., 1905 GMT M-F) (No report for June was received by the SCM). Reports for the Ham Butchers Net will appear in the Kansas activities column July through December. Field Day messages were received by the SCM from the following (all stations operating portable): WÖEBE (Ash Grove), KÖITZ (Maryville), KÖOKI (Kansas City), WÖDR (Joplin), KÖGSO (Lees Summit), KÖIHK (Eldorado Springs), WÖRPU (O'Fallon), WÖENR (Columbia), WÖEEF (Phelps Co.), KÖJWN (Harrisonville), KÖOYM (Jefferson City). This represented a total of 107 operators with 39 members of the AREC. Endorsements: KÖONK as RM for MSN; WÖBUL as OPS; WÖOVV, as OPS, KÖVPH, while attending Girl's State at Stephens College (Columbia), was elected to serve as Senator from her home town. WÖKCG reports a QSO on 7 Mc. with K4SMO, ex-W9LBA (Brookfield) after a lapse of 30 years. Officers of the Kansas City V.H.F. Club are KÖLFI, pres.; WÖBCE, vice-pres.; WÖWFC, secy.; KÖZKC, treas. Traffic: KÖONK 1322, KÖLTJ 583, KÖFPC 524, KÖGFA 270, WÖTPK 133, KÖVPH 129, WÖOD 113, WÖKIK 93, WÖBUL 47, WÖRTW 34, WÖEPI 22, WÖBVL 14, KÖWNZ 11, KÖVMZ 10, WÖPXE 9, KÖVNB 7, WÖAYB 5, WÖKCG 2, WÖOVV 1.

**NEBRASKA**—SCM, Charles E. McNeel, WÖEXP—SEC: KÖTSU. Field Day reports were received as follows: Crete Amateur Radio Club, KÖIQO reports 5 operators. Hastings Amateur Radio Club, KÖSOQ reports 10 operators; also 2 operators at WÖDSU. Falls City Amateur Radio Club, KÖJKS, reports 8 operators. Ord Radio Club, KÖCDH, reports 2 operators. Fairbury Amateur Radio Club, WÖTQD, reports 6 operators. Bellevue Amateur Radio Club, 3 stations, 10 operators, reported by KÖAIR. WÖHXH reports the Nebraska 75-Meter Emergency Net had QNI 426, QTC 27, new members KÖTIH, KÖGNV, KÖWEP, KÖMZV, WÖDAR, Western Nebraska Net, WÖNIK NC reports QNI 681, QTC 34, 100 per cent check-in for June. WÖAGS, WÖDVB, WÖLDO, WÖNIK, WÖORP, WÖRIH, Nebraska Morning Phone Net, KÖDGV NC, reports QNI 592, QTC 149. The annual Estes Park Hamfest was a good one again this year with the usual good Nebraska section turn out. Traffic: (June) WÖOKO 69, WÖFNH 62, WÖLOD 61, KÖDGV 59, WÖNIK 51, WÖUWK 44, WÖEQ 40, KÖGAT 25, KÖRL 22, KÖJP 16, WÖVZJ 16, KÖZFO 16, KÖMSS 15, WÖVEA 14, KÖBRQ 12, WÖZJE 10, WÖXOV 9, WÖAHB 8, KÖFJU 5, KÖTIH 5, WÖGGP 4, WÖHOP 4, WÖKLB 4, WÖYFR 4, WÖBOQ 3, WÖLJO 3, WÖBSH 1, WÖPQP 1. (May) KÖJAT 44, WÖBSH 2.

## NEW ENGLAND DIVISION

**CONNECTICUT**—SCM, Henry B. Sprague, jr., W1CHR—SEC: W1EOR, RM: W1KYQ, PAM: W1YBIL, V.H.F. PAM: W1FHP, CPN held 30 sessions, with a traffic total of 256, an average of 9 per session; daily at-

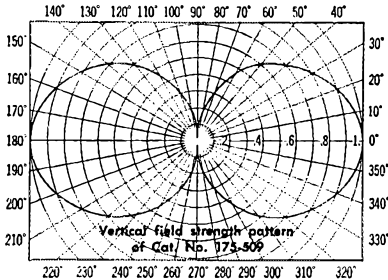
(Continued on page 112)



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BASE STATION STORM CHAMPION UNITY-GAIN ANTENNA (Heavy-Duty, Precipitation-Static Resistant)



**Cat. No. 175-509  
Frequency Range  
30-50 MC\***

Cat. No. 175-509 STORM CHAMPION Antenna is designed for service in areas where maximum physical strength and/or resistance to precipitation static is required. The antenna consists of a galvanized steel element support tube running from the grounded antenna base through the entire structure to a lightning arresting device at the extreme top. The shunt-fed coaxial radiating element is mounted on this element support tube and the entire structure inserted into a fiberglass tube which is permanently sealed. This design results in a reduction of precipitation static interference in the order of 20 db. This noise reduction will permit a communication system to render effective service when nearby installations with exposed radiators are completely inoperative.

### Electrical Specifications:

Nominal input impedance.....50 ohms  
 Maximum power input.....500 watts  
 Internal feedline.....RG-8A/U  
 Flexible terminal extension.....18" of RG-8A/U  
 Termination.....Type N male with Neoprene housing  
 VSWR.....1.5:1  
 Bandwidth.....±1%  
 Lightning protection.....Direct ground

### Mechanical Specifications:

Radiating element.....2" dia. red brass tube  
 Radiating element housing.....3" dia. fiberglass tube  
 Support pipe.....4" dia. hot-galvanized steel, 24" length available for mounting  
 Rated wind velocity.....100 MPH with ½" of ice  
 Lateral thrust at rated wind and ice load.....150 lbs. at 30 Mc  
 Bending moment 6" below top of support tube at rated wind and ice load.....1400 ft. lbs. at 30 Mc  
 Weight.....80 lbs. at 30 Mc

\*Exact frequency must be specified      †Formerly STORM/MASTER



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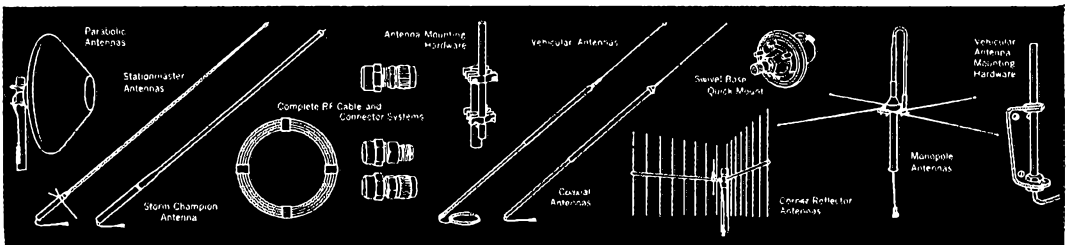
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E-Z WAY AERO-DYNAMIC design decreases wind load and provides telescoping action that permits raising and lowering of tower sections. **CRANK UP TO 60 FEET, DOWN TO 25 FEET and TILTS OVER FOR ACCESS TO ROTOR OR BEAM.**

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**112**

tendance averaged 27. WIAPA operates 14-Mc. s.s.b. mostly and has made many choice DX contacts. KIPUG's HQ-160 suffered a casualty. WIOJR had a ball in Field Day with a battery-powered BC-474 transceiver on 80 meters. WIAFT is on 220 and 420 Mc. WIWKK works s.s.b. WIWX is active on 75-meter phone and 80-meter c.w. in the early morning with a BC-474. WIKB has over 200 countries confirmed. KINBZ is putting up a ten-element yagi for 2 meters. WICUH is back on CN after recovery from an operation. KIIVV/1 is active again on CPN. KIRTS is rebuilding all his antennas and attended the Mobileer Picnic with KIUPE. KIBLM is on 220 Mc. and KIBHY will be ready as soon as his transmitter is finished. KIPKQ reports 2 meters is extremely good. KIPQS made BPL. The Waterbury Wireless Assn. enjoyed its first FD. KIPT has a new beam and KNIWLF a new DX-60. KIs WHT and WHS have just put rigs on 50, 144 and 220 Mc. New officers at the USN Med. Res. Lab. RC are KNIIVH, pres.; KNIWLX, vice-pres.; KISDY, secy-treas.; and WIWAZ, act. mgr. The club has 100 per cent League membership. Wis ZGO, RAN, PHP, PHT, OJR, LIG and KIHTV were in the May FMT. That's the best turnout from this section in years. KITBC has a Johnson 6 and 2 converter and is getting married. WIUWY expects to be on 6 and 2 meters with a T-23/ARC-5. KIQAL has a new 6-meter vertical. KIHUH runs a DX-35. KIs SPA and QQR now have 6-meter v.t.o.s. WINAJ uses p.p. 6146s. KNINPH is building a 150-watt 2-meter transmitter. WIKUO expects to be active on CN by the time this appears. WILG's monthly reporting of "tidbits" on Bridgeport ham doings indicates he gets around. How about more of this from others? Traffic: (June) KIPQS 574, WIAW 151, WIYBH 145, KIGGG 105, KIIFJ 102, WIVVA 88, WIRZG 82, KIPUG 80, KIPPF 73, KIHTV 60, WIRFJ 60, WIBDI 56, WIEFW 43, WILUH 43, KIMBA 33, KIONZ 24, WIC/TI 21, KIEIR 18, WIQV 12, KIDGK 11, KIQPN 11, KIIVV/1 10, WBNB 9, WIAPA 5, WIFXS 5, KIHZJ 1. (May) WICUH 8.

**MAINE**—SCM, Albert C. Hodson. W1BCB—June brought much increased activity on 2 meters with skip into other New England Areas. W1SO reports tracking Oscar II on three passes with excellent signals. The 6th Annual Augusta Hamfest was a success with an attendance of well over 300. It was a pleasure to see several of our neighbors from New Brunswick and Nova Scotia, Canada, in attendance. Field Day activities showed several Maine groups and clubs participating and reports indicate some good scores in spite of only fair conditions. Speaking of clubs; now is the time to be planning fall and winter activities. KIMDM, Togus Veteran's Facility, wishes to extend thanks to the many amateurs who have helped with contacts to relatives of patients. The next group activity will be the Knox Radio Club Hamfest at Rockland, Me. Sept. 9 at Legion Hall. Listen for announcements on the Seagull Net, Pine Tree Net and Barnyard Net. May we welcome the several new amateurs licensed during the summer and hope they will join in all activities. Traffic: KIGUP 157, KIMZB 84, KIBZD 30, KIMDM 30, K4BSS/1 30, W1SO 16, KIDUG 15, KILBE 11.

**EASTERN MASSACHUSETTS**—SCM, Frank L. Baker, jr., W1ALP—SEC: W1AOG. New appointments: W1STX Needham as EC; KIs SRZ, RHY, DYA as OESs; KIDYA as GO. WIEFW presented the ARRL charter to the Nausket ARC at a supper meeting in Lakeville. Wis BGW, AYG, TZ and KIIZM took part in the May FMT. The Middle-ex ARC elected WILJO, pres.; KIOQN, vice-pres.; KIOGA, secy.; WILJK, treas.; KIMIA, program mgr. The QRA held its annual bean supper, with a film "About Time." Many Field Day messages were received. New officers of the Rockport Wireless Club are KIJBR, pres.; K1GKB, vice-pres.; W1BE, secy. W1JQB's son has the call KNIWWL. K1YBN has his General Class license and is building a vacuum tube keyer. K1RHY is on 2 and 6 meters. K1DYA, ex-K7ROB, is on 2 and 6 meters and some on other bands. W1HYH, Fall River EC, says they have had 17 tests this year. W1BOG will be in charge while he is on vacation. W1BK1, ex-K3CRU, is on 6 meters. K1QJT is building equipment for 432 Mc. and is on s.s.b. K1VHZ has his Tech. Class license. The 6-Meter Mobileers were alerted in a recent tornado alarm. W1WEJ will have 440 watts s.s.b. on all bands. W1CWW is going to the West Coast on a trip. K1JBR is piloting his boat around Cape Ann. W1NF is going to N.Y.C. again. K1RHZ has a Globe Chief 90A. W1FEC is on 6-, 10- and 80-meter c.w. New officers of the Yankee Radio Club: K1HL, pres.; W1KAR, vice-pres.; K1LFE, treas.; W1MCE, secy.; K1VZX, KNISMP, W1TQ and W1GHD, directors; W1TY, ham tanner. The club held its Annual Banquet. K1VBN/1 is up in New Hampshire (Continued on page 114)

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CRYSTAL CONTROLLED  
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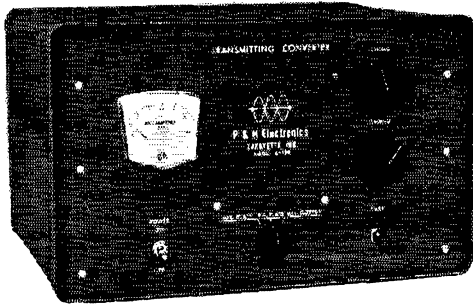
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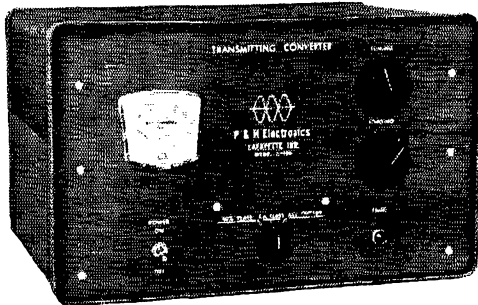
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## MODEL 6-150 SIX METER TRANSMITTING CONVERTER

Converts the 20 meter output of your SSB, AM or CW exciter to 6 meters. Power input to 8117 final; 175 watts PEP on SSB, 165 watts CW, 90 watts linear AM. Resistive pi-pad permits operation with any 10 to 100 watt output VFO or crystal controlled exciter. Meter reads; PA grid, PA plate, Relative output. 50-70 ohm input and output. Quiet forced air cooling. Modernistic, recessed panel cabinet 9" x 15" x 10 1/2".

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and has a Clegg 99er mobile. W1HIL has a Marauder. W1AKN been under the weather but is O.K. now. The EM2MN reports 21 sessions, 239 stations, 148 traffic. K1GNR is moving. W1EPL is working DX on 20 meters. W1PEX has a Marauder. Ex-K1GVR. In California, has a son. W1SIV is home from the hospital. K1KZP is back on 2 meters. W1OFK says 2 meters opened up and he heard New York and New Jersey with a Halo. K1QNM has a rotor for a beam. W1AOG, our SEC, wants to hear from our ECs each month. The Mass. V.H.F. Society met at W1IME's QTH. W1MW is back on 10 meters. W1MCX and K1III have G-28s. K1RFE is fixing W1JFS's 522 for 2 meters. Appointments endorsed: W1AOG, W1MX, W1AR and K1MEM as OPSs; K1QJT as OES; W1s RCQ and MX as ORSs; W1YYI Carlisle, W1YHY Fall River and W1AR Belmont as ECs. When you read this, your SCM may be in a new QTH. I will notify the nets as soon as I can. W1AUQ has a DX-100B. W1AYG/W1BGW has been endorsed as an OO and is working on a mobile s.s.b. transmitter. There is a new Novice on his street, K1WYF. K1DLJ now is Radio Officer for Lawrence. K7OTR, ex-1FVD, was around here on a visit. W1s EFW and EAE presented the ARRL Charter of Affiliation to the Minuteman ARC at a meeting. W1PEX made BPL again. The 6-Meter Cross Band Net had 200 check-ins and handled 23 pieces of traffic. W1AWA's rig blew up on him. Traffic: (June) W1PEX 938, W1OFK 299, K1TSD 279, W1ZSS 173, W1DOM 69, W1EAE 65, W1EMG 53, W1AOG 40, K1OCD 37, K1UCT 27, W1SIV 21, W1VYS 19, W1AUQ 14, K1GTX 3. (May) W1EMG 342, W1EAE 82, K1QNZ 18, K1VBN 6, W1RCQ 4, W1BKI 2.

**WESTERN MASSACHUSETTS**—SCM, Percy C. Noble. W1BVR—SEC: W1BYH/K1APR. RM: K1IJV. A very excellent bulletin from the Nipmuc Emergency Radio Corps of Upton was received here. Its 12 pages cover a questionnaire to members, general and specific news, information about various members, ARRL, and c.d. news and an excellent organization chart listing 14 mobiles in Framingham, Hopkinton, Milford and Marlboro. Our congrats on a very swell job The West. Mass. C.W. Traffic Net (W1MN 3560 kc. 7:00 pm. EDT) handled 80 messages during its 26 sessions. K1PES and RM K1IJV were high stations in attendance. W1DPY took a vacation trip by air to VP5-, PJ-, KP4-, and KV4-Land. K1PGV graduated from Lenox High School with a \$500 scholarship and expects to enter the University of Massachusetts this fall. K1JQT worked 21 countries on 20 meters in a month and a half. K1MEB has a new Heath v.f.o. W1ZPB spent the summer at Wesleyan University. K1RYT (ex-K8BDZ) is a newcomer to our section and formerly was Net Control of the Ohio Phone Net (note his traffic total at the end of this report). K1TLY is on with a DX-100 and an HQ-170. New officers of the Berkshire County Amateur Radio Assn. are W1BKQ, pres.; Rolfe Hendrick, vice-pres.; W1DPY, secy.; Chet Wisner, trans. W1BVR spent the last week in June at the annual conference of Mass. Vocational Teachers held this year at Bridgewater State College. Our West. Mass. section extends greetings and best wishes to our new League President, Herbert Hoover, jr., W8ZH. Traffic: K1RYT 702, K1IJV 161, W1BVR 68, K1PES 57, K1JQT 28, K1LBB 26, W1SSH 11, W1OSK 3, K1RGG 3.

**NEW HAMPSHIRE**—SCM, Ellis F. Miller, W1IIQ—SEC: K1GQK. PAM: K1JDN. GSPN meets Mon. through Fri. at 2300 and Sun. 1330 on 3842 kc. C1NEN meets Mon. through Sat. at 1030 on 3842 kc. N1HN (c.w.) meets Mon. through Sat. at 2330 on 3685 kc. Endorsements: W1EVN and K1IHK as ORS and W1YHF as OPS. Bad weather sort of put a damper on Field Day activities, but reports indicate that the intrepid members of several clubs and groups were right in there pitching with very favorable results. Under the able guidance of W1CNX and W1JNC, and with a big assist from W1YHE and K1NXV, the GSPN Annual Picnic was a huge success. Fun, games and eats were enjoyed at the Belknap Recreation Area by 69 members and their families. The business meeting brought forth a number of changes for the betterment of net operations. We are losing our PAM, K1JDN, who for the past year has so ably advanced the progress of GSPN, is being transferred to Germany. We are indeed sorry to have you leave us, Bart. Your contributions to our activities are most sincerely appreciated. All of us wish you bon voyage. Traffic: K1JDN 63, W1TA 49, W1PFW 46, W1AGM 35, K1QDM 30, K1IHK 12, W1YMJ 5, K1BYS 4.

**RHODE ISLAND**—SCM, John E. Johnson, K1AAV—SEC: W1PAZ. RM: W1SMU. PAM: W1TXL. Endorsement: K1HZN as OES. Appointment: K1OZI as OES. R1SPN report: 30 sessions, 442 QNI, 87 traffic. The R1SPN held its Annual Meeting at the home of the PAM in Newport June 17. N. E. Director W1EWF was guest speaker for the afternoon with the SCM K1AAV. K1DZX was reelected net mgr. Those present were W1s  
(Continued on page 116)



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EFW, TXL, BQH, JFF, K1s AAV, PZY, TPK, NJT, GRC, SXY, DUH, VEX, DZX, WA2YEK/1 and K2RHS/1. A word of thanks goes to the XYL of WITXL for providing the refreshments. KITPK is now mobile with a G-50 and worked W1LJY/1 on Block Island from Candia, N. H., on 6 meters. K1NJT is building a 6293 2-meter rig. The R.L. Mobilers will attend a picnic with the Mass. Mobilers. Congratulations to W1NZB, who was issued a certificate for working 100 countries on two-way sideband. This has been the first certificate of this kind issued to an R. I. amateur. K1DZX now has his 65-ft. tower equipped with a new rotor. W1DDD, the Club of Woonsocket, operated FD constantly despite frequent thunderstorms in the N. Smithfield Area. Traffic: WITXL 733, K1NEF/1 98, K1NJT 30, K1GRC 29, K1DZX 28, K1AAV 13, K1SXY 12, K1GRA 8, KITPK 7.

**VERMONT**—SCM, Miss Harriet Proctor, W1EIB—SEC: K1DQB, PAM: W1HRG, RM: W1KRV. All Vermont amateurs will miss W1IT, who became a Silent Key recently. About 20 members of the CVARC took part in Field Day. The Middlebury Mike and Key Club operated FD from Ferrisburgh with K1BXV in charge. W1KJG operates also as K1TJ. Congratulations to the thirty members of the Sacred Heart High School ARC in Newport on their new call, K1UQD. K1HKI is responsible. Activity on 420 Mc. is on the increase. When antennas are made ready for winter, remember to equip your station with all possible safety devices. Do this for your family. Traffic: W1KJG 6.

## NORTHWESTERN DIVISION

**ALASKA**—SCM, Kenneth E. Koestler, KL7BZO—The Anchorage Field Day was a huge success in spite of poor band conditions. The three new QOs for Alaska are KL7BJW, KL7AQU and KL7EIT. W7TDO, formerly KL7DOC, Walt and Wanda, are the proud parents of a baby boy and now reside in Great Falls, Montana. KL7EIT has a new Halliater rig and a Hornet beam. KL7BZO also has a new Halliater rig. KL7DQT has his new final on the air. His wife Donna, KL7DQS, just about has her DXCC. KL7DFE is the new act. mgr. for the AARC. KL7CAH has been a bachelor for about 3 months since his wife is helping at the Alaska Exhibit station in Seattle at the World's Fair. Mary is doing a terrific job down there. KL7DLA has returned from her trip outside with her husband. KL7CUK is making a trip to the Orient on business and pleasure. The XYL of former KL7SFN hopes to join her husband in Spain in the very near future. Remember the ARRL Convention in Portland Sept. 13. Please send your reports to the SCM. We need more SEC, EC, etc., appointees.

**IDAHO**—SCM, Mrs. Helen M. Maillet, W7GGV—The Gem State Net, 3580 kc., 0300Z, is showing steady monthly increase in traffic and check-ins. The FARM Net meets on 3935 kc. at 0200Z. Your SCM and OM K7CXP look forward to many eye-ball QSOs with Idahoans at the ARRL Convention in Portland. She will conduct the YLR Forum Sept. 1. W7GDA and K7LLA compiled an FB handbook for the 35 Third Emergency Net. The Idaho Falls Area has a new Eagle Rock Radio Club with W7DHD, prexy; W7BSP, veep; K7DZA, secy.; and W7GRU, treas., and has already organized code classes. K7HLR transmits Novice code practice on 3700 kc. at 0230Z. Eastern Idaho amateurs met at Shelley for transmitter hunts sponsored by the Shelley Tubers. K7KBY solicits ham club data for publication in the Idaho Club Directory. K7ENE won the QSL Contest sponsored by *Hambone News*. Traffic: (June) K7HLR 108, K7KBY 33, W7EMT 44, W7GGV 37, K7OAB 30, W7FBL 24, K7NNM 7, W7VQC 1. (May) W7VQC 103.

**MONTANA**—SCM, Ray Woods, W7SFK—SEC: W7-BOZ, PAM: W7YHS, RM: K7AEZ. The Montana Phone Net meets on 3910 kc. at 1800 hours M-W-F. MSN meets T-T-S on 3550 kc. at 1830 hours. TSN meets M through F at 1200 hours on 7230 kc. The Harlowton and the Havre Picnics were well attended with W7EEO's Halliater mobile s.s.b. causing quite a stir at both places. W7INM and W7JRB visited in the Harlo Area. W7EWR is doing right well with a new home-brew mobile in his car. Montana seemed to be real hot on Field Day as many stations were heard. K7EWZ is working a new QTH. Many Montana hams are going worked on 6 meters as openings occur quite often. W8KNC is around Malstrom with a 6-meter mobile. The Billings gang sure ran a real FB civil defense drill in May. W7YHS entertained VE3BWY and W1MM awhile back. W7EPZ and W7EEP were in Billings for a short while. K7BEN is back at Fort Ord. W7RZY reported contacts with Oscar II. Reports are that Sidney hams had a real fine picnic. K7OGF worked WAR, AIR and NSS on Armed Forces

(Continued on page 118)



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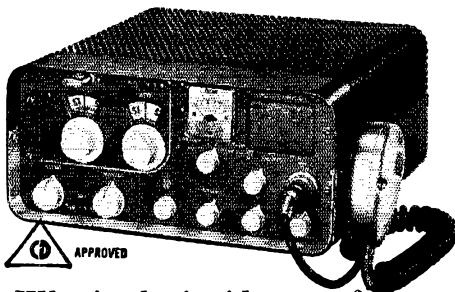
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Day again this year and received a certificate. W7JRG is reported as copying Oscar 2. Traffic: K7EWZ 103, K7OGF 8.

**OREGON**—SCM, Everett H. France, W7AJN—SEC: W7WKP. RM: W7MTW, PAM: W7NJS. Section nets, times GMT: OSN C.W. Traffic, 3585 kc, 0230 Tue.-Sat. OAREC C.W. Emerg., 3585 kc, 0330 Wed.-Thurs. AREC Phone Emerg., 3875 kc, 0300 Tue.-Sat. OFN Phone Emerg., 3840 kc, 0200 and 0300 daily. AREC V.H.F. Emerg., 50.550 Mc, 0400 Fri. Certificate endorsements: W7GUH as OO, W7MTW as RM, K7DFU and K7AXF as ECs. Field Day reports: W7OTV/7 on Green Mountain, 21 operators, 17 AREC members, 6 emergency powered generators, W7CMC/7, Bay Area Radio Club, on Coon Ridge, 9 operators, 3 AREC, W7DP/7, Washington section, on Bald Mountain, Ore., 12 operators, 12 AREC, W7ZFH, net mgr., reports OSN sessions 22, check-ins 243, traffic 132. The OAREC C.W. Net had sessions 8, check-ins 46, traffic 13; by counties, QNS, Lane 6, Multnomah 27, Columbia 4, Clackamas 3, Klamath 1 and Washington section 3. OSN BRAT awards went to W7AJN, W7BVH, W7MTW, W7ZFH and K7IWD. On June 17 a 7-year-old boy became lost on Mt. Hood, Ore. Search was started by the Mountain Rescue Council of Oregon and 25 amateur radio operators, using mobile and fixed stations, assisted with communications. A full report was made by W7RVN, W7ADR, as OES, has been busy making propagation observations and making good 6- and 2-meter contacts with Seattle stations, W7KAB, an old-timer, at traffic handling, is back on OSN and RN7. Traffic: (June) K7IWD 174, W7ZFH 114, W7RVN 90, W7MTW 65, W7AJN 21, W7MAO 15, W7DEM 13. (May) K7KKB 27.

**WASHINGTON**—SCM, Robert B. Thurston, W7PGY—SEC: W7HMQ. RM: W7AIB, PAM: W7LFA. The reports received from the Field Day sites throughout the state indicate a very large turnout for the Field Day activities in the Washington section. A total of twenty-seven messages was received by the SCM, reporting from different locations. W7JC assists KN7SZM in getting on the air. K7PXV received an SWL from UA-3. K7CWO was married July 1 and left for a honeymoon to Yellowstone Park. W7BTB reports visitors from out of state cut down on traffic. W7AMC again is active on the bands after a big let-down from the Bremerton Hamfest. W7JUS, of Port Orchard, became a Silent Key June 7. W7OEB reports the Richland Club had a successful adventure during FD activities and that K7s GZM, PVO, QFY, RRM, PWM and QOM did outstanding operating duty with no power or rig troubles. W7s CXJ, JII, OIH, OEB and K7BFI all work for Richland Power and Light Co. W7JFO has moved from Seattle to Alabama for five years. The Skagit Bar B Que was held at Bowmans Bay Aug. 19. K7CHH is working on a new 6-meter transmitter and giving thought to 220 Mc. W7IST worked K7IRR and K7ISI from atop Pack Mountain near Eatonville on 220 Mc. Al is planning on an 80-watt final on 220 Mc. W7IXR received a code certificate from W6OWP. W7PFP and W7GVC went on a big vacation in July. W7VOL was home on leave from the Army. W7NPN is active on 75-meter s.s.b. W7LJK has steps on his antenna mast (understand he also has a tall step ladder at the bottom end). KN7TOO still is trying to get the rig going. W7IKG handled FD activities for DK, the Radio Club of Tacoma, and did an outstanding job while filling in for K7AYD, who had to resign because of health. W7RNS is QRL building a new cabin on the beach on Fox Island, PUA and MCU-RMI, from New York and Oklahoma, returned for FD activities at the Valley Amateur Radio Club site. W7FQD has a new harmonic (a boy). W7BJV is in a new QTH. The Section had 100 per cent representation on RN7 for June. The WSN had 23 sessions with 173 QNIs and 130 QTCs for June. K7JHA is the new manager of RN7, having relieved W7DZX June 1. W7BA took a vacation and business trip to Seaside, Oregon. Three RPL certificates were issued to the following: W7BA, K7JHA and W7DZX. W7DZX vacationed in Seattle and B.C. W7SAB is a new OES appointee. W7AMC, W7APS, W7GIP, W7OEB and W7PGY renewed their ORS certificates. W7PGY is QRL underground feedlines and a new lawn. W7FIX went on vacation to Nevada. The 16th Annual Picnic of the Walla Walla Valley Amateur Radio Club has tentatively been set for Sept. 16. Plan to attend this affair if at all possible. A new 6-meter net has been started in the Burlington Area. Traffic: W7BA 1026, K7JHA 1009, W7DZX 968, W7PGY 466, W7APS 145, W7OEB 110, W7GIP 107, W7GYF/7 90, W7AMC 23, W7AIB 16, W7BTR 15, W7EHH 14, W7LEU 14, K7CWO 8, K7PXV 7, W7JC 6, W7EBU 4.

## PACIFIC DIVISION

**NEVADA**—SCM, Charles A. Rhines, W7VIU—The NARA is getting up a 6-meter f.m. mobile net. K7KBN  
(Continued on page 120)



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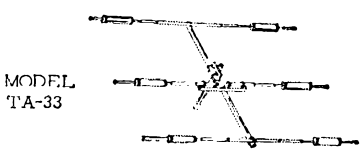
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Phone: Victor 2-8350 Ward J. Hinkle, Owner

has started code-theory classes at the Las Vegas Recreation Center. He has changed his DX-100B to grid-lock keying. W7JU works WLEE in Parker, Ariz., on 2 meters (160 miles). He still is keeping his skeets on 2 meters with W6WSQ every Sun. morning. The SNARC held a 2-meter transmitter hunt at its June meeting. K7KTS was winner. W7BVZ was burglarized for a second time. K7ICW is a new OES. W7VYC is experimenting with 6-meter i.m. gear. K7TDQ, W7VYC, K7RLX and K7ICW were on for the V.H.F. QSO Party. W7OYQ is looking for some of the old Reno bunch from Las Vegas with a Swan 140 mobile. W7PBV attended the Southwestern Division Convention at Disneyland. W7VIU has his new 600-watt final going. Appointees—SEC: W7JU. ORS: W7VIU. OPSs: W7KOI, W7PBV. OBS: K7KBN. OES: K7ICW. OOs: W7KHU, W7YKC. ECs: W7HJ, W7PC, W7YKC. AEC: K7ICW. Traffic: K7KBN 15.

**SANTA CLARA VALLEY**—SCM, W. Conley Smith, K6DYX—The Mission City RACES net (Santa Clara) is on 145.54 Mc. Mon. and Wed. at 1930 local time. Fifteen regular members operate under K8TCC, RO, and WA6RBB. Asst. RO. The SCCARA has enjoyed a series of talks on s.s.b. by W6VMH, K6TEH. OBS. is the new prexy of the MBRC. 37 old-timers, mostly hams, showed up at a get-together of ex-PAA Flight Radio Officers and Communications men which was held in Flood Park July 1. K6MPN. Asst. EC. Redwood City, thinks he has one of the oldest tortoises in captivity. His (or its) name is Oscar and he has been estimated to be 125 years old. Be nice if Oscar III lived that long. W6ASII and his group reported 45 Doppler trackings of Oscar II. W6UJA, OO Class I, says his uncle, KP4BEM, and father, KP4ACH, operate only on 6 meters which makes QSOs difficult to say the least. W6YEM is off on his annual business trip to KL7-Land. W6MMG enjoyed a visit by W1MLW and K1PIA. Mike Fern, KH6ARL. Asst. SCM Hawaii, visited W6HC and K6DYX during his mainland trip to the Porsche Convention in Monterey. WA6OLQ, Junior Statesman, is at the J.S. Summer School in Santa Barbara. W6PBC is overhauling and rebuilding his 60-ft. antenna structure of 50, 145, 222 and 432 Mc. W6AUC, SCARS prexy, now has a complete S/Line station. Traffic: (June) K6KCB 504, W6RSY 261, K6ZC 246, W6DEF 103, W6YHM 89, W6AIT 84, W6YBV 75, WA6EIC 72, W6ASH 45, K6ZCR 40, K6AIHW 33, K6DYX 31, WA6NAV 30, W6AUC 26, W6ZRJ 26, W6OII 14, W6HC 9, W6RFF 8, K6BBF 5, W6UVP 5, K6EQE 2. (May) K6KCB 65, WA6EIC 44.

**EAST BAY**—SCM, B. W. Southwell, W6QJW—SEC: WA6MIE. ECs: W6NOP Napa, W6WAH Vallejo, K6OSO E. Contra Costa, WA6MHJ W. Contra Costa, K6EAD N. Alameda, K6HJT S. Alameda, WA6IGD Metro, Oakland, W6LDV Acting Lake County. K6QXY moved to Vallejo and WA6MXI and he are building a joint station for 6 and 2 meters, with tiltable, rotatable spiral-ray antennas 130 ft. high. WA6RGD is on NCN, RN6 and PAN traffic nets. WA6KLL was ill but was back again for Field Day. New officers of the LARK are WA6KLL, pres.; K6URG, vice-pres.; K6SZA, secy-treas. WA6WQM, ex-VR3, now is mobile on 75 meters in the Livermore Area. K6FDG is active with the MARS setup at Travis AFB and copied 98 per cent of the RTTY A.F. Day message. K6ZYZ, RM, is active on PAN and TCC and says traffic skeeds are on 40 meters for the summer because of QRN. W7QOH/6 has a new Ranger. K6GK was home from a world trip, and off again to the East for 2 months. WA6ODP, LARK's station, was active with 13 transmitters during FD. 21-Mc. phone had both long and short skip on during the FD week end and yet SCM worked local clubs, 30 to 50 miles through U.S. QRM with 589 signals both ways. A New Tech. Glass license in the Walnut Creek Area is WA6ZMX. K6BRG and K6KDS won ORC's award for working all California counties. K6YSS was QRL vacation in the Monterey Area. WA6EJA, WA6NEL, WA6BMT, WA6QZA and WA6PTU spent their vacations seeing the Seattle World's Fair. K6KQD is in Mexico on vacation and visiting KE2BT. The HARC has its own design for club members' QSL cards. WA6RYN wants to sell his G-50. WA6IER is on 6-meter mobile. The NYL of WA6DJD is recovering from a serious operation. WA6AHF had had such hot QSOs lately he melted his final tank coil. K6SPP lost his beam in a windstorm. WA6NEL qualified for the Highbanders certificate. WA6GUM and K6SPP had a 30-minute cross-band QSO on 6 meters and 432 Mc. Ex-9ALG is a new member of the HARC. K6DKQ swapped his rig for a new Swan transceiver. W6ICR has a new Valiant; car that is. Hi! WA6LTG is mobile with an ARC-5 and a Gonsert Super 6. K6YBS and his NYL are proud grandparents. Congrats to you both. That's it for this month, gang. Drive carefully during these vacation months so you will be around this fall. Traffic: (June) K6GK 90, W7QOH/6 23. (May) WA6RGD 266, K6ZYZ 109.

(Continued on page 122)



## So we asked Collins...

There is an old saying that curiosity killed the cat. But curiosity was instrumental in getting a signal to the moon and back, so this trait is not without benefit.

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So, you might say that the Sylvania Type 6146A is a souped-up 6146.

Subsequently, we were highly pleased to learn that Collins had become interested in testing our 6146A for both the KWM-2 Transceiver and the 32S-3 Exciter.

To us, this all sounded very logical for a mobile job...at least for the KWM-2 mobile job. But our curiosity got the better of us when we learned that Collins had standardized on our 6146A for the new 32S-3 fixed-station rig. So we asked the Collins boys why...and we're glad we did.

Since the 6146 and the 6146A are directly interchangeable in any final, and cost the same, it could have been a case of easy bookkeeping. But there was a more forceful reason. After extensive life tests at 110 nominal watts at 30mc, Collins engineers found the Sylvania 6146A maintained consistently high power output...well beyond their expectations.

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73,

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K2RMM

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**SAN FRANCISCO—SCM.** Wilbur E. Bachman, W6BIP—K6LFM spoke on Mobile Antenna Design at the San Francisco Club's July meeting. He is chairman of the Board of Project Oscar Assn. Chuck is staff engineer in the Rocket Div. of Lockheed Missile & Space Co. Both the S.F. Club and HAMS were very active on Field Day. The BAYLARC girls were on hand to help the S.F. Club pile up a score. The Red Cross gang (HAMS) was portable—RTTY on Field Day and we believe this is the first group to use this type of Field Day gear. The Marin Amateur Club racked up 110 contacts on 75 meters, 44 on 40, 3 on 6 and 7 on 2. WA6ASW was set up at the Montecito Shopping Center on the eastern edge of San Rafael. W6CXO and W6MLK, local Red Cross nets, were alerted on the Petrero Hill Cave-in. The Western Pacific Tunnel caught fire and at this writing (after a full week) the fire still is burning, and 19 families have been evacuated as the streets have caved in and the houses are slowly but surely slipping, so S.F. C.D. has had some practice on a local disaster. *QVA News* of the Tamalpais Radio Club reports that K6JBJ came back well satisfied with the Seattle World's Fair. K6KEW's new Volks bus setup puts out a fine signal. K9OVQ/6 has been on 20-meter s.s.b. working DX from MARS station. WA6QCR now is an employee at PT&T in San Rafael. K6AMP also is working the swing shift at San Rafael station. WA6KDN is heard over the mike at K6FCT. Hamilton AF Base station. W6MQQ gave a talk on s.s.b. at the club meeting. Field Day was held at the Lindholm Family location. Many of the S.F. section gang attended the Fresno Hamfest. The Mission Trail Net Roundup was a huge success. Held at San Cruz, L.A., Northern section of California and even Arizona members attended. WA6DAU, of Clovis, Calif., is the new net manager of NCN. W6JOH, a faithful member in NCN, now is a Silent Key. K6VXI worked in both the V.H.F. Contest and Field Day and reported more activity on 6 and 2 meters during Field Day. K6LNN worked KØINC from his home QTH using BPN's rig and his own long wire. W6KZF reports: "Be sure your local club net is signed up with civil defense. Thus members participating in drills or actual emergency operations are covered by State Compensation Insurance in case of accident. Keep in touch via AREC Net 1900 kc. at 10:30 A.M. Sun." WA6LST lost his tower in recent high winds. W6FEA gave a 100-watt transmitter and other gear to the Marine Club. Gertie plans to move to Fresno in the near future. W6KZF is working real hard on the Marin paper. QS45. K6FCT operates during the morning commute run. WA6FJY is going s.s.b. this fall. W6IFO operated mobile in Alpine Co. while on vacation and now is wondering how to send out QSLs on contacts. (Note: W6ILKB from Sunnyvale, will be on a construction job at Alpine within a few months and plans on being active on the airwaves. Anyone interested can listen for his call (he is having W6GGC make up QSL cards for him). Marin news was received from WA6AUD. WA6MDL is active on NCN, NCTN and TCEN. Traffic: WA6MDL 50, W6JWF 12, W6GGC 10.

**SAN JOAQUIN VALLEY—SCM.** Ralph Saroyan, W6JPU—The Fresno Radio Club held its annual Field Day at a location 6½ miles east of Shager Lake with 50 hams participating and made over 500 contacts. The Stockton Radio Club held FD at Camp Connell. W6ARE and group held FD at Esheim Point. 6 operators with 5 AREC members. The Turlock Radio Club held FD at McConnell State Park. W6ADB won the club trophy for the best FD score. The SJVN had 140 check-ins, 91 contacts, 11 traffic, 3 QST, 3 phone calls, 9 bulletins and 26 sessions. Anyone who contacts 10 amateurs on 6 meters in the Fresno Area and who lives 50 miles from Fresno gets a beautiful certificate. Anyone interested in more details should contact W6PRU. WA6WYN has an HRO-50 and a Valiant. W6T7J worked K6BPC on 1215 Mc. with APX transceivers 163 miles. W6SVM has a Moseley receiver. W6PJM is looking at s.s.b. mobile. W6KTW has a Hornet beam on 15 and 20 meters. W6BJI got a DUF certificate. W6JPS has a 19-ft. trailer house with plenty of room for portable radio gear for his vacation. W6PPO's new quad is stuck pointing toward the South Pacific. W6QON is working all his DX in his back yard swimming pool. Ex-W6NOH is vacationing in Seattle on his yacht. WA6DAU had some minor problems with the GSG-100. W6JXY has a new KWM-2. W6JUK is putting out a good signal on phone. W6PNP is on 40-meter a.m. mobile. Traffic: W6ADB 128, W6EFB 18.

**ROANOKE DIVISION**

**NORTH CAROLINA—SCM.** N. J. Boruch, W4CH—SEC: W4YMI. RM: K4CPX. V.H.F. PAM: W4ACY. Oscar II dominated June events with the Salisbury boys very well represented. K4QVF retransmitted many OBs and was official tracking station along with K4MHS.

(Continued on page 124)

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K4SNF and K4YYJ. W4BUZ and W4CCK also tracked daytime passes. The ARRL V.H.F. QSO Party showed spirited participation. Happy results came about because of sporadic-E openings and many stations in Kentucky, Tennessee, Georgia and Nevada and even Cuba were worked. Among the clubs and groups taking part in the Annual Field Day were Wake County, New Bern, Piedmont, Greensboro, Belmont, Alamance and the Charlotte s.s.b. group. Our beautiful and scenic mountain tops served many as a good operating advantage. Congratulations to all those sending in such fine, detailed reports. A very successful hamfest was put on by the Charlotte Club. W4FUI submitted an excellent Frequency Measuring Test result. W44EJM has been appointed manager of NCN, with K4YCL to assist. THEN meets every night now and has a new procedure. The Rowan County C.D. Net meets on 145.2 Mc. each Fri. at 0230 GMT. The Guilford Co. RACES Net meets on 146.88 Mc. each Sun. at 2300 GMT. Recent new appointments: K4WVP, K4YYJ, K4MHS as OESs; K4SWN as EC; K4EX as OO and ORS. Traffic: W44FJM 121, K4CPX 111, W4BDU 48, K4YCL 45, K4QVY 41, W4LSX 26, W4BAW 24, K4TPK 3.

**VIRGINIA**—SCM, Robert L. Follmar, W4QDY—Asst. SCM: H. J. Hopkins, W4SHJ, SEC: W4VMA, PAMs: W4LK, K4MXF, W4SHJ, W4IA, W4QDY, PAMs: W4BGP, K4JQO, K4PQV. The traffic fellows in the Tidewater Area have formed a trade net which meets at noontime on 3850 kc. It is dubbed "The Cavalier Net." Good luck, boys. The last of the Field Day reports have arrived and much enthusiasm was evidenced by all the participants followed by resolutions to do better next year. W4CVO, one of our top frequency measuring boys, retired from the USN June 1! Nice sailing. OM, W4KFC worked CR8AF for a new country and added VQ9A on 80-meter c.w.! More calls for the Locator. Got yours yet? W4JUJ tied for first in the Richmond Spring Tune-up and received VA-CWC and 507 Awards. W4OOL still is turning Novices into Generals. K4MLD got the rig working on after one year on 77 meters. Multi-appointee W4FOR turns in a nice job with each and TCC besides! K4QIX is "just mobiling away the summer." K4TZF's new vertical has him sweating (20 meters), but he worked on 11H and a KG4 on 15 meters. 2-meter station K4DCO got taken out by lightning. It got the beam, rotator, final and modulator. W4CTU graduated from college and will be operating on 52.525-Mc. f.m. in Lynchburg. The PVRC and the Frankford RC held their annual joint meeting at Philadelphia where PVRC gloated over winning both the SS and the CQ DX Test. That's my boys. Hi, W4LRN was off the air because of transmitter and antenna troubles but is on again. W4PTR, a newcomer, reports first activity. W4DLA is back on the air after a major breakdown and now is running 325 watts. K4UVT made DXCC and is working for CHC. How about some traffic activity, Bob? W4NVX says he got a new s.w.r. meter, a heterodyne exciter and a transmitter. Traffic: (June) K4PQL 665, W4DLA 409, W4FOR 383, W4SHJ 326, W4PPC 284, W4NTR 225, W4LK 115, W4RHA 100, K4TSJ 87, K4RNH 84, K4MXF 61, K4FSS 49, W4NVX 32, W4IA 29, W4QDY 28, K4ITV 20, K4Y2T 17, W4KFC 13, K4MLD 13, W4BZE 12, W4MYA 12, W4TE 12, K4AL 9, K4IIP 8, W4OOL 7, K4SGQ 6, W4JUJ 5, K4LTK 4, K4TZF 4, W4WBC 4, W4OID 3, W4OWV 3, W4LRN 2, W4CVO 1, W4KX 1, W4PTR 1, (May) K4TZF 32, W4ZM 26, K4PQV 18, W4OOL 15, K4DCN 9, K4QIX 7, K4UVT 2.

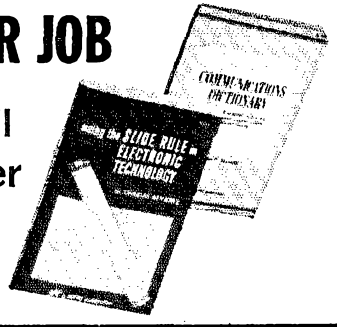
**WEST VIRGINIA**—SCM, Donald B. Morris, W8JM—SEC: W8SSA, RM: K8HID, PAM: K8CFT. The West Va. C.W. Net meets on 3570 kc. at 0000 GMT and the Phone Net on 3890 kc. at 2300 GMT. Congratulations to K8CFT, of Oak Hill, on being named West Virginia's Outstanding Amateur of the Year at the 4th Annual West Virginia State Radio Convention, Jackson Mills. In attendance were Director Anderson, W4MWH, National Emergency Coordinator George Hart, W1NJI, from Headquarters, and over 500 amateurs from West Virginia and the Tri-State Area. Under the leadership of W8SSA, of Bluefield, general chairman for the '62 convention, a well-planned convention was presented, with a SWOOP for the ladies and the Wouff Hong Ceremony for the men. K8QUY, of Fairmont, was named net manager of the c.w. (WVN) and K8CFT (WVAMO) was named PAM and net manager for the phone (WVN) nets. Let's support these men and the nets. OES K8TSB's reports are outstanding. A new ORS is W8DIE. K8MNG won first prize in the West Va. QSO Party. Have you and your club made a contribution to the ARRL Building Fund? Your reporting of traffic handled will be appreciated. Traffic: K8CSG 12, W8SSA 10, K8CFT 8, K8ELH 6, K8QUY 5, W8JM 4.

**ROCKY MOUNTAIN DIVISION**

**COLORADO**—SCM, Donald S. Middleton, W0NIT—SEC: W0SIN. PAMs: W0CXW, W0JXR and W0GNK.  
(Continued on page 128)

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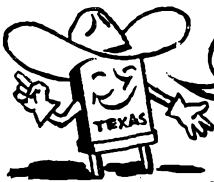
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RAMS: W0FEO, K0DTK. OBS: K0DCC. The Colorado SCM and his all-hairn family spent the months of June and July in Bend, Ore., where the OM, W0NIT, taught summer school classes at Central Oregon College. Clubs from Arvada, Delta, Pueblo, Boulder, Denver and Littleton reported Field Day activity. Denver's club station W00U reported contacts in excess of 200 on 6 meters in the PD exercises. W0ETT operated during PD from a 10,000-ft. QTH with 653 QSOs. A RACES net is being activated in the Grand Junction Support Area on 1994.5 kc. The PAKA operated for 22 hours on emergency power on PD. K0MNG reported 2-meter daily contacts from Denver to K0WCP at the Pueblo Ordinance Depot during the month of June. W0CA has made several tape recordings of this unusual 2-meter Denver-Pueblo v.h.f. condition. Contacts were made on phone. Boulder amateurs K0JSV, K0MRY and W0CGO made over 150 contacts in 25 sections during the V.H.F. Contest from on top of Bighorn Mt. Traffic: W0S1N 64, K0DCW 59, W0KQD 56, K0QGG 48, W0ETT 8.

**UTAH—SCM,** Thomas H. Miller, W7QWH—Asst. SCM; John H. Sampson, W7OXC, SEC, K7BLR. W7MSY has been appointed EC for Utah County to replace K7HYF, who is serving a mission for the LDS Church. The SCM received Field Day messages from the Oquirrh and Utah (Salt Lake) Clubs. Other groups on the air were the Ogden ARC and the Bountiful ARC. K7NWP made the RPL, W7OXC, K7BGU and K7MPQ received BRAT Awards on BUN. W7QWH has moved to a new QTH and is back on the air. Guest speaker at the June meeting of the UARC was Dick Baldwin, W1KE, Managing Editor of QST. W7OXC attended the Wyoming Hamfest and met quite a few of the Wyoming group. W7BAJ has been experimenting with 80/40 meter antennas and is also on s.s.b. W7CYH has a new HT-37. W7WLV is looking for a transmuter in the 150-watt class. Traffic: K7NWP 579, W7OXC 110, W7QWH 2.

**NEW MEXICO—SCM,** Carl W. Franz, W5ZHN—SEC; K5QIN. PAM: W5ZU. V.H.F. PAM: W5FPB. It is with deep regret that I must report the passing of W5FVY, the son of a former Governor and an active member of Albuquerque emergency groups. The Caravan Club and AREC/RACES put on a Field Day display at the Winrock Shopping Center for a very interested public. We welcome WNSs CFO, CFP, CFQ and CFR, all new hams in Las Vegas, and WNSCWR, of Albuquerque. About 150 operators, XYLs, YLs and jr. operators attended the Los Alamos/Caravan Club Picnic at Los Alamos on July 4 and had a most enjoyable time. The Totah Radio Club held its picnic at Vallecita, Colo., July 8. K5IPK has gone mobile with an AF68/PMR 7. Glad to hear from you, Phil. The Boiled Owls went to Tajique for PD. K5UYF was the World's 8th recipient of AHC. W5s UOZ, ONK, ZHN, DLE, LQM, LEF, UAF, WNU, K5CXN, SFU, K5U and IVR received Public Service Awards for their emergency work of 1961. Well done, gang, you earned it. I'm proud of every one of you. W5QNT is QNI NTS; thanks, "Dit" we need the help. Traffic: (June) W5QNT 61, K5FMF 46, W5WZK 42, W5UBW 38, K5ONE 8, K5HTS 2. (May) W5UBW 38, K5ONE 28.

**WYOMING—SCM,** Lial D. Branson, W7AMU—Our newly-appointed SEC is Donald T. Wright, W7HH, 1417 Flint St., Laramie, Wyo. The Pony Express Net meets Sun. at 00800 MST on 3920 kc. The YO Net is c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. Wyo. C.D. Net meets Wed. at 1900 MST on 3537.5 kc. The TWN meets daily at 2000 MST on 7060 kc. K7GDW and family made a quick trip to the West Coast and the World's Fair. W7LVU is building a new sideband oscillator. W7KWR is back in Casper after a long stay on the West Coast. W7AMU still is living on soup. W7BHH has acquired a daughter-in-law. The Wyoming Hamfest was well attended and a good time was reported. W7OXC, Deputy Director of the Rocky Mountain Division, and W7BXS, Deputy Director of the Wyoming Division of ARRL, attended and were on the program at the Wyoming Hamfest. Casper Amateur Radio station K7VJN and W7HH, both portable, furnished SCM W7AMU with standby communication two days during the Wyoming Hamfest. Traffic: W7GZG 44, W7BHH 39, W7AMU 19, K7ONK 16, W7HH 15, W7NMW 2.

### SOUTHEASTERN DIVISION

**ALABAMA—SCM,** Harvell V. Tilley, K4PHH—SEC: W4FQQ. RM: K4YUD. PAMs: K4BTO, K4PFM. S.S.B.: K4KJD. New appointees: W4ATK, EC Jefferson County; K4WWP and K4FZQ, OPSS. W4KCCQ, W4MI and W4RLG have been awarded lifetime memberships in the AREC for outstanding service in the organization in Alabama. WN4DQZ and K4NUV are operating portable at camp this summer. K4KJD has been

(Continued on page 123)



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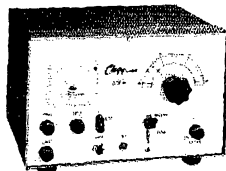
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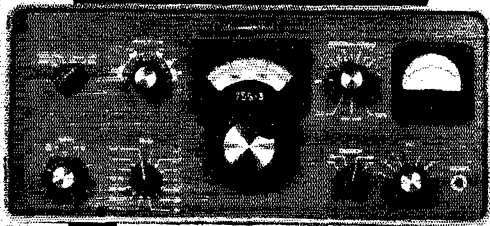
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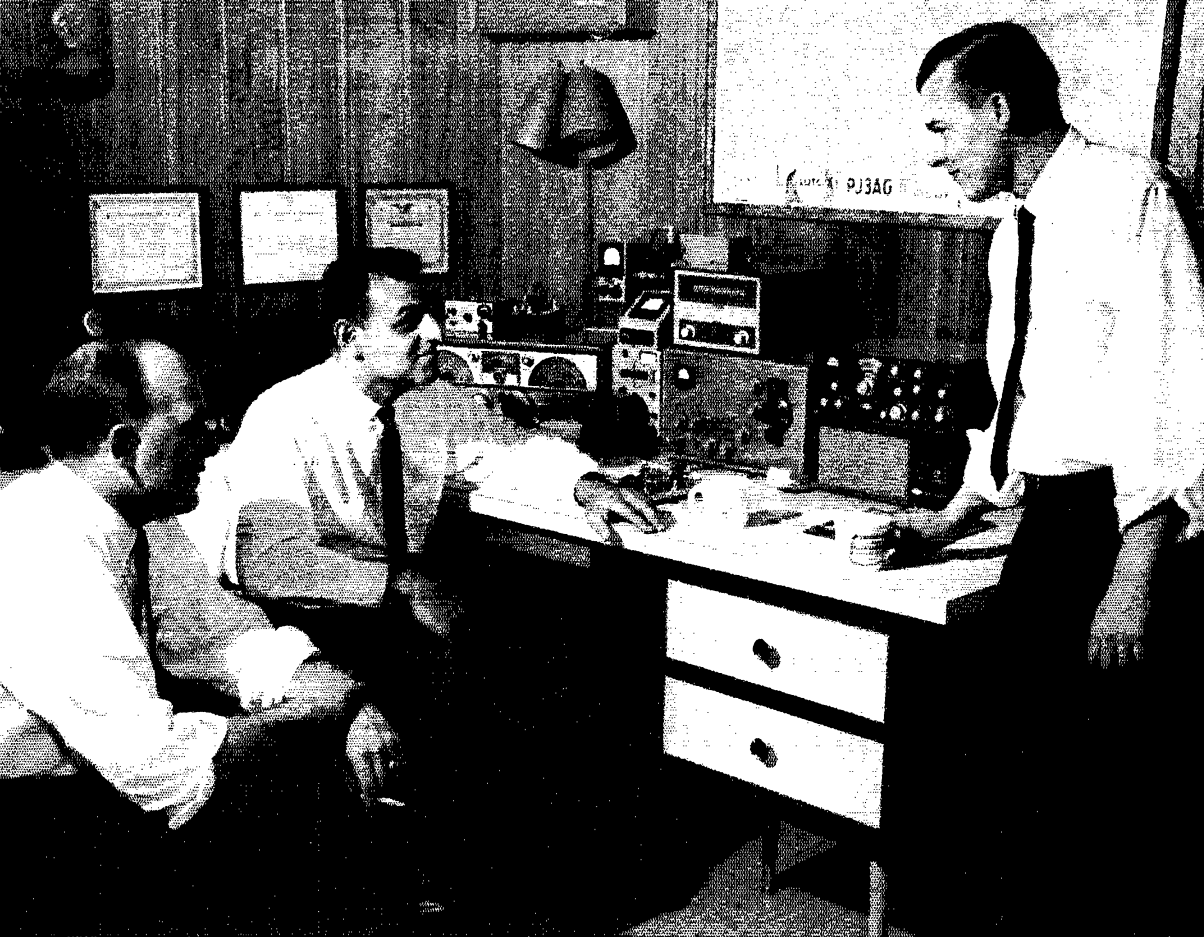
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reelected NM for the AENM. K4S1GZ and K4WVD have received the "Out-standing Net Member" Award on the AENT. WA4CPF has his 6-meter mobile rig almost completed. K4NKT has been elected NM of AENS. Congrats to new hams in Morgan County: WN4s GGD, GGE, GNG, HMIJ, GGG, GNK and FAU. K4WHW has a new Drake 2B. K4WVP is getting a TA-33 Jr. K4WOP has a new keyer. K4SFH had 92 contacts during the V.H.F. QSO Party June 9-10. K4FHG is conducting code classes in Anniston. W4YFN was awarded the Amateur of the Year Award by the Huntsville ARC and K4AOZ received the Citizenship Award presented by the Birmingham ARC. WA4DPX is now on s.s.b. with a KWM-2. Traffic: (June) K4YUD 208, WA4BDW 87, K4AOZ 84, K4WOP 83, K4WVP 62, K4FZQ 50, K4PEM 42, K4PHH 36, K4YVO 36, K4WHW 35, K4DJR 31, K4KDE 30, K4NKT 26, K4BTO 23, WA4CPF 22, K4HJM 21, K4BRZ 18, K4DSO 18, K4GXS 14, K4KJD 14, W4YRO 12, K4WVD 11, K4ZTT 10, K4PBY 8, K4SUY 8, K4WSH 8, WA4VM 7, WA4BTA 7, K4TDJ 6, K4YTT 6, W4CUU 5, K4HVN 5, K4RIL 5, W4WGI 4, W4DFE 3, K4JDA 2, K4CMA 2, WA4BSE 1. (May) K4WSH 12, WA4CPF 11, W4DS 5, W4MI 3.

**EASTERN FLORIDA**—SCM, Albert L. Hamel, K4SJH—SEC: W4YVT, RM: K4KDN, RM RTTY: W4EHU, PAMs: 40 W4SDR; 75 K4LCF; V.H.F. W4RAMU; S.S.B. W4CNZ. Congrats to W4CNZ on his election as president of the S.S.B. Assn. Couldn't have picked a better man. Our appreciation to W4GJI, outgoing president for a job well done. Everyone is working like mad for the coming SET. V.h.f. activity is going ahead by leaps and bounds in this section in all phases and it seems like the OESs are keeping pace fairly well. OOs have been pared down pretty well but there are a few whose reported activity still is too low for our limited number. Hope that by now K4LCE, FPTN manager, is back on his feet. The Biscayne ARC is now 100 per cent ARRL. How many clubs in E. Fla. can match this? The monitoring frequency for the Orlando Area has been changed from 145.2 to 145.370 Mc. Hope that by the time you read this you have done *everything possible* in preparation for our lady friends, those tropical disturbances. The Florida Chamber of Commerce frowns on the word "hurricane." Traffic: (June) K4SJH 938, WA4BMC 572, W4AKB 370, W4TUB 367, W4NDL 274, K4BY 226, W4KIS 212, W4EHW 154, K4BTB 105, W4LDM 94, W4WUK 94, WA4RGW 91, K4AHU 86, K4JWM 83, W4SDR 78, K4AX 77, W4VLH 69, K4AKQ 65, W4CNZ 63, W4EAT 60, W4MIN 58, K4RNG 57, WA4CJC 55, W4SDR 78, K4AX 77, W4VLH 69, K4AKQ 65, W4CNZ K4YOQ 50, W4CWD 42, K4KGB 41, W4ZAK 40, K4ENW 37, K4FMA 36, K4KDN 32, WA4COR 31, W4TRU 31, K4MZR 30, K4VNA 30, K4LCP 28, WA4AME 27, W4YVT 26, W4BRX 25, W4YPX 25, WA4DCI 20, K4AIP 20, K4FQP 19, W4BKC 18, W4IMC 18, K4YBE 18, K4NXW 17, W4TRS 17, K4JZU 16, W4HLE 15, WA4AZZ 14, K4HQK 14, W4LSA 13, W4BNE 12, W4WPD 12, W4SMK 11, W4AIG 10, W4HFR 10, K4OSQ 10, W8LJU/4 9, WA4RAW 8, W4SVI 8, K4IWT 6, K4PVP 6, W4QVJ 4, W4UHB 4, W4YD 3, WN4GBM 3, W4BBZ 2, W4DFZ 2, WA4IHH 2, K4LML 2, W4ZUT 2. (May) K4EHY 67, W4MIN 42, W4HRC 33, W4HTH 32, K4NVD/4 26, K4NXW 19, W4TRU 18, W4WPD 18, W4VCX 17, W4DFZ 15, K4FQP 14, W4DSH 9, K4VGD 5, W4BWR 3, W4LNV 2, W4ZUT 1.

**WESTERN FLORIDA**—SCM, Frank M. Butler, Jr., W4RKH—SEC: W4MLE, PAM: W4WEB, RM: K4UBR, Panama City: Field Day was held at the QTH of W4MMA. WA4GWQ is on with a DX-40, K6PSJ/4 is active on 6 meters. WA4PIJ and WA4FJF helped in a boat regatta. The net roster was mailed to all WFPN members, thanks to WA4FJF. K4VYF checks into the phone and c.w. section traffic nets. Fort Walton/Eglin AFB: New EARS officers are K4JSJ, pres.; K4AAK, vice-pres.; K4CZA, secy.-treas.; W4ZGS, act. mgr.; W4UXW, editor. 2 meters was used during the boat cruise and Billy Bowlegs Parades with good results. Among those active were K4JSJ, K4CUC, W4RKH, W4ZGS, W4UXW, K4CZA, WN4DYN, W4TJO and WA4EUV. EARS Field Day was held at Silver Beach again. W6PTG/4 is active on 6 and 2 meters with a Comcommunicator JV for each band. K4OFP is working on a 220-Mc. rig. W4PLK completed a 20-watt modulator for the 432-Mc. rig. W4BVE is active in QFN and W4RN, Blountstown: K4DHK is the new Calhoun County EC. Madison: WA4GHE is a regular on WFPN. W4RDQ is back on the air after a move. Perry: W4KQP is moving to Jacksonville after many years activity in AREC and traffic nets in Taylor Co. Tallahassee: New club officers are W4MLE, pres.; W4GAA, vice-pres.; WA4DTG, secy. 2-meter activity is growing with W4GAA, W4DKT/4, K4YPI, K4UDD, WN4EAO and WN4GEF on Pensacola. The PARC, NAS and V.H.F. Clubs were all out for Field Day. Traffic: (June) K4VYF 140, K4CNY 124, W4BVE 121, W4GAA 33, (Continued on page 130)



George Lucas, W1ZYS, "Pops" Karentz, W1YLB, and Ray Churchill, W1VBI, enjoy an infrequent eyeball QSO at "Pops'" Millis, Mass., QTH.

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George Lucas, W1ZYS, is currently Raytheon's resident field engineer at Boeing, Wichita, Kansas. He has advised and instructed on new ACR alignment techniques at many major Air Force bases in the U. S.

Ray Churchill, W1VBI, specializes in high speed bombing radar aboard B-52's. He may be at Loring AFB, Maine one day, Edwards AFB, California the next.

Pops is the Field Project Supervisor of Air Force Programs for Raytheon's Electronic Services Operation. Pops served in a wide range of field engineering assignments prior to his promotion to Project Supervisor and is currently responsible for field programs requiring the services of a large group of field engineers, George Lucas and Ray

Churchill are members of Pops' highly capable and fast moving field team.

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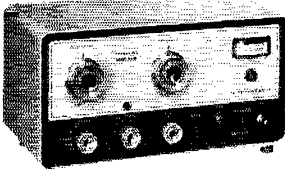
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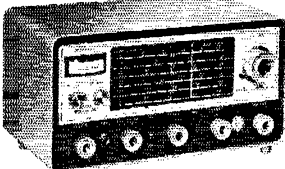
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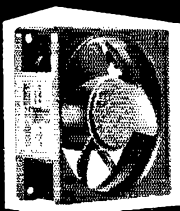


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WA4FIJ 32, K4BDF 9, K4DHK 2. (May) K4CNY 131,  
K4KHC 40, W4PBO 2.

**GEORGIA**—SCM, James A. Giglio, W4LG—SEG:  
W4TJS, RM: W4DDY. Three cheers for the new Mil-  
ledgeville Amateur Radio Club. First officers are W4-  
PCF, pres.; K4FRM, vice-pres.; and W4AARE, secy.-  
treas. Good hams just won't give up; W4PCF was in  
Baldwin Co. Hospital for three weeks and operated  
portable from there. Welcome to the new Milledgeville  
hams, WN4FUH and WN4HJJ. Happy haraming to the  
great Scoutmaster, Harry Price, now WN4HW. He  
holds the world's record with 82 Eagle Scouts. It has  
been reported that K4TKM is as happy as can be with  
a new HA-1 keyer. K4WWY is sporting a 6-meter mobile  
rig. The Savannah Radio Club will resume code and  
theory classes Sept. 17. Congratulations, fellows, on the  
exceptional Field Day publicity. K4MCL, Albany, Ga.,  
has graduated 8 Novices from his code and Theory class.  
New offices of the Columbus Amateur Radio Club  
are K4UYC, pres.; W4NCF, vice-pres.; K4REU, secy.;  
W4A0SE, act. mgr.; K4CVH, treas. The nicest surprise  
Father's Day gift that we heard about was the com-  
plete S/Line rig presented to K4EJW by his family.  
The Albany Amateur Radio Club, Inc., has elected the  
following new officers: W4OJB, pres.; K4LPG, vice-  
pres.; W4TYG, act. chairman; C. T. Royal, secy.-treas.  
Traffic: K4ZYI 560, W4DDY 262, K4MCL 140, K4FPZ  
135, K4QPL 132, K4KSH/4 120, W4PTM 51, W4HYW 40,  
K4WWY 37, W4MLA 32, K4RHU 30, K4BAI 26, K4YRL  
23, W4LG 18, K4TKM 12, W4FRM 11, K4TEA 1.

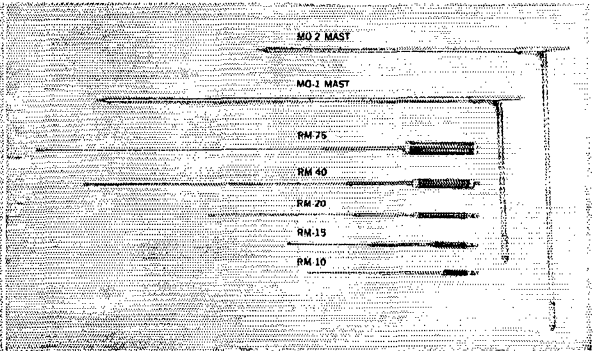
**WEST INDIES**—SCM, William Werner, KP4DJ—  
C.D. Radio Officer: KP4MC. QSL Mgr.: KP4YT. Your  
SCM was guest of the LMRE in Mexico City. El Morro  
RC held Field Day at El Verde with four operators  
using the call KP4ASK/KP4. KP4BAU/AH2AE con-  
tacted a C-54 type aircraft flying a sick boy from Recife,  
Brazil, to P.R. from time of departure to arrival on  
MARS frequency 14,405 kc. KP4BAU has started code  
classes in his home at Ramey AFB. KP4AFL repaired the  
DX-100 and added the Heath "Cantenna" dummy  
load and Heath 0-12 oscilloscope for modulation moni-  
toring. KP4BCA has a new Elmac AF-68 and an  
SX-100. The El Morro Radio Club meets Thurs. at 1730  
AST at the P.R. Iron Works. KP4PJ and KP4ATV has  
new VRL vertical antennas. KP4CH and KP4DJ vaca-  
tioned in New York City. KP4ACF vacationed in  
California. KP4AWH vacationed Stateside. KV4RZ was  
hospitalized in San Juan. KP4WT celebrated her 45th  
wedding anniversary. KP4WVY is now General Class  
and using a 20-A/LA1 and in NC-300. His son, KP4-  
AWW, is Technician on 6 meters. KP4DJ and KP4AXB  
visited W2LJE/mm and W4UDE/mm on the SS *Flying  
Hawk* while the ship was in San Juan. W4UDE uses a  
KWM-2. KP4TL contacts his son-in-law YSOJMJZ,  
who operates mobile in Salvador on 20-meter s.s.b.  
KP4AQQ, CHC No. 399, has recovered from an illness  
and is again very active. The C.D. Net on 3810 kc. meets  
Wed. at 2130 GMT with KP4TIN as NCS. KP4ACX re-  
ceived the WPR-25 Award certificate. KP4BRB, Fray  
Epifanio, GSB-100, GSB-101 and KWM-2 mobile. KP4-  
BRB renewed his AREC membership and has ordered a  
Viking Invader 2000. Being a building contractor he  
has gasoline-driven generators for emergency power.  
KP4AYP joined the AREC and is on with a kw.  
KP4SV joined the AREC and uses a100V-600L, an  
75S-3 and beams and multiband dipoles. KP4AWL  
joined the AREC and has equipment for 6 through 80  
meters both fixed and mobile. KP4ATV has ordered a  
Model 15 teletype printer and has built the converter for  
use with the 75A-4. Traffic: (June) KP4WT 118. (May)  
KP4WT 132, KP4BAU 20, KP4AFL 4.

**CANAL ZONE**—SCM, Thomas B. DeMeis, KZ5TD  
—KA5AF/KZ5 was set up for Field Day in the Dugouts  
at Beam Stadium on Albrook Air Force Base. The  
operation was conducted jointly by Army MARS and  
Air Force MARS. I received SCM messages from both  
KZ5AF and KZ5AP. The Drake 2B and HT-37 combi-  
nation worked out very well for Field Day. Emergency  
power was supplied by a gasoline generator that held  
up quite well. There also was excellent coverage by  
the local newspaper of the event. KZ5LM and KZ5KT  
are in the U.S. on vacations. KZ5RN is a new YL on the  
air. KZ5HA is set up with a globe Scout and a BC-779  
to a quad. KZ5GM is here on leave from Notre Dame.  
KZ5BL is on leave in the U.S. also. KZ5MQ is keying  
with a homebrew automatic keyer now. KZ5OB is on  
the air with the new HX-10. reporting excellent results.  
KZ5TD is using a borrowed HT-32 on s.s.b. KZ5CG  
has up another quad by his tri-bander beam. KZ5KR is  
packaging a kw. linear in a BC-610 chassis. KZ5RW is  
on the air with his HT-37 from Coco Solo. KZ5SW is  
operating from Coco Solo also but is portable awaiting  
transfer back to the Pacific Side. The Army MARS pro-  
(Continued on page 132)

# GOOD MOBILES GO...

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**MOBILE**  
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● **Now, Get Fixed Station Reports with the "HUSTLER"**

Buy only the mast and resonators for the bands you operate. No need for matching devices, no feed line length problems. Use any length of 52 ohm cable. This is a new, efficient concept of center loading. Each of the five resonators has a coil specially designed for maximum radiation for a particular band. Center frequency tuning is by means of an adjustable stainless steel rod in the resonator.

The 54-inch fold-over, heat treated, 1/2-inch aluminum mast permits instantaneous interchange of resonators. Mast folds over for garage storage. When opened to full height, the two sections of the permanently hinged mast are held rigidly in position by a shake proof sleeve arrangement. Mast has 3/8-24 base stud to fit all standard mobile mounts. Power rating is 75 watts dc input A.M. — 250 watts PEP input for SSB.

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Part No.	Description	Total Height of Antenna	Amateur Net
MO-1	54" Mast folds at 15" from base	(For Rear Deck or Fender Mount)	\$ 7.95
MO-2	54" Mast folds at 27" from base	(For Bumper Mount)	7.95
RM-10	10 Meter Resonator	Maximum 80" — Minimum 75"	5.95
RM-15	15 Meter Resonator	Maximum 81" — Minimum 76"	6.95
RM-20	20 Meter Resonator	Maximum 83" — Minimum 78"	7.95
RM-40	40 Meter Resonator	Maximum 92" — Minimum 87"	9.95
RM-75	75 Meter Resonator	Maximum 97" — Minimum 91"	11.95

**ANY MAST OR RESONATOR MAY BE PURCHASED SEPARATELY**

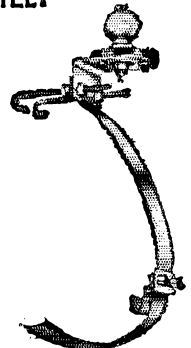
**FITS MORE CARS THAN ANY OTHER BUMPER MOUNT!**

**MODEL BM-1.** Flat alloy steel strap fits tightly against any shape bumper yet is inconspicuous. Length of strap permits its attachment to both large and small bumpers.

Assembly is held in place by two "J" bolts at the top of the bumper and strap, clamp at the bottom. "J" bolts may be inserted between top of bumper and car body where clearance is as low as 1/4".

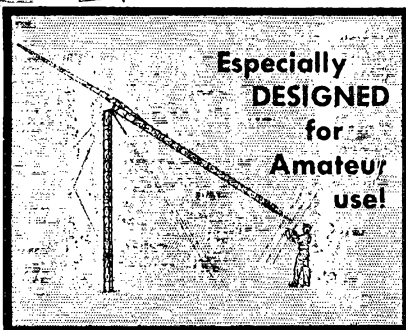
Whip receptacle assembly consists of a heavily chrome plated 1 1/2" die cast Zamak ball with 3/8-24 thread. Adjustable so as to maintain whip in true vertical position. Black phenolic base. All metal parts of the bumper mount are heavy cadmium plated. ....\$6.95

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gram is trying to start some c.w. code classes provided they can get the right equipment. Traffic: KZ5JW 161, KZ5TF 52, KZ5OA 46, KZ5AD 43, KZ5OB 23, KZ5SH 21, KZ5TD 18, KZ5VF 12.

### SOUTHWESTERN DIVISION

**LOS ANGELES**—SCM, Albert F. Hill, jr., W6JQB—Asst. SCM; Lyle G. Farrell, W6KGC. PAAs: W6ORS, K6PZM. RAs: W6BHG, WA6ROF. The following stations earned BPL in June: W6WPF, WA6TYX and K6-EPT. Congrats, fellows! W6BRO has a new Drake 2-B receiver, K6EVR worked several new ones on 20-meter c.w. W6CG has the Worldwide RTTY Contest lined up for October. WA6TYR reports fine work in amateur communications for the Redondo Beach Boat Race. W6SRE has moved to Alamitos Bay for the summer. WA6ODF is planning to make the Seattle Fair. WA6-CKR received a broken foot at the MITN Round-up in Santa Cruz. A speedy recovery, Mickey! WA6DWP completed his electronics course at Citrus College. WA6QNN is Sunday NCS for the Golden Bear Net. New officers of the San Gabriel Valley Radio Club are W6GVU, pres.; K6GNO, vice-pres.; WA6GLF, 2nd vice-pres.; K6TRH, secy.; K6ZWR, treas. W6VUZ has a new SB-10 s.s.b. exciter. K6THM has a broken leg and is in the L.A. General Hospital. W6NKR worked VQ1DR for a new country. WA6KVS welcomed a new jr. operator June 15. K6UMV received his CP-30 certificate! W6VOZ visited W6COB in Colorado Springs, Colo. W6GYH spent a well-deserved three weeks in Victoria, B.C., and visited the Seattle Fair. New officers of the Conway/Pomona Ham Club are K6CT, pres.; K6LHA, vice-pres.; K6-JYR, secy.; WA6LLB, treas. W6UGA put up new 20-meter beam and is working lots of DX. New officers of the Romona Radio Club are K6GWH, pres.; W6TMY, vice-pres.; W6QVK, secy.; WA6UPT, treas. New officers of the Tri-County Amateur Radio Assn. are WA6ORJ, pres.; WA6HIB, vice-pres.; K6CHH, secy.; K6YTQ, treas. Support your section nets. On c.w. the Southern California Net (SCN) meeting on 3600 kc. at 0300 GMT daily; on phone, the Southern California 6 Net (SoCal 6) meeting at 0230 GMT daily on 50.4 Mc. Traffic: (June) W6WPF 1968, K6EPT 304, K6IUV 356, WA6TYX 327, K6MDD 295, W6QAE 278, W6GYH 251, WA6JDB 225, WA6QNN 199, WA6ROF 195, W6BHG 130, K6YVN 130, K6OZJ 94, WA6VFX 66, WA6TYR 55, WA6CKR 35, K6HOV 34, W6USY 28, K6STX 18, K6-UMV 16, W6NKR 14, W6EBK 12, WA6LJB 11, W6CG 10, WA6QMC 10, WA6KVS 9, W6UGA 6, W6VOZ 6, WA6GRG 5, W6SRE 4, WA6KVA 1, WA6SLF 1, W6VUZ 1, (May) WA6ROF 14, K6SIX 42, WA6KVS 33, K6UMV 17, (Apr.) W6PNE 213.

**ARIZONA**—SCM, Kenneth P. Cole, W7QZH—Asst. SCM/SEC, George Mezey, K7NIY. PAM: W7OIF. RM: W7LND. The Copper State Net meets at 1930 MST Mon. through Fri. on 3880 kc.; the Grand Canyon Net Sun. at 0800 MST on 3880 kc.; the Tucson AREC Net Wed. at 1900 MST on 3880 kc.; the Cochise County AREC Net each Sun. at 1400 MST on 7260 kc.; the Tucson 2-Meter Net at 1000 MST on 145.35 Mc.; the Arizona Interstate Net, c.w., Mon. through Fri. at 1900 MST on 3555 kc. The Sun City Amateur Club elected K7NIY, pres.; K7RDC, vice-pres.; K7RUR, secy.-treas. The Club has 11 members, all ARRL members. Congratulations to one of the first Honor Roll clubs in the state. K7RUR (formerly W6BUK) vacationed in California and attended the Mission Trail Net Roundup at Santa Cruz. The Scottsdale Amateur Radio Club elected W7YAL, pres.; K7DLW, vice-pres.; K7BGL, secy.; K7HQI, treas. The club meets at the Western Savings and Loan Building the 4th Mon. of each month promptly at 2000. The Catalina Radio Club, Tucson, Ariz., elected K7IBX, K7RKC, W7UCX, W7CUR and W7LHN to its Board of Directors. W7AMM, EC for the Sierra Vista Area, has been awarded a BPL certificate. W6WHE/7 also originated and delivered the required number of messages for BPL. Traffic: W6WHE/7 416, W7AMM 214, W7CAF 40, K7CET 8, K7RUR 1.

**SAN DIEGO**—SCM, Don Stansifer, W6LRU—My sincere thanks to W6EWU, my Assistant SCM in San Diego, for keeping me posted while I'm away this summer. K6JPI, Wes Lees, San Diego, is now Section Emergency Coordinator. He is ex-City Radio Officer for c.d., is retired from the Marine Corps, and knows emergency communications. I'm sure with the assist of section ECs we soon will have an emergency program second to none. W6UWL, in Orange County, was a recent Far East visitor. A meeting was held in San Diego in mid-June to organize a San Diego Chapter of the QCWA. About 85 members and guests attended and elected W6BKZ temporary chairman and W6GWY secy.-treas. W6AKY was the oldest ham present. George Floore, old 160-meter standby, is relicensed and active on 20, 40 and 80 meters as WA6YMN. W6MHY has a  
(Continued on page 134)

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73, *Bil Harrison, W2AVA*



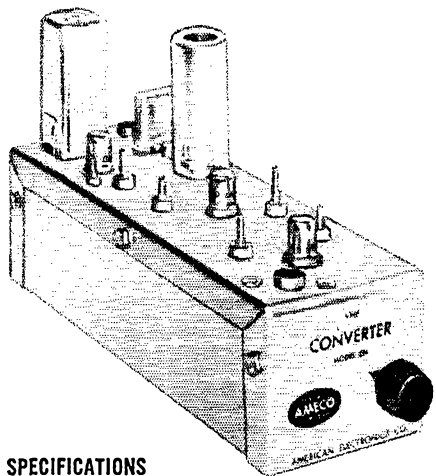
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Write Dept. QG for new catalog showing low cost converters and OTHER Ham Gear.

**AMECO EQUIPMENT CORP.**

178 HERRICKS RD., MINEOLA, L. I., N. Y.  
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new half-gallon linear using four 211A tubes. W6IEY, OES, reports many good 6-meter openings during June. WA6ZOW is now an OES in Orange County. W6SK, San Diego again is aiding his fellow hams by taking time to serve as an OO. Both K6EC and W6CAE turned in excellent FMT results for the May FMT. WA6OAC now on 420 Mc. and WA6PIB is now on 6-meter mobile on a motor scooter. Field Day sounded red hot from up here, and better than usual operating was noted from all participants. Traffic: K6BPI 3501, W6IAB 2547, W6YDK 2176, W6UUS 831, W6EOT 592, WA6CDD 188, K6GJM 4, WA6PDE 4.

**SANTA BARBARA**—SCM, Robert A. Hemke, K6CVR —W6LLK, WA6JXH, WA6KNU and WV6SGU were instrumental in the handling of 600 messages at the Ojai Valley Tennis Tournament. The net was out for ten hours but the net control kept the traffic flowing in an orderly fashion at all times. If you want to know more about this club, look for them at 3875 kc. Sun. afternoons. The Poinsettia ARC changed its 2-meter check-in to 1630 GMT Sun. Net calls are WA6YYH and WV6WUO, both in the Ventura Area. The Santa Barbara ARC had Don Stoner as its guest speaker. Don gave an up-to-the minute report on Oscar. The Fishy Hamfest took place at Foster's Park in Ventura. A total of 60 licensed rams attended plus their families. Space does not permit us to list all the calls, but K6RWP certainly was busy directing mobiles to the hamfest. We have a new club in Baywood Park, the Estero Radio Club, K6HGK, the club secretary, informs me that the club is ready to organize an AREC. Traffic: K6HGK 4.

**WEST GULF DIVISION**

**NORTHERN TEXAS**—SCM, L. L. Harbin, W5BNG —Asst. SCM: E. C. Pool, W5NFO. SEC: K5AEX. PAM: W5AYX. RM: W5LR. An epidemic of chigger and mosquito bites along with the irritation of poison ivy and sunburn marked the end of another Field Day. After all the inconveniences of loss of sleep, dirt and trash in the scrambled eggs and of some prankster putting salt in the sugar-can, I don't think you could find a single ham who would not say he had a big time. Field Day messages were received from W5VFM/5, W5CF/5, W5VUE/5, K5FKH/5, K5YEA/5, K5SLD/5, W5FC/5, W5TKB/5, K5OJI/5, K5LHT/5, W5NW/5, K5ODH/5 and K5LDL/5. I am unable to understand why more FD messages were not received. That is the easiest way of adding 25 points to your score. Be sure to call this to the attention of your FD chairman next year and see that he files an FD message. K5QWR has resigned as net manager for the TEX C.W. Traffic Net. Congratulations, Ben, on a job well done. I regret to inform you of the death of W5VGC June 7. Hugh was Lubbock County EC, a member of the ARRL, the South Plains ARC and Army MARS, and was very active in c.d. and RACES work. As a suggestion to mobile operators and anyone who drives a car, think about having seat belts installed in your car. One ham recently was killed when he was thrown from his car after a collision with another car. I would like to remind all holders of certificates to check the renewal dates and have them endorsed by the SCM at the proper time. Traffic: W5GY 439, W5BKH 184, K5QWR 158, K5RAV 99, K5PXV 61, W5EXU 8.

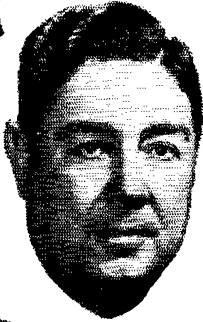
**SOUTHERN TEXAS**—SCM, Roy K. Eggleston, W5QEM—SEC: W5AIR, W5AUM is the net control for the South Texas Emergency Net. He is elected at the STEN Convention at Victoria. He is one of the old-timers in this part of the country and will make an FB net control. All South Texas owes W5CIX, the outgoing control, a vote of thanks for the fine work he did with the net. This was proven during Hurricane Carla. W5QKF and W5AIR visited the El Paso Amateur Radio Club, W5QEM and K5COZ, W5QKF and XYL visited in San Antonio at the club. Band conditions have been very poor in South Texas, especially on the 75- and 40-meter bands, although DX has been exceptionally good on 20 meters. The s.s.b. bug finally bit W5BRZ, running the DX-100 and Heathkit exciter. W5AQK, W5QKF, W5HQR, W5SIL, W5RPH and W5QEM furnished communications for the July 4th Parade in Corpus Christi. They used 2-meter mobiles and had very good coverage. Maybe we will have more news after the summer let-down.

**CANADIAN DIVISION**

**MARITIME**—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A.E.W. Street, VE1EK, and H. C. Hillyard, VO1CZ. Deepest sympathy is extended to the family of VE1EY, who has joined the ranks of Silent Keys. Humorous Field incidents include the one which forced VE1KX to make a gasoline filter bowl out of wood and  
 (Continued on page 138)



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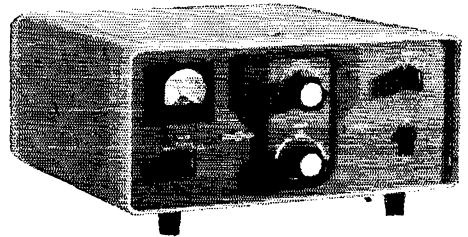
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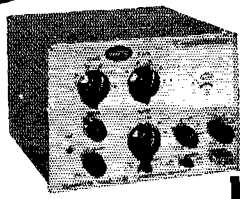
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a gasket from a car floor mat to put VE1PF/1 back in operation! Congratulations and best wishes to VE1OZ and his bride. VE1CL reports working over 70 stations on 6 meters in a recent opening. Burns states he could have worked many more but the pileup was too terrific! From SONRA: New calls include VO1EM, DU. The Bob Lewis Award was presented to VO1AA, active in amateur radio for over 41 years. Interested in WAVO award? Request a copy of the rules from P.O. Box 1226, St. John's, Newfoundland. VO1FC is active on 2 meters. VO1EI is on phone. VE1ACY has transferred to VE3-Land. VE1NV has a new 6-meter quad. VE1MQ has a new HT-30. VE1UW is on 6 meters and VE1OB is on 50-Mc. mobile with a new rig and halo. VE1AFP is the first VE1 to receive the W-VT (Worked all Vermont) Award. Traffic: VE1WB 18, VE1OM 6.

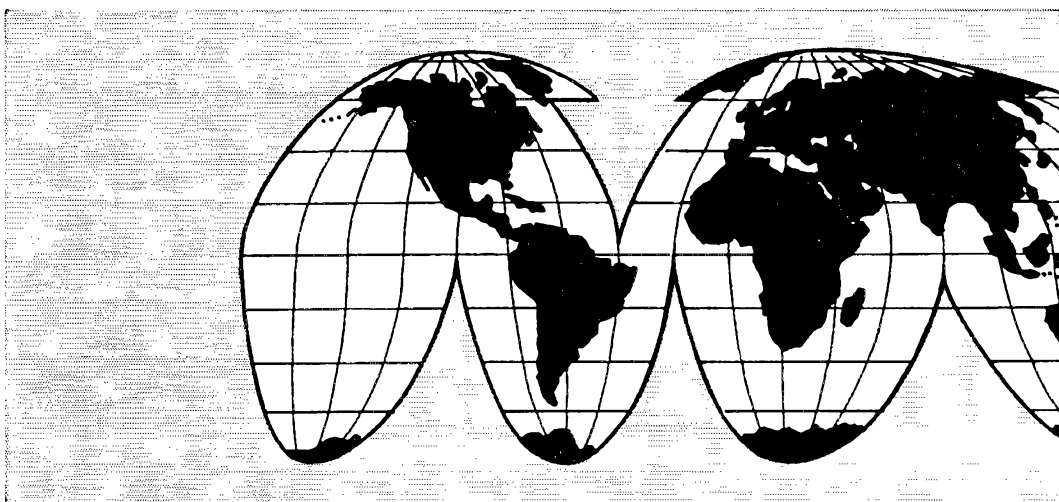
**ONTARIO**—SCM, Richard W. Roberts, VE3NG—VE3ACU is out of the hospital. VE3COE reports the Hamilton ARC is running a worked-all-members contest within the club. VE3EIK soon will be back on the air. VE3CJ and VE3QU were fishing at Loring. VE3-RCS, at Vimy, is hot on 2 meters. The ARRL Canadian Division Newsletter is very welcome. Keep it up, Noel, we need it. VE3DKR, VE3CMN and VE3EUX are now Class A, while VE3FEI, VE3FDV, VE3FEN and VE3FEA are newcomers to the airwaves. All are members of Skywide of Toronto. We regret to record that VE3FAT is a Silent Key. VE3BWL is a new OO and is hot on 6 meters. Windsor made over 12,000 points in the Field Day activity. Who will beat that? VE3EMA won the Ontario section of the YL-OM Contest. The Huron ARC officers are VE3CYF, pres.; VE3DYB, vice-pres.; VE3CYE, secy.; VE3CXX, editor. VE3CKP is visiting in Wales. VE3DYB is s.s.b. VE3DPG will be s.s.b. soon. VE3BJR is now in Sarnia. New hams are VE3EXI and VE3AFJ, members of the Huron Club. VE3CXL is moving to the U.S.A. The London Club ran up over 500 Field Day contacts. The LARC had some very nice write-ups in the local press. VE3EXJ is now s.s.b. Our PAM has won his second BPL award. We now find that we have two LARCS, the London group and the Lakehead ARC. Could it be that we will have two LARC awards? The president of the Lakehead gang is VE3AGA, with VE3EG as assistant and VE3EEK as secretary. The club is ARRL affiliated. Eight members of the Oshawa Club passed their D.O.T. test. VE3CMG is living in B.C. May I urge all clubs or individual members to consider a donation to the ARRL Building Fund. Even though the Headquarters is in the U.S.A. we are a part of it, and will be for some time to come. My sincere thanks to all who were instrumental in my reelection as SCM. VE3NF now is on RTTY. VE3DSX is mobile on all bands. Traffic: VE3FES 170, VE3FAS 152, VE3NG 147, VE3CYR 109, VE3CFR 98, VE3DPO 86, VE3AML 48, VE3BAQ 39, VE3DRF 39, VE3NO 35, VE3EHL 28, VE3GP 21, VE3CFI 16, VE3AKQ 15, VE3DU 14, VE3DWN 10, VE3DUU 9, VE3DH 8, VE3BUR 7, VE3AUH 6, VE3EPM 6, VE3-FES/3 6, VE3LK 6.

**QUEBEC**—SCM, C. W. Skarstedt, VE2DR—Asst. SCM: Jean P. Achim, VE2ATL, VE2ADX, VE2ARC, VE2CO, VE2APX, VE2UN, VE2BY and VE2QI kept some 70 operators on the hop on Field Day. VE2BEN and VE2BEH are the first locals on RTTY. VE2TY, VE2RS, VE2PY and VE2AZF are active. Surplus machines were snapped up by many and possibly some owners, not active, would be glad to pass on to stations anxious to try this mode of communication. Contact VE2BEN, VE2LO is married again. VE2BK, VE2GK and VE2JK enjoyed golf at Lake Louise. VE2AGI, on 80, 40 and 2 meters, is always ready for emergency work. VE2SH's new QTH is Timmins, Ont. VE2AQV reports the Montreal Technology Institute (VE2BDS) was instrumental in getting VE2BLI, VE2BJW, VE2BNJ and VE2AQV on the air. There is talk of a Trans-Canada net again. VE2DR reaped a heavy front yield at Murray Bay. VE2UQ handled the Canadian end of the Oscar II project efficiently and VE2BK helped pass traffic. VE2ZO travels the world for TCA; is back from VK- and off to PY-Land. VE2AMB expects a TH-2 beam shortly with a new SX-115, HT-37 and HT-41. Our Asst. SCM proudly announces the arrival of an 8½-lb. girl and reports: VE2BHA and VE2UT are active on 2 meters. VE2BC also is active with 500 watts. VE2JU has a Ranger II and an SX-111. VE2PX is en la visite de W2AFT. VE2AN est maintenant au 574 rue Ouimet à St-Jérôme. VE2SO s'est construit un gros pouvoir. VE2BKE s'est construit un convertisseur de 2 metres en employant des nuvisters. VE2AAD opere maintenant en s.s.b. VE2PY est redevenue SWL pour quelques mois. Traffic: VE2DR 81, VE2BK 40, VE2AU 32, VE2CT 27, VE2BT 26, VE2BG 18, VE2EC 13, VE2AQV 12, VE2AJD 10, VE2ALE 8, VE2SD 6, VE2BLR 5, VE2AXU 4, VE2YA 3.

(Continued on page 138)

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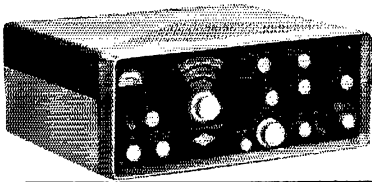


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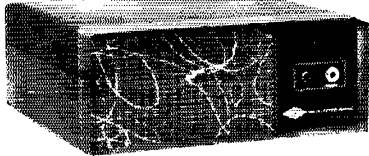
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**ALBERTA—SCM, Harry Harrold, VE6TG—SEC: VE6FS. PAM: VE6PV. RM: VE6AEN. ECs: VE6ABS. VE6SS, VE6FK. OOs: VE6HM, VE6PL. OBS: VE6HM. ORSs: VE6WG, VE6BR. OPS: VE6CA. OESs: VE6DB. VE6HO.** Our PAM reports that summer static is very bad, but the boys should try for their section net certificates. Our RM reports that with all the traffic outlets, traffic is at a very low ebb these days with very little coming into Alberta. Our SEC reports that emergency groups are coming along fine and should be ready to put on a province-wide test drill this fall. Most of the boys have consented to help out with the Boy Scout Jamboree this October. The Calgary gang sure is active with something going all the time. Are there any hams in Edmonton? If so, we would like to hear from them. We know that there is a club up there called the NARC. VE6TG, VE6ABS and VE6ADJ had the pleasure of attending the first social of the newly-formed club at Vulcan. This looks like a 100 per cent ARRL club. Nice going, fellows, keep it up. Traffic: VE6HM 161, K4-RAJ/VE8MA 100, VE6AEN 11, VE6FS 10, VE6CA 2, VE6BA 4, VE6FK 4, VE6VE 3, VE6PZ 2, VE6UH 2, VE6PV 1.

**BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB**—1962 paid licensed amateurs for B.C. total 1150. Twelve clubs checked in with Field Day traffic for the SCM. We have a new Section Emergency Coordinator, VE7OM. How about supporting him by asking for and filing a Form 7? To my six faithful reporters, many thanks again for your service. I would like to get news from other parts of B.C. Rumors have been confirmed that VE7GE and VE7DV have done it and the VE7s will have their call signs on their motor vehicles in 1963. Thanks, gentlemen, for a job well done. VE7XM and VE7AQG have gone s.s.b. The Nanaimo ARC's new president is VE7PN; vice-president is VE7BBQ. VE7AC reports DX is good with 33 countries worked in two months. VE7BGE has had school work and has been in the hospital but hopes to be active again soon. VE7BBB still is piling up her scores on countries and certificates. More and more voices are being heard on 2-meter mobile in Vancouver. Please, let's have a 2-second pause on 3755 kc., the AREC net frequency, for mobiles. You who want c.w. practice, check 3650 kc. at 7 and 10 p.m. Daylight Time. The BCEN is always looking for new members and there are many places in B.C. that are needed to fill the gap. Traffic: VE7AGF 111, VE7AC 19, VE7AOY 4.

**MANITOBA—SCM, M. S. Watson, VE4JY—The WARA and the Bison Club joined in Field Day operations at Birds Hill. At the WARA June meeting VE4AX gave a talk on Semiconductor Fundamentals. The RCAF tour under VE4MG, VE4TK, VE4RI and VE4GI was enjoyed. The ARLM meeting was favored with a talk by representatives of CJOB on Stereo Multiplex F.M. broadcasting. The Beausjour Club was active on Field Day under the direction of VE4JW, our QO. The so-called DX Club, with VE4CJ, VE4TJ, VE4SA, VE4MP, VE4XJ and VE4NO operating, made 300 contacts on Field Day from Falcon Lake. Your SCM received Field Day messages from VE4JW, VE4XV, VE4CJ and VE4DF, the latter operating from Big Island Lake. VE4IV, our OBS, sent in the only station activity report in June. How about letting your SCM hear from you? New licenses were issued by DGT to VE4AQ, VE4AR, VE4CC, VE4FR, VE4PX, VE4RI and VE4ZD. VE4DX, editor of the ARLM *Satellite*, reports a pleasant trip to Britain. VE4HW received WAW Award No. 13. It is with deep regret that we record the death of VE4XP May 19. Jack was a prominent amateur and a past-pres. of the Dauphin Club. Traffic: VE4JY 22, VE4AN 4, VE4GB 4, VE4QD 4, VE4HF 2, VE4JA 2, VE4MN 2.**

**SASKATCHEWAN—SCM, Jack Robinson, VE5BL—Clubs at Moose Jaw, Saskatoon and Regina were active on the Field Day week end with scores comparable to those of last year's event. The hamfest at Saskatoon was a successful event with about 170 hams and families taking in the proceedings; altogether there was a total of 332 registrations with hams from Ontario, Manitoba, Alberta, British Columbia, Montana, North Dakota and Saskatchewan attending. VE5JT won the C.W. Contest. VE5MG had the best homebrew gear. The oldest ham was VE5AT. VE5EA walked away with both the CKBI Trophy and the fur-lined buttonhole. VE5LO was guest speaker after the banquet. VE5QC found the hidden transmitter with VE6MQ a close second. VE5GT, VE5GQ and VE5TH won the mobile judging contest, respectively. Special prizes were won by VE5YT and VE5SX. VE5DCI had the honor of traveling the farthest distance, while the main prize went to Regina.**

**SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, VE4QV—K4HDX, Jack Worthington of 418 Crestview Drive, Spartanburg, is your elected SCM for the next**

(Continued on page 140)

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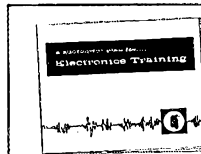
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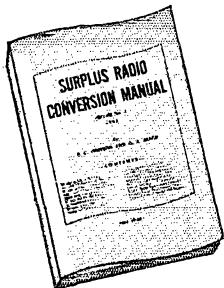
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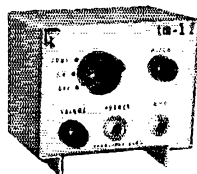
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two years. Let's all give him our unqualified support at every opportunity. W4GQV hopes to have more time to get "on the air" after releasing his responsibilities as SCM to his successor. W4PED has taken over publication of *SCN Net News*. The summer issue of *Scarah* is off the press and the Rock Hill RC is busy preparing for the big Oct. 14 Hamfest to be held at Joslin Park. Interest in PD was widespread and excellent scores should be turned in by many clubs and groups. Reports from the c.w. and phone nets show some lag in activity, as is usual during the summer months, but the nets are extremely well operated. The hurricane season is here and several local and area nets are well organized and ready. Traffic: K4OCN 67, K4KIT 63, W4ADGH 62, K4LND 39, K4HJK 30, W44CSO 8.

**SACRAMENTO VALLEY**—SCM, George R. Hudson, W6BTY—Asst. SCM/SEC: Antone F. Buzdas, K8-1KV, EC8; W46ONK, K4VNP/6, K6BNB, K6GOT, W6LSW, OBSS; W6AF, W6WGO, K6IHD, K6EIL, OCS; W6WLI, K6ER, K6HEZ, W6ZJW, K6EIL, W46NAU, W6TFH, OBSS; W6WGO, W6CEI, K6YZU, OES; W6PIV, OPS; W6WGO, K6EIL, W6PIV, W6GQS, W6PVT, W46ONK. Congrats to new OO K6HEZ, in Milford, and to new OBS K6EIL, in Sacramento. The Valley's youngest club, Yolo County ARC, featured speaker Nay Landry of the S.P. FCC office at a recent meeting in the Capitol Inn. A big crowd attended, says prexy W46MIO. The new manager of SCN is W46DAU. Check-in time is 0200Z daily. W6ZJW says WX conditions have curtailed activity up his way. W6AF is running 950 watts, has a three-element beam, a GPR-90 receiver, has received WAS, WAC and WAZ Awards and still has time for OBS work. W46PVT went portable for Field Day. W6TFH has a twelve-element beam on 2 meters and is almost ready to go on with RTTY. W6WLI is on RTTY with contacts into the Bay Area via a 14-Mc. repeater on Mt. Yaca. W6GDO and committee furnished 2-meter communications again this year for the Annual Stockton Yacht Club Motorboat Races, Stockton to Colusa and return. Your Asst. SCM/SEC and SCM attended the downtown Sacramento ARC Annual Mid-year Dinner Party, chairmanned by K6QIF, in the Cypress Room of Country Club Centre. K6KFF and W6YHI are doing some good extended range work with high-power s.s.b. 144 Mc. has many new calls on it, making more interesting monitoring. 432 Mc. came to life locally during June. W6VZK has a big signal with a Frank Jones type transmitter.

## Oscar I. A Summary

(Continued from page 62)


equatorial crossing longitude for the beginning of the orbital sequence.

## Acknowledgments

The information contained in this report was obtained from 5200 observations made by more than 570 radio-amateur tracking stations in 28 countries. Processing of the data was handled by members of the Hewlett-Packard Amateur Radio Club, who have contributed many, many hours to reading, transcribing, sifting and interpreting the individual reports. They are to be commended for their work. The material presented in this report is the summation of evaluations and reports made by members of the Oscar Association.

*Oscar Data Reduction Group:* Harold White, K6RNX; Arthur Walters, W6DKH; James Endsley, W6RRU; Bernard Critz, W6PDI; Carl Shaw, W6IITR; Carl Buchhass, W46GGW; Joe Chandler, W6LOJ; Conrad Bleau, Don Norgaard, W6VMH; Henry Briske; Leonard Clarkson, W6BCD; Charles Clavell, K6JKI; Edgar Hilton, W6VKP; William Hixon, W46EEV; Ira Rogers, K6GAP; William Spurgeon, K6OKM; Lesley Vickery, W6AKR; Dorothy Ligon, K6ZLQ.

*Oscar Data Analysis Group:* Harley Gabrielson, W6HEK; Carl Hillestad, W6LFP; John Gibson, K6YGS; Ralph Wells, K6QMJ; William Haven, W46ALD; Arthur Walters, W6DKH. (Note: Harley Gabrielson, W6HEK, prepared the special report of the Data Analysis Group, from which much of the material in this article is derived.)

To them all, thanks for a job well done! 

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TS-884 — 84" Same description as above		4.50
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 Dbl. to 40 Meter 3576-3599. Steps of 1 KC. FT-243  
 15 Meter 5276-5312—7034-7083 Steps of 1 KC. FT-243

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## V.H.F. Party Summary

(Continued from page 27)

### HUDSON DIVISION

Eastern New York  
 WA2BAH 16,848-316-52-ABC  
 WA2SPG/2

852- 71-12-A
WV2VDM 684- 76-1-B
W2CTH 400-40-10-AB
WA2ROJ 203- 29- 7-AB
WV2ZGM 80- 20- 4-B
WA2TOK 78- 26- 3-A
WA2VJY 76- 19- 4-AB
WA2YJL 60- 30- 2-A
W2ZQK 51- 17- 3-B
W2HF/2 48- 12- 4-B
W2LW1/2 (14 ops.)
50,616-645-72-ABCDE
W2ZRV/2 (8 ops.)
21,424-396-52-ABCDE
W2AF/2 (7 ops.)
13,920-348-40-AB
K2JLL/2 (6 ops.)
8970-205-34-AB
K2YVE/2 (8 ops.)
4218-222-19-AB
WA2IMG (WA2S IMG FQA)
2502-139-18-A
K2HSL/2 (5 ops.)
1071- 60-17-ABE

### N.Y.C.-L.I.

W2SEU 5146-138-31-ABC
K2MUB 4175-167-25-A
K2IPY 3538-122-29-AB
WA2FBA 2940- 99-28-ABC
W2KXG 1536-128-12-B
WA2PUE 1104- 69-16-AB
K2DUX 803- 73-11-B
WA2VUG 730- 78-10-B
WA2DRK 564- 47-12-B
W2ZVKK 594- 30- 2-A
WA2YLL 531- 59- 9-B
WA2EUS 420- 42-10-B
WA2IFP 414- 40- 9-C
WA2WOR 300- 61- 6-A
WA2RJJ 300- 50- 6-B
WV2ZJF 280- 35- 8-B
WV2YBC 180- 20- 9-B
WV2YXK 160- 40- 4-B
WA2WGV 110- 22- 5-B
W2ZVKK 104- 26- 4-B
WA2MXZ 93- 31- 3-B
WV2TYC 48- 12- 4-B
W2HF/2 28- 7- 2-C
WA2YHF 24- 12-2-AB
WA2OUM 18- 9- 2-B
W2BYN 12- 4- 3-B
K2SWI/2 (21 ops.)
17,708-464-38-ABE

WA2GFP (WA2S GFP VNK YMN)
7752-210-34-ABCDE
K2UMO/2 (K2S MITT UMO UMN)
5600-224-25-AB
W2EIC/2 (W2EIC, K2s BGJ GYT)
4263-203-21-AB
WA2BNK (W2A2-NK, WV2-YGA)
1100-100-11-B
WA2FUL (WA2A FRW FUL)
832- 64-13-A
WA2YDB (WA2S YDB YHS)
399- 57- 7-B

WA2RKK (W2N2QK), WA2-RKK)
203- 34- 6-AB
WA2IKN (WA2s IKN JUG)
117- 39- 3-B

### North. New Jersey

K2LNS 13,566-357-38-AB
W2FHR 8370-280-31-ABC
W2GKR 5920-179-32-ABE
WA2BDP 2730-130-21-AB
K2RGF 1550- 60-25-ABE
WA2VEH 1313-101-13-A
WV2WL 1130-113-10-B
WA2DLI 1100-113- 80-B
WA2PGY 1104- 92-12-B
WA2JSB 672- 84- 8-B
WA2EMA 616- 44-14-B
W2WE 616- 56-11-B
WA2VWV 470- 47-10-AB
WV2YEB 420- 60- 7-B
W2DZA 252- 20- 6-CD
WA2IDH 216- 54- 4-B
WA2VTE 65- 13- 5-B
W2PDC 48- 12- 4-B
W2CCF 16- 6- 3-B
W2PEZ/2 (11 ops.)
27,330-843-83-ABCDE
W2ZDR/2 (4 ops.)
22,015-629-35-AB
K2BJP/2 (20 ops.)
19,875-387-47-ABCDE
K2OKA (K2OKA, WA2VCO)
9486-305-31-ABD
WA2VLR (4 ops.)
6291-233-27-AB
W2JUJ/2 (7 ops.)
4532-200-22-AB
WA2SAB (WA2S ASV SAW)
2397-141-17-AB

WA2PTS (WA2s KZV PTS)
2015-155-13-B
WV2VUT (WV2s VUT VUS)
720- 46-15-A
K2YNT (WA2s KZV NT)
460- 46-10-AB

### MIDWEST DIVISION

#### Iowa

W0PFP 2700-108-25-AB
W0PFG 1558- 97-14-A
K0HBP 720- 46-15-A
K0DDUG 686- 49-14-A
W0RMM 520- 52-10-A
K0RTF 151- 41-11-AB
W0DRLE 441- 40- 9-A
K0LTX 351- 39- 9-A
W0EHW 710- 30- 7-A
W0FIP (W0FIP, K0HTK)
672- 56-12-A

#### Kansas

K0ITF 8094-213-38-AB
W0QDH/0
2052- 57-36-AB
W0YZZ 1620- 81-20-AB
K0GIC 1608- 67-24-AB
K0RWC 486- 27-18-A
K0YEQ 329- 47- 7-AB
K0LTA 112- 16- 7-AB
W0HNG 30- 10- 3-B
W0NBDU 8- 4- 2-B
W0ROY/0 (W0ROY, W0N-ATF)
108- 4- 4-B

#### Missouri

K0LCB 5280-176-30-A
W0CML 1494- 84-18-A
K0SFP 1360- 68-20-A
K0JNH 792- 44-18-A
W0RVA/0 (4 ops.)
1449- 69-21-AB

#### Nebraska

K0SRV 1230- 82-15-A
K0LTA 901- 53-17-A
K0ABI 816- 51-16-A

### NEW ENGLAND DIVISION

#### Connecticut

W1BYX 5350-214-25-AB
W1YDS 2700- 79-30-ABCDE
W1WHL 2583-123-2-AB
W1MHE 2261-133-17-B
K1PKQ/1

2106-162-13-B
K1QQZ 1581- 93-17-A
K1RGO 756- 84- 9-B
K1WLE 127- 14-AB
W1LGE 645- 43-15-A
W1LCP 564- 47-12-AB
W1MFT 473- 27-11-BC
W1CIV 320- 32-10-B
K1NTRS 275- 55- 5-B
W1HJP 274- 27- 7-A
K1SBB 216- 36- 6-B
K1QEO 204- 34- 6-B
K1NUTU 200- 50- 4-B
K1VIK 160- 40- 4-B
K1NVTU 160- 40- 4-B
K1PFD 144- 39- 4-B
K1RFS 120- 24- 5-B
K1TFE 75- 15- 5-A
K1NVM 63- 21- 3-B
W1HAN 54- 18- 3-B
K1LW 2- 1- 1-D
W1GB/2 (11 ops.)
20,470-329-46-ABC
K1BUK/1 (K1s BUK DBA)
1584-191-24-AB

W1IPN/1 (6 ops.)
3504-146-24-AB
W1HXG (W1HXG, K1LOGC)
2596-118-22-AB
W1AWS (K1MFT, W1RUMD WPR)
2156- 98-22-AB
K1PLR (K1s PLR LKE)
528- 86- 6-AB
K1SBN/1 (K1SBN SWA)
1555- 31- 5-B
W1CUT/1 (K1LW, W1-CUT)
8- 2- 2-BE

#### Maine

K1NTC 2000-100-20-A
W1COP 540- 60- 9-B
W1EOM 56- 14- 4-B
K1OYB 16- 16- 1-B
K1GPJ (K1s GPJ TUL)
945- 63-15-A
K1HAY/1 (K1s HAY QIC, W1CFE)
588- 49-12-AB
K1KKK (K1KKK, K1N-TEU)
88- 22- 4-AB

#### Eastern Massachusetts

K1QHO 3841-187-23-A
K1BRZ 2260-113-20-AB

(Continued on page 144)

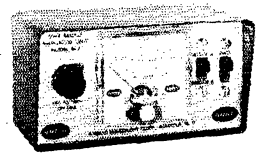




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High quality bridge accurately reads SWR's from 1.8 to 225 mc. (including ham, CB and commercial bands). Can handle up to 1 KW.

Uses inductive coupling and can be left in the line continuously without insertion loss. Contains two SO-239 VHF connectors. Satin copper case, 1 1/2" x 2 1/4" x 4 1/2". Wired and tested. **\$9.95**



**AMECO MODEL BIU BRIDGE INDICATOR UNIT**

Model BIU, when used with the Ameco SWB or other make of bridge, will accurately read SWR, percentage power and percentage voltage (3 scales). Contains a sensitive 100 microampere 2 1/2" D'Arsonval meter. Unique switching circuit provides for reading either one of 2 bridges. Charcoal grey cabinet with satin copper panel, 2 3/4" x 5" x 3". Wired and tested. **\$15.95**



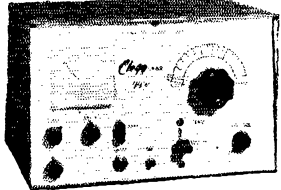
**AMECO MODEL CSB  
CONVERTER SELECTOR BOX**

Model CSB makes bandswitching possible with several VHF converters. 4-position selector switch allows user to switch any one of up to 3 converters or connect the receiver directly to the low band antenna.

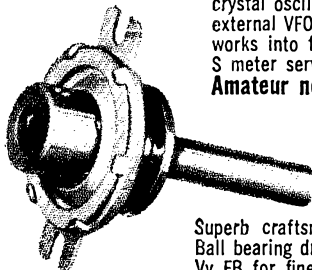
Both RF and power are automatically switched. Can be used with Ameco or other makes of converters and power supplies. Available in kit form only, with all plugs and cables. Size: 2" x 2 1/2" x 4 1/2". **\$9.95**

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A true ham station, ideal for both fixed station and mobile operation. Double conversion superhet gives you extreme selectivity and freedom from images and cross modulation. Transmitter section has an ultra-stable crystal oscillator which also may be controlled by external VFO. Efficient, fully modulated 8 watt final works into flexible Pi network tank circuit. Large S meter serves for transmitter tune-up procedure. **Amateur net price \$159.95.**



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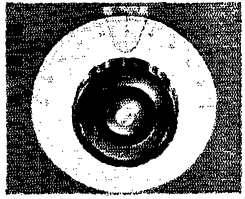
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**\$285.00**  
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**HALLICRAFTERS**  
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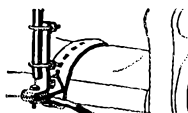
**HARRISON**  
"HAM  
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**HURRY!** see page 141, August QST  
for fabulous offers on other models too!



## "SATURN 6" MOBILEER

- ▶ Horizontally polarized
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- ▶ Adjusts to your frequency in 6 meter band
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**MODEL S-1**  
"Saturn 6" Antenna  
2-pc. adjustable aluminum mast,  
bracket, universal bumper hitch.  
No holesto drill. Co-ax feed line  
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WIJSM 2052-108-19-ABC  
KIOUV 710-71-10-AB  
WIVAH 600-50-12-A  
KIRFF 174-29-6-B  
WIKKI 147-21-7-A  
KITSH 80-16-5-A  
KIRIF 42-7-6-B  
WIBU<sup>2</sup> (5 oprs.)  
43,776-741-57-ABCDE  
WIQIB (9 oprs.)  
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KIHFM (K18 HRM HSD)  
5452-223-24-AB  
WIACT (7 oprs.)  
5040-210-24-AB  
KIUGO/1 (4 oprs.)  
3588-156-23-AB  
KIHGY (K18 IGY REX)  
1950-130-15-A  
KIGRP/1 (KIGRP, W4-  
UDK) 1729-91-19-AB  
KIHRY (4 oprs.)  
1392-116-12-B  
KNIWVN (KN18 UNK  
VWN) 98-34-2-B  
*Western Massachusetts*  
KIJQT 1304-163-8-A  
WIHDQ/1 (4 oprs.)  
492-67-8-B  
KICYG/1 112-16-7-B  
WUCB 70-10-7-AB  
KIPRI 64-16-4-B  
WIURI 18-6-3-A  
KLOOR/1 (4 oprs.)  
75,600-908-75-ABCDE  
WIOBQ/1 (4 oprs.)  
3520-160-22-AB  
*New Hampshire*  
WIFZ/1 5445-155-33-ABCD  
KIQXN 2898-126-23-AB  
WIURH 1530-85-18-AB  
KITPR 741-57-13-A  
KIPJT 360-45-8-B  
WIMHL/1 (22 oprs.)  
100,240-1136-80-ABCDE  
WIALB (W18 A1F YQH)  
4437-153-29-AB  
WIHGV/1 (7 oprs.)  
1417-109-13-AB  
KIQJT/1 (W18R, K1QJT)  
10-3-2-BD  
*Rhode Island*  
WIAJR 10,339-185-49-ABCD  
KIADK 897-69-13-A  
KIPAM 871-67-13-AB  
KIBBY 477-33-2-B  
WIFEO 225-25-9-B  
*Vermont*  
KNIRSI/1 672-84-8-B  
WIHP/1 (10 oprs.)  
10,840-250-40-ABCD

### NORTHWESTERN DIVISION

*Idaho*  
W7UBI 817-43-19-A  
817-43-19-A  
*Montana*  
W7EGN/7 600-40-15-A  
K7KOK 4-2-2-A  
*Oregon*  
K7AAD 2512-157-16-AB  
K7PXY/7 (Multiple-  
operator)  
2925-195-15-AB  
K7AUC/7 (10 oprs.)  
852-71-12-AB  
*Washington*  
K7BBO 3738-178-21-AB  
K7DTH 3302-254-13-A  
K7QQZ/7 3090-206-15-A  
W7ZOW 1188-108-11-A  
K7IQI 963-107-9-A  
KN7DP 28-13-2-B  
W7HZ/7 (Multiple-operator)  
6220-256-20-ABCDE  
K7IVC (K7S IVC JZP)  
805-115-7-A

### PACIFIC DIVISION

*Verada*  
K7ICW 555-37-15-A  
*Santa Clara Valley*  
W6YX<sup>2</sup> 1775-71-25-AB  
K6JMK/6 585-117-5-B  
W6BYA 448-28-16-AB  
W6UW/6 (18 oprs.)  
9120-304-30-ABC  
WA6MGZ (5 oprs.)  
7028-251-28-ABCD  
*East Bay*  
K6RNQ 1656-90-18-AC  
W6OJW 42-14-3-B  
K6KLY/6 (4 oprs.)  
14,040-367-36-ABCD  
*San Francisco*  
K6VXI 600-60-10-AB

W6YOB 342-57-8-A  
WA6NDZ 57-19-3-A

### Sacramento Valley

W6PIV 594-60-9-ABD  
W6ARDZ 228-35-6-ABD  
K6CFE 180-60-3-B  
K6GNP/6 76-19-4-B  
W6AK (5 oprs.)  
690-60-10-ABD

### San Joaquin Valley

W6EZA 1740-55-30-ABC  
W6SDM/6 (4 oprs.)  
2950-112-25-ABCD

### ROANOKE DIVISION

#### North Carolina

K4DNF 4100-164-25-A  
W4HJZ 3780-139-27-ABD  
K4WVP 2457-117-21-AB  
K4HJE 2356-124-19-AB  
K4YVJ 1040-70-13-ABD  
K4MBS 812-57-14-ABD  
W4BUZ 364-91-4-B  
W4CCK 246-82-3-B  
K4GPL 231-77-3-B  
W4OAB 160-20-8-AB  
K4GUV 160-40-4-B  
W4AKT 152-38-4-B  
W4REK/4 38-38-1-B  
W4TI 34-34-1-B  
K4IHN 16-16-1-B  
W4CPI/42 (8 oprs.)  
282-156-17-AB  
K4PRG/4 (K4S KSM PRG)  
1232-88-14-A  
W4GNF/4 (5 oprs.)  
1188-66-18-AB  
W4BSS (W4S BSS SVP URS)  
600-60-10-AB

#### South Carolina

K4JQY 2260-113-20-AB  
W4TLC 1530-83-18-ABC  
W4DEN 1040-65-16-AB

#### Virginia

K4DIG 1498-174-26-A  
W4LTU 2460-121-20-BD  
W4TEG 994-71-14-A  
K4GUV 160-40-4-B  
K4EJZ 40-10-4-B  
W4ZCR 16-8-2-B  
W4VWH (K4VWH, W4-  
BVV) 16,168-344-47-AB

#### West Virginia

K8HLR 1638-91-18-A  
K8AXU 611-42-13-BC  
W8AQW 520-52-10-A  
K8KDL/8<sup>2</sup> (6 oprs.)  
5887-203-29-AB  
K8WML/8 (14 oprs.)  
5348-191-28-AB  
K8EYS/8 (4 oprs.)  
6280-220-24-A  
W8BTL/8 (W8BTL, K8-  
AON) 1136-71-16-A  
K8VHE (4 oprs.)  
82-66-12-AB  
W3DHQ/8 (W3S DHQ KDZ)  
312-39-8-AB

### ROCKY MOUNTAIN DIVISION

*Colorado*  
K0ISC 4640-160-29-A  
W0AZT 2402-89-28-AB  
K0LES 430-32-15-A  
K0MNO 75-25-3-AB  
W0JUR/0 (7 oprs.)  
9801-297-33-AB  
W0PPP/0 (K0S MRY JSV,  
W0CGQ)  
4100-164-25-AB

#### New Mexico

K5UYF 2592-108-24-A  
K5UNK 2328-97-24-A  
K5IQI 800-40-20-A  
W5TXS 96-12-8-A

### SOUTHEASTERN DIVISION

*Alabama*  
K4SFF 2516-92-28-A  
W4LWL 780-52-15-A  
W4ARXU 264-24-11-A  
*Eastern Florida*  
W4GJO 32,292-508-54-AB  
W41JP 24,696-504-49-AB  
K4RNG 20,200-404-50-A  
W4LXL 7740-258-30-AB  
W4ADRJ 4981-181-31-AB  
K4IXG 3348-108-31-A  
W4ABAW 1738-79-22-A  
WN4COC 14-14-1-B

(Continued on page 146)



# FORT ORANGE

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AMATEUR HEADQUARTERS

Cable Address "Uncledave"

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UNCLE DAVE SAYS WHILE YOU'RE RESTING FROM YOUR LABORS TAKE A GOOD LOOK AT YOUR SHACK, STUDY THIS PAGE, AND THEN REMEMBER THAT FALL IS HOUSECLEANING TIME. SO FILL YOUR JUNK BOX WITH YOUR JUNK—BUT BRING YOUR TRADING ITEMS TO THE SHACK OF BARGAINS

### NATIONAL RECEIVERS

NC300.....	\$250.00
NC98.....	98.00
NC188.....	100.00
NC98.....	79.50

### TECHNICAL MATERIEL CORP. RECEIVERS

GPR90 w/spk. Excelnt. Cond.....	\$293.00
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### HALLICRAFTERS XMTRS. AND RECEIVERS

S38DB.....	44.95
S38D.....	44.95
SX99.....	89.50
HA4.....	39.95
SR34AC.....	195.00
HT32A SSB Xmtr.....	495.00
HT31 Linear.....	195.00
HT33 Linear.....	395.00
SX100 Rec.....	219.00
S108 Receiver.....	104.50
SX110 Receiver.....	129.50
SX111 Receiver.....	229.50

### GONSET XMTRS—REC.—CONV.

G5B100 SSB Xmtr.....	325.00
CommII—2 Mtrs.....	175.00
2Mtr Linear.....	95.00
VFO preamp.....	34.95
G66 with P.S.....	175.00

### COLLINS XMTRS. AND RECEIVERS

KWS-1.....	\$995.00
KWM-1 with AC PS & console....	725.00
32V2.....	250.00
75S1.....	425.00
75S2.....	625.00

### JOHNSON XMTRS. AND ACC.

Mobile Xmtr.....	\$ 69.50
Viking 1-w/VFO 122 Xmtr.....	175.00
Valiant Xmtr.....	350.00
Viking 1—Xmtr.....	125.00
Pacemaker SSB Xmtr.....	175.00
Navigator.....	115.00
Challenger.....	115.00
VFO 122.....	34.95

### "WRL"—GLOBE XMTRS.

DSB100 DSB Xmtr.....	\$ 74.50
VOX-10 Voice OP Relay.....	\$ 19.50
QT-10 Anti-Trip Unit.....	5.95
PA-1 Power Reducer.....	7.95

### VANTRON

300A Linear Amp.....	\$ 75.00
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### BARKER AND WILLIAMSON XMTRS., ETC.

5100 AM Trans.....	\$250.00
51SB.....	150.00

### HEATH XMTRS. AND ACC.

DX 20.....	\$ 44.95
------------	----------

### TUBES—NEW—GUARANTEED

All individually boxed except where noted in bulk.

	Reg.	Each	Dozen
6H6.....	\$3.50	\$1.05	\$11.50
6SJ7.....	3.75	1.15	12.65
6J7.....	4.55	1.25	13.75
45 (Bulk pack).....	2.05	.65	7.15
2A6 (Bulk pack).....	3.65	1.10	12.10
6A8G.....	5.80	1.75	19.25
6AE6G.....	2.05	.65	7.15
6SB8T (Bulk pack).....	2.75	.85	9.35
6C4 (Bulk pack).....	1.50	.45	4.95
6J6 (Bulk pack).....	2.35	.75	8.25

1962 Calendar and Schedule Pad Free with purchase of 5 Receiving Type Tubes

### BEAMS—NEW AND USED (AS INDICATED)

Mosley V-27 GP (CB) new.....	\$29.95
------------------------------	---------

We have more beams and verticals at very special prices—write us about your needs and we will quote.

Mosley VPA1 520 (New).....	\$109.50
Mosley VPA1020 (New).....	99.50
Mosley V144GP (2 mtr.) used....	17.50
Mosley VPA20-2 (New).....	39.50

Mosley TA33 (New).....	84.95
Mosley V3 (New).....	19.95
Mosley V3 Jr. (New).....	15.95
Mosley TA32 (New).....	59.95
Mosley TA32 Jr.....	42.95
Mosley A320.....	66.95
Mosley S153.....	42.50
Cushcraft AGP15.....	11.95
Cushcraft AGP10.....	10.95
Cushcraft ATGP3.....	24.95
Cushcraft A28A.....	21.95

### EXTRA SPECIALS

New Items—Overstock and Discounted

COLLINS RECEIVER FILTER	
35U1 (New).....	\$ 10.00
COPPERWELD WIRE (Nos. 12-14-16).....	per 100 ft. 2.85
GLASLINE—Standard.....	per 100 ft. 3.08
	per 600 ft. 17.84
Heavy Duty.....	per 100 ft. 5.89
	per 600 ft. 34.75

### HAMMARLUND RECEIVERS

HQ160.....	\$295.00
HQ110.....	195.00
HQ100.....	145.00

DEMONSTRATORS AND DISPLAY MODELS, ONE OF A TYPE, NO TRADES ACCEPTED ON THESE SPECIALS. IF YOU DON'T SEE WHAT YOU WANT HERE—WRITE—WE PROBABLY HAVE IT.

Collins 30L-1.....	\$450.00
Drake 2B.....	250.00
Hallie SX115.....	510.00
Hallie SX140(w).....	105.00
Hallie HT40.....	90.00
Hallie SX111.....	250.00
Hallie HT32B.....	650.00
Johnson Invader 2000.....	1110.00
Johnson Ranger II (w).....	320.00
RME	
DB23 Preselector.....	42.00
Gonset	
88-108 mc FM Tuner (12V)....	49.95

Write Uncledave  
W2APF  
with your needs  
and problems.

TRADE-INS ACCEPTED AND  
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RADIO SHACK

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U.S.A."

**HURRY!** see page 141, August QST  
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4700 S. Crenshaw Blvd., Los Angeles 43, Calif.

### Western Florida

WA4FIJ 11,508-274-42-AB  
W4ZGB 2280-95-24-AB  
K4CZA/4 902-41-22-AB  
WA4JFJ 126-14-9-AB  
WN4DYN 12-13-1-B  
WA4ECY (6 optrs.)  
2511-81-31-A

### Georgia

WA4BDT 4350-145-30-A  
K4YFU 2376-108-22-AB  
K4YQK 2357-107-22-AB  
K4KLD 1260-69-18-ABC  
W4GIS 58-22-4-AB  
K4ZYF 74-37-2-B  
W4FWH/4 (W48 FWH NWK  
VHH) 7161-230-31-ABC

### SOUTHWESTERN DIVISION

#### Los Angeles

W6NLZ 3740-73-44-ABCD  
W6ABN/6 2150-86-25-A  
W6BWG 378-27-14-AB  
W16KGA 297-17-9-BCE  
K6SSN 135-15-9-AB  
WA6SLF 69-23-3-R  
K6RCW (K68 F. KIRAY)  
2160-144-15-A

#### San Diego

WA6NCV 93-31-3-B  
K6BYV/6 (10 optrs.)  
28,249-640-41-ABUDE  
K6RCK (K68 LDN RCK)  
2088-116-18-AB

#### Santa Barbara

K6BPC/6 (9 optrs.)  
30,932-673-44-ABUDE

### WEST GULF DIVISION

#### Northern Texas

K5ARU 9828-273-36-A  
W5PVT 9694-262-37-A  
K5ZMH 8274-197-42-A  
W5KCN 4653-141-33-A  
WA5AAR 3720-124-30-A  
WA5AEB 1560-60-26-A  
WA5DIP 936-55-17-A  
K5MTK 572-44-13-A  
K5FLK 252-36-7-A  
K5TXX 252-21-12-AB  
K5FWM 180-18-10-A  
K5HRL 128-16-8-A  
K5KPC 119-17-7-A  
K5TKR<sup>2</sup> (4 optrs.)  
15,134-327-46-ABCD  
WA5DHF/5 (8 optrs.)  
10,064-272-37-A  
K5FGI (6 optrs.)  
9390-270-37-A

### W5GQU (W58 GQU GQV) K5ZYP)

7595-217-35-AB  
K5EHM (K58 FHMT JTL)  
702-54-13-A

### Oklahoma

K5ZTH 6384-168-38-A  
K5YZQ 6156-162-38-AB  
K5BXG 570-30-19-A  
WA5BRQ 405-45-9-A  
W5JCT/5 48-46-4-B  
W5KHT (W58 HOK KHT,  
K5JKX)  
14,600-292-50-AB

### Southern Texas

W5GBE 9760-244-40-A  
W5ABG 7437-201-37-A  
W5FUJ 6800-200-34-A  
K5RCO 5814-171-34-A  
W5BRR 4865-139-35-A  
W5HGW 1760-88-20-A  
K5HUT/5 252-28-9-A  
W5HYD 36-12-8-A  
W5ND (10 optrs.)  
6771-183-37-A

### CANADIAN DIVISION

#### Quebec

VE2SH 2645-115-23-AB  
VE2BEW 78-13-6-AB  
VE2AXO/2 39-13-3-B  
VE2APN 18-9-2-B  
VE3RC/2 (VE38 CDS CUA)  
671-61-11-AB

#### Ontario

VE3BPR 1936-84-22-ABCD  
VE3BCB 1612-123-13-ABC  
VE3ELA/3

812-116-7-B  
VE3APF 756-126-6-B  
VE3EZC 564-91-6-B  
VE3ESE 540-108-5-B  
VE3DIR 285-19-15-B  
VE3AIB 282-47-6-AB  
VE3DUK 189-27-7-AB  
VE3AHH 48-42-4-B  
VE3DWQ 78-38-2-B  
VE3BBW 45-15-3-B  
VE3VH 40-20-2-B  
VE3BWL 24-12-2-AB

#### Alberta

VE60H 273-21-13-A  
VE6DB 77-11-7-A

#### British Columbia

VE7ASM/7 930-93-10-AB

#### Yukon — V.H.T.

VE8BY 15-5-3-A

<sup>1</sup> Novice Award Winner; <sup>2</sup> Multiple Operator Award Winner;  
<sup>3</sup> W2MTA, opr.; <sup>4</sup> K1JPE, opr.; <sup>5</sup> Hq. Staff, not eligible for  
award; <sup>6</sup> W7QDJ, opr.  
Check logs: K1VRO, WA2AQL, XE1CT, XE1OE.

## Armed Forces Day

(Continued from page 41)

POTENTIAL PD THEY RECOGNIZE ALSO THE INDIVIDUAL INITIATIVE CMM EFFORT AND TECHNICAL ABILITY REQUIRED TO SUCCESSFULLY COMMUNICATE BY THIS ADVANCED MEANS PD SPEAKING FOR THE DEPARTMENT OF DEFENSE AND ITS COMMUNICATIONS SERVICES I COMMEND EACH OF YOU FOR YOUR ACCOMPLISHMENTS AND WISH YOU SUCCESS IN ALL YOUR FUTURE ENDEAVORS  
SGD ROBERT S MCNAMARA CMM SECRETARY OF DEFENSE BT

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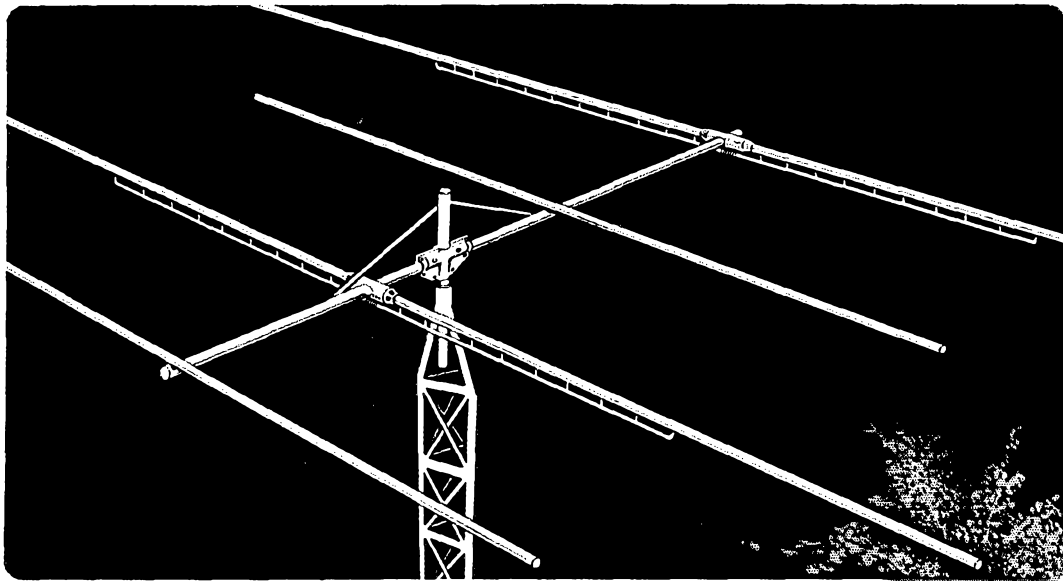
K1AAA, K1CLD, W1GWW, W1HCN, W1IO, K1LCN, W1MB, K1NAH, K1NHP, W1OMN, W1QDV, W1RDL, K1RPZ, W1ZLS, K2AXM, K2BPM, W2BXW, K2CIP, K2CWI, W2DLT, W2DLU, K2DVH, K2EID, WA2ELE, W2ESW, W2EXB, W2FAN, WA2GNL, W2GQN, W2ZGSO, WA2GTH, K2GYX, W2ICA, K2IRE, W2JAV, W2KLD, WA2LKF, W2LKP, W2LWR, W2MFB, K2MKQ, W2MZF, K2NRY, W2OKO, W2ORX, WA2QOG, K2RJF, K2SDR, W2SFY, W2SKK, K2SKK, W2SUH, W2TAM, W2ZMK, W3BBV, K3BHK, W3CA, W3CRO, W3DJZ, W3DNN, W3DTH, W3ENU, K3HGM,

(Continued on page 148)

# NEW *Hy-Gain*

# DUOBANDER

for the popular 20-40 meter bands



## *New compact lightweight unit features Linear Decoupling Stub and Beta Match*

The 20-meter and 40-meter bands are becoming more and more popular with amateurs because of more room for expansion and low sun spot activity. That's why the Hy-Gain engineering staff has designed this important new antenna. The Hy-Gain Duo-bander has three full-sized elements on 20 meters and two reduced-size elements on 40 meters. It's compact, lightweight, highly practical—and priced right.

Through the exclusive Hy-Gain development, the linear decoupling stub, the ordinarily outsize 40-meter element is reduced to about  $\frac{2}{3}$  of the normal size. This makes the Hy-Gain antenna practical, usable where others won't work out, but keeps performance standards high.

The exclusive Hy-Gain advancement of the linear decoupling stub makes two-band operation possible. You do away with inductance and capacity traps, yet the Duobander elements sections can be decoupled very efficiently. The linear loading principle, another Hy-Gain exclusive, does far better than a loading coil in reducing antenna size.

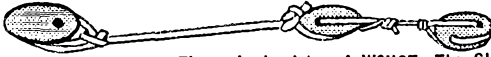
A proven Hy-Gain development—THE BETA MATCH makes possible maximum gain and low standing wave ratio into a single 52 ohm coaxial feed line. For perfect pattern symmetry, a broad band balun is an integral part of the matching system.

*price \$169.50*

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	<b>ELECTRONIC WHOLESALERS INC.</b> 1301 HIBISCUS BLVD. • MELBOURNE, FLA. • Phone PARkway 3-1441	
	<b>ELECTRONIC WHOLESALERS'</b>	
	<b>DALTON-HEGE, INC.</b> 938 BURKE ST., WINSTON-SALEM, N.C. • Phone PARk 5-8711	

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The main insulator of W3UCT. The Glas-Line is between the two egg insulators running to the lower left. The copper link between the center egg insulator and the upper right egg insulator is for the dead-end feeder of a Zepp antenna.



View of an open thimble and eye bolt for coupling the Glas-Line guy wire to a tree. GLAS-LINE cannot rot, will not shrink, stretch or sag . . . has high breaking strength of over 500 pounds with proper use.

100' SPOOL Plus \$1.00 for postage & handling **\$3.75**  
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**'SUPER' GLAS-LINE**

with 1,000 lb. TENSILE STRENGTH with proper use.

100' SPOOL **\$6.95** Plus \$1.00 for postage & handling  
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"HAM  
HEADQUARTERS  
U. S. A."

**HURRY! see page 141, August QST**  
for fabulous offers on other models too!

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**A REVOLUTIONARY NEW T-R SWITCH AND PRESELECTOR**

Send for free booklet illustrating how deficiencies of conventional T-R switches have been eliminated.

Beautiful case complete with power supply and cables. No soldering.

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- Remote switching unit mounts in xmr. MODEL 101
- Band switched tuned R.F. stage. **\$69.45**
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- Will handle maximum legal input.

We Also Offer MODEL 102 (integral unit) **\$64.45** (Ppd. USA)

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Auld, William A., Baker, S. C., Berk, Douglas K., Benson, Donald, Blanchard, Dick B., Bollenbach, George, Boston, USS (CAG-1), Calhoun County, USS (LST-519), Cason, G. R., Clarke, H. R., Cooper, James E., Enrman, Robert G., Glens Falls, USNRTC, Goodman, David J., Hale, Robert L., Heward, Frederick R., Hinor, Nesley A., Hutt, W., Idaho, Boise-USNRTC, Jones, Billy, Laycock, Jack D., Lee, Orville, Long, Robert R., Margo, Hugh W., Martin, Aldredge, Newkirk, Bert E., Osburn, D. R., Poore, Hollis B., Prokop, Charles, Roberts, Conrad E., Jr., Rosenberg, B., Sanders, James W., Schaefer, Edward C., Snyder, C. E., Solomon, Mark, Swan, M. L., Thom, R. J., Turner, James, Ungari, Jess A., Wells, Mineral — Mars Radio Station.

Plans for next year's affair have already begun, and it is believed that hams will find it easier to work cross-band in 1963. Circle 18 May 1963 on your calendars, and be ready to participate in the once-a-year opportunity to work the contributing military stations. **QST**

**Hamfest Calendar**

(Continued from page 10)

Route 51, 2 miles north of Uniontown, Pa., Contact Joseph M. Sofranko, 438 Braddock Ave., Uniontown, Pa. for further info.

**Washington** — The Walla Walla Valley Radio Amateur Club, W7DP, will hold its 16th annual all-family picnic on Sunday, Sept. 16, at Wildwood Park in Walla Walla. There will be a full day program for all members of the family, rain or shine. Registration 10:00 A.M. to 12:00 noon. Potluck dinner at 12:30 with coffee, pop and dessert furnished by local club. Free swap shop — bring your gear for sale or trade. W7AEF will display all the latest gear. ARRL representatives on hand to answer your questions. "Greased Lightning" and "Pea Pickers" certificates awarded at picnic. No registration fee. 29.6 and 3970 monitored to home you in; listen for W7DP, Contact Pat Stewart, 1404 Ruth Ave., Walla Walla, Washington, for further info.

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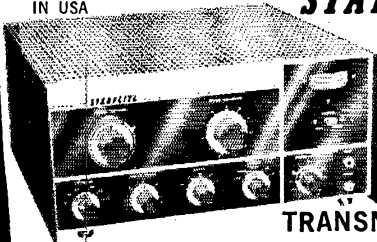
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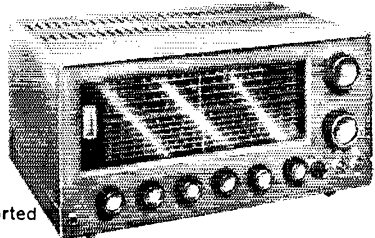
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**How's DX?**

(Continued from page 81)

that PY2ON, a 14-Mc. s.s.b. stalwart, speaks fourteen languages and once signed XU3AR as an old China hand . . . . . YV6AV/2 and XYL YV2DW are quite popular on DX bands with their IYX-500, Thunderbolt, cubical quad, TA-36 spinner, a assorted dipoles and HQ-170 . . . . . VP4NC says KP4CGB now is control station for the vital 7-Mc. Antilles Emergency Weather Net. With the hurricane season coming up you'll be hearing a lot from this outfit . . . . . WGDXC hears that PY1BLR hopes to follow friend PY4RT/Ø's Fernando de Noronha doings with his own Trindade PYØNG production this month.

**Hereabouts** — On the 15th of this month W9-DXCC constituents hold their annual jamboree at Chicago's Hotel Sheraton. Chairman W9QYW assures the usual punch-packed agenda — check with Ink without delay for your attendance credentials . . . . . The 12th Annual New England DXCC Dinner is scheduled for October 6th at Motel 128, Dedham, Mass. Chairman WIBAN stresses that all DXCC members are invited to register for reservations. A potent program is assured . . . . . WA6PMK notes that famed DXer ex-HB9AW-FP8AW now sports a kilowatt, 75A-3 and superbeam in Burlingame as WA6QAU. Good to have Gerard on our side . . . . . KG1BO, manned by K8NFC, W1DUB and others, keeps the boys in touch with home via an elaborate Collins layout at APO 28 . . . . . K1JTC (ex-W9ERW-W9PKW) recently entertained well-known DXer Y8LTA. WIRST (ex-W2DQT) joined the brawl with a sharp-eyed camera . . . . . W2ZVS/2 was delighted to be reassigned to the second call area after his F7FI stint. DXCC Rule 9, you know . . . . . W9NN spent some of the summer trying to pep up brother-in-law W9RIL's 7-Mc. DX score up Wisconsin way . . . . . K2JJR and K9JJR found themselves working SVØWN consecutively, so they QSY'd and got thoroughly acquainted . . . . . K7KBN finds single-sidebander TG9AD busy rediscovering the c.w. art . . . . . K5UYF has details on *Amigos de Albuquerque*, a certification issued by Certificate Hunters Club Chapter No. 1 for certain combinations of 25 QSOs with Albuquerque stations.

**Ten Years Ago in "How's DX?"** — Hamdom's royalty, with a photo of the Prince of Sikkim, AC3PT, makes worthy editorial material for September, 1952 . . . . . Airwise, 20-phone delicacies reported are AC3PT, FF8s CG CJ CN CS, FQ8AI, HZ1s MY TA, Iwo's JAØJ, JY1AJ, KT1s BB DD WX, MI3s CE MK NA VG, OQ8RU, PJ5FN, SU1s AS JY, TA2EFA, YI3BZL, YK1AE, ZD4s AX BB, 3V8BB and 4W1MY . . . . . Twenty c.w.'s cream: CR8AD, ET3R, FN8AD, FR7ZA, HI6TC, JY1s AU BB CG, KH6MF/KB6, LB6s BD XD of Jan Mayen, M1B, MB9AJ, MDs 5AP 7AC 7PQ, MF2s AB AG, MI3s DD ZX, PJ9VDZ, SU1s GG HG, TA3AA, VRs 4AF 7AB, VSs 2CN 2YL 7LB 7WA, ZC2MAC, ZD9AA and 3V8AC . . . . . Featured on 15 phone are FQ8AQ, OQ5RA, ZC6UNJ and ZD9AA . . . . . HE9LAA is a scoop on 40 c.w., while 80-meter code men manage V87NG, YJ1AB and a batch of VK/ZLs . . . . . Ten phone is a mere shell of its former robust self but PJ5RE has quite a following . . . . . Japanese nationals take over the JA prefix. Yanks in Japan becoming KAs . . . . . EA9DC rolled up 3911 IJni contacts and EA8AW may go to Rio de Oro . . . . . Jeeves goes for a crazy ride on an Arabian QSL while pictures of W1FH, the shacks of VQ4-ERR, MI3US and ZS6Z round out the write-up. **QST**

**Magnetic-Tape Operator**

(Continued from page 58)

by threading them up and down over various posts or pulleys mounted to one side of the rack. If you try this scheme, test it thoroughly before using it during a schedule.

A cute trick for a scatter schedule is to form the tape into a Moebius strip. This is done by giving the tape a half twist before splicing. When the loop is placed on the keyer it will require two revolutions to complete one cycle. On the first revolution, the tape will be rightside up and normal keying will result. On the second revolution, the tape will be upside down and there will be little or no output. With my break-in system, the equipment drops back to the receive condition for the second revolution. If the tape is made 30 seconds long, a one-minute cycle results — 30 seconds transmitting and 30 seconds receiving. Actually, it pays to make the tape

(Continued on page 152)

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for your  
**NATIONAL**  
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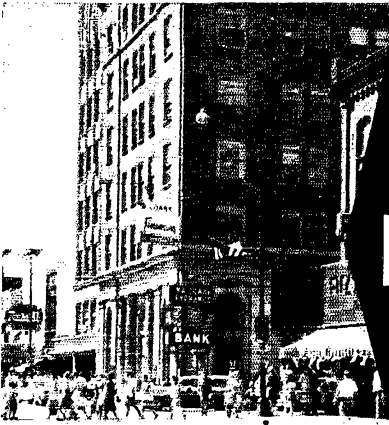
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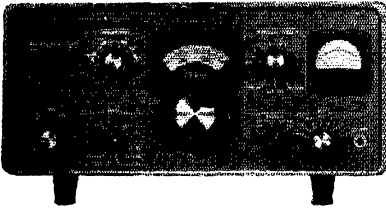
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The picture above is Main Street in a small town in Wisconsin. Up here the pace is slower and things cost less. Our bank in the picture agreed to handle payments on all Collins equipment sales we bring them at the astonishingly low rate of 5% . . . because Hams, in general, have such good credit standing and because our bank recognizes *Collins Quality*—and also that Collins radio equipment retains its value year after year. This is just about half what it costs you to finance anywhere else. If you don't believe us, compare our monthly payments. In addition, if you make five regular payments and decide to pay up in full at the end of six months, you get **FULL CREDIT** for all finance charges paid to date! Any Collins equipment you want is in stock right now . . . yours for just \$5 down; up to three years to pay.

**\$5 DOWN DELIVERS ANY NEW COLLINS GEAR**

	Amateur	1 yr.	2 yrs.	3 yrs.		Amateur	1 yr.	2 yrs.	3 yrs.
30L-1 Linear Amplifier	\$520.00	\$45.96	\$23.50	\$16.45	399C-1 PTO Speaker (KWM-2)	\$164.00	\$13.66	\$7.28	\$5.07
30S-1 Linear Amplifier	1556.00	135.71	71.08	49.54	SM-1 Fixed Station Microphone	32.00	2.87	1.43	.95
32S-3 Transmitter	750.00	65.18	34.14	23.79	SM-2 Fixed Station Microphone	48.00	4.20	2.10	1.53
75S-3 Receiver	680.00	59.06	30.93	21.56	MM-1 Mobile Hand Microphone	25.00	2.29	1.14	.76
75S-3A Receiver	750.00	65.18	34.14	23.79	MM-2 Mobile Boom Microphone with Earphone	39.00	3.45	1.72	1.15
KWM-2 Transceiver	1150.00	100.18	52.47	36.57	MM-3 Mobile Boom Mike	27.00	2.45	1.22	.81
KWM-2A Transceiver	1250.00	108.93	57.06	39.77	302C-3 Directional Wattmeter	130.00	11.04	6.25	3.99
DL-1 Dummy Load	38.00	5.04	2.52	1.68	440E-1 Cable (516E-1 to KWM-2)	17.00	1.62	.81	.54
351D-2 Mobile Mount (KWM-2)	120.00	10.20	5.27	3.67	136B-2 Noise Blanker (KWM-2)	124.00	10.54	5.45	3.80
MP-1 14V DC Power Supply (KWM-2)	198.00	16.88	8.84	6.16	TD-1 Antenna	152.00	12.87	6.73	4.69
PM-2 Portable Power Supply (KWM-2)	150.00	12.70	6.64	4.63	F455J-05 Mechanical Filter	77.50	6.66	3.33	2.31
516F-2 AC Power Supply (32S/KWM-2)	115.00	9.79	5.04	3.51	F455J-15 Mechanical Filter	58.00	5.04	2.52	1.69
312B-3 Speaker (S-Line, KWM-2)	32.00	2.87	1.43	.95	F455J-21 Mechanical Filter	57.50	5.00	2.50	1.67
312B-4 Speaker Console (S-Line, KWM-2)	195.00	16.62	8.70	6.06	F455J-31 Mechanical Filter	57.50	5.00	2.50	1.67
312B-5 PTO Console (KWM-2)	350.00	30.18	15.81	8.24	F455J-60 Mechanical Filter	57.50	5.00	2.50	1.67

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*on A-1*

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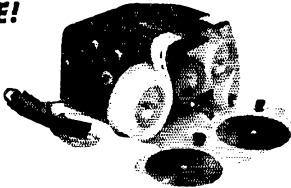
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Adjustable speed control, maintains constant speed at any Setting. Complete with ten rolls of double perforated tape. A wide variety of other practice tapes available at 50c per roll.

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"HAM  
HEADQUARTERS  
U.S.A."

**HURRY! see page 141, August QST  
for fabulous offers on other models too!**

about 29 seconds long (better short than long). Then, with one eye on the clock (or one ear to WWV), one can chop the tape-motor switch momentarily every few minutes when the tape gets ahead of the clock.

That's the tape keyer. Design your own. Build it from junk. Amaze everybody. Grab a beer or a smoke while it does the work. **QST**

### **6GJ5s on 6 Meters**

*(Continued from page 39)*

point. Here, again, be sure the amplifier is in resonance when loaded to 230 ma. On voice peaks the meter will "kick" up. To determine how far the plate meter should rise on peaks, switch the meter to read grid current, run your audio gain up until you just start to show grid current and then back off slightly on the control. Switch the meter back to read plate current, and by using the same voice level and audio gain-control setting you can see where the voice plate-current peaks should be.

#### **Plate Modulation**

July *QST*<sup>2</sup> carried a description of a plate modulator that can be used with this amplifier. If you use a TV power transformer, your power supply will be adequate to handle both the amplifier and modulator. The +B lead should be opened at the point marked X to insert the secondary of the modulation transformer. The article shows how the modulator should be connected to a transmitter that was described the previous month,<sup>1</sup> and a similar arrangement can be used with the 6-meter amplifier. A low-voltage source of approximately 250 volts is needed for the speech amplifier and driver tubes; this can be obtained from a dropping resistor from the +B line. A 30,000-ohm 10-watt resistor would be suitable. Also, there is an extra set of contacts on the meter switch; these can be used, if desired, to monitor the modulator plate current.

If TVI is a problem in your area, the amplifier can be "buttoned up" by putting on a bottom plate made from perforated aluminum. A low-pass filter on the output will take care of harmonic TVI. Adjacent-channel interference (Channel 2) is a receiver problem and requires a filter on the offending TV set. **QST**

<sup>2</sup> McCoy, "Plate Modulation for the 150-Watter," *QST*, July, 1962.

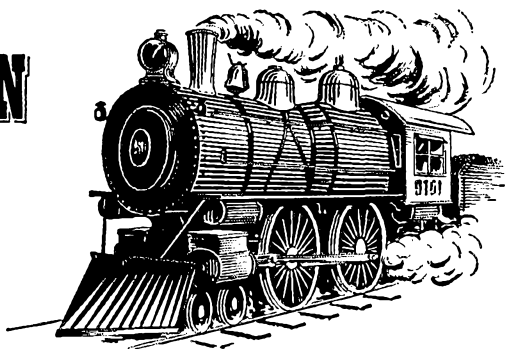
### **Strays**

W3TVI, Donald G. Fink, has recently been named general manager of the new Institute of Electrical and Electronic Engineers, a merger of the IRE and AIEE. He has been serving as director of research activities for Philco.

Don Erickson (24360 Myers St., Sunnymead, Calif.) has 100 back copies of *QST*, 75 *CQs*, 75 copies of *Popular Electronics*, plus some *Radio Electronics*, *Electronics World*, and *Electronics World* which he would like to give away. Let him know which ones you'd like.

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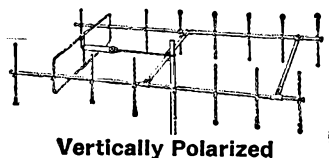
WIREMAKER FOR INDUSTRY  
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8-6-2

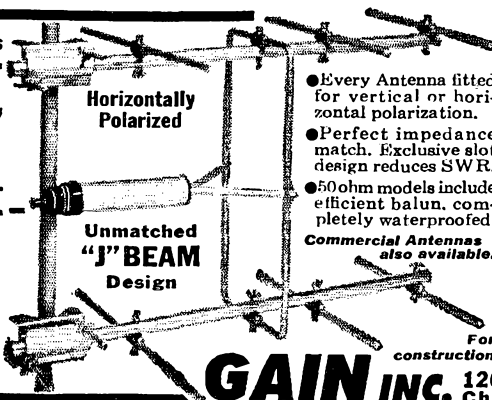
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**"Add-on" Modular Design  
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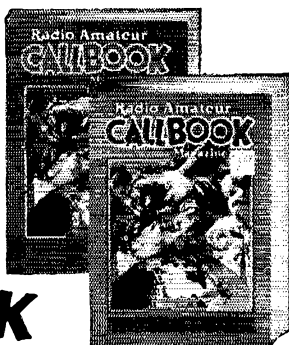
- Add elements anytime for increased gain.
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These models are ordered cut to exact frequency

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3/4" Aluminum Pipe	per foot	1.00 net
RG-8/U with 2 PL 259's attached,	per foot	.20 net

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## STOLEN HAM GEAR

VE3DLS reports his Pye Ranger serial number AT-53-3861-046 stolen from his car in Toronto. Anyone having info on this unit please wire or phone collect to Lyle Stanway, 194 Acton Ave., Toronto (Downsview), Canada.

On or about July 23 a Collins KWM-1 (Serial No. 600) and a Collins 516F-1 (Serial No. 249) was stolen from the Keesler Amateur Radio Club, Keesler AFB, Miss. This gear was the property of K6SHJ (Frans J. Janson, 744 Ashland Ave., Santa Monica, Calif.) who offers a reward for its return.

## World Above 50 Mc.

(Continued from page 72)

reported was the fact that XE10E worked PJ3AL and HC1FS; that Texas and Oklahoma worked Hawaii and that New Mexico heard it but did not work.

On the 25th between 1800 and 2045 45 states were logged at K4RNG with Alaska, Nevada, Montana, Idaho and Hawaii being the missing states.

Through Les we also receive word from Jack Reich, KL7AUV, who sez "I am only on 50.084 running a beacon almost every night from 0400 to 0435 give or take a little, usually with the beam east. The tape calls "CQ", gives my call, location and phone number very slowly. If you should hear my beacon, you can direct dial Anchorage, number is Fairfax 2-2950." Surely would be nice to hear that a lot of the gang had a phone call to Anchorage on their next bill.

In California, W6IEY heard skip on seventeen different occasions during the month of June and sent us a detailed report of stations heard and worked. Among this group are W5BLJ in New Mexico, K7HKD in Wyoming, VE7ASM and VE7YZ. Lou heard all call areas except 1, 2, and 3, and heard just about every state in each call area heard. W6ENC South Dakota sez "50 Mc. was open 25 days in June, not as good as last year, more erratic and most openings in southerly direction. Worked XE10E on June 9 and 10. An unidentified Spanish phone station heard by K0EIC below 50.1 on June 29 around 10:30 local time." Report also made that K0EIC worked XE10E and XE2BT.

Mike Long, K8PBE, gives us the information that W4ZZ/4 is operating again from his mountain-top location in the Great Smokies in Tennessee. His frequency is 50.245 Mc. Mike worked Brownie on July 11 with S9 reports exchanged. Brownie himself sez that the opening of the 11th was the wildest one he's ever seen with reports of S8 and S9 and over being common. If you're looking for Tennessee, Brownie will be active from Mt. LeConte until October.

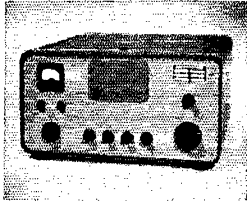
We're happy to hear from the state of Washington via Larry, K7PIG, who tells us that K7OQP operating from Mt. Vernon has his hands full working DX when the band is open. Stations now active in that area include K7SIN, K7PCR, K7OYP and K7PDA. Sam Armstrong, WA2JVE, has been doing all right with his halo antenna 60 feet high; since 1960 he has worked thirty-five states and Puerto Rico.

WA4AWH would like some ground wave contacts on six meters. He is located in Shelbyville, Tennessee, and would particularly like skeds with anyone in West Virginia, North Carolina, South Carolina, Arkansas and Louisiana. Chuck is running about 70 watts to a five-element beam about fifty feet high and is receiving with an HQ-100A. K1VBN sez there were many openings noted during June with conditions to the mid west being excellent. Southern states were also worked but with more QRN and QSB.

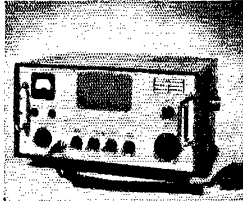
Las Vegas, Nevada, has among other things, K7ICW who sez: "I will have to disagree with some experts about the expected increase in E<sub>s</sub> type openings which occurred this season so far. June, 1962, had far less intensive activity compared to previous years. A noted lack of strong signals, short-short E (under 500 miles) and E backscatter were my best indicators, but I also take into consideration the

(Continued on page 166)

# COMPLETE FIXED CHANNEL SSB SYSTEMS



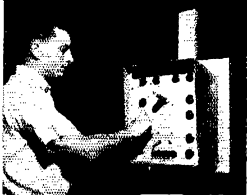
SB-6F BASE STATION TRANSCEIVER



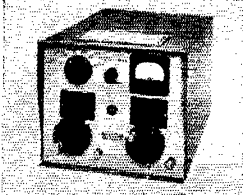
SB-6M MOBILE TRANSCEIVER



SB-6MR REMOTE CONTROL



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number, duration and extreme distance of *EE* signals. Compared to last year in June, we have had only one observed opening to W1 compared to four occasions last year, and more the previous year. The peak intensity of signals both *E* and *EE* was June 15th to 18th, with June 17 the long *EE*. Unusual observations were the abnormal QSOs going on elsewhere — E. Texas to W. Texas; Oklahoma to New Mexico; Colorado to N. Texas; Idaho to Washington."

K1JQI comments on openings with June 17 being best; all call areas heard except 2s and 3s. K9HBT noted a number of openings and on June 15 Nevada, Oregon, Washington, Idaho and Utah were heard in addition to the usual 4's and 5's. Jerry also worked XE1OE on June 9, and heard CO3NR on the 14th. "Activity is moving up," sez Bob, K8FPC, who copied a WA2 on 52 Mc. and Dave, K8LCB sez that on June 16 "the Virginia f.m. boys did a fine job of rolling into West Central Missouri just above 52.5." Dave also heard WA2WWF in New Jersey calling CQ via RTTY on June 17 at 51.570 Mc. In Overland, Missouri, Dan, W8CMI sez that June 12 was a good one for him when he worked Georgia, South Carolina and Wisconsin for new states. He's waiting for the QSLs from South Carolina and Georgia. Through Dan we also learn that W0DJF and W9CHV both heard KL7AB on the 13th for about 45 seconds. Signal was S8. The opening of the 17th was a good one for Dan also; he says that stations in 1, 2, 3, and VE3 lands were worked with QSOs ranging from 5 to 35 minutes.

Another satisfied customer on 50 Mc. was K8RWC in the month of June; Dave picked up thirteen new states during the month and sez the number doesn't seem to be unlucky for him. According to Dave, activity has spread into the entire eastern seaboard as well as the northeast and midwest. However, he has not heard the northwest as frequently as the others.

Dot, K8GIC, notes openings on twelve different days during June with the 9th being the best and twelve states heard or worked. W9DFS sez that the band was open to the south and southeast almost every day in June and that on June 29 KP4BCS, KP4CK and KP4AMK were heard. Knoxville, Tennessee seems to be a good location to pick up the good ones too. According to Jim Rule, K4KYL, just about everything good was heard during June; among them were Cuba, Texas, Colorado, Nevada, Wyoming, Kansas, Oklahoma, New Mexico, Arizona, California, Mexico, South Dakota, North Dakota, Ontario, Puerto Rico and Venezuela. W4AYV in Umatilla, Florida sez that the opening of June 9, 10 was the best he ever heard; and WA4BMC sent in a list of twenty-two states worked and heard during the month.

K5ZMS heard all of the states during the contest except Washington, North Dakota, Idaho, Alaska and Hawaii. The New England States were not heard at that time either. Happy to receive word from Paul Wilson, W4HHK, who informs us that he is transmitting a beacon signal on 49.94 Mc. with 100 watts, A1 emission; and 143.990 Mc. with 1 kw., A1 emission; using MARS (Army) call A4HHK. Times vary, but usually are in the 1000-1200 CST periods. Transmissions are beamed toward Atlanta, Georgia, and Nashville, Tennessee. Reports of reception are requested.

An interesting letter received from W6NLZ who sez: "Another area in which I have been losing lots of time is working the 6-meter band when it is closed. Results are just good enough that I can't stop, that is when the station on the other end has about a kw. and a good antenna, you just can make the grade most of the days of the year. By this I mean the ionospheric forward scatter-signal fades in and out but the meteor bursts keep coming and between them a fellow can squeeze out a pretty good QSO on c.w. Also, results on s.s.b. have been amazingly good. This led to experiments in continuous 100% s.s.b. modulation, an effort which should be pursued further." John is like most of us and just can't spend enough time at the rig.

**Clubs and Nets**

Two new nets in the Burlington, Wisconsin, area are now holding meetings on 50.4 Mc. Sundays at 2100 the "Croc Net" and the "Bark Net" (Burlington Amateur Radio Klub) meets every night at 2000. Both nets are strictly rag-chew and new check-ins are welcomed. The Two Meter Northeastern Wisconsin Net meets on Tuesdays at 2030 CDST at 145.23; net control is W9LYX in Green Bay. Primarily for c.d. purposes the group welcomes all comers.

(Continued on page 158)



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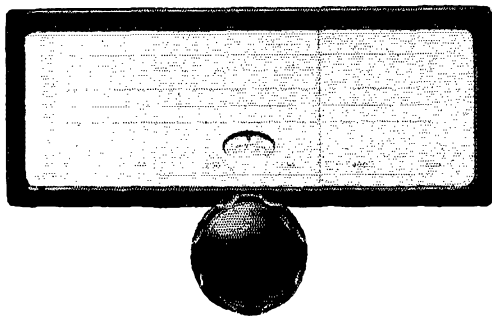
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## GEARED SLOW MOTION DRIVE For Amateur Radio & Communications RECEIVERS & TRANSMITTERS

A high grade assembly, flywheel loaded, manufactured to fine tolerances, provides a smooth positive drive with a reduction ratio of 110:1. The vernier with its 100 divisions rotates 5 times for one pointer traverse, giving 500 divisions with positive reset readings. A cam adjustment on the vernier assures correct zero setting. A spring loaded jockey arm maintains tension of the pointer drive. Overall dimensions 9 $\frac{1}{4}$ " x 5 $\frac{3}{4}$ ".

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A new club has been formed in the St. Louis area, "The Crystal Cookers Society". This club has only six members and is offering a certificate for working three (locals must work five) of the members. Details can be obtained by writing W8CMI, 3 Goeck Place, Overland 14, Missouri. A new club has just been organized in Pennsylvania and is called the "Lancaster County VHF Club"; the group consisting of W3JYL, W3VDY, K3BKH and W3YAM, is now working on Constitution and By-laws for the club.

### 144 Mc. and Up

We hear from VE6HO that although he has done little listening on 144 Mc. recently, he is preparing for the Perseids meteor shower and schedules with W8IC in Denver on that band. Norm now has a 500-watt final finished and operating — watch for him. In Birmingham, Michigan, Bill, K8KQV reports that good ground wave on two meters has been the "norm" both night and day and that good skip conditions to southern U.S. during the day have been observed at his QTH.

K8NOD and K8KQV are experimenting with various antennas for 220 Mc. In Rhode Island, Andy, W1AJR reports the evening of June 7 good on 432 Mc. with activity in 1, 2 and 3 call areas. Andy worked K3KDI in Aberdeen, Maryland that evening for state number 11 on 432 Mc. The evening of June 14 saw a nice two-meter contact between W1AJR and VE1BC in Halifax, Nova Scotia; and June 28, 29 and 30 were the best in a couple of years on 144 Mc. according to Andy. During those days he worked K5HIO, W4MKT, W4VHH, W4BUZ, K4MHS, K4YYJ and K4HJE, all from North Carolina. In Benton Harbor, Michigan, W8PT made hay during the opening of June 17 when he worked W5SWV, Texas (144.042) — W8YMG, Kansas (144.042 s.s.b.), K9AAJ, W8EMIS and K8ITF. Jack also heard K5IJA, W5WAX and W5UGO/5 all in Oklahoma. The opening was good toward the east from Benton Harbor the following day. On 220 Mc. checks between W8PT and K8AXU show it is possible to work West Virginia on 220 Mc. anytime. Jack, W8PT, also worked K8ITF in Kansas on 220, June 17, and K9AAJ (260 miles) on 432 Mc. during the same opening.

One of the 432 Mc. enthusiasts is Bob Bisha, K2GGA, who is running 250-275 watts output into a dummy load at 432 Mc., and is quite anxious to work skeds. Antenna is a 32-element extended array. Bob also operates 220 Mc. where he is running 500 watts on 220.050 Mc. and is on each night at 2200 EDST calling "CQ" to the east on both c.w. and phone. Anyone interested in skeds with Bob on either band, drop him a card. Moonbounce on 432 Mc. is another of Bob's projects, so "get in touch" if it's yours too. W2SEU notes an opening or temperature inversion on June 9 when he worked W1MHL/1 and K1RNS, both in New Hampshire, on 220 Mc., a distance of about 225 miles. Fred will be operating 220.050 Mc. on Saturday nights around 2100 EST whenever he can arrange it. He is now using an 11-over-11 beam up 30 feet, and is running 100 watts. K3OGA sez he has not heard anything more from stations interested in 420-Mc. work. He's still looking for that first 420-Mc. QSO.

W4ZGS mentions that more interest in 220 and 432 is being expressed on the two-meter net in his area, possible f.m. will be tried on 432 Mc. W1ZGI in Connecticut sez that groundwave was good on 144 Mc. on June 4, 7, and 18, when he worked Pennsylvania, Maryland, Virginia, Maine and Massachusetts, all with good signals. On 220 Mc. Al reports a strong tropo during the v.h.f. contest when he worked New Hampshire, Eastern Pennsylvania, E. Massachusetts, N. New Jersey, W. Massachusetts, E. New York, Rhode Island and Connecticut. W4KYJ has a new HB-2 meter collinear and a converted ARC-5 with a very good signal. W4CCA is on with a Pawnee and 11 element yagi. WN4DYN from Ft. Walton Beach is usually very strong with a Twoer and 11 elements. WA4FIJ is looking for skeds with eastern Florida and Georgia stations for ground wave QSOs any time of the day or night.

K8LFL in Ironwood, Michigan, states that on 144 Mc. conditions have been mostly normal to subnormal in that area due to lots of wind and rain, and then more wind and rain. In Ypsilanti K8PBA had things better, hearing out-of-state stations on seven different days during the month of June. The best day for Bob was June 16 when he heard North and South Carolina, Oklahoma, Arkansas, Texas, Missouri, Pennsylvania and New York. (Sounds a bit like

(Continued on page 160)



# HAM and INDUSTRIAL TOWERS



All Tri-Ex Towers and accessories feature a triple coated finish for maximum weather protection; (1) iron phosphate rustproof undercoating, (2) newly designed durable epoxy resin prime coat, and (3) baked auto-type enamel finish coat.

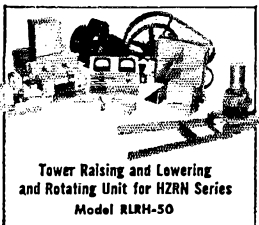
## HM SERIES CRANK-UP/CRANK-OVER 2 WAY HINGE OVER TOWER

New Two-Way-Hinge-Over Pilot Base, either in concrete or earth mounting models, eliminates climbing . . . eliminates cranes or A-frames . . . eliminates "antenna parties" (one man job) . . . gets your beam up faster . . . gets you on the air faster.

### 3-STEP INSTALLATION

- 1—Install foundation unit either directly in earth excavation, or concrete, as desired.
- 2—Attach upper base unit and fasten tower to tower bracket.
- 3—Raise tower to vertical position with 9-to-1 winch on pilot base, swap holding bolt positions, and you have a hinged, crank-up/crank-over SELF-SUPPORTING tower. That's all there is to it!

The new Tri-Ex series is available in 37 and 54 foot models (actual full height is exclusive of mast). Design of tower permits use without



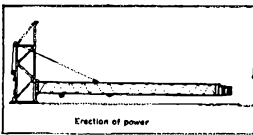
Tower Raising and Lowering and Rotating Unit for HZR Series Model RLRH-50

guying, and the unique 30-degree bracing of alternating design assures highest degree of strength and wind resistance.

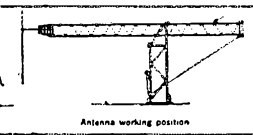
HEAVY DUTY SERIES		
Model HDM-237	2 Section	37 feet
Model HDM-354	3 Section	54 feet

See your distributor for complete literature and prices on the complete line of Tri-Ex Towers, or write direct to:

**TRI-EX TOWER CORP.**



Erection of tower



Antenna working position

Write for catalog showing complete line of Towers and Accessories.

**TRI-EX TOWER CORP.** 2920 W. Magnolia, Burbank, California

## HZR SERIES ROTATING TOWER

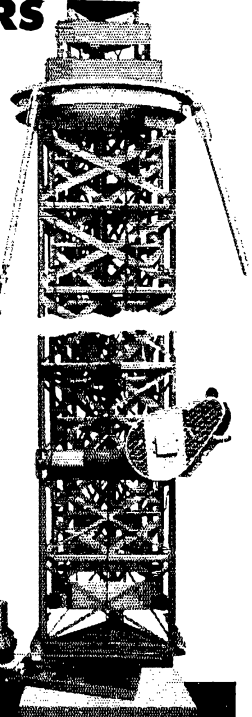
The new HZR Rotating Tower is completely redesigned for smooth, frictionless rotating and raising and lowering. Featuring increased strength and greater weight, it meets and surpasses RETMA and UBC Building Standards.

The complete tower and antenna rotate on twelve large, sealed precision ball bearings at the 20' level, and on a heavy duty, flange type, self-aligning ball bearing at the base. No guying is necessary.

The tower is equipped with a 35 to 1 Timken roller bearing, sealed worm gear drive raising winch. You can motorize for full remote control with the aid of Tri-Ex accessories.

All HZR Series towers are shipped complete with rotating base, 2 roller chain sprockets and drive chain, crank, and 3 concrete anchor rods and braces. Full engineering calculations and data are available upon request.

Model	Height	Weight
HZR-237N	37'	510 lbs.
HZR-354N	54'	805 lbs.
HZR-471N	71'	1235 lbs.



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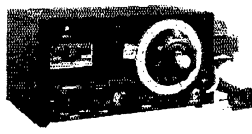


# 11 METER

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At no obligation to me, please send me free booklet "HOW TO MAKE MONEY in MOBILE-RADIO MAINTENANCE"—and data on Lampkin meters.

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  - 1 Package Ammonium Bifluoride flakes
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  - 2 Plastic containers
  - 2 Crystal blank holders
- \$3.50**  
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INSTRUCTIONS

(See August QST, page 27)

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**DRAKE**  
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HEADQUARTERS  
U.S.A."

**HURRY!** see page 141, August QST  
for fabulous offers on other models too!

50 Mc.) Now on sideband in that area are W8ZSX, K8OVJ, W8JNZ, K8PBA, W8PYY, W8FRN and W8BPD. From K7ICW we hear that "W7JU at Boulder City sez he hears W7LEE in Parker, Arizona (160 miles) on two meters and that they have had QSOs even with low efficiency screen modulation on Ray's big cw rig. Of course W6WSQ is coming through regularly from southern California on 144.010 Mc. or thereabouts every Sunday morning at 0800 PDT.

K9DLS/8 in Ann Arbor, Michigan is still holding skeds with K9DTC and has started a new one with K2LOK. Sked with K9DTC is held at 2000 EST on 145.026. Bill now has seven states on 144 Mc., having worked West Virginia during June. In Mascoutah, Illinois, Dick, K9FNB, reports that although activity has been good in the area there has been no real DX coming in. Extended ground wave was good at times and on June 16 he heard W9CTI in Milwaukee and another time he worked K0ZID in Cairo, Illinois. Dick expects to raise more DX on 114 Mc. when he raises his tower to 60 feet in the near future.

From Flushing, New York, Phil, K2LJO, tells us that in Flushing v.h.f. activity is second only to sleeping and eating. "Many Virginia and for the first time that I can remember, more North Carolina stations were on and readable than the good old state of Virginia could muster up on June 29. Signals were good with W4MKT over S7 most of the time. Other stations logged were W4VHH, K4MHS, W4BUZ and K4YYJ." W2ESX in Moorestown, New Jersey, would like to present a number of bouquets to the North Carolina gang that operate two meters. John sez that the tropo opening of June 29 was a pip. Things opened up around 2200 EDST when KINGI was pounding into New Jersey off the back of the beam. After working him, John worked K1RGO in Connecticut and then swung beam back to the south for his nightly sked with W4FJ. He then commenced to work K4MHS, W4MKT, K4YYJ, W4VHH, W4HJZ and W4BUZ. After working K4YYJ in the wee small hours the morning of the 30th, John heard a very strong signal and figured that the locals finally woke up to good band conditions. Quite a surprise to find out that the strong signal was Andy, W1AJR, in Rhode Island, and the signal was the strongest heard in New Jersey for a number of years. Band was a true coastal inversion, according to John, as nothing inland more than 100 miles in W2, 3, or 1 land was worked.

On the night of June 8, following initial contact on 144 Mc., W4HHK and W5JWL, Gurdon, Arkansas, about 225 miles distant, tested on 432 Mc. A complete two-way contact was enjoyed on c.w. at 2130 CST. This was the first known Arkansas-Tennessee QSO on 432 Mc., and a new state for each. W4HHK now has seven states on this band: Tennessee, Mississippi, Wisconsin, Ohio, Oklahoma, Alabama and Arkansas.

Jim Adams, W4ZOU, and Herb Hinkle, W4SMY, recently were issued code-proficiency certificates. This would hardly be news, except that they copied the code run from W4RHZ, Florence, Kentucky, on 435 Mc. For some time now W4RHZ has been transmitting code practice on 51, 144.5 and 220.8 Mc. He recently added 435 Mc., using a pole-mounted transmitter running 3 watts. The qualifying run transmitted May 30 was the first to be transmitted simultaneously on all bands from 50 through 450 Mc., as far as is known. Joe Rice, W4RHZ, says that most of his audience uses the 50-Mc. transmissions, but those on 144 are also used extensively. The 220- and 435-Mc. transmissions are popular with experimenters on these bands. The code runs have helped many Novice and Technician licensees in the area to build up their code speed for the General examination. A list of amateur stations transmitting code practice is available upon request from ARRL Headquarters.

Among the many skeds now being kept on 144 Mc. is the one between VE3BQR and W1BU; nightly at 2200 EDST.

QST



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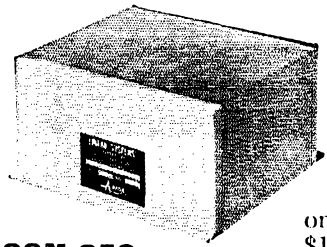
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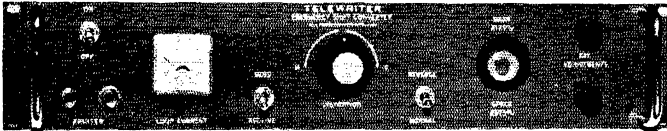
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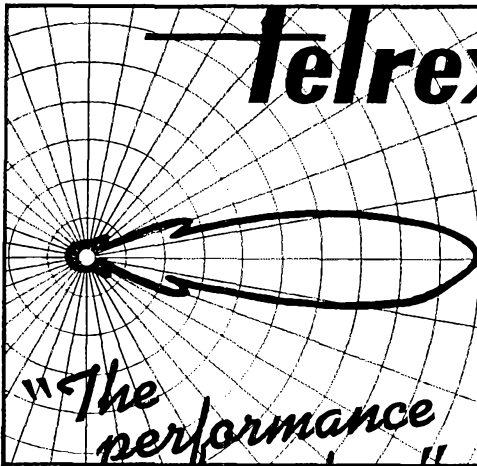
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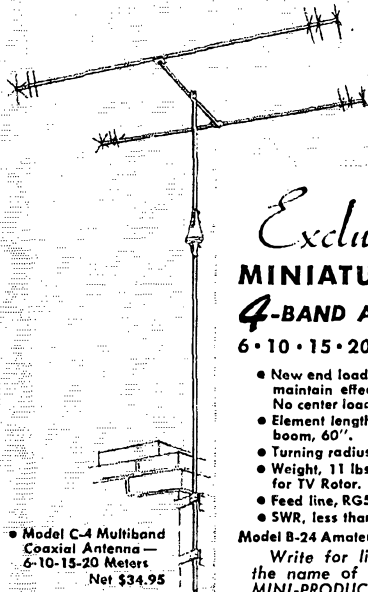
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"HAM  
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for fabulous offers on other models too!



**25 Years Ago**  
*this month*

September 1937

... Interference to local broadcast receivers was a big thing, and W1DF told how to avoid such troubles by the proper choice of transmitting frequency.

... Constructional articles included a 50-watt c.w.-phone transmitter for 220-volts d.c.; beam tubes in a push-pull amplifier; a 6-band, 3-tube transmitter; adding super-regeneration to the SW-3; an electronic volume compressor; a multi-use test meter; an a.v.c.-controlled preamplifier; a phone transmitter with vibrator power supply; and three pages of hints and kinks.

... Other technical articles discussed modes of fracture in piezo-electric crystals, Class-B audio driver considerations, circuit equalizing to improve receiver performance, and a new quartz filter of wide-range selectivity.

... Technical Editor Jim Lamb, W1AL, and Canadian representative John Stadler, VE2AP, reported on their attendance at the Bucharest meeting of the International Radio Consulting Committee.

... It was reported that the Naval Communications Reserve was moving all of its drills to government frequencies.

... Final scores were reported on the VE-W contest. W6ITH was high scorer in the States, while VE3GT topped the VE gang and was high over-all.

... And it was just 25 years ago that the DXCC award was first announced in QST. There appears to be still a modest amount of interest in this award.

... The editorial reported the results of a survey of League members, including amongst other things the intelligence that the average age of amateurs was 27 years.

... The Detroit ARA announced a "Good Fist Award," to promote better on-the-air fists. QST

**Silent Keys**

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

- W1IT, Clayton A. Paulette, North Troy, Vt.
- W2MAF, Henry G. Frey, Jackson Heights, N. Y.
- W2NKG, Moses J. Fink, New York, N. Y.
- W2QUB, Ivan R. Fenton, Boonville, N. Y.
- WA2SFJ, Edward J. Dromgoole, Chatham, N. Y.
- ex-W3AIS, Howard H. Layton, Wilmington, Del.
- W3DMO, Francis J. Quantin, Clifton Heights, Pa.
- W3PVJ, Walter A. Gerrity, Scranton, Pa.
- W3ZWJ, Harold S. Daniels, Everett, Pa.
- W4BQK, Paul T. Metzger, Jonesboro, Tenn.
- W4FK, Edward C. Frase, jr., Memphis, Tenn.
- K4QAV, Arnold V. Helminger, St. Simons Island, Ga.
- W5BAD, George A. Krutilek, El Paso, Tex.
- W5BUZ, Ralph H. Palmer, Starks, La.
- W5DFK, Robert S. Alexander, Tunica, Miss.
- W5FVY, William A. Hannett, Albuquerque, N.M.
- W5KPR, Jack Cecil, Midland, Tex.
- W5JX, Vernon Crawford, Fort Worth, Tex.
- W5VC, E. Dave Miller, El Paso, Tex.
- W5VGC, James H. MacDonald, Lubbock, Tex.
- W6BGE, Robert C. Stoner, Temple City, Calif.
- K6GIP, Franc M. Putt, Los Angeles, Calif.
- W6GPD, John J. Whitfield, Los Angeles, Calif.
- W6MCW, Henry P. Bailey, Riverside, Calif.
- W6SCJ, Harold Whitworth, Oceanside, Calif.
- W7KUJ, Harold S. Schwartz, Ajo, Arizona
- W7SAZ, Bert W. Felt, Ogden, Utah
- ex 8AJC, James R. Bird, Chagrin Falls, Ohio
- W8ACN, Charles M. Blust, Cincinnati, Ohio
- W8CMQ, Charles R. Serfass, jr., Hudson, Ohio
- W9ZUJ, Joseph C. Holinko, Richmond, Ind.
- W0AK, Charles M. Orcutt, Des Moines, Iowa
- W0GZS, Roger F. Standefer, Pueblo, Colo.
- ET3XY, Sable Selassie, Addis Ababa, Ethiopia
- G13DQE, Edward Doran, Belfast, Ireland
- GW3FVI, Walter Pennell, Bridgend, Glam, Wales
- VE3FAT, Garry R. Warren, Toronto, Ont., Canada
- VE3QD, R. D. Carter, Willowdale, Ont., Canada



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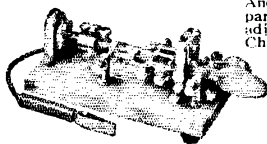
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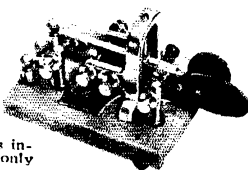
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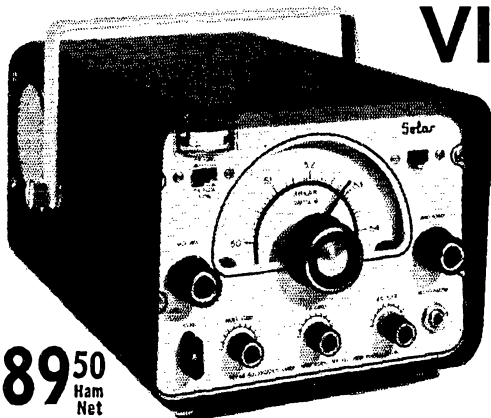
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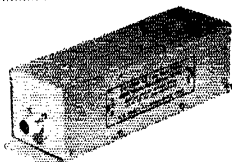
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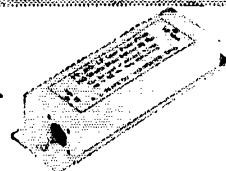
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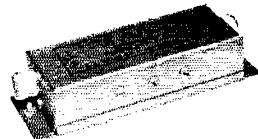


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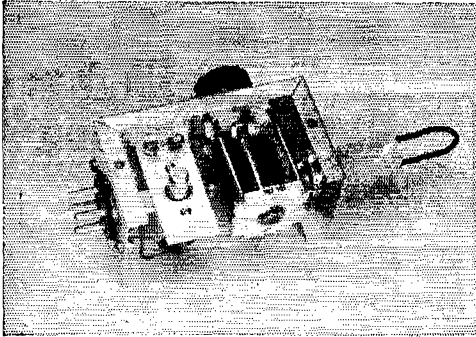


Fig. 21-15—Grid-dip meter covering the range 1.7 to 275 Mc., with the 90-165 Mc. coil in place. The power supply and transistor meter booster are a separate unit (see Fig. 21-17). The split-stator tuning capacitor is made from a single-stator variable. The Nuvistor tube socket is mounted on a small bracket, and a tie point under the bracket supports associated capacitors and resistors that aren't supported by socket and tuning-capacitor terminals.

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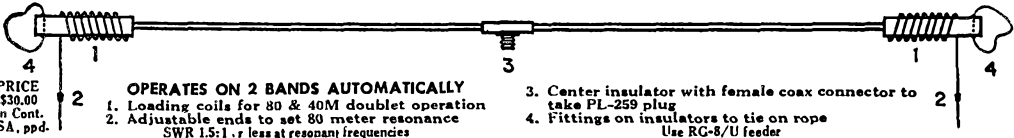
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70' LONG, 80 & 40 M

Power rating 2 Kw. P.E.P. or over



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**OPERATES ON 2 BANDS AUTOMATICALLY**  
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Box 44

Owensboro, Kentucky

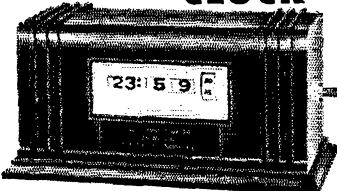
## CALL-IDENT TYMETER®

10-MINUTE STATION CALL REMINDER

#124

**22.50**

Plus applicable taxes



10-minute repeating timer buzzes warning to sign in your call letters. Walnut or ebony plastic case. H4", W7¾", D4". Wt. 3 lbs. 110V, 60 cy. 1 year guarantee.

At Your Dealer, or WRITE TO

TYMETER ELECTRONICS

**PENNWOOD NUMECHRON CO.**

7249 FRANKSTOWN AVE., PITTSBURGH 8, PA.

**24 HOUR CLOCK**

## ALTERNATORS

New, 12V, complete with universal installation kit and transistor regulator. Fully guaranteed. Write for details.

30A unit \$49.95, 45A, \$59.95.

Electrocom Corp., 115 Ward St., Boston 20, Mass.

**NEW CLEGG 99'ERS**

**NEW PRICE \$159.95**

**SPECIAL \$139.95**

WHILE OUR PRESENT STOCK LASTS

**GRAHAM RADIO, INC.**

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READING, MASS.

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U. S. and ABROAD

## RADIO COMMUNICATION

- Installation Supervisors
- Operating Personnel
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for **INSTALLATION • OPERATION • MAINTENANCE**

of TRANSMITTERS — RECEIVERS — TERMINAL EQUIPMENT  
CRYPTO — TELETYPE — RELAY CENTER OPERATION — ANTENNAS  
MICROWAVE RELAY and PRIMARY POWER EQUIPMENT

Recent experience in Military or Commercial Communication Systems desired. We also have selected openings for Qualified Equipment Design Engineers.

Send resume to

**DIRECTOR OF INDUSTRIAL RELATIONS**  
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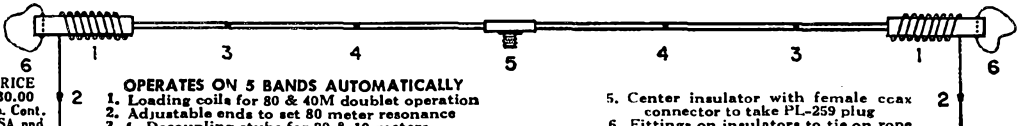
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### LRL-66 ANTENNA

66' LONG. 80 THRU 10M

Power rating 2 Kw. P.E.P. or over on 80, 40, 15  
On 20 and 10 1 Kw. P.E.P. Transmitter input



PRICE  
\$30.00  
in. Cent.  
USA, ppd.

- OPERATES ON 5 BANDS AUTOMATICALLY**
1. Loading coils for 80 & 40M doublet operation
  2. Adjustable ends to set 80 meter resonance
  - 3, 4. Decoupling stubs for 20 & 10 meters

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ARE you Canada touring through Eastern Quebec?  
BUSINESS? PLEASURE?

Why not, then, "QSY" to  
"LES PELERINS"

The place where "Hams" get together

For information, special rates, reservations, write to  
MOTEL "LES PELERINS" "H" way #2, Notre Dame  
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**\$285.00**  
for your  
**DRAKE**  
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**HARRISON**  
"HAM  
HEADQUARTERS  
U. S. A."

**HURRY!** see page 141, August QST  
for fabulous offers on other models too!

### GET YOUR COMMERCIAL TICKET EASIER WITH ...

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with new supplement  
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# IN 1914

IN 1914 two eminent pioneers in amateur radio, Hiram Percy Maxim and Clarence D. Tuska, answered the need for a national amateur organization by forming the American Radio Relay League. The following year in an attempt to circulate the latest and most accurate information to serious hams, QST magazine was conceived and distributed. Today, some 46 years later, progressive hams still look to QST for leadership. In its pages can be found new equipment from the workbenches of the experimenter; information about League sponsored contests and conventions; operating tips for the beginner, the average ham, and the DX man; news about traffic nets, and SCM reports; VHF news; humorous stories; and, yes ma'am, even a YL column. Every issue, to be sure, has something for everyone.

THE voice of QST is respected by amateurs for three mighty important reasons: QST is written and edited by hams for hams; QST is backed up by the League staff of 65 full-time people devoted to helping every ham enjoy his hobby to its fullest; QST is owned by the members who exercise their control through their democratically elected representatives, the Board of Directors. In addition almost half a century of experience is at the disposal of members. Whatever the problem—operating, legal, technical—the League staff is ready to serve you. Is it worth five dollars a year for membership? JOIN NOW.

QST AND ARRL membership \$5 (Additional Family members at the same address \$1) \$5.25 in Canada, \$6 elsewhere.

THE AMERICAN RADIO  
RELAY LEAGUE, INC.

38 LASALLE ROAD  
WEST HARTFORD 7, CONN.

## HAM RADIO INVENTORY CLEARANCE SALE

- BRAND NEW RADIO GEAR
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- WARRANTED BY MFRS.

BELOW COST

	Reg.	Sale
<b>GONSET</b>		
6SB-100, 100-watt PEP SSB	\$495.00	\$375.00
6-meter Linear Amp for Com- municator III	169.50	99.50
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2-meter Communicator IV	369.50	294.50
G-76 Mobile Transceiver	399.50	299.50
G-63 Receiver	239.50	179.50
<b>E. F. JOHNSON</b>		
10-watt Audio Amp	99.50	69.50
Courier 500-watts PEP	289.50	149.50
Navigator	199.50	149.50
<b>GLOBE</b>		
Scout Transmitter	159.95	119.95
DSB-100 Sidebander	139.95	99.95
<b>HALLICRAFTERS</b>		
S95 152-178 mc FM Receiver	69.95	54.95
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PHILMORE CR5AC All Band Receiver	87.75	34.95
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817 BOYLSTON ST., BOSTON 16, MASS. ★ CO 7-4700

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**CRAMER**  
ELECTRONICS, INC.

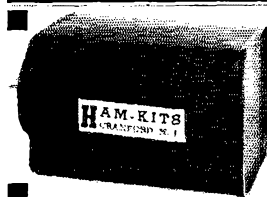
### TELEVISION ENGINEER

Need good right hand man. Must be experienced and competent in troubleshooting RCA studio, transmitter and microwave equipment. Need someone to keep TV station on air while I chase DX. Good opportunity for right man.

KRIS-TV • JERRY E. SMITH, W5TFV

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### DUMMY LOAD

52 ohm, non-reactive film oxide R.F. unit. All band, all power to 1 KW. SWR 1.2 to 1.

Kit \$7.95 postpaid. Wired, add \$2

HAM KITS

308 Edgar Ave., Box 175, Cranford, N.J.

## SKYLANE QUADS

"famous the world over!"

**\$59.95** Three Bands **\$99.95**  
Bamboo Fiberglass



- HIGH F/B RATIO
- VERY LOW SWR
- HIGH GAIN
- LOW Q — BROADLY TUNED
- EASY TO MATCH
- LOW WIND RESISTANCE
- RUGGED CONSTRUCTION

FOR FREE LITERATURE  
WRITE DEPT. A

**SkyLane** PRODUCTS 406 BON AIR DR.  
TEMPLE TERRACE FLA

# HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.

(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. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a box number without identifying signature cannot be accepted.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.

(6) A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature. 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, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ 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 copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.

(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 except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.*

SYRACUSE VHF Club 8th Annual Roundup October 6, 1962. Three Rivers Inn: outstanding speakers, awards, dinner, floor show. This is one to attend if you want a day you'll long remember. Bring the wife, there is a program for her, too. Write Joseph Bancheri, Sec'y., WA2ADG, 215 Westfall Drive, Syracuse 9, N.Y.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold. W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, N.Y.

STORM Warning Stations. Send \$2.00 for our book on making 12 Weather Instruments. Saco Press, Box 2513, South Bend, Ind.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Factory service at reasonable prices on Collins, Hallicrafters, Hammarlund, Gonset, National, Harvey-Wells. Our 26th year, 90 day guarantee. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

TRIGGER. Cash paid for ham equipment. 7361 W. North Ave., River Forest, Ill. PR 1-8616. Chicago #TU 1-9-629

TOROIDs: Uncased 88 Mhy. like new. Dollar each. Five/\$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif.

SOUTHERN California: Transmitters and receivers repaired, aligned. Bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded. Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllog 8-0500.

WANTED: Two or more 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

CASH For your gear! We buy, trade and sell. We stock Hammarlund, Hallicrafters, National, Johnson, RME, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & H Electronic Supply Inc., 506-510 Kishwaukee St., Rockford, Ill.

WANTED: Military or Industrial laboratory test equipment. Electraircraft, Box 399, Mt. Kisco, N.Y.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N.C.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase W4RP, Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Johnson, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halstead St., Chicago Heights, Ill. Tel. SKyline 5-4056.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

KWSI, \$900. W2ADD

MOBILE Station. Gonset G66B and G77A. Center loaded Master Mobile antenna with 900 Aristocrat coil, heavy-duty bumper mount and Aero-Z Match Cable for mobile and fixed use. Shure 505C mike. Factory cartons and manuals. All exc. condn. \$345.00. K3JHX, 109 Spring Valley Rd., Wilmington 7, Del.

QSLs? WPE? America's finest and largest variety samples 25¢. Religious QSL samples 20¢. "Rus" Sackers, W8DED, Box 218, Holland, Mich.

3-D QSLs now in W6 Land. Please be patient while I catch up with back correspondence and orders. Everyone will hear from me. Handling back orders rapidly. Ron Kratovil, 3-D QSLs, Box 552, Sierra Madre, Calif.

C. FRITZ QSLs guarantee greater returns! Samples, 25¢ deductible. Box 1684, Scottsdale, Arizona (formerly Joliet, Ill.).

QSLs. Twenty exclusive designs in 3 colors. Rush \$3.85 for 100 or \$6.90 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

\$1.00 Frames 60 QSL cards in clear plastic! See picture on page 160 this issue. John Thomas, K4NMT, Box 198, Gallatin, Tennessee.

QSL-SWL-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

QSLs "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Catalog with samples, 25¢.

QSLs-SWLs. Samples 10¢. Malgo Press, Box 375 M.O., Toledo, I. Ohio.

DELUXE QSLs. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢.

QSL Cards. Call-letter D-cals. Samples 10¢, or send 25¢ for extra large selection and free "Danger, High Voltage!" card. Dick, W8VVK, Rte. 4, Gladwin, Michigan.

QSL-SWLs, 100 2-color glossy, \$3.00. QSO file cards, \$1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

HUNDRED QSLs: 80¢. Samples, dime. Meininger, Jesup, Iowa.

QSLs: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLs, SWLs, WPE. Samples 5¢. Nicholas & Son Printery, P.O. Box 11184, Phoenix 17, Ariz.

QSLs, SWLs, XYL-OMs (sample assortment approximately 95¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypical, snazzy, unparagoned cards (Wow!). Rogers, K8AAB, 961 Arcade St., St. Paul 6, Minn.

DON'T Buy QSLs-SWLs until you see my free samples. Bolles, W5OWC, 7701 Tisdale, Austin, Texas.

SUPERIOR QSLs, samples 10¢. Ham Specialties, Box 823 Bellaire, Texas

PICTURE QSLs. Cards of your shack, home, etc. Made from your photograph. 1000, \$13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QSL Specialists. Distinctive Samples 15¢. DRJ Studios, 2114 N. Laverne Ave., Chicago 39, Ill.

QSLs, 300 for \$4.35. Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill.

QSLs-SWLs. Samples free. W4BKT Press, 123 No. Main, McKenzie, Tenn.

QSLs, Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLs, Samples dime. Rubber stamps; name, call and address \$1.35. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLs, \$2.50 and up. Samples 10¢. RBL Print M.R. 12, Phillipsburg, N.J.

QSLs, Free Samples. W7IIZ Press, Box 183, Springfield, Oregon.

QSLs, SWL's that are different, colored, embossed card stock, etc. "Kromekote". Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

CERTIFIED QSLs-SWLs, unique designs, speedy service. Catalog, 25¢ (refundable) Certified Printing, Box 1023, Whittier, Calif.

QSLs, Kromekote 2 & 3 colors, attractive, distinctive, different. Free ball point pen with order. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N.J.

QUALITY QSLs. New designs monthly. Samples 10¢. Giant, 25¢. Savory, 172 Roosevelt Rd., Weymouth, Mass.

RUBBER Stamps, \$1.00. Call and Address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N. J.

QSLs 2 color glossy, 100, \$2.50 samples dime. Ramsbottom Print Shop, Box 237F, Kirksville, Mo.

QSLs, Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSL-SWL Samples 25¢. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLs, Samples, dime. Printer, Corwith, Iowa.

QSLs-SWLs, 3-colors 100 \$2.00. Samples dime. Bob Garra, Lehighton, Penna.

1 1/4" CALL QSLs (2 sides printed), 100, \$2.75. Sample free. Garipey, 2624 Kroemer, Ft. Wayne, Ind.

QSL Cards; Low prices, free samples. Debbeler Printing, 1309-B North, 38th St., Milwaukee 8, Wis.

QSLs, New, original, dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

RUBBER Stamps for hams, sample impressions, W9UNY, Hamm, 542 North 93, Milwaukee, Wis.

RUBBER Stamp, Case, ink pad, Call, name, address, \$1.00. K4ISA, Perry, Box 8080, Allandale, Fla.

QUALITY QSLs. New designs monthly. Samples 10¢. Giant 25¢. Savory, 172 Roosevelt Rd., Weymouth, Mass.

**ATTRACTIVE QSLs:** Large variety of styles, cartoons, colors, personal ham stationery, ampies 25¢ (deductible). Paul Levin, K2MTI, 1460 Carroll St., Brooklyn 13, N.Y.

**QSLs.** Low cost. High quality. (Samples 10¢). Rimer, WA2-WAO, 212-03 53rd Ave., Bayside, L.I., N.Y.

**RUTGERS Vari-Typing Service,** 7 Fairfield Road, Somerset, N.J.

**RUBBER Stamps,** 3 lines \$1.00. Travis, Box 612, Austin 63, Texas.

**WANTED:** Commercially built ham equipment in trade for my resort area vacant lot worth \$1890 near Los Angeles. I want to use on the lot go first cabin and can very easily be had by some sharp horse trader. W6YTA, 1109 Harvard St., Santa Monica, Calif.

**SELL:** 6146, 6883. \$2.00; Monoscope RCA 1698, \$2.50; blowers, \$7.00; Variacs, \$7.00; 500W 6M final, \$60; pro recorder, \$300. H.P. Aud. osc. \$60.00; Stud sil. rec., 35¢ up. Free list. A & B Enr., 4206 Ave. U., Brooklyn, N.Y. De-8-3313.

**SELL Or trade:** HT32A and SX-101A, Mk III. Want: Tektronix IIX scope and General Radio signal generator, W4IWA, 105 Lynnhaven, Hampton, Va.

**CUP-CORE Inductances,** excellent for sharp or band-pass 50 to 100 Kc. I.F. or B.F.O. Very high Q. Unused, cased, adjustable; solder terminals. Type 1, 2.9 Mh., Type 7, 3.7 mh. Dollar each postpaid. U.S. Circuit suggestions included. H. Woods, 2346 Clifton Lane, Northfield, Ill.

**MY Fifty-foot fold-over tower** built for less than fifty dollars. Send three dollars for specifications, drawings, instructions and photographs. Satisfaction guaranteed or money refunded. Jim Briaman, W4IEN, Norcross, Ga.

**X-TAL-CONTROLLED 21 Mc converter** for sale. See November 1959 CQ, p. 100, \$15.00. W3GHS, Hauff, 420 S. Lewis Road, Royersford, Penna.

**QSTs** need all early issues; CQ all issues 1945. W4ID, 461 3rd Ave., Sea Park, Eau Gallie, Fla.

**CHANGE X-tal frequency,** including plated type. Safe method, ammonium bi-fluoride, containers, holders, instructions, complete, \$1.00. Deluxe model, \$2.00. Ham-Kits, Box 175, Cranford, N.J.

**WE Pay cash** for used 2-way radio equipment. State model, price, quantity and condition. Communications Service, 3209 Canton, Dallas, Texas. Tel. RI 7-1832.

**RECEIVER,** Hallicrafters SX-96 (1956 model). Original price \$250.00. Ten tubes plus rectifier and voltage regulator. Selectable sideband feature. 450 Kc to 34 Mc. See write-up in "Recent Equipment" column in QST, June 1955. \$150.00 cash. Also for personal collection, QSTs January through August 1956; ARRL Handbooks Editions 1 and 5. WICUT, Box 1, West Hartford 7, Conn.

**TUBES Wanted.** All types, highest prices paid. Write or phone. Lou-Tronics, Inc., 131 Lawrence St., Brooklyn 1, N.Y. Tel. UL 5-2615.

**WANTED:** All types military aircraft ground radios, teletype and test equipment, GRC, PRC, etc. Have all types amateur gear for trading, purchases or cash. Phil Rickson, K2HJC, Morrisonville, N.Y.

**BARGAINS Builders,** cleaning shack. Example: G-E 3" round meters, \$2.25; Chicago Tila transformers, from \$1.20; Ham-land variables, from \$1.00. Many, many more. Stamp for list. W9AZA, 256 Robert, Burlington, Wis.

**NEW And used ham gear.** Top trades. Norm, K9HRI, at Dahn Electronic Supply, 14 Jayne St., Algonquin, Ill. Mail orders welcome.

**FOR Sale:** KWS-1 with accessories in excellent condx, best offer over \$900. Dave De Armond, 3024 Seminary, Oakland 5, Calif.

**WANTED:** Old wireless gear, tubes, mazaings and catalogs before 1925. Amateur or ship equipment only. Please give complete information including prices. My purpose is to buy this equipment, put it in first-class shape and make it available either to a museum or demonstration basis to all amateurs who didn't live and operate during this era. W5VA, I. Frank Smith, P.O. Box 840, Corpus Christi, Texas.

**ARC-3 top condx T67B xmtr and R77A rcvr,** Schematics and instrs. for 2-mcstr rig. All accessory parts, 115v pwr, supplies, cables, connectors, spare tubes. First \$75 takes all. John Griswold, Catalpa Rd., Morristown, N.J. Tel. Jefferson 9-6617.

**ATTENTION Mobilizers:** Heavy-duty Lecce-Neville 6 volt 100 amp. system, \$50; 12 volt 50 amp system, \$50; 12 volt 60 amp system, \$60; 12 volt 100 amp. system, \$100. Built-in silicon rectifier alternators 12 volt 60 amps, \$100; 12 volt 100 amps, \$125.00. Guaranteed to police car units. Herbert A. Zimmerman, Jr., K2PAJ, 1907 Coney Island, Ave. Brooklyn 30, N.Y. Tel. DEWEY 6-7388.

**WANTED:** Heathkit SB-10 SSB adapter. Will pay price plus shipping. K6BBJ, 1851 43rd Ave., San Francisco, Calif.

**PROCEEDINGS of the I.R.E.** 1914 through 1949, 1923, 1928, 1931, 1932 complete. Will sell any copy or copies. Excellent price on entire lot. Mrs. Miriam Knapp, W21ZM, 191 Beechwood Rd., West Hartford 7, Conn. Tel. 521-2055

**BEFORE You buy receiving tubes or electronic components,** send now for your giant free Zalytron current catalog featuring nationally known Zalytron first quality TV-Radio tubes. Ham, Hi-Fi Stereo equipment, kits, parts, special purpose tubes, antennas, etc. All priced to save you plenty. Why pay more? Zalytron Tube Corp., 220-Q W. 42nd St., N.Y.C.

**HAM Discount House.** Write us for lowest prices on ham equipment. Factory sealed cartons. H D H Sales Co., 327 Greenwich Ave., Stamford, Conn.

**SELL Hallicrafters HT-37,** \$350.00; SX-96, \$100; R-47, \$8.00. Dowkey Av. relay, \$3.00. HT-11 for \$450.00. W9AEN, 4629 No. 100th St., Milwaukee 18, Wis.

**COLLINS 51J2, 51J3, 51J4 reconditioned receivers** 500 kc.-30.5 mc. 32V, \$195; URA-8A new \$225. Teletype and Kleinschmidt equipment taken in trade for new amateur equipment. Write Tom, W1AFN, Alltronics-Howard Co., P.O. Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

**WANT:** 2170, 721-B, OK-159, RK-6043. Have 2129, 730-A, 2149, 2161-A, ID-6A, ZPN-4 indicator. Make offer. W5JGV.

**McMURDO-Silver masterpiece** #1 20-tube model. Urgently require schematic. Finch, 1343 E. 5935S, Salt Lake City 17, Utah.

**6 & 2 METER FM gear.** Surplus police units. Receiver strips, \$15.00. Transmitter strips, \$10.00. Write for details. Two-Way Radio, 115 Ward St., Boston 20, Mass.

**SELL:** Like new HRO-60 with Bandspeed coils for 80-40-20-15-10 crystal calibrator and Select-O-Ject, \$350.00 or best reasonable offer. W9PUY.

**JOHNSON KW Matchbox;** built-in SWR meter; no reasonable offer refused. K3JHG, 2789 Highland Ave., Broomall, Penna. Area 215 EL 6-0822.

**GONSET Communicator III, A-1 shape,** \$195; Morrow 5BR-2 converter, \$35; Paco R.F. signal Generator & TV/FM marker generator, Model G30, \$25.00; National Radio & TV Home Study Course, \$15. J. P. Neugent, c/o Marathon, Div. American Can Co., Green Bay, Wisconsin.

**COMPLETE Multi-Elmac mobile rig AF-68 xmtr:** PMR-8 rcvr M1070 P.S. 6 or 12V. DC, 115 AC supply; 10-4 Shure mics, cables and base whip antenna also a whip load 6 antenna coil complete; mobile rig only 3 months old (purchased from Evans Radio, Concord, N.H.). Asking \$350.00. cash. D. Conlin, 92 Chatham St., Worcester 9, Mass.

**EXCELLENT HT-30,** \$195.00. No trades. sry. Write K2ITP. FOR Sale: Power supply, primary 110,115, 120, 50/70 cy. Sec. 2.36 KVA. 3140-0-3140 at 700 Ma. Filter reactors, 30 h at 350 Ma., 7.5 h at 700 ma. Condensers 2 eac., 2500 VDC 4 microfarads, fil xmtr 5.4 volts at 42 amperes. \$100. F.o.b. Treadwell, K4DKJ, 3289 Hallwood Circle, Macon, Georgia.

**SELL:** ART-13 with pwr. supply. Both exclnt condx. \$125.00. F.o.b. 576 Solon Road, Chagrin Falls, Ohio. K8WWR.

**COMPLETE Station** for sale: HQ-129X rcvr, DX-40 transmitter, V4-6 vertical, Co-ax and xtals included. All in gud condx. Best offer. WA6CCO, Elliot Zais, 320 Colon, San Francisco 12, Calif. 585-2589.

**BARGAINS!** Used equipment sold, traded, wanted by other hams in "Equipment Exchange Bulletin." Sample copy free! Write: Brand, Sycamore, Ill.

**FOR Sale:** Central Electronics 100-V, used 25 hours, like new condx. Will ship in original packing. \$550. M. B. Patterson, 1924 I. R. 7, Box 347, Dallas, Texas.

**B&W L-1000-A linear,** spare 813's, \$175; heavy duty supply 0-2000V @ 1 amp. Variac controlled (for 800V in bridge) 4 meters, 10-20 input, all in 15" compact cabinet professional appearance, parts value over \$550, 3735; 4 mfd. at 5000V new, \$10; Heath grid dip, \$18; RCA 3" scope to 50 Kc, \$20. W1VNY, Ashton, 12 Top O'Hill Road, Darien, Conn. Tel. DAVIS 5-2125.

**KWS-1 #970,** works perfectly but surplus to my needs, \$850. W2KOY, 1740 Front St., East Meadow, L.I., N.Y.

**"HAVE The S/LINE."** For sale: Drake I.-A. exc. condx. \$160.00. Marvin Gehr, 165 School St., Marion, Iowa.

**FOR Sale:** GPR-90 with GSB-1 and matching speaker, \$350.00; Seneca, \$175; Chycenne, \$85. Will deliver within 50 miles of NYC. Tom Burnside, WA2VHB, 167 State St., Brooklyn 1, N.Y.

**VARIACS:** Large quantities brand new factory cartons, 120 volt type; W2 @ 2.4 amps, \$15; W5 @ 6 amps, \$18; W10 @ 10 amps, \$31; W20 @ 20 amps, \$48; also 240 volt types: W5H @ 2 amps, \$21.50; W10H @ 4 amps, \$33; 20H @ 8 amps, \$50; W30H @ 12 amps, \$75, other models available. F.o.b. Los Angeles. No C.O.Ds. Westates Electronics, 6344 Arizona Circle, Los Angeles 45, Calif.

**SELL:** DX-40, \$50.00 Knight kit R-100 with all accessories, \$100.00; VE-1, \$12.50; D-104, \$10.00; bug, \$7.50; Tri-band vertical, \$20.00; or entire station with cables, relay, etc. \$175.00. 14 David Silvka, 102-19 65th Road, Forest Hills, L.I., N.Y. TW 7-2297.

**WANTED:** Perfect, scratchless late 32S1 with AC power, will pick up in lower Connecticut area and New York, Philadelphia and Wilmington areas. Buzz Mack, W2EEK, 178 Seven Bridge Road, Chappaqua, N.Y.

**SALE:** Collins 75A-4 receiver, serial 2319, in gud condx with .8, 2.1 and 6 kc. filters, \$495.00. Irvin Reed Weir, K2PO1, 559 Grant Blvd., Syracuse 6, N.Y.

**RETURNING To college.** Drake 2B with Q-multiplier, speaker, xtal calibrator, all xtals, \$300; Elmac AF68 with M1070 pwr. supply, \$190; Johnson TR switch, \$22.00; Heathkit Conrad with radio, \$15; WRL ant. coupler, \$8.00. Complete station with mics and cables, \$500. All gear new December 1961. Herb, K7CWO, 527 S. Vancouver St., Kennewick, Wash.

**75A-1, in perfect condx.** Best offer over \$150.00. W2YKT, Frank Madietta, Forest Hills, L.I., N.Y.

**SELL:** Johnson Ranger. In mint condx. Priced for a quick sale. Will deliver 30 mile radius NYC. E. S. Darwin, 343 E. 30th St., New York 16, N.Y. Days tel. (Area code 212) LO 4-0354; evenings, OR 9-8208.

**GONSET III 2-meter Communicator** for sale. Make an offer. Stan Teich, 1668 Vyse Ave., New York City, Tel. LU 3-6668.

**SELL:** HRO-60, \$375, like new condx, 6 coils, spkr, Steele, Wheatley Court, Scotch Plains, N.J. Phone 889-7625.

**WANTED:** National I-10 receiver, in any condx. W9YVZ, 11316 Oakley Ave., Chicago 43, Ill.

**FOR Sale:** new Eico 460 oscilloscope, \$100. Lewis Rollins, Jr., 1805 Michael Lane, Anniston, Alabama.

**SELL:** 60-watt Class B modulator, self-contained 600-V pwr. supply, mod. meter, attractive cabinet, \$35.00, matched 10-meter R.F. unit with supply for above, \$15.00. W2MZQ, Frank Stolpen, 2132 East 13th St., Brooklyn 29, N.Y. Tel. DE 9-8175

**FOR Sale:** Model MM2 Multiphase RF analyzer with RM 455 adapter, factory wired, like new, \$100. A. Avalone, 30 Aetna Ave., Torrington, Conn.

**DX-40 gud condition,** \$45.00. I'll pay postage. Frank Kolarich, 7509 Broadway, Crown Point, Ind.

WANTED: Late model car with ham gear installed, commercial or home brew, SSB preferred, Cash deal. No trades! Send full particulars to Albert J. Bertolisi, 382 Fulton St., Farmingdale, N.Y. Tel. CH 9-0923.

COLLINS 75A4 with 800, 3100, 6000 cycle filters in mint condx, \$575; 32V3, 2000; HRO 1100; capacitors, 2 mfd. 4000 G.E., \$6.00; 3 mfd. 2000 Westinghouse. \$2.00; 10 mfd. 600 fast \$1.50. Thordarson 866 filament xfrmr. \$2.00; Bendix selsyns type V-11, \$10 pr.; BC-458 new, \$10; BC-645 new, \$15; PE-101, \$1.00; PE-103, \$1.00; PE-75U power generator, 2 1/2 kw. \$250.00; B-W type BVL coils 10 through 80 with base and link and Cardwell split stator capacitor, \$15; 211 and 1625 tubes, 50¢, 829, \$2.00; three inch Westinghouse round meters 800 mils, \$3.00. All f.o.b. John Huey, W9AMU, 390 Hill Ave., Elmhurst, Ill.

KWM-2, \$810.39, Huston, K0WMMN, 941 Oakland NE, Cedar Rapids, Iowa.

SALE: Heath Apache \$200, professionally built Heath mobile receiver and transmitter, \$140.00. K9KSP, 7411 N. Pennsylvania St., Indianapolis, Ind. CL 1-0965.

SELL: Month old G-76 with calibrator, Gonset 12 V DC supply, mike, Webster Bandspringer and bumper mount, all cables. In excellent condx, \$450.00. WA6EML, 1816 Linda Vista, West Covina, Calif.

JOHNSON Valiant xmt and low-pass filter, SWR meter, RCA mike, key, all in exc. condx, \$275.00. K3R1V, 312 Owen Ave., Lansdowne, Penna.

MM-2 Central Electronics monitoring scope; practically new, used only few hours; also new, unused receiver adapter, \$95.00 for both. Need cash for damaged beam. W2PMM, Bloomfield, N.J.

WANTED: For cash, Johnson Viking Model 122 VFO. Must be factory wired, in perfect condx with shipping charges prepaid. W6CLB.

SELL: Good AF-67. \$85.00. Also complete fixed station. Write W4YOK.

FOR Sale cheap: QSTs 1917 to 1960. One or a hundred. Send your list to Rasmussen, Box 612, Redwood City, Calif.

NEW Collins 2 KW modulation xfrmr. Real cheap. Write to W3LST.

SELLOUT: Heath Marauder SSB transmitter, Mohawk receiver, SWR bridge, Johnson electronic TR switch, 114-520 "Bug". B&W 1 KW, low pass filter, Shure 505C mobile microphone, balun coil 275 watt, surplus 80M transmitter converted for mobile with modulator 100 watts, AM power supply A, 600 VDC 200 MA, 000VDC 200 MA, 250VDC 50 MA, 28VAC 8 amp, 12.6VAC 5 amp, 6.3VAC 10 amp, power supply B, 300VDC 300 MA, 6.3 VAC 10 amp, power supply C, 250VDC 50 MA, 28VAC 8 amp, 6.3 VAC 3 amp, like new sold separately. Best offer K5HXO, 109 Main Elk City, Oklahoma.

HAM'S Dream home, available for immediate occupancy: on 92' x 265' lot; two 5/8 wavelength antennas in phase on 75 M; 60' tower in back; Wincharger Mod, 300, designed to go to 400'; 3-el. rotator; fed by RG17/U cable buried between house and tower, latter situated so it holds the two 5/8 w/1 ants. in phase; radio shack in home equipped with 220V 60 amps service—5 KVA emer. gen. built-in; has 5 bedrooms, 2 1/2 baths, 42 ft. long living room w/2 fireplaces. Will rent or sell. W1A0H, Hank Gelst., Tel. 203-DA-4-1000, Darien, Conn.

COLLINS KWM-1, 516E-1, 12V mobile supply, 351D-1 mobile mounting rack, in exc. condx, \$495 takes all three. K2EQO, 123 River Bend Rd., Berkeley Heights, N.J.

VIDECON Camera, GPL PD150, new condition, \$2400 new, with Videcon, swap or best offer above \$750. W5MAA, 501 East William David Parkway, Metairie, La.

FOR Sale: Calrad stereo headset, used twice, \$10 postpaid. William Mozer, 18 Marden Ave., Sea Cliff, L.I., N.Y.

75A4 speaker book A-1. W6YVE, 3073 Knoxville, Long Beach, Calif.

TRADE: Remington Automatic 20 gauge (Browning patent) for xmt or linear amplifier. WA4ACZ, 1214 Edgedale, Salisbury, N.C.

75S-3, serial 10117, best offer over \$500. W8OPR.

WILL BUY HT-37, Will pay \$325 for nice one. K4EOS.

R-100 Knight revr, S-mtr., calibr., spkr, \$90. Art Lawler, K2-HFL, 507 Colonia Blvd., Colonia, N.J.

SSB. Sell HT-37, \$350; SX-111, spkr, \$200; P & H linear, \$100; used 4 months, Will deliver Chicago area. Phone "Tom," K9-MKX, 762-7787.

WANTED: SX-101, Mk III, sud condx. With or without spkr. Advise serial No. and price. G. Black, K8VAS, 563 Center, Essexville, Mich.

HQ-150—\$150; DX-100 with T.S.K. and modified loading condx, \$140.00; Heath Q multiplier, \$5.00; BC-221 AK with calibration book, but no cabinet or power supply \$35.00. W2QDY, 2319 Wayne Ave., Camden, N.J.

NEW Ampex 601 portable tape recorder, \$350.00. Cash only. RCA commercial 19" tape deck only. Would like to swap for linear on SSB radio in \$300 to \$600 class. Dr. C. Henry Waters, 104 Kreuger St., Orlando, Fla.

A-1 reconditioned equipment. On approval. Trades. Terms. Hallicrafters S-107, \$69.00; S-85, \$79.00; SX-99, \$99.00; SX-100, \$199.00; SX-111, \$199.00; SX-11A, \$299.00; Hammarlund HQ-100, \$129.00; HQ-110, \$179.00; HQ-160, \$229.00; HQ-170, \$259.00; HQ-180, \$329.00; Collins 75S-1, \$359.00; 75A-3, \$349.00; 75A-4, \$499.00; 32S-1, \$499.00; KWS-1, \$995.00; Central 10A, \$79.00; 20A, \$149.00; National, Gonset, Elmac, Heath, Johnson, RME, many others. Write for free list. Henry Radio Co., Butler, Mo.

WANTED: All types of aircraft or ground radios. 17L, 618F or S 388, 390, GRC, PRC, 51J, R V X. Especially any item made by Collins Radio, ham or commercial. Also large tube types and test equipment. General. For fast cash action contact Ted Dames, W2WUW, 308 Hickory, Arlington, N.J.

MECHANICAL Filters. Want 1.5 or 2.1 Kc for 74A4. Will buy or trade for 6.0 Kc filter. Also want 75A4 noise blanker. K2MLB, P.O. Box 204, West Orange, N.J.

SELL Or trade: Friez dual traverse weighing type, recording rain and snow gauge, New condition. Weekly record. WILWV. FOR Sale: Estate of W8CMO—Ham radio equipment including Viking II transmitter and 2-40 D National receiver. Please call, send inquiries, after September 14th. Mrs. Joseph E. Sirtass, 33 Aurora St., Hudson, Ohio. #653-5151, Ext 21, or 653-5929.

XXXX Copper laminates, 2 oz., 2 sides; 7/4 x 8 1/4—3 for 1.00; 7/4 x 14 1/2, \$1.00 each; plus postage for one pound parcels post. Macleod, 46 Botolph, Melrose, Mass.

CUSTOM Building Ham gear, VHF specialists, converters, power supplies, etc. Free quotes. Frontier Electronics, Orr 1, Minnesota. W0HPS, Everett Hoard, W0PYC, Frankie Hoard, SOUTHERN California: KWM-2 with AC supply, extra crystals, \$995. Prefer not to ship. W6BLZ, 528 Colima St., La Jolla, Calif.

COLLINS 75S-1, \$325. W5HXW, 1234 Glen Cove, Richardson, Texas.

FOR Sale: Heathkit Mohawk receiver, \$250; National NC-98 receiver, \$80. F.o.b. Richard Bedard, 15 Queen St., Worcester, Mass.

TELETYPE, Model 14 TD, \$45; Model 14 reperforator with base, \$60; NC88, all band receiver, \$60, 6 volt 100 amp. Lecco movie alternator, Tom White, 867 berkshire, Dallas 18, Texas.

RECEIVER HQ-110, like new, \$175. K2YFM, Tel. DA 7-0136.

SELL Or Swap: Entire photographic darkroom, Omega. Want Johnson Valiant, Mike, 49 Hollywood Ave., Massapequa, L.I., N.Y.

COLLINS KWM-1 with Collins AC and DC, power supplies. Also Collins mobile mount and all cables, also heliwhips for 10 and 20. Getting new car. OM refuses to reinstall. \$700. Lila Howard, WA2JIO (516) FL 4-2046, 27 Ash St., Floral Park, N.Y.

COLLEGE First, Sell converted ART-13 w/ps. Works fine. Auto-tune works. TVI suppressed. ABT, \$150. Lower offers considered. Info. K6POD/5, Box 88 University Station, Shawnee, Okla.

TRADE, Sell? TMC VFO, 2-64 Mc. works, adjustment. Best offer, Randy Gawtry, P.O. Box 970, International Falls, Minn. NC-300 for sale with matching speaker and calibrator. Perfect condition, \$190. Rev. Strautmeyer, 2828 Perrysville Ave., Pittsburgh 14, Penna.

SELL: Central Electronics 200V for \$600.00. Purchased new in December. Consider Apache on trade. Will deliver 100 miles from Philadelphia area. WA2WKU, 2193 Riverton Road, Riverton, N.J.

SELL: SCR522A transceiver (100-156 Mc), \$35 complete; Heath "Tweeter," \$45.00; Johnson Sentry \$15. Ameco 6 meter converter to BC new \$20; Homebrew 6 M. converter to 14 Mc \$10. Abramson (K9KWV), 522 S. Dearborn St., Chicago, Ill.

COLLINS 75A4, .5 and 3.1 filters, noise blanker, vernier dial, \$495. KWS-1, \$875, both for \$1250. Priced for quick sale. K0HTP, 890 17th Ave., Marlon, Iowa.

GLOBE VHF62, factory job, \$95; AF-67, \$90 and AC pwr. supply, \$25; B&W TR switch 380B, \$9; National VFO62, \$35. All in exc. condx; never used 4E27A/5-125B3, 810s and 100T5, QSTs 1935-1955. Best offers. W3BS, 1012 Wilde Ave., Drexel Hill, Penna.

PACEMAKER, \$150; SX-101, \$250; Tecraft CC-50, \$25; check for \$400 takes all, plus accessories. WA2AJH, 515 3rd Ave., Olean, N. Y.

SELLING Station: Heathkit Mohawk, \$200; Heathkit Twoer, \$40; Globe Chief 90A, \$35; Johnson Signal Sentry, \$14; BW Model 380 TR switch, \$17; Johnson LP filter, \$10; Knight R-100 speaker, \$6. Everything in exc. condx. Barolet, W3BUD, North Town Creek, California, Md.

LIKE NEW, B&W LPA-1 linear amplifier and pwr. supply LPS-1, \$350. W2CMM, 1741 Andrews Ave., NYC 53.

MOBILE! Elmac AF-67 exc. condx, Fibreglas whip with all-band loading coil, \$105. WA2IVS/1, 94 Wilson Dr., Framingham, Mass.

WANTED: Viking Johnson kilowatt. State price, age and condition. George Bouffill, 320 Ringwood Ave., Menlo Park, Calif.

SELL Or trade: RME 4350A, \$150. Need mobile receiver. Berg, 2225 S. Cabrillo San Pedro, Calif.

WANTED: Commercial or surplus airborne, ground, transmitters, receivers, test sets, 18S, 17L, 51R, 618S, BC611, 180L, GRC, PRC, ARN14, Bendix, Collins, others. Ritco, Box 156, Va.

SELL Or trade large list of ham gear, SSB, VHF, etcetera. W4API, 1420 South Randolph, Arlington 4, Va.

FOR Sale: Gonset Communicator III, 6 meters with mike, excellent, \$180. K8BBB, Dan Hartman, 2227 Whitney Place, Dayton 20, Ohio.

NC-300, 6N2 converter, calibrator, \$250. Johnson 6N2 transmitter, blower, \$100. K2CQG, 2514 Crompond Road, Yorktown Heights, N.Y.

KWM-2 transceiver, 351D-2 mobile mount, MP-1 12vdc supply, MM-2 boom headset, PM2 110VAC portable supply, CC-1 carrying case for PM-2 and KWM-2, Hy-Gain mobile Tribander, cost over \$1750. Sell: \$1150. Like new condx guaranteed. A. R. King, W9EUQ, 808 Ridgely Bldg., Springfield, Ill.

KIT Assembly work wanted, any type or quantity, for individuals or manufacturers. Results guaranteed. Western Electric electronics experience for 35 years, radio amateur and designer 32 years. Reasonable prices. Inquiries invited. Joseph Harms, WA4FJE ex W1GET, W2JME, W3COP, 905 Fernald, Edgewater, Fla.

DRAKE 2A, in mint condx. Will ship in original carton, First \$200. K9TKB, Evansville, Ind.

SELL: Collins station. Orig. cartons. 75S-1, \$355; matching spkr, \$24.00; 32S-1, \$495; \$16F2, \$70 used 56 short QSO. MM2 scope w/450 kc. adpt. \$135.00, used one hour. Turner 80X mike and stand, \$6.00. Consider selling separate. M. E. Brown, 1032 Lee Ave., San Leandro, Calif. W6FJQ.

HEATH, 1 Kw plus linear amplifier model KL-1 complete with power supply model KS-1 in exc. cond. Less than 6 months old. \$375. RMF, 4350A, #120. L. A. Jackson, W8ARV, 37 Covetside Dr., Dayton 59, Ohio.

GONSET G-50 brand new condx. \$225. WA2PKO, 92 Lakeshore Dr., Eastchester, N.Y. Tel. SWHUtwater 3-6160.

WANTED! Switches for BC-312, QF1QM by Heath \$25 complete. Alan Gray, WV2WYN, Mt. Holly, N.J.

TRADE: Unused silicon equivalent #R4 for 1 mc and 100 kc. 0.05% xtals. Douglas Faunt, Darlington School, Rome, Ga.

SALE: S-22-R, revr. \$30.00 or best offer. Healal bank coils, \$7.00. Dow-Key IR switch, \$8.00. DKC-FRM, 12 volts. K9-FEN.

FOR Sale: SX-101A, 2 months old; \$325.00. W2M2VZ.

FOR Sale: One each Hammarlund Four-20 transmitter and four 11 modulator. Best price. Ben Miller, 8 Market, Ellenville, N.Y.

HAM BURGERS. Used equipment, money-back guarantee. B&W 370, \$79.95; B&W 518B, \$174.95; Globe 90A, \$49.95; Globe Linear LA-1, \$89.95; Heath Apache, \$249.95; Mohawk RX-1 and speaker, \$274.95; Johnson VIK-1, \$124.95; Paccemaker, \$124.95; Valiant, \$375.00; Thunderbolt, \$494.50; National NC-109, \$129.95; NC183D, \$239.95; NC100, \$244.95; NC-303, \$169.95; Central Electronics 10A with VFO, \$149.95; Drake IA, \$184.95; Eico 720, \$84.95; Phasemaster 2 with VFO \$279.00; Polymco 6 & 2, demo, \$339.00. Trades. Write for free list. Ham Burgers, Wyncote, Penna. Tel CA 4-1740.

FB Globe Sxet 65 in perfect condx. No scratches. \$55.00. K8-111X, 729 Allerton St., Kent, Ohio.

AF67 and PMR7, \$180.00. WA2DCA, 9 W. Cedar, Merchantville 8, N.J.

DETROIT Authorized distributor offers amateur equipment new and used from Collins down. Volume purchases permit bargain prices on new units at old prices while they last. Hallcrafters HT-37, \$450.00; SX-101A, \$299.50; SX-111, \$249.50; HT-40, \$94.95; HT-40K, \$79.95; SX-140K, \$94.95; Collins 753, \$62.00; all new, not demos, full warranty. Write or phone for prices. Pay cash and save money! Reference D & B Radio Supply & Eng. Co., RSE Ham Shack, Keuse, W8VSK, 90 Selden, Detroit 1, Mich. Tel. Temple 1-3171.

STILL Going gun buy, if we didn't swap in January, let's try again. Will take handuns in trade on new Elmac mobile rig including antenna, relay, mike cables, used two hours. Also have Eico #460 scope, Larry Churchill, 314 N. 7th St., Waukega, Ill.

1908 Oldsmobile replica, runs and looks like new (photo available). Will trade for KWM-2 complete with power supplies. Leo Avazian, 1305 West Adair, Creston, Iowa.

MUST Sell: Brand new HO-170, perfect, in carton, also my never used Central 20-A, wired by professional technician. Both guaranteed. Best cash offer or trade for commercial two-way rigs. KSZUN, J. R. Canion, Jr., 5903 Dunbury Dr., Austin, Texas.

GONSET III 6 M, \$150. Lee Palmer, K9HCC, Rt. 1, So. Beloit, Ill.

FOR Sale: Complete KW station; Gonset GSB-100 Thunderbolt amp. and SX-101A, \$1100. Will ship. Equipment in exc. condx. Tom, K9GTK, 2932 W. 99th St., Evergreen Park 42, Ill.

FOR Sale: QST complete set (to highest bidder). Science & Invention, complete set; Radio News, complete set; Radio Craft, complete set; Wireless Age 1913 to 1925. Many other radio publications. Dorothy Simpson, 85-39 152nd St., Jamaica 32, N.Y.

WANTED: RM-22 remote control unit. Also cover for Model 14 high base typing repertorizer; cover for PRXD. WANZY, 119 North Birchwood, Louisville 6, Ky.

TRADE: Pair Eimac, 4X250B sockets for pair of 4CX300A sockets. L. M. Divinia, 115 South Battin, Wichita 18, Kans.

SELL: LA-1 linear, Knight VFO, DX-40, complete with instruction books, in mint condx, expert wiring, \$150.00. K9EZG, Spring Valley, Wis.

SELL: Heathkit AR-3 receiver w/cabinet, \$25.00; DX-20 transmitter, \$30; QF-1 Q Multiplier, \$8.00. Victor Daniel, 1110 Woodland Ave., Winchester, Va.

SELL: SX-110, manual, gud condx, \$119.00. Brand new Heath IM-11 VTM, \$39.00. Charles Shinn, 48 Midfield Lane, Levittown, N.J. Tel. TR 7-9622.

THUNDERBOLT Linear amplifier, never used, \$395.00; Ranger transmitter, \$145.00. Sry, will not ship. Harry Miller, 584 Oliva Ave., Lakewood, Calif. Phone: MBcalf 3-7706.

APACHE, Like new condx, professionally wired, \$185.00; HO-170 w/spkr, also like new \$275.00. John Williams, K8GOW, G-4381 S. Saginaw St., Flint, Michigan.

SELL: Viking 500 xmt, in excnt condx; \$500 or best reasonable offer. Prefer a pick-up deal. W9PUY, Walt Robinson, 500 N. Montgomery St., Gary, Ind.

COLLINS 310B-1 40-watt c.w. exciter. In excnt condx. \$125.00. W2PVO, 845 Walton Ave., Bronx 51, N.Y.

JOHNSON Courier, 500 watts, new condx, \$185.00. Steve Steckler, 1082 East 59th St., Brooklyn 34, N.Y. Tel. HI 4-5895.

DX-20, in excnt condx, \$29.00. K7MRP, 1832 East Rovey, Phoenix 16, Ariz.

SELL: Gonset G-76 with D.C. transistor power and heavy-duty home-built A.C. supply, factory reconditioned and re-aligned recently; \$435.00. WA6KUM, 1075 E. 8th St., Chico, Calif.

SSB: HT32A, \$440.00; HO-170C, speaker, \$280.00. Going portable. K4PRO, 8913 Norwick Rd., Richmond 29, Va.

(G-50 for sale with mike, 4-el, and beam in excnt condx; also AR-22 rotor, 100 ft. cable, \$25.00; also Gonset G-50 Gooseybird, mike, very exc. condx, with two 8-el, and i beams, \$220.00. DX-60 wanted for missionary must be well built and in exc. condx. K9FNM, Charles Vandercruff, 2127 College Ave., Alton, Ill.

HEATH Mohican, immaculate condx, both 115 VAC and battery power packs. \$110.00. Will ship freight collect, expertly packed. B. Thunman, KIUFV, 71 Strawberry Hill Ave., Stamford, Conn.

HEATHKIT DX-40, \$50. Gud condx! K3KTT, Bill Whiteley, 904 Summit Rd., Narberth, Penna.

GOOD Condition S38C Hallcrafters receiver, \$20. Buyer pays transportation. Joseph Leto, W2OEU, 306 West 94th St., N.Y.C. SELL: HO-145C, \$210; Eico 720, \$65. WA2ZVJ, 2115 East 27th St., Brooklyn, N.Y.

APACHE Perfect, \$175.00. Will ship. WA6VSC, 16 LaSalle, Moraga, Calif.

FOR Sale: Viking 500 and NC-400, both for \$850.00. Will deliver 400 mile radius. Penta Nick, Pittsburgh, 549 Farnsworth Ave., Clairton, Penna. W3FOR, Tel. BE 3-6869.

NC-300 in excellent condition with xtal calibrator, \$190. New Leuce-Neville 6 volt 100 amp. alternator regulator, \$15. Trecraft 2-meter transmitter with metered power supply and coax relay, \$57. Factory wired International Xtal 2 meter pre-amp. and converter with 30-35 Mc. I.F. in cases, \$20. W5GYB, 5900 Overlook, Austin, Texas.

SELL: KWM-2 with spkr, \$810. WOAML, 2900 7th Ave., Marion, Iowa.

SELL: HO-140X w/spkr, \$160; DX-40, \$50; VF-1, \$19; complete, \$220. Ron, WA4CWN, Natchez Trace Dr., Lexington, Tenn.

BC-348 H receiver internal AC power supply, minimum modifications. Recently aligned. \$65 cash and carry N.Y.C. Higgins, Apt. 15-G, 600 W. 111th St.

DX-100, Advance Relay, B&W filter. Perfect condition. First \$150, best offer, or swap! Want 6 meter gear. K3NQA, Drake, 4120 Taylor Ave., Baltimore-36, Maryland, Ex K2PGC.

SELL: Drake 2B, xtal calib., Q-mute, and speaker, 1 week old, \$270; Eldico SSB 100F, \$400; RME 4303-CB walkie-talkies, pair \$80; Hallcrafters SX-101 MK3, \$250. All like new and F.o.b. Lamb, 1219 Yardley Road, Morrisville, Penna.

SELL: VFO Transmitter, 80, 40, 20 with pwr. supply, \$17.00; transmitter, all band, 6C16, 6B6, 814 less power supply, \$35.00; Drake 54 receiver 3-6 Mc. with power supply, neat, \$16; complete all band phone transmitter with power supplies, 300-watt, \$100. HO-129X w/spkr, \$110.00. Dean, W4SJ, 4203 Farrar Ave., Nashville 12, Tenn.

EXCELLENT HRO-60 for sale with coils A,B,C,D. \$295; 75A-4 recently aligned by Collins expert, 3 kw. filter, \$450. GSB-100 in perfect condx. \$285; Johnson KW Matchbox, \$65; KWM-1 with blander, DX adapter, 516E-1 12V pwr. supply, mobile mounted with cable, \$895. Will pack and ship collect receipt certified check or money-order. Clark, W0UDZ, 2317 Vine, West Des Moines, Iowa.

HORNET TB500 Tribander beam, \$25. W6EBY, 789 Garland Drive, Palo Alto, Calif.

FOR Sale: Famous Greenwood collection, Wireless, Antique Radio. Send stamped envelope for list. Paul Giganti, 2429 San Carlos Ave., San Carlos, Calif.

FOR Sale: 57 ft. Acromotor, J legged ham tower in excnt condx with construction instructions, \$150.00. Johnson Rotomatic antenna rotator with 100 ft. control cable and control box, \$75.00. Buyer pays postage, prices firm, no hagglng. Richard Nonnard, W9NXL, 446 Sunset Road, Winnetka, Ill.

SALE: Globe Sxet xmt, \$55; Knight VFO, \$13; Electronic keyer, paddle, \$12.00. Lot price: \$70. K2KJV, phone: 212 WE 3-338. Write: L. Lester, 2241 Creston Ave., Bronx 53, N.Y.

SELL: Vesto 61-l, tower, crankover head, mast clamp, thrust bearing, motor plate, brand new. Cost \$566, with freight W3WLOS, 138 Chautauque, Erie, Penn.

SELL: NC181D National revr with matching speaker. Recently factory reconditioned and in excellent condition. Price \$250.00. K8WYU, 377 Franklin Court, Worthington, Ohio.

SELL: Hallcrafters SX-100, \$175.00; Heath Cheyenne, Cumanche and UT-1; BC-221; BC-604, M. H. Klapp, W2EOV, 17 Kenosha St., Albany 9, N.Y.

SELL: factory wired 10B, OT1, 160-15 mtr. VFO in C.E. deluxe cabinet, \$140. Doug, K7OJT, 2266 E. 3205 S. Salt Lake City 9, Utah.

GSB-100 Exciter and 101 linear amp., perf. condx, in original cartons and booklets. For quick sale, \$495.00 for both. Phone HE 3-0803. Webb, K2GKH, 125 Ocean Ave., Jersey City 5, N.J.

COLLINS Receiver 75A-4 Serial No. 4921, in excnt condx, \$500. Kenneth H. Enstrom, W5CUM, 833 Oak Forest Dr., Dallas 32, Texas.

HT-32A, HQ-170C, both year old, \$695. Heathkit Cheyenne Comanche rig, AC supply, \$195.00. Cash f.o.b. WA2DDV, Chester, N.J., Phone TR 9-5319.

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COLLINS KW-1 Serial No. 150. factory converted for SSB, also FSK RTTY optional. Complete set new spare tubes, instruction books, excnt condx, \$2200.00. Lester Benson, K4HWF, Box 2832, Pompano Beach, Fla.

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TF1REX 56-149-3 el. beam, like new, \$50. W2DVH, 61-58 71 St. Middle Village 79, N.Y. Tel. HI 6-6373.

CRYSTALS Airmailed; SSB, MARKS, Marine, CD, Novice, CAP, net, etc. Custom finished FT-243, .01% any kilocycle 3500 to 8600, \$1.49; (10 or more same frequency FT-243, 99¢), 1707 to 20,000, \$1.95; Overtones above 10 megacycles. Fundamentals up to 13.5 megacycles, \$2.95. Add 50¢ each for 005%. Add 65¢ each for HC-604 hermetics. OST Projects (FT-243): "SSB Package, five mixer, \$9.95, seven matched filter (FT-241-A), \$9.95, "DCS-500", "IMP", "Phasing", \$9.95 each. Write regarding your crystal requirements. Airmailing 10¢ crystal, surface 5¢. Crystals since 1933. C-W Crystals, Box 2065-Q, El Monte, Calif.

COLLECTORS: UX 201-A's, 49's, 99's, 124's, original cartons. \$4.00. Exchange for Edison cylinders. Sanders, WA4EDW, 3596 Canadian Way, Tucker, Georgia.

LINEAR Amplifier, SSB/CW/AM, HT-31 with new 811A's, 500 watts CW, 1000 watts PEP on SSB. Best offer. WA6PMK, 709 Hurlingham, San Mateo, Calif.

BRAND New Johnson Viking Invader transmitter in factory sealed carton. Sacrifice for \$450.00 plus shipping, which is below wholesale. W. E. Bauer, WA6PDU, 4255 Lido Dr., Riverside, Calif.

SELL: Zenith Transoceanic Communications rcvr, \$50; Bud 7-ft. relay rack, \$30. V. R. Hein, 418 Gregory, Rockford, Ill. FOR Sale: TVI suppressed BC-610 with BC-614 speech pre-amp., \$200. 4125As, nearly new, \$8. W6DNO, 492 Anacapa St., Ventura, Calif.

SELL: G-76 Transceiver with AC supply. Perfect condx. \$360. W1BHH.

WANTED: KWM-1, AC supply, state all the particulars. WA2-ZVJ, 2115 East 27th St., Brooklyn 29, N.Y.

NEED College cash. Must sell Invader, \$400; NC-303, \$250; RME DB-23, \$20; GD-104, \$120. K2QA1, 298 Clermont Ave., Brooklyn 5, N.Y. Phone JA 2-2629.

HEATHKIT Shawnee 6 meter transceiver. New, wired and tested, but never used. Complete with mike and all cables. \$200. Or best offer. W1AAZ/1, 212 Aspinwall Ave., Brookline, Mass.

TS 186/UP frequency meter, 100-10,000 Mcs. In exc. condx. \$150. W6RET, 8831 Sovereign Rd., San Diego 23, Calif.

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VALIANT, factory-wired, \$285; HQ-120X, 70. George I. Rand, K2KTT, 66 Field Ave., Hicksville, N.Y. Tel. WE 1-0732.

COMPLETE Station: Factory-wired Ranger II, Drake 2-B, D-104 mike, coax relay. Used 2 hours. In mint condx. First \$520 takes all. Lt. Col. William Schlarb, Hq. 2nd Logistical Command, Ft. Lee, Va.

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TRADE Or sell panel-mounted power supplies, modulator, RF deck, metered control panel, all from homebrew AM kilowatt; six ft. rack cabinet, miscellaneous. Stamped envelope for list. Bill Hauser, W5TVL, 1425 Stafford Dr., WA 3-4140, Ft. Worth, Texas.

SELL: Hammarlund HX-500; Drake 2B with 2-AQ O multiplier and 2-AC calibrator. Gonset G76 transceiver transistorized P/S, \$350; two mobile transistorized P/S 12 VDC, 600VDC 200 MA, 500VDC, 250 MA, \$25.00 each. All in new condx. Wm 7094 vacuum tubes, \$12, each. Want KWM-2. F. Williams, W2WZT, 64 Prospect Ave., Hackensack, N.J.

WANTED: 12V Leeco-Neville alternator. Roger, W8QFX, 426 Pleasant, Birmingham, Mich.

SELL: 75S-1 receiver, accessory filter and BFO, clean as they come, \$385; Also Edystone 888-A rcvr. in new condx. make offer. Want fourth edition ARRL Handbook and QSTs 1915-1921 period. Have QST run 1928 up with old issues earlier. Best offer. W2DYU, 36 New Lawn Ave., Kearny, N.J.

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KWS-1, extras, \$875; 75S-3, \$575; 20A, \$125.00; LA-400C, \$135. W8WGA.

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NEED 488 VFO for 20A. K0TNC.

SELL: ART 13 transmitter; 1275 watts plate modulated; modified, and power supply. Perfect working condx. \$125.00. Shipping is extra. K1NDV, Lewis Lipson, 16 Centre St., Brookline, Mass.

TRADE: Pair new 4X150A for what have you. Lin Smith, 810 S. Worth, Sullivan, Ill.

SELL: Heathkit DX-100. Wired and tested. Brand new condition: \$150. William Rogers, RD #4, Carrollton, Ohio.

REDUCED Price. Must sell Johnson Invader: \$450; Johnson mobile, \$40. Gonset Super 12, \$39. K0IFT, Chuck Camp, RFD, Peyton, Colorado.

SX-100, R43, HT-30, both exceptionally good condition. Best offer. Mervyn Ely, 1404 N. Kenmore, South Bend, Ind.

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SELL: DX-40 transmitter, clean and in vy gud condx, \$50; NC-109 rcvr. in excnt condx, \$125. K0VMD, 146 North Lot, Montrose, Colorado.

SELL: Model 80 Measurements Corp. signal generator, \$250; Elmac PMR7 receiver, \$80; 2 meter FM pack set, \$25. W4NF5, 640 Capri Blvd., Treasure Isle, Fla.

Johnson Viking II, \$110 and VFO. \$200; Hallicrafters SX-99, QF-1 and R46B, \$110; Signal Sentry, \$15. D-104 and PTT stand, \$25. To keyer, \$55 (with lever). Misc. filters, relays. K1CCA, 22 Minivale Rd., Springdale, Conn.

HQ-110C, in gud condx; first \$166 gets it; also have DX-40 with VFO, \$55, together, \$215. K5AWA, Wayne La Grone, Box 292, Vega, Texas.

25% Down and 12 equal monthly payments with no interest for a flawless station! SX-101, M-3; HT-32, M-1, Johnson Matchbox/SWR meter and low-pass filter; Shure and Electro-Voice mikes; fittings, etc., \$775. K9DNR, Box 183, Cicero, Ill.

SLIMMEX Crystal microphone, \$8.00; 4 1/4" reflecting telescope, \$35. Write for information and/or list of meters and transformers. Fred WA2EBR/4, 526 Churchill Rd., McLean, Va.

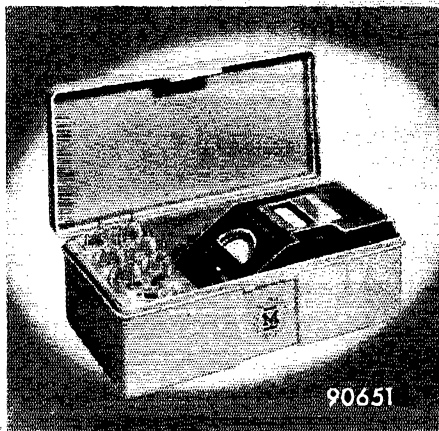
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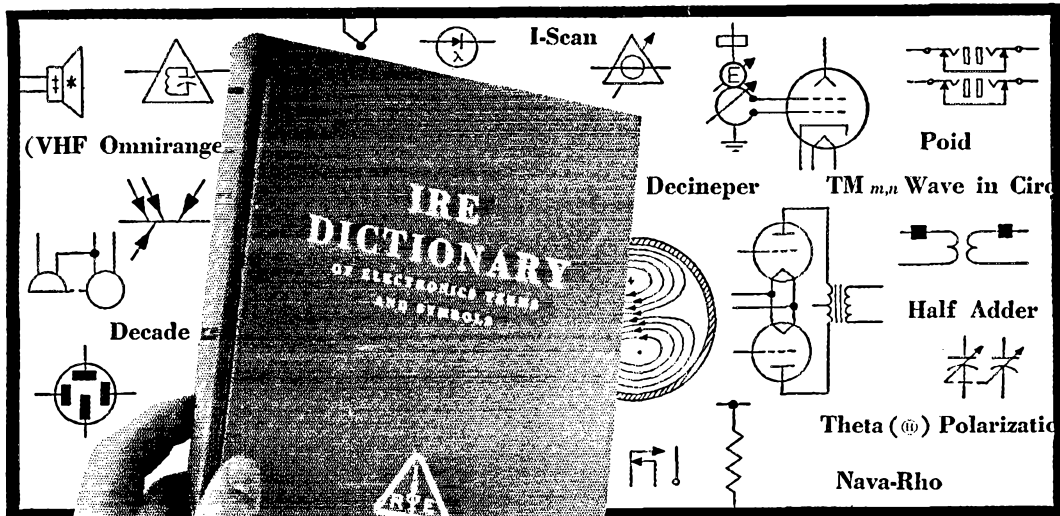
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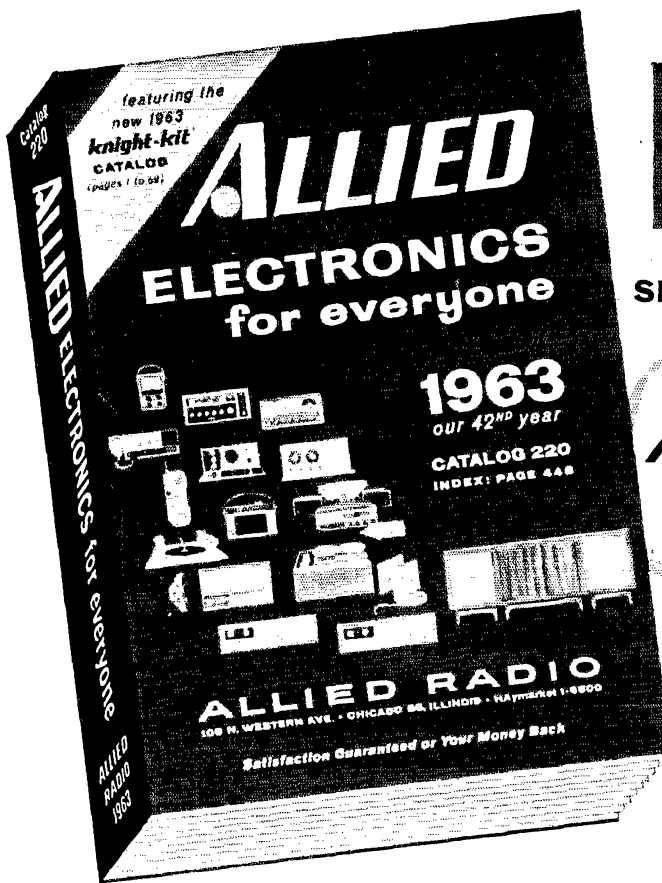
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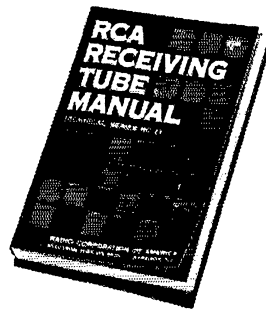
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