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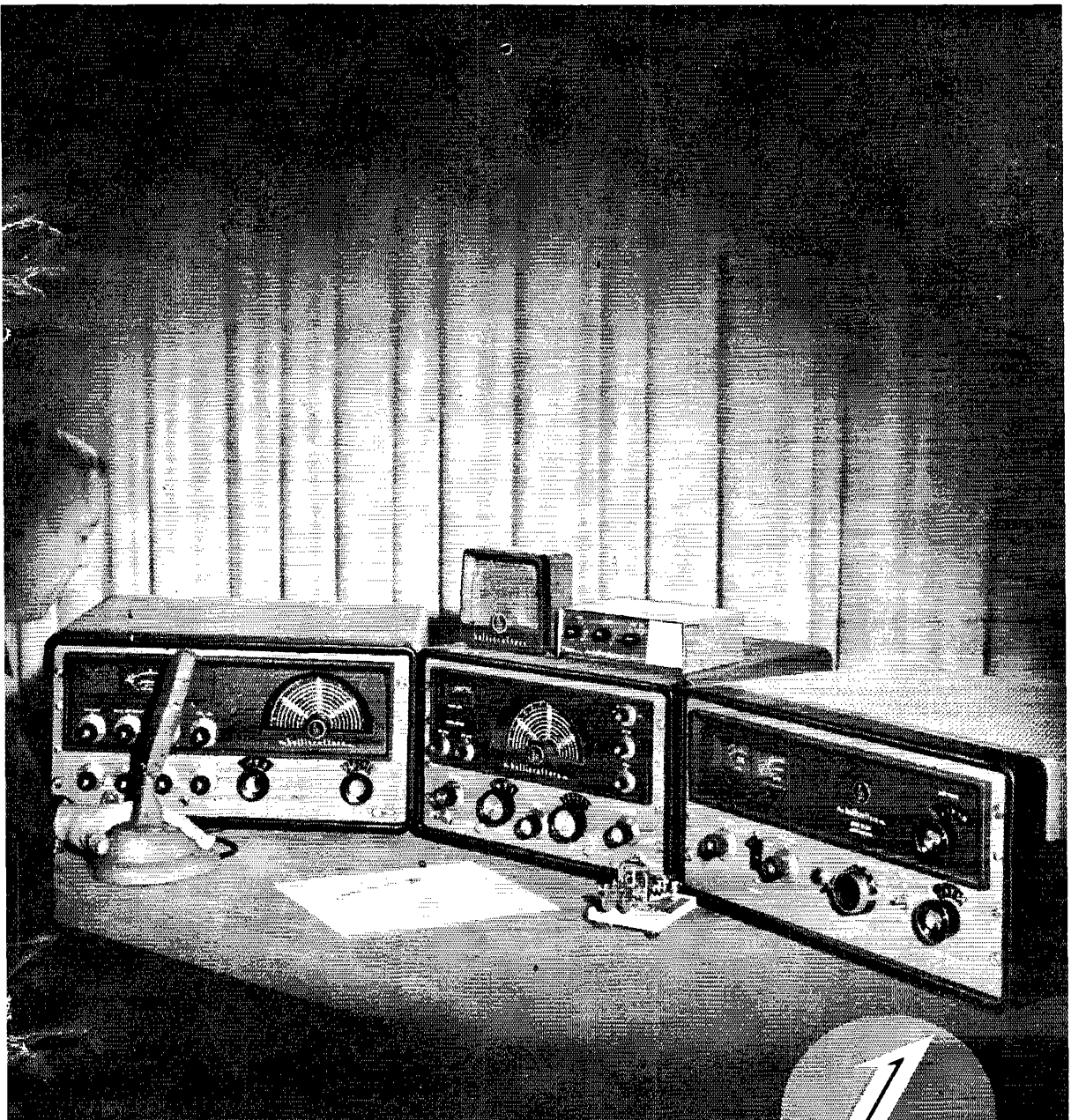

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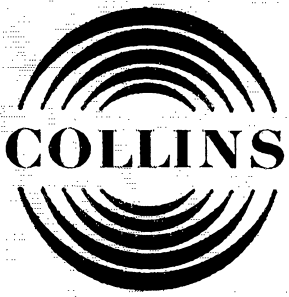

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JANUARY 1962

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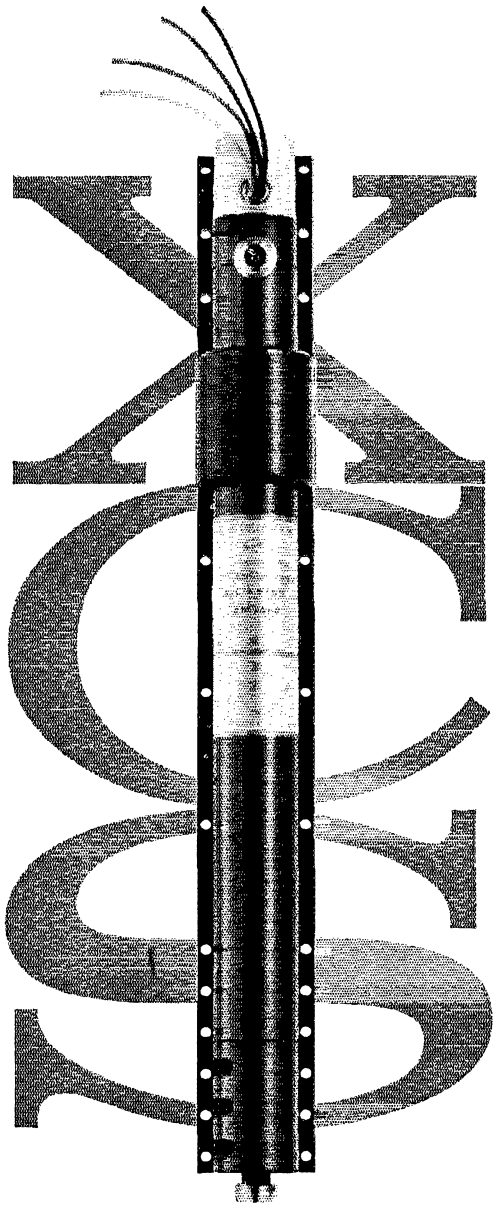

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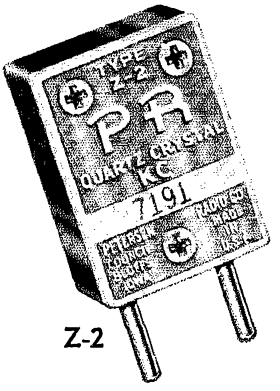

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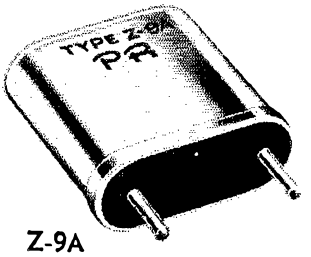

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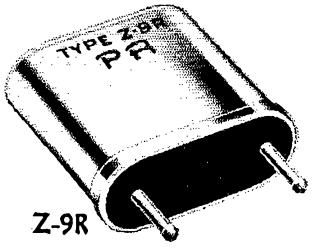

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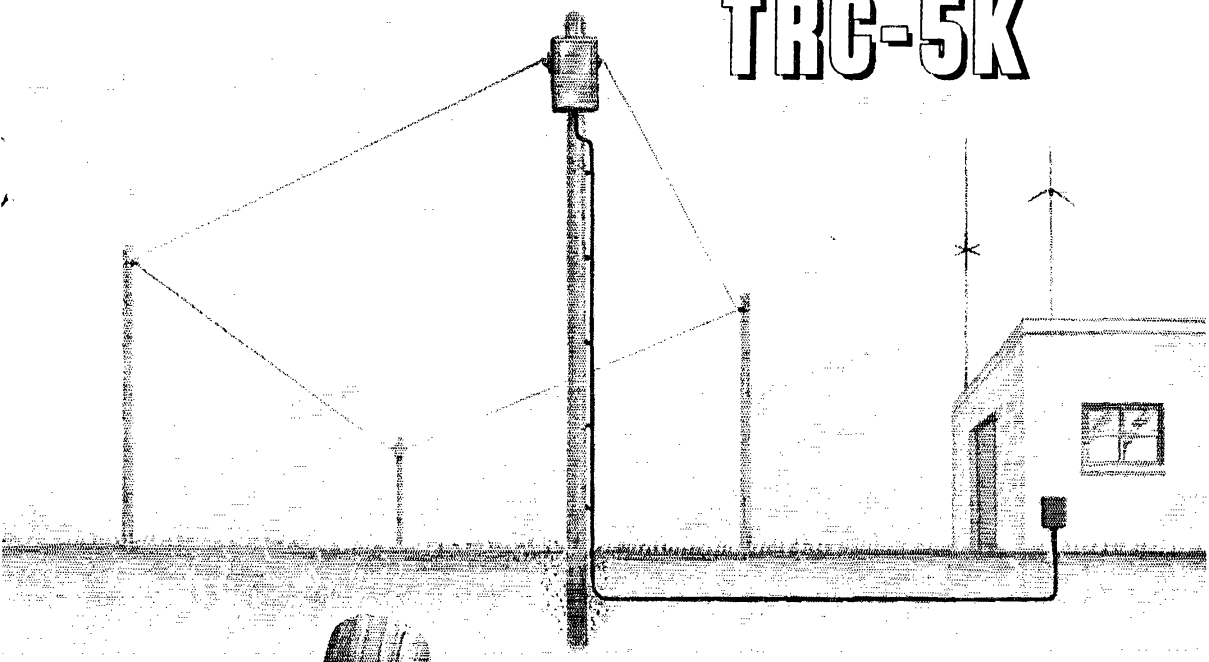

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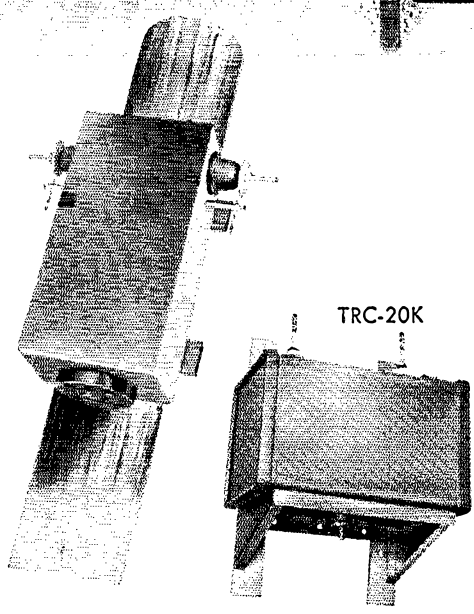

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors.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

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

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

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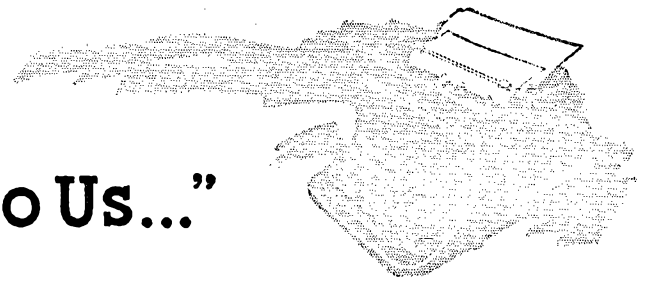


"It Seems to Us..."

THE YEAR IN REVIEW

LIKE many another year, 1961 had its ups and downs: its fast-paced drama — and its share of slow, drawn-out, hard work. All in all it was a good year — a year that amateurs can remember with pride.

To begin with, amateur radio entered the space age in '61 with well-laid plans, and the necessary hardware, for an amateur satellite complete with two-meter transmitter. The project, called OSCAR for Orbital Satellite Carrying Amateur Radio, will give amateurs throughout the world the opportunity to participate directly in space communications experimentation. The OSCAR package has been designed and built entirely by amateurs, and the project approved by Government authorities; at press time, all it required was a piggyback ride on a U. S. satellite launch.

With efficiency born of necessity, and long hours of practice, radio amateurs in Texas, Louisiana and nearby states girded themselves against Hurricane Carla and provided, in many cases, the only communication available to some of the hardest-hit areas. Less spectacular, but just as important, were the hundreds of incidents, duly documented in *QST*, involving tornados, floods, sleet and snow storms, fires (particularly the California holocaust), accidents, and medical assistance for individuals in remote areas of this and foreign countries.

The Federal Communications Commission amended the amateur regulations, effective in August, to permit amateurs operating on or over the high seas to use the 14-Mc. band in addition to the 21- and 28-Mc. bands. Previously, the 14-Mc. band could be used by such stations only when they were within ITU Region II (roughly, the western hemisphere extended to include Hawaii). FCC also changed its rules to permit American citizens overseas to take the Conditional Class license examination, regardless of their lack of residence eligibility under other sections of the rules. On file with the FCC and awaiting decision are League petitions involving: slow-scan TV, RTTY dual-signing procedures, easier mobile logging, expansion of privileges in 1800–2000 kc., and a power increase for the 420-Mc. amateur band. New amateur license application forms 610 and 610-A were adopted, and the headaches of discontinued renewal form 405A gradually disappeared. There was considerable talk of a license fee for all radio stations, but no specific proposal was made.

The U. S. ratified the 1959 Geneva Radio Regulations, the only change for amateurs involving an eventual shift of the 3500 *Megacycles* (3,500,000 *kc.*) band to its old location at 3300–3500 *Mc.* A bill was introduced by Senator Barry Goldwater, ex-6BPI, providing for U. S. reciprocal licensing privileges for amateurs, with action awaiting the 1962 session of Congress. Bolivia and the U. S. signed a third-party message traffic agreement. Canada consummated its first such agreement, with Venezuela, and we hope it is but the forerunner of many to come. Laos was removed from the list of "banned" countries for U. S. amateurs. For morale and recreation purposes, amateur radio was installed on the *S.S. Hope* (W8OLJ/MM and /PK) and was used to pass messages between the crew of that mercy vessel and their families as the hospital ship made its way around the world.

Back on the home front, there was steady growth both in the number of amateurs and members of the League. The ARRL Board of Directors held its annual meeting in Anaheim, California, the first away from Hartford since the Denver meeting in 1954. John Huntoon, W1LVQ, became the League's General Manager, upon the retirement of A. L. Budlong, W1BUD, after 37 years of service. In another administrative change, Paul M. Segal, General Counsel of the League since 1928, turned over his office to Robert M. Booth, jr., W3PS (see story page 40 of this issue). Slow but definite progress was made toward the eventual construction of a new Hq. office building.

John Chambers, W6NLZ, and Ralph E. Thomas, KH6UK, were jointly presented both the 1961 Edison award and the 1960 ARRL Merit Award for their California-Hawaii experiments with tropospheric propagation on the 144- and 220-Mc. amateur bands. A new "Cover Plaque" award was created for the author of the best article appearing in each issue of *QST*.

Activity increased in virtually every phase of amateur operation with the most dramatic growth in the v.h.f. region and less spectacu-

(Please turn the page)

lar but steady increases in the h.f. bands.

Rather than an expected drop in 50-Mc. activity resulting from the waning solar cycle, it appears that more stations than ever before are using this band. The 144- and 220-Mc. records seem to have kindled new interest in those frequencies, with a number of stations building and experimenting with 144-Mc. moonbounce. There is a good indication that u.h.f. and microwave experimentation is being taken up by an increasing number of technically qualified amateurs, and equipment for this work is gradually getting out of the entirely-surplus phase.

Two good indications of activity were the V.h.f. Sweepstakes, in which 1550 logs were returned (nearly as many as in the h.f. version of the same contest), and the June V.h.f. Party, which broke all previous records for number of entries, geographical coverage, scores, section multiplier totals, and number of portable stations in the field.

On the h.f. bands participation was strong in all of the contests, with Field Day the most popular. Last year saw well over two million message handlings by the amateur fraternity. Nine new countries were added to the DXCC list and applications for the DXCC award and the WAS award remain at a high level. Nine states held Amateur Radio Week observances. Maine became the forty-sixth state and Newfoundland the seventh Canadian Province to issue amateur call letter license plates.

These are but a few of the highlights of 1961, a year of definite progress. May the record be even better in 1962! QST

OUR COVER

We sent our staff photographer aloft to get an asteroid's view of the first OSCAR (*O*rbital *S*atellite *C*arrying *A*mateur *R*adio) — signifying a new era in amateur radio: space communication. A year ago OSCAR was little more than a dream, but through the imagination and drive of a group of enthusiastic amateurs, and with ARRL backing, Government approval has made it a reality. We hope by now you'll be listening to the amateur satellite saying "HI" on 145 Mc., and that you'll send intercept reports (as outlined in previous *QST* articles — see index on page 190 of December) to Project OSCAR, Box 183, Sunnyvale, Calif.

Hamfest Calendar

California — All DXers are invited to attend the annual joint meeting of the Northern and Southern California DX Clubs, to be held at the Hacienda Hotel in Fresno on January 20 and 21. The program includes a cocktail party, a banquet, and a special DX breakfast. Present will be some of the country's greatest. For further info and for reservations, contact Frank Cuevas, W6AOA, 1030 West 93rd St., Los Angeles 44.

Don't forget to write. Who? Your Senators. Why? To support Senate Bill 2361. See pages 9 and 73 of October *QST*. This is the reciprocal licensing bill, gang.

COMING A.R.R.L. CONVENTIONS

April 7–8 — New England Division, Swampscott, Massachusetts.
April 13–14 — Michigan State, Grand Rapids, Michigan.
May 19—20 — Roanoke Division, Roanoke, Virginia.
June 1–3 — Southwestern Division, Anaheim, California.
August 31–September 3 — ARRL National, Portland, Oregon.
September 1–3 — Delta Division, New Orleans, Louisiana.
October 13 — Hudson Division, New York, N. Y.

Strays

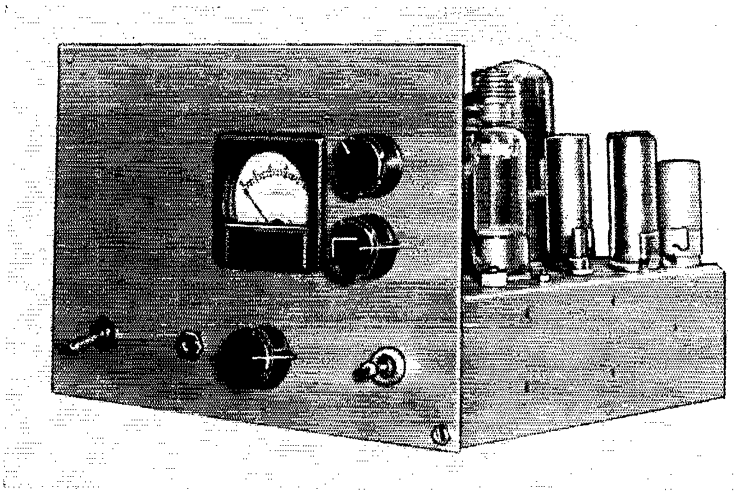
In the center, the new Chief MARS, Air Force—Capt. A. N. Cole, W4IYR. He is flanked by Major Sid Rexford, W2TBZ, Chief MARS Army, and Commander Al Kunz, K4NAA, Chief Amateur Liaison Branch, USN.

Anyone interested in a 40-meter Novice training net in the Texas-Arkansas-Oklahoma area please contact WN5AID, Box 65, Route 1, Hartford, Arkansas.

—···—

Here's the January schedule for the Air Force MARS Eastern Technical Net, meeting at 1900 GMT Sundays on 3295, 7540, and 15,715 kc.

Jan. 7 — New Electron Tubes for the Modern Era.
Jan. 14 — Thermionic Integrated Micro-Module Circuits for High Temperature Environments.
Jan. 21 — Applications of Transistors.
Jan. 28 — General Discussion of Semiconductor Devices.



The panel arrangement is based on a good r.f. layout rather than symmetry. The two knobs alongside the meter are for the final tank tuning (top) and loading. The control that looks like a toggle switch, below these knobs, is the tuning-slug screw for the amplifier grid tank. The knob at bottom center is the converter tuning control. The shaft bearing alongside it merely fills a hole representing a discarded idea. At the far left is the on-off switch in the power-supply circuit.

Six-Meter S.S.B., the Simple Way

The converter circuit discussed in this article is quite straightforward, and its output will drive a Class AB_1 amplifier of considerable size. Included also is a Class AB_2 amplifier of some 20 watts output, making a 6-meter setup suitable for practical communication. Any 14-Mc. s.s.b. exciter can be used to drive it.

Converting 14-Mc. S.S.B. to 50 Mc.

BY ROGER P. RIES,* KØIAX 9

IT is very easy to get on 6-meter s.s.b. without having to sacrifice performance, or too much cash. Shown in Fig. 1 is a circuit of a small converter which puts a solid 20 watts on the air. By suitable alterations to the output amplifier, power outputs ranging from 2 to over 100 watts may be had. The converter is easily driven by nearly any existing exciter.

The converter section proper consists of a 5763 mixer followed by a 12AX7 grounded-grid amplifier. Enough 50-Mc. energy is available at this point for local work, or to drive a pair of 6146s or even a 4-65A, if close attention is paid to efficiency. In the unit pictured, a 2E26 is used as a Class AB_2 amplifier. With this arrangement, ample power is available for local contacts and openings, and there is plenty of drive for a high-powered linear amplifier for scatter work. With the 2E26 tied to a simple three-element beam, I have been able to work up to 150 miles quite consistently.

The input frequency of 14 Mc. was chosen for a number of reasons. It is high enough so that separating the desired 50-Mc. s.s.b. energy from the spurious mixer products is not too difficult a task. At the same time, 14 Mc. is one of the most clean and stable operating frequencies of the popular 9-Mc. phasing exciters. Last, but not least, nearly any commercial or home-brew s.s.b. exciter will be capable of operating on 14 Mc. with the necessary watt or two of output required to drive the converter.

The Circuit

The only unusual element in the circuit is the 12AX7 amplifier. It would probably be possible to drive the 2E26 directly from the 5763 mixer, eliminating the 12AX7 completely. However, the 12AX7 allows the mixer to operate at a low signal

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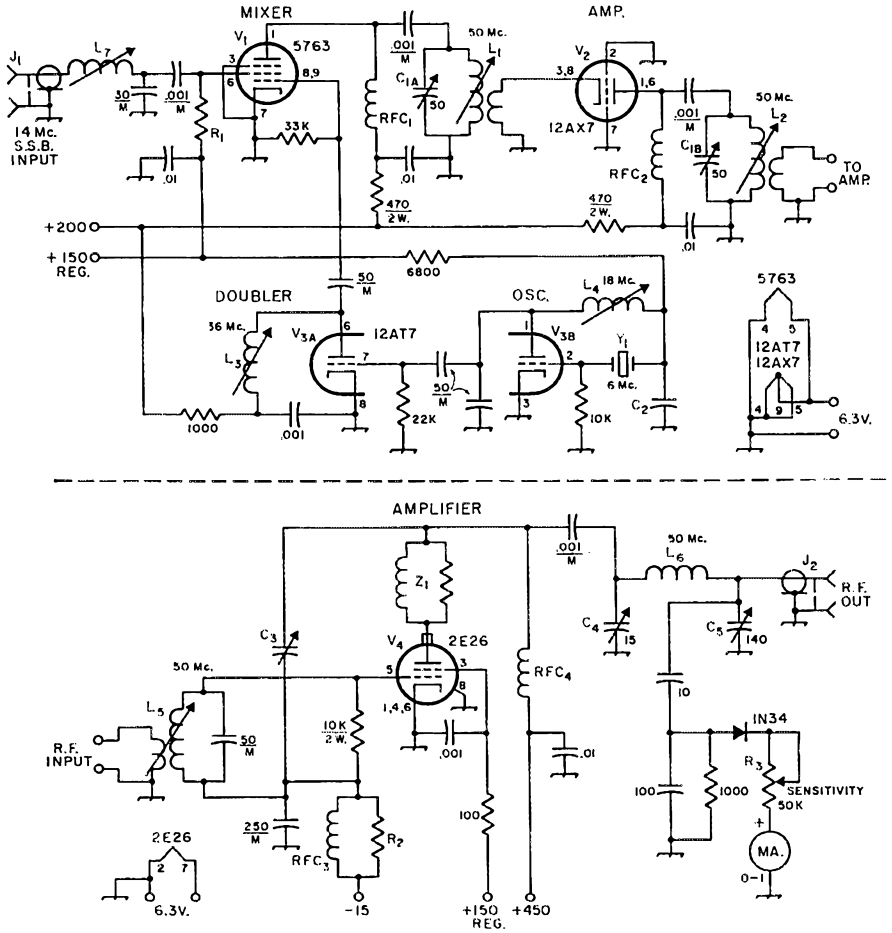
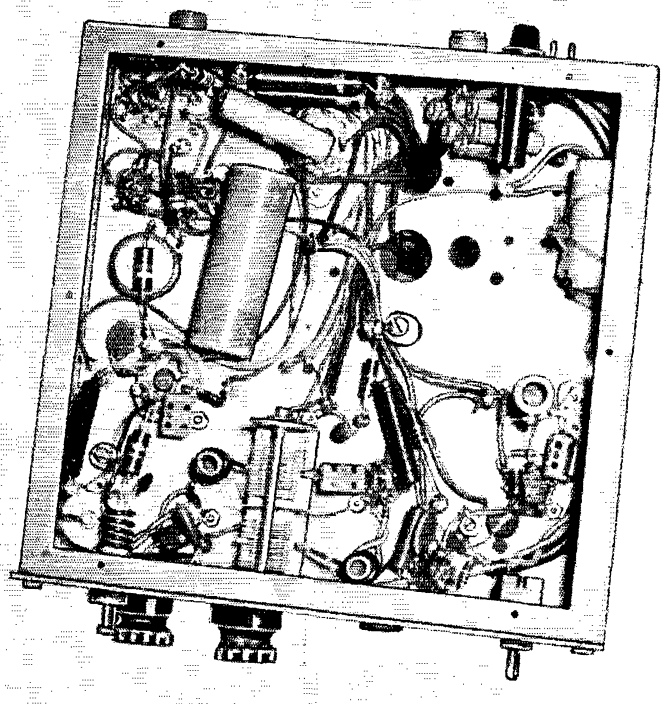


Fig. 1—14- to 50-Mc. s.s.b. converter circuit. Sections of V_2 are in parallel. Decimal values of capacitance are in μf.; others are in $\mu\mu$f.; fixed capacitors are disk ceramic, except those marked M (mica). Resistors are ½-watt composition, except as indicated below; resistances are in ohms.

C_1—Dual 50-$\mu\mu$f. variable (Hammarlund HFD-50 or equivalent).
C_2—Approx. 300 $\mu\mu$f. (mica); see text.
C_3—Air padder capacitor, approx. 15 $\mu\mu$f.
C_4—15-$\mu\mu$f. midget variable (Hammarlund HF-15 or equivalent).
C_5—140-$\mu\mu$f. midget variable (Hammarlund HF-140 or equivalent).
J_1, J_2—Coaxial connector, chassis mounting.
L_1, L_2—5½ turns No. 12 enam. close-wound around a ⅜-inch diam. slug-tuned form (Miller 4400 or equivalent). Link, 3 turns insulated wire at cold end.
L_3—20 turns No. 22 enam. close-wound on ¼-inch diam. slug-tuned form (Miller 4500 or equivalent).
L_4—9 turns No. 22 enam. close-wound on ½-inch diam. slug-tuned form (National XR-50, Millen 69046 or equivalent).
L_5—3½ turns No. 12 enam. close-wound on same type form as L_1 and L_2. Link, 3 turns insulated wire at cold end.
L_6—6 turns No. 12 enam. spaced wire diameter; coil diameter ¾ inch (supported between C_4 and C_5).
L_7—App. 14 turns No. 22 enam. on same type form as L_4.
R_1—See text and Fig. 2.
R_2—See text.
R_3—50,000-ohm control, linear taper.
RFC_1-RFC_4, inc.—7-μh. r.f. choke (Ohmite Z-50).
Y_1—18-Mc. crystal; or, preferably, 6-Mc. crystal operated on 3rd overtone; see text.
Z_1—Parasitic suppressor; 4 turns No. 20, spaced, on 47-ohm, 2-watt resistor.

level, with two notable results. The first is the low level of the spurious mixer products produced, and the second is the increased selectivity between mixer and output, both of which combine to produce a high degree of spurious-signal rejection. The extra parts add little to the size, weight, or cost of the unit, and really paid off in the writer's case in that although no special precautions were taken to prevent TVI, the unit was perfectly clean. Even so, if you live in a difficult area it would probably pay to use suitable wiring and shielding techniques.

The photographs show the locations of the important parts. The really important thing in layout is to isolate all the 50-Mc. tanks from each other. In the unit shown, this was done by put-



The rear half of the chassis, which is 9 by 9 by 3 inches, is occupied by the power supply and voltage regulator. The r.f. wiring occupies the lower half of the chassis in this view. The dual-section variable capacitor is C_1. The crystal-oscillator section is at the right; L_4 can be seen end on about halfway up the chassis. The mixer socket is near the lower edge, with L_1 (also end on) between it and C_1. L_2 is to the left of the upper section of C_1.

ting the output tank above the chassis and then arranging the other tanks under the chassis for adequate isolation. C_1, if thoroughly grounded at both ends, will serve to separate L_1 and L_2. Be sure to select a capacitor for C_1 which has a shield between the two sections.

A 6-Mc. crystal is recommended in this circuit because of its ruggedness. Although overtone crystals can be used, they seem to be more prone to drift in frequency as they become warm, especially when the amount of feedback is large. A normal 6-Mc. crystal will oscillate readily in this circuit and will be quite stable. The major disadvantage of using a 6-Mc. crystal seems to be loss of exact calibration. The writer tried about a dozen surplus crystals marked 6050 kc. and the mean output frequency was 36.100 Mc.; individual crystals varied within plus or minus 15 kc. of this frequency. A 5975-kc. crystal should cause the injection frequency to be reasonably close to 36.000 Mc., which would make the 14-Mc. calibration come out fairly close to the corresponding 50-Mc. points. Aside from this, either frequency will give coverage of the sideband frequencies normally used on 6 meters — 50.1 to 50.2 Mc.

Power Supply

The plate and screen power requirements for the converter section can easily be met by a supply delivering 200 to 250 volts at 75 ma. or so. The regulated 150 volts can be from a VR tube which is part of the same supply. The 2E26 amplifier screen supply can be taken from the same source. The plate supplies should have good regulation from resting plate current to the full-input value.

Aside from these points no special design features are involved. The power supply used by the author was built around a salvaged TV transformer and powers both the converter and 2E26 amplifier. An electronic voltage regulator was incorporated to insure the stability of the lower B+ voltages, but this is an unnecessary refinement.

Bias is obtained from two 9-volt transistor batteries in series; this is slightly over the 15-volt bias recommended for AB_2 operation of the 2E26, but the bias is not highly critical. Other types of small batteries could be used. The principal point is that the bias voltage should not change when grid current flows; that is, a bias source of low internal resistance is needed.

Alignment

Once the unit is wired, it should be aligned using the following procedure: First, grid-dip all coils to the frequencies shown. Do this with all tubes in their sockets, shields in place, and power off. Resonate L_1 and L_2 with C_1 approximately half open.

The next step is to get the 36-Mc. injection circuit going. Remove all tubes except the 12AT7 and apply the power. Adjust the slug in L_4 until

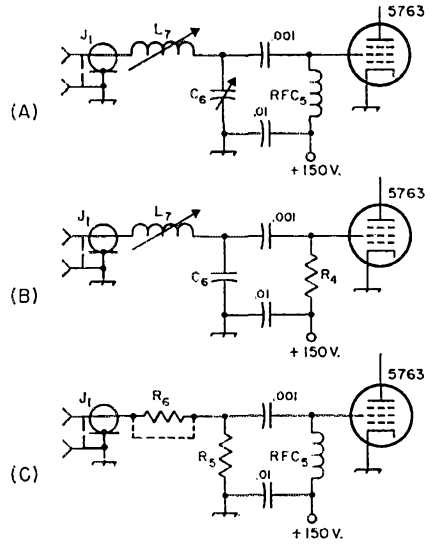


Fig. 2—Alternative input circuits for use with s.s.b. exciters of various power outputs.

A—For exciters of very low power output:
L_7—Same as in Fig. 1.
C_6—100-$\mu\mu$f. variable.
RFC_5—1-mh. r.f. choke.
Vary C_6 and L_7 for maximum drive; increase or decrease the number of turns on L_7, if necessary. C_6 may be replaced with a fixed mica capacitor after the optimum value has been determined.

B—For exciters of medium power output (10–35 watts):
C_6 and L_7—Same as above (30 $\mu\mu$f. is about optimum for the 20A exciter).
R_4—See text. App. 1000 ohms, 4 watts for 10A or 10B (two 470-ohm, 2-watt resistors in series). App. 450 ohms, 6 watts for 20A (three 150-ohm, 2-watt resistors in series).

C—For higher-powered exciters:
R_5—50-ohm dummy antenna of appropriate power rating.
R_6—As needed for adequate attenuation. May be omitted with most "100-watt" exciters.
RFC_5—1 mh.

For further details on r.f. attenuators, see Hubbell, "A Step-Type R.F. Attenuator", *QST*, December, 1959.

the circuit oscillates. Check to make sure that the oscillation is crystal controlled, and on 18 Mc. If you have trouble here, it will probably be caused by either too much or too little crystal feedback. Capacitor C_2 controls the amount of feedback. The value listed for C_2 is approximately correct for the average 6-Mc. surplus crystal. Other types of crystals may require a different value. If C_2 is changed appreciably, it may be necessary to alter the value of L_4 to maintain resonance. Too much feedback will cause the oscillator to become unstable (and possibly ruin a delicate overtone crystal if one is used) while too little feedback will result in no oscillation at all. To increase the amount of feedback, decrease the size of C_2. If you use a surplus crystal and have trouble making it oscillate properly, try substituting another crystal — some surplus rocks are just not too active on the third overtone.

When you have the oscillator working properly, plug the 5763 into its socket and peak up L_3 for maximum 36-Mc. drive to the 5763.

Connect a source of 14-Mc. energy to J_1 and peak L_1 for maximum 50-Mc. output from the 5763 with C_1 approximately half open. Insert the 12AX7 in its socket and peak L_2 for maximum output. A No. 47 pilot bulb connected to a couple of turns of wire and loosely coupled to L_2 makes a good output indicator. Go back and retouch L_3, L_1, and L_2 for maximum output. The converter is now finished and can be coupled to an antenna or amplifier.

The next step, in the circuit shown, is to get the amplifier going. Plug in the 2E26 but do not apply power to it. Leave the heater circuit open until the amplifier is neutralized. Peak up L_5 and the output pi network for maximum output as shown by a sensitive wavemeter coupled to L_6. Neutralize the 2E26 by adjusting C_3 for minimum feed-through. Be sure to resonate the plate circuit after each adjustment of C_3. When the amplifier has been neutralized, connect a dummy load to J_2 and apply all voltages to the 2E26. Adjust L_5 and the output tank for maximum output.

TABLE I

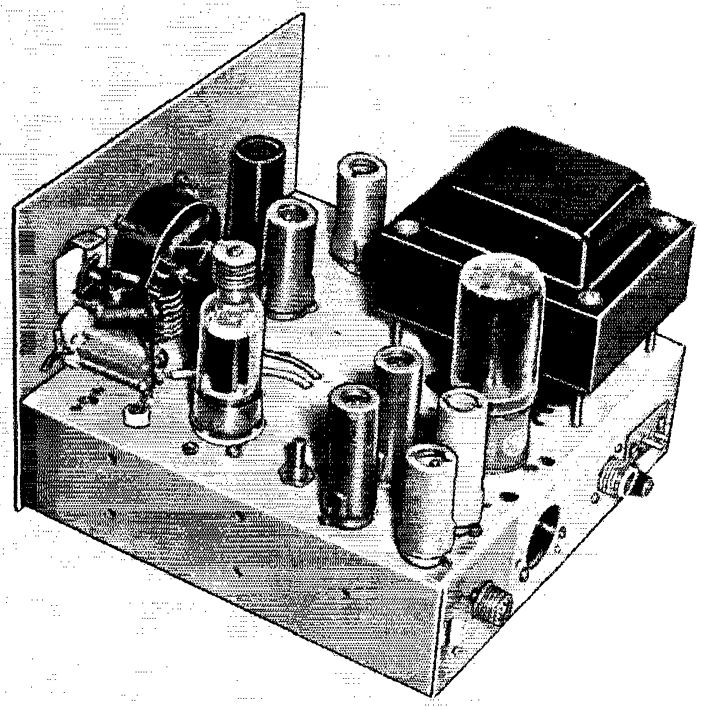
Typical Operating Conditions for the Converter

Measurement	*Indication*
12AT7 Osc. Plate Current	5 ma.
12AT7 Dblr. Plate Current	5 ma.
5763 Plate Current 5763 Screen Current	10 ma. 2.5 ma.
12AX7 Plate Current	12 to 30 ma.
2E26 Plate Current 2E26 Power Input 2E26 Screen Current 2E26 Grid Current Power Output	10 to 100 ma. 45 w. peak 0 to 8.5 ma. 0 to 7 ma. 25 w. peak

After getting the amplifier adjusted, remove the 14-Mc. input and check thoroughly through the unit for instability of any kind. The rig shown was thoroughly stable, but minor variations in layout could possibly change this, although it is not at all likely. Two types of oscillations have shown up in similar units. One was caused by improper grounding of C_1, and the other was a low-frequency parasitic in the 2E26 caused by the arrangement of the grid and plate r.f. chokes. This was easily cured by shunting the grid choke with R_2. Use as large a value a resistor as will suppress the oscillation.

R.F. Input Circuits

When you are sure the rig is perfectly stable, you are ready to adjust the 14-Mc. input to the proper value. If your exciter is very low powered, use the alternate input circuit shown in Fig. 2A and simply peak L_7 for maximum drive to the



The final tank coil is supported between the stators of the tuning and loading capacitors, at the left in this view. The tube in the black shield alongside the panel is the 5763 mixer. The 12AT7 oscillator-multiplier is beyond it at the edge of the chassis. The third tube in this group is the 12AX7 amplifier.

unit. If you have a surplus of drive, you must swamp down the input, as in Fig. 2B. To match my 20A exciter, I used three 150-ohm 2-watt resistors in series for R_4. (R_4 corresponds to R_1 in Fig. 1). These resistors match the 20A and absorb the extra drive at the same time. For other exciters, simply swamp the input until full exciter power is required to give full output from the converter. If a high-powered exciter is used, it will be necessary to add series resistance as shown in Fig. 2C to prevent a serious mismatch to the exciter.

After these adjustments have been completed, it is a good idea to check all plate currents to see that they approximate those listed in Table I. The actual values will vary somewhat according to the plate voltage used. The values shown were measured with 200 volts (regulated) on the plates of the 12AT7 doubler, 5763 mixer, and 12AX7 amplifier, 150 volts on the 12AT7 oscillator and the screens of both the 5763 and 2E26, and 450 volts on the plate of the 2E26. Note the input power to the 2E26 at maximum output for your log. (In the unit shown the tube is operating AB_2 at 45 watts input peak-envelope value.) Finally, adjust the sensitivity of the output indicato , and the converter is ready to be put into service.

Hope to see you on six! QST

Strays

John DiBlasi, W2FX (left) and Ralph Barber, W2ZM (right), have been re-elected president and executive secretary, respectively, of the Quarter Century Wireless Association. They are shown here with the Association's new gold-and-blue banner, adopted to celebrate its founding fifteen years ago. Membership in the QCWA is open to hams who have held licenses continuously for twenty-five years or more. Many members can boast of forty or more years of activity, and a few have reached the half-century mark. Present enrollment is about 3000 and is growing steadily.

The cigarette is king size, but the filter is not. The switch provides four degrees of selectivity, and a position for cutting the filter out of the circuit. A non-metallic box top should be substituted for the original steel cover.

The OCO Audio Filter

A good c.w. operator soon develops an automatic power of mental concentration to a point where interfering signals removed 1000 cycles or more from the desired signal go virtually unnoticed. To be of any significant assistance, the receiver selectivity must be effective within a few hundred cycles and in this region the attenuation must be good — not just a few db. down. The audio filter described here should do that kind of job.

High Skirt Selectivity for C. W. Reception

BY HARRY J. GENSLER, JR.,* K8OCO

For the past few years most of the commercial receiver manufacturers have set a limit of about 500 cycles for the maximum code selectivity position. However, because of the present crowded band conditions, a greater degree of selectivity is often desirable. Even the old crystal-filter receivers of the '30s could go down to about 100 cycles bandwidth. Have we been slipping?

With these thoughts in my mind, I decided to develop a means of obtaining a greater degree of selectivity. Like most amateurs, I trembled at the thought of tearing into a high-priced commercial receiver to try to improve its selectivity. An r.f. filter in front of the receiver, or an a.f. filter in the output seemed to be the only methods of approach. Since, of course, the former was impractical, an audio filter was decided upon.

The initial attempt produced a circuit hardly more complex than a tuned circuit in series with the headphones. The selectivity of this was measured at about 100 cycles. Still this did not seem to help the QRM any. In fact, I could hardly tell the difference between this and the normal bandwidth. Slowly I came to the realization that there is such a thing as skirt selectivity. Sure, the tuned circuit was about 100 cycles wide at 6 db. However, it was about 100 *kilocycles* wide at 60 db.! It became apparent that a *single* tuned circuit could not give the desired results. The single-crystal filters suffered from this same problem. According to the *Handbook*, the ability to reject adjacent-channel signals is determined by the band width at high attenuation. Looking at it this way, the 60-db. band width is a very important consideration. In this respect our present receivers are easily superior to the old crystal-filter receivers.

Skirt selectivity is largely dependent on the total number of tuned circuits (or crystals) used and the frequency to which they are tuned. This is why single-crystal filters, regenerative amplifiers, *Q* multipliers, and the like, can't compare with multistage crystal or mechanical filters or a large number of tuned circuits in a low-frequency i.f. or a.f. system.

The OCO filter was designed to have the

* 15335 St. Marys, Detroit 27, Michigan.

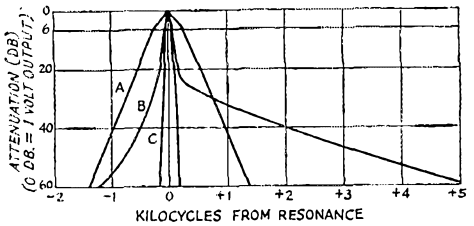


Fig. 1—Response curves comparing the selectivity of (A) typical "500-cycle" i.f., (B) crystal filter, and (C) sharpest condition of the OCO audio filter.

greatest practical selectivity at high attenuation in keeping with cost, ease of tuning, and distortion of the signal. The basic filter is about 100 cycles wide at 6 db. and 360 cycles wide at 60 db. Fig. 1 compares this with crystal-filter (notch on audio image frequency) and conventional 500-cycle selectivity. Other degrees of selectivity — 140, 300, and 1000 cycles — are provided for varying QRM conditions. The switching arrangement gives approximately the same output level in all positions. The first place on the switch turns off battery power and connects the headphones directly to the receiver.

The OCO filter is a completely self-contained audio filter and battery-powered transistor audio amplifier. It requires only one connection to the receiver — at the 3.2-ohm secondary of the output transformer. The total cost for new parts for the filter should run about fifty dollars, most of which goes for the inductors.

The Circuit

The complete circuit is shown in Fig. 2. The six 750-cycle tuned circuits are direct resistive-coupled. This system has proved just as effective as the more common capacitive coupling, but at a great saving in cost and space. The only unusual parts in the filter are the inductors L_1 through L_6. They are television-receiver replacement parts used in transistor remote-control units to modulate the carrier at about 400 cycles. Their small size, adjustability, stability and complete shielding make them ideal for a filter of this type.[1]

A transistor amplifier is used to compensate for the losses in the tuned circuits. Here an effort was made to provide the greatest simplicity and least battery drain. The 0.001-μf. capacitor limits the small amount of static-type noise generated within the amplifier by cutting the highs. This capacitor, together with the coupling capacitors, limits the selectivity to 1000 cycles when the tuned circuits are bypassed. When used with a 500-cycle receiver, of course, the bandwidth is 500 cycles. Incidentally, for the benefit of those who might be tempted to "simplify" the wiring, I might say that an attempt to use chassis ground as the common point for the tuned circuits resulted in a noticeable loss in skirt selectivity.

Construction

The unit described was built in a 3 × 4 × 5-inch steel utility box. The inductors were mounted on an L-shaped piece of aluminum, as shown in Fig. 3, with all connections and adjustments made underneath. Two 4-36 screws were used for mounting each inductor, using them as you would use wood screws, no tapping being necessary for the soft plastic form. The only precaution in wiring the inductors is to leave enough room for a plastic alignment tool to adjust the tuned circuits to resonance.

The audio amplifier was constructed on the bottom plate of the box. The connecting leads

[1] Obtainable from any G.E. television distributor. Ask for replacement part Et35x42. (The tap is not used.)

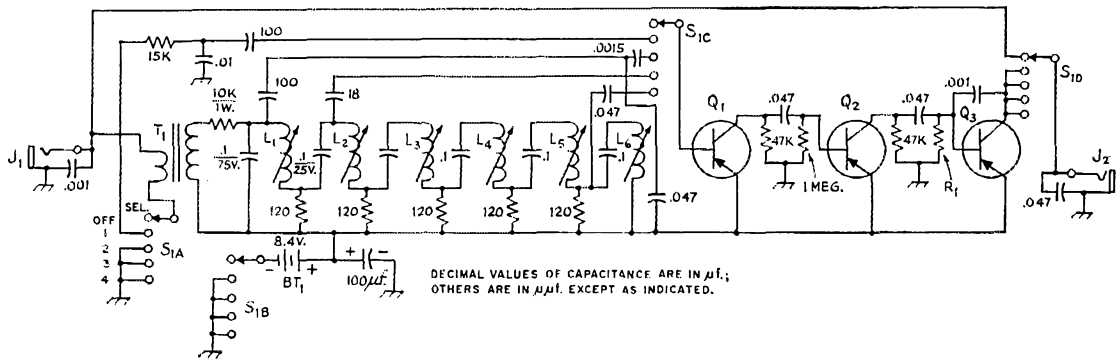
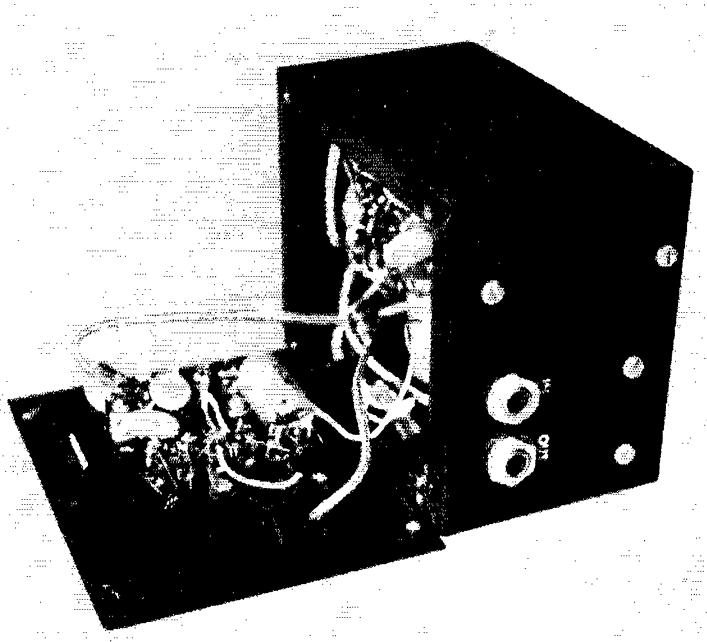


Fig. 2—Circuit of the OCO audio filter. S_1 provides four degrees of selectivity, the selectivity increasing with the switch-position numbers. Capacitor marked with polarity is electrolytic. Capacitors having values less than 0.001-μf. should be mica; others may be paper or ceramic. Except where minimum capacitor voltage rating is indicated, minimum rating should be 9 volts. Resistances are in ohms and resistors are ½ watt unless indicated otherwise.

BT_1—8.4-volt mercury battery.
J_1, J_2—Open-circuit headphone jack.
L_1–L_6—Iron-slug variable inductor, nominal value 650 mh., d.c. resistance 280 ohms (see text).
Q_1–Q_3—2N107 or similar p-n-p transistor.
R_1—Nominal value 47,000 ohms (see text for adjustment).
S_1—2-section 4-pole 5-position rotary switch (Centralab PA-1012).
T_1—Standard output transformer; primary 1000 to 10,000 ohms, secondary 3.2 ohms, 1-watt minimum (J_1 connects to voice coil).



Bottom cover removed, showing the transistor amplifier. Input and output jacks are mounted at the rear end of the box.

were then made long enough so that the amplifier might be tested with the plate resting alongside the box. Shielded wire was used for all of the longer audio leads.

A 4 × 5-inch piece of paper can be placed between the bottom plate and the rest of the filter to prevent the connection lugs of the amplifier from accidentally shorting out to the shielded wire.

Adjustment

The value of R_1 is best determined by experimentation. Temporarily connect in a variable control of about 1 megohm and adjust for a drop of 1 to 4 volts across the headphones. The larger readings will give slightly greater output at the expense of increased battery drain. When the optimum value is determined, substitute a fixed resistor of equivalent value.

The filter may be used as shown for magnetic headphones having a d.c. resistance between 500 and 5000 ohms. For other values, or for crystal headphones, a transformer from about 10K to the required impedance will be needed. In this case, adjust R_1 for 2 ma. of collector current. An additional power amplifier will be required to drive a speaker.

Resonating the tuned circuits can best be done with the aid of the station receiver and an a.c. voltmeter. First, adjust the slugs of the inductors until they are two turns from fully in, using a plastic alignment tool. Then connect the receiver and the headphones. Put the voltmeter on its lowest-voltage a.c. scale and connect it across the headphones. Throw the switch on the filter to the 100-cycle position. Beat the receiver with a harmonic of your 100-kc. oscillator, or the signal from a low-power stage of your transmitter. Vary the receiver tuning until a peak is obtained on the meter; then adjust the first five inductors for maximum reading and the last inductor for minimum, being careful not to overload the filter! Then tune across the band and note the difference.

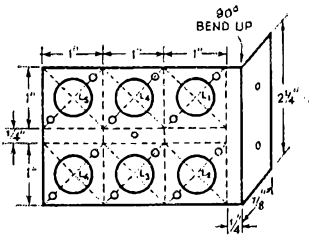
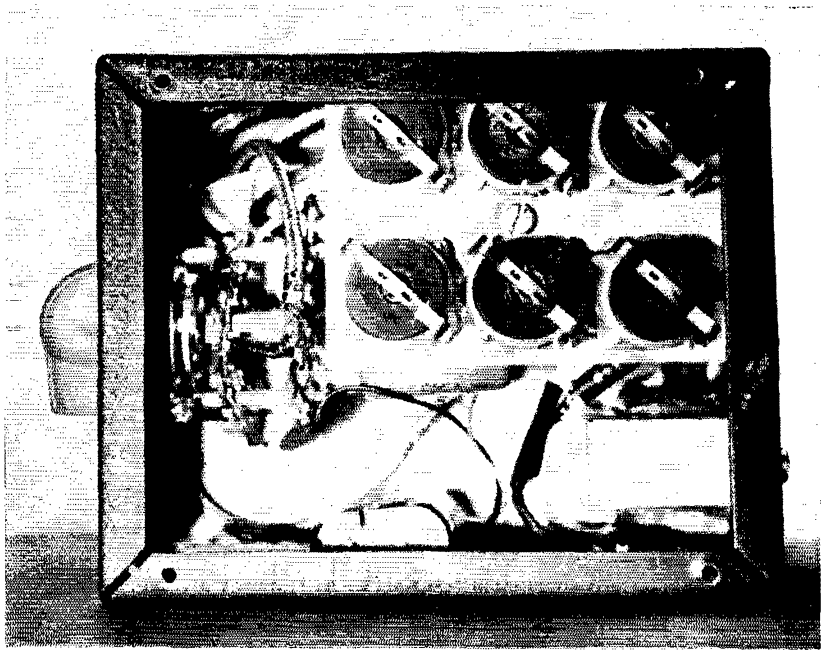


Fig. 3—The inductor mounting bracket consists of an aluminum sheet bent as indicated. The large holes are 1 1/16 inch in diameter, and the small holes are ⅛ inch. The six coils should be positioned as shown.

Using the Filter

Of course, it is very much easier to copy stations in a crowded band with the filter. It also gives weak stations a boost over the noise (theoretically a five-times power increase). There is some ringing noise and a very little "softening" of the code characters, but this does not hinder copy.

More care should be taken in tuning in a signal with the filter than with standard selectivity. It is important not to overload the filter, for this reduces the skirt selectivity. When tuning across the band, it will be found helpful to turn up the gain. However, once a station is found, the gain



Top view of the OCO filter, showing the mounting of the inductors and selectivity switch.

should be reduced to provide a comfortable listening level.

Signals can be tuned in easily with a receiver having good bandspread — 20 or 30 kc. per dial revolution. The filter is usable with receivers having less bandspread, but only with difficulty. The stability of the receiver should be good or excellent. This does not necessarily mean that the receiver has to be expensive. A good test for your receiver is to give it a five- or ten-minute warm-up, and then beat it against a harmonic of your 100-kc. oscillator. The frequency should remain steady over a considerable amount of time, even with some jarring of the receiver.

Most present-day transmitters have enough stability to remain in the 100-cycle pass band without too much retuning. With selectivity of the order provided by the filter, it goes without saying that you can't very well copy those who still use a.c. on their t.g.t.p. transmitters. Some of the less stable signals can't even be held in an 8-kc. pass band.

This filter was designed for the h.f. bands. The amount of skirt selectivity could prove to be a disadvantage on v.h.f., using some of the newer narrow band-pass techniques to cut noise. In this case, a single tuned circuit or a regenerative audio stage might be used so that a signal could still be heard with a little detuning. Still the filter can show a great noise improvement over standard selectivity if suitable stability precautions are taken. QST

25 Years Ago this month

January 1937

. . . A "second" Field Day was held during 1937, and this January issue reported the scores. Highest club score was made with 136 contacts and an 18-watt transmitter. Highest individual score resulted from 54 QSOs.

. . . Technical articles included dope on a T55 amplifier for a previously described rig, using an 807 as a crystal oscillator, an inexpensive oscilloscope, audio inverse feedback circuits, a complete 50-watt phone transmitter occupying a 5½-foot rack, some precision wavemeters, a low-power 160-meter phone rig for local QSOs, an optical pyrometer for measuring plate dissipation, how to test transmitting tubes, a tuning fork, and notes on autotransformer design.

. . . In the IARU section was proposed a "standard" list of countries, inviting comment from the gang. Some 250 countries were on this list.

. . . Twenty-five years ago you could buy 2-color QSLs for a dollar a hundred, and $5 was offered for a copy of the first issue of *QST*. QST

Strays

Have you written your Senators supporting Senate Bill 2361? See pages 9 and 73 of October *QST* — then do it!

—···—

W6MLZ, ARRL's Southwestern Division Director, checked into a net on 7209 during the west coast fires to see if he could be of help in handling emergency traffic. The traffic situation was under control, but a ham radio demonstration was being presented to 250 Fresno Rotarians, and W6MLZ was able to work the ham station set up there and give them some first-hand info on what public service amateurs were rendering right at that very time.

—···—

MEMBERSCRIPTIONS ANYONE? ? ? ? ? See page 136 for details.

1962 ARRL International DX Competition

Phone: Feb. 2-4 and Mar. 2-4
C. W.: Feb. 16-18 and Mar. 16-18

CONTEST PERIODS

Phone Section:

Starts	*Ends*
Feb. 2, 2400 GMT	Feb. 4, 2400 GMT
Mar. 2, 2400 GMT	Mar. 4, 2400 GMT

C.W. Section:

Starts	*Ends*
Feb. 16, 2400 GMT	Feb. 18, 2400 GMT
Mar. 16, 2400 GMT	Mar. 18, 2400 GMT

ANNOUNCING the 1962 ARRL DX Contest . . . your opportunity to show your DX prowess, bag a few "new ones" for DXCC, and to have a lot of fun working the world . . . also for the DX stations to complete those difficult states for their WAS certificate, and provinces for WAVE. This contest is nothing new by any means, the 1962 version being the 28th running with the usual two week ends for c.w., and two week ends for phone . . . phone being all modes of phone work like s.s.b., a.m., etc. See above for dates and times.

The object is for DX stations to work as many W-K-WA-VE-VO-KH6-KL7 stations as possible per band, and for the U.S.-Canadian stations to work the DX.

Certificates are awarded to the top single-operator phone and c.w. scorer in each country and ARRL section. A special certificate goes to the highest scoring multioperator from countries and sections of at least three such entries. You may also credit your score to your ARRL-affiliated club for separate club aggregate listing (total of all club members' scores) . . . with an engraved cocobolo gavel to the club with the highest total, and a certificate to each club's top phone and c.w. scorer. For club credit make sure your logs are clearly marked: "Participating for club award in the ..... (club)."

The award and scoring system is designed to encourage widest use of our bands with flexibility of operation rewarded. Repeat QSOs on additional bands are permitted. For example, W3GRF works F8VJ on 10, 15, 20, and 40 meters; both stations have added to their contact-point total, multiplier, and score. For the DX the multiplier is the total of the U.S.A.-Canada call areas (not states) worked *per band*. For U.S.A.-Canada stations the multiplier is the total of different countries (see ARRL Countries List, p. 22) contacted *per band*. No credit for W/VE-to-W/VE QSOs is allowed.

Here is a list of the 21 call areas and state/province abbreviations used by U.S.A.-Canada stations in those areas:

W1, K1 — CONN MAINE MASS NH RI VT
W2, K2, WA2 — NJ NY
W3, K3 — DEL MD PA DC
W4, K4, WA4 — ALA FLA GA KY NC SC TENN VA
W5, K5, WA5 — ARK LA MISS NMEX OKLA TEXAS
W6, K6, WA6 — CAL
KH6 — HAWAII
W7, K7 — ARIZ IDAHO MONT NEV ORE UTAH WASH WYO
KL7 — ALASKA
W8, K8, WA8 — MICH OHIO WVA
W9, K9, WA9 — ILL IND WIS
W0, K0, WA0 — COLO IOWA KANS MINN MO NEBR NDAK SDAK
VE1 — NB NS PEI
VE2 — QUE
VE3 — ONT
VE4 — MAN
VE5 — SASK
VE6 — ALTA
VE7 — BC
VE8 — NWT YUKON
VO — NFLD LAB

U.S.-Canadian amateurs have quotas on c.w. (see rule 10) but none on phone. DX amateurs have no quotas; they will QSO as many stations as they can in the 21 call areas on each band.

Check the rules which follow below. Keep a neat and accurate log like the sample shown in this announcement. Send a copy of your log at the conclusion of the contest to: ARRL Communications Dept., 38 LaSalle Road, West Hartford 7, Conn., U.S.A. You can obtain log forms free for the asking at that address. Logs must be postmarked by April 28, 1962, to be eligible for awards and *QST* listing. All reports, big and small, are welcome.

Rules

1) *Eligibility:* Amateurs operating fixed amateur stations in any and all parts of the world are invited to participate.

2) *Object:* Amateurs in the United States and Canada will try to work as many amateur stations in other parts of the world as possible under the rules and during the contest periods.

3) *Conditions of Entry:* Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

4) *Entry Classifications:* Entry may be made in either or both the phone or c.w. sections: c.w. scores are independent of phone scores. Entries will be further classified as single- or multiple-operator stations. Single-operator stations are those at which one person performs all the operating functions. Multiple-operator stations are those obtaining assistance, such as from "spotting" or relief operators, or in keeping the station log and records.

5) *Contest Periods:* There are four week ends, each 48 hours long: two for phone work and two for c.w. The phone section starts at 2400 GMT, Friday, February 2 and Friday, March 2, ends 2400 GMT, Sunday, February 4 and Sunday, March 4. The c.w. section starts at 2400 GMT, Friday, February 16 and Friday, March 16, ends 2400 GMT, Sunday, February 18 and Sunday, March 18.

6) *Valid Contacts:* In the phone section, all claimed credits must be made voice-to-voice. In the telegraph section,

LOG[1], ARRL INTERNATIONAL DX COMPETITION

Sheet..1.... of..16.. CALL KV4AQ ARRL Section.....or Country VIRGIN ISLANDS

DATE & TIME (GMT) 2/17	STATION WORKED	COUNTRY	RECORD OF NEW COUNTRIES FOR EACH BAND 1.8	3.5	7	14	21	27	28	EXCHANGE SENT	EXCHANGE RECEIVED	POINTS
0010	W1BIH	W1				1				579100	589 CONN	3
0012	K2GXI	K2				2				579100	589 NY	3
0013	W2GGE					2				589100	589 NJ	3
0015	W8UCI	W8				3				569100	599 MICH	3
0021	W1JYH	W1					1			579100	589 MASS	3
0022	K1MLI						1			579100	579 CONN	3
0023	K6CQM	K6					2			579100	599 CAL	3
0024	W6WB						2			579100	579 CAL	3
0024	W5KC	W5					3			589100	599 LA	3
0025	WØBMN	WØ					4			579100	589 MO	3
0101	K2DCA					3				579100	579 NJ	3
0102	WA2BLV					3				579100	589 NJ	3
0104	K2GHM					3				579100	599 NJ	3

Total points:

[1]This report form to be used by all phone entrants and by those c.w. participants outside W/K and VE/VO.

Sample log form that must be used by W/VE phone entrants and all participants outside U. S. and Canada, phone and c.w. This example is a DX c.w. log. U. S.-Canadian phone logs would reverse information in the "Sent" and "Received" columns; their "Sent" column would show exchanges like "59CAL," "57ONT." All DX stations, both phone and c.w., use this type log report.

only c.w.-c.w. contacts count. Crossband contacts may not be counted.

7) *Exchanges:*

a) *Amateurs in U. S. and Canada* will transmit a three-figure number, representing the RST report, plus their state or province. (The latter may consist of an appropriate abbreviation.) Phone participants will transmit a two-figure number consisting of the readability-strength report plus the state or province. *Example:* W6YY might transmit "579CAL" on c.w., "57 California" on phone.

b) *Amateurs outside W (K) and VE/VO* will transmit six-figure numbers, each consisting of the RST report plus three "power" numbers; the power indicator will represent the approximate transmitter power input. Phone contestants will transmit five-figure numbers, each consisting of a readability-strength report and the three "power" numbers. *Example:* VK2GW, with 100 watts input, might transmit "569100" on c.w., "56100"on phone. If the input power varies considerably on different bands, the "power" number should be changed accordingly.

8) *Scoring:*

a) *Points:* One point is earned by a W (K) or VE/VO station upon receiving acknowledgment of a contest exchange sent, and two points upon acknowledging an exchange received. Two points are earned by any other station upon receiving acknowledgement of a contest exchange sent, and one point upon acknowledging an exchange received.

b) *Final Score:* W (K) and VE/VO stations multiply total points earned under Rule 8(a) by the number of countries worked on one band plus the number of countries worked on each other band. All other stations multiply total points earned under Rule 8(a) by the sum of the number of W (K) and VE/VO licensing areas worked on one band plus the number of W (K) and VE/VO licensing areas worked on each other band.

Countries will be those on the ARRL Countries List. There are 21 licensing areas: 12 in the United States (W1-0, KH6, KL7), 9 in Canada (VO, VE1-VE8). [See Countries List on p. 22 — Ed.]

9) *Repeat Contacts:* The same station may be worked again for additional points if the contact is made on a different frequency band. The same station may be worked again on the same band if the complete exchange for a total of three points was not made during the original contact on that band.

10) *Quotas:* The maximum number of points per country per band which may be earned by W, K, KL7, KH6 stations *in the c.w. section* is 18, and contacts made on the same band with the same country after the quota is filled will not count. Thus complete exchanges with 6 stations in one country on one band fill the band quota for that country. The maximum number of points per country per band which *may* be earned by VE/VO stations *in the c.w. section* is 24, and contacts made on the same band with the same country after the quota is filled will not count. Exchanges with 8 stations in one country on one band are thus permitted Canadian participants. There is *no quota* for stations in the c.w. section *outside* of the U. S. and Canada. There is *no quota* for *any* stations in the phone section.

11) *Reporting:* Contest work must be reported as shown in the sample forms. Each entry must include the signed statement. Contest reports must be mailed no later than April 28, 1962, to be eligible for *QST* listings and awards. All DX Contest logs become the property of the American Radio Relay League and none can be returned.

12) *Awards:* To document the performance of participants in the 28th ARRL International DX Competition,

EXPLANATION OF DX CONTEST EXCHANGES

Stations in U. S. and Canada Send:

	RS or RST Report of Station Worked	*Your State or Province (or Abbreviation)*
Sample (c.w.)	579	ORE
Sample (phone)	57	Oregon

Stations Outside U. S. and Canada Send:

	RS or RST Report of Station Worked	*Three-Digit Number Representing Your Power Input*
Sample (c.w.)	579	075
Sample (phone)	57	500

a full report will be carried in *QST*. In addition, special recognition will be made as follows:

a) A certificate will be awarded to the high-scoring single-operator phone and to the high-scoring single-operator c.w. entrant in each country (as shown in the ARRL Countries List) and in each of the mainland U. S. (plus Alaska and Hawaii) and Canadian ARRL sections (see page 6 of any *QST*) from which valid entries are received. In addition, a certificate will be awarded to the high-scoring multiple-operator station in each section or country from which three or more valid multiple-operator entries are received.

b) A suitable certificate will be awarded to the operator making the highest single-operator phone score in each ARRL-affiliated club, provided the club secretary submits a listing of a minimum of three phone entries by members of the club and that these scores are confirmed by receipt at ARRL of the individual contest logs from such members. The highest single-operator c.w. scorer in each club will be awarded a certificate under the same conditions. Only a bona fide resident member, operating a station in local club territory, may compete for club certificates.

c) ARRL will award a gavel to the affiliated club submitting the greatest aggregate phone and c.w. score by its members, whether single- or multiple-operator entries, provided such scores are confirmed by receipt at ARRL of the individual contest logs from such members. Only scores of bona fide resident members, operating stations in local club territory, may be included in club totals.

13) *Judges:* All entries will be passed upon by the ARRL Award Committee, whose decisions will be final. The Committee will void or adjust entries as its interpretation of these rules may require.

14) *Disqualifications:* Each participant agrees to observe the contest rules as well as all regulations established for amateur radio in his country. Violation of any regulation, as confirmed by a single FCC citation or advisory notice or two ARRL accredited Official Observer reports, may constitute grounds for disqualification. Some examples of practices which can result in disqualification: off-frequency (out-of-band) operation, harmonics, spurious emissions, low tone reports in logs, key clicks, splatter, excessive sidebands, W (K) stations working banned countries. QST

[illegible]¹, ARRL INTERNATIONAL DX COMPETITION

Call....W1AW....... ARRL Section.....CONN.......

Band......14.........Mc. Sheet...1.....of.....15.........

Country*	Station Worked	Date	Time (GMT)	Exchange Sent	Exchange Received
FRANCE	F8VJ	2-17	1300	589 CONN	479075
	F8TQ	2-17	1345	579 CONN	579060
ENGLAND	G2QT	2-17	1306	599 CONN	469150
	G2DC	2-18	1245	579 CONN	469125
	G3EYN	2-18	1255	569 CONN	579100
	G2RQ	3-17	1430	469 CONN	559100
	G3KHT	3-17	1822	579 CONN	589125
	G6BQ	3-18	1851	479 CONN	459075
ESTONIA	UR2BU	2-17	1245	599 CONN	599200
NEW ZEALAND	ZL1NG	2-17	1003	569 CONN	569040
	ZL2PM	3-17	1101	569 CONN	559060

*Canadian entrants should allow two "blocks" for each country, but may record no more than eight contacts therein.
¹This report form to be used by W/K and VE/VO c.w. participants.

Sample of log form that must be used by W/VE c.w. participants. When a station is worked for less than the maximum number of points allowed, the additional contact to make up the points not earned in the first contact should be entered at the bottom of the sheet. Canadian entrants should allow two blocks for each country, but may record no more than eight contacts therein. A separate set of sheets should be used for each band.

SUMMARY, ARRL INTERNATIONAL DX COMPETITION

Entry............. Call............. ARRL Section.............or Country...............
(CW or Phone)

Name......................... Address..

Transmitting Equipment...

....Power Input.......................

Receiver.............................. Antenna(s)...

(Non-W/K/VE/VO entrants show number of U.S.A. and Canadian call areas worked, instead of number of countries QSOd.)

Bands	1.8 Mc.	3.5 Mc.	7 Mc.	14 Mc.	21 Mc.	27 Mc.	28 Mc.	Totals
Number of Countries QSOd								*
Number of Contacts								

Number of Different Countries Worked..... Number of Hours of Station Operation..........

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

**
.... X .... = ...
(Points) (Multiplier) Claimed Score

Participating for club award in the..
(name of club)

I certify, on my honor, that I have observed all competition rules as well as all regulations established for amateur radio in my country, and that my report is correct and true to the best of my belief. I agree to be bound by the decisions of the ARRL Award Committee.

....
Operator's Signature and Call

*Figure in this box is the multiplier.
**Count 3 points per completed QSO; see contest rule 8a in January QST.

Sample summary sheet that must accompany all reports.

1962 ARRL DX Contest Countries List

AC3........................Sikkim
AC4........................Tibet
AC5........................Bhutan
AP........................East Pakistan
AP........................West Pakistan
BV........................Formosa
BY........................China
C9........................Manchuria
CE........................Chile
CE9AA-AM, KC4, LU-Z, VK0
VP8, ZL5, etc...........Antarctica
CE9........................(See VP8)
CE0A........................Easter Island
CE0Z...Juan Fernandez Archipelago
CM, CO........................Cuba
CN2, CN8, CN9..........Morocco
CP........................Bolivia
CR4........................Cape Verde Islands
CR5........................Portuguese Guinea
CR5........................Principe, Sao Thome
CR6........................Angola
CR7........................Mozambique
CR8........................Damao, Diu

CR8 ..... Goa
CR9 ..... Macau
CR10 ..... Portuguese Timor
CT1 ..... Portugal
CT2 ..... Azores
CT3 ..... Madeira Islands
CX ..... Uruguay
DJ, DL, DM ..... Germany
DU ..... Philippine Islands
EA ..... Spain
EA6 ..... Balearic Islands
EA8 ..... Canary Islands
EA9 ..... Ifni
EA9 ..... Rio de Oro
EA9 ..... Spanish Morocco
EA0 ..... Spanish Guinea
EI ..... Republic of Ireland
EL ..... Liberia
EP, EQ ..... Iran
ET2 ..... Eritrea
ET3 ..... Ethiopia
F ..... France
FA ..... Algeria
FB8 ..... Amsterdam & St. Paul Islands
FB8 ..... Comoro Islands
FB8 ..... Kerguelen Islands
FB8 ..... Tromelin Island
FC (unofficial) ..... Corsica
FG7 ..... Guadeloupe
FK8 ..... New Caledonia
FL8 ..... French Somaliland
FM7 ..... Martinique
FO8 ..... Clipperton Island
FO8 ..... French Oceania
FP8 ..... St. Pierre & Miquelon Islands
FR7 ..... Reunion Island
FS7 ..... Saint Martin
FU8, YJ1 ..... New Hebrides
FW8 ..... Wallis & Futuna Islands
FY7 ..... French Guiana & Inini
G ..... England
GC ..... Channel Islands
GD ..... Isle of Man
GI ..... Northern Ireland
GM ..... Scotland
GW ..... Wales
HA ..... Hungary
HB ..... Switzerland
HC ..... Ecuador
HC8 ..... Galapagos Islands
HE ..... Liechtenstein
HH ..... Haiti
HI ..... Dominican Republic
HK ..... Colombia
HK0 ..... Bajo Nuevo
HK0 ..... Malpelo
HK0 ..... San Andres and Providencia
HM, HL ..... Korea
HP ..... Panama
HR ..... Honduras
HS ..... Thailand
HV ..... Vatican City
HZ ..... Saudi Arabia
I, IT1 ..... Italy
IS1 ..... Sardinia
JA, KA ..... Japan
JT1 ..... Mongolia
JY ..... Jordan
JZ0 ..... Netherlands New Guinea
KA ..... (See JA)
KA0, KG6I, Bonin & Volcano Islands
KB6 ..... Baker, Howland & American Phoenix Islands
KC4 ..... (See CE9, VP8)
KC4 ..... Navassa Island
KC6 ..... Eastern Caroline Islands
KC6 ..... Western Caroline Islands
KG1 ..... (See OX)
KG4 ..... Guantanamo Bay
KG6 ..... Marcus Is.
KG6 ..... Mariana Islands
KG6I ..... (See KA0)
KH6 ..... Kure Is.
KJ6 ..... Johnston Island
KM6 ..... Midway Islands
KP4 ..... Puerto Rico
KP6 ..... Palmyra Group, Jarvis Island
KR6 ..... Ryukyu Islands
KS4 ..... Serrana Bank & Roncador Cay
KS4 ..... Swan Islands
KS6 ..... American Samoa
KV4 ..... Virgin Islands
KW6 ..... Wake Island
KX6 ..... Marshall Islands
KZ5 ..... Canal Zone
LA ..... Jan Mayen
LA ..... Norway
LA ..... Svalbard
LU ..... Argentina
LU-Z ..... (See CE9, VP8)
LX ..... Luxembourg
LZ ..... Bulgaria
M1 ..... San Marino
MP4 ..... Bahrein Island
MP4 ..... Qatar
MP4 ..... Trucial Oman
OA ..... Peru
OD5 ..... Lebanon
OE ..... Austria
OH ..... Finland
OH0 ..... Aland Islands
OK ..... Czechoslovakia
ON4 ..... Belgium
OX, KG1 ..... Greenland
OY ..... Faeroes
OZ ..... Denmark
PA0, PI1 ..... Netherlands
PJ ..... Netherlands West Indies
PJ2M ..... Sint Maarten
PX ..... Andorra
PY ..... Brazil
PY0 ..... Fernando de Noronha
PY0 ..... Trindade & Martim Vaz Is.
PZ1 ..... Netherlands Guiana
SL, SM ..... Sweden
SP ..... Poland
ST2 ..... Sudan
SU ..... Egypt
SV ..... Crete
SV ..... Dodecanese
SV ..... Greece
TA ..... Turkey
TF ..... Iceland
TG ..... Guatemala
TI ..... Costa Rica
TI9 ..... Cocos Island
TJ ..... Cameroons.
TL ..... Central African Rep.
TN ..... Congo Rep.
TR ..... Gabon Rep.
TT ..... Chad Rep.
TU ..... Ivory Coast
TY ..... Dahomey Rep.
TZ ..... Mali Rep.
UA1-6, UN1 ..... European Russian Socialist Federated Soviet Republic
UA1 ..... Franz Josef Land
UA2 ..... Kaliningrad
UA9, 0 ..... Asiatic Russian S.F.S.R.
UB5 ..... Ukraine
UC2 ..... White Russian S.S.R.
UD6 ..... Azerbaijan
UF6 ..... Georgia
UG6 ..... Armenia
UH8 ..... Turkoman
UI8 ..... Uzbek
UJ8 ..... Tadzhik
UL7 ..... Kazakh
UM8 ..... Kirghiz
UO5 ..... Moldavia
UP2 ..... Lithuania
UQ2 ..... Latvia
UR2 ..... Estonia
VK ..... Australia (Including Tasmania)
VK ..... Lord Howe Island
VK ..... Willis Islands
VK9 ..... Christmas Is.
VK9 ..... Cocos Island
VK9 ..... Nauru Island
VK9 ..... Norfolk Island
VK9 ..... Papua Territory
VK9 ..... Territory of New Guinea
VK0 ..... (See CE9, VP8)
VK0 ..... Heard Island
VK0 ..... Macquarie Island
VP1 ..... British Honduras
VP2 ..... Anguilla
VP2 ..... Antigua, Barbuda
VP2 ..... British Virgin Islands
VP2 ..... Dominica
VP2 ..... Granada & Dependencies
VP2 ..... Montserrat
VP2 ..... St. Kitts, Nevis
VP2 ..... St. Lucia
VP2 ..... St. Vincent & Dependencies
VP3 ..... British Guiana
VP4 ..... Trinidad & Tobago
VP5 ..... Cayman Is.
VP5 ..... Jamaica
VP5 ..... Turks & Caicos Islands
VP6 ..... Barbados
VP7 ..... Bahama Islands
VP8 ..... (See CE9, VP8)
VP8 ..... Falkland Islands
VP8, LU-Z ..... South Georgia Islands
VP8, LU-Z ..... South Orkney Islands
VP8, LU-Z ..... South Sandwich Islands
VP8, LU-Z, CE9AN-AZ ..... South Shetland Islands
VP9 ..... Bermuda Islands
VQ1 ..... Zanzibar
VQ2 ..... Northern Rhodesia
VQ3 ..... Tanganyika Territory
VQ4 ..... Kenya
VQ5 ..... Uganda
VQ8 ..... Cargados Carajos
VQ8 ..... Chagos Islands
VQ8 ..... Mauritius
VQ8 ..... Rodriguez Island
VQ9 ..... Seychelles
VR1 ..... British Phoenix Islands
VR1 ..... Gilbert & Ellice Islands & Ocean Island
VR2 ..... Fiji Islands
VR3 ..... Fanning & Christmas Islands
VR4 ..... Solomon Islands
VR5 ..... Tonga Islands
VR6 ..... Pitcairn Island
VS1 ..... Singapore
VS4 ..... Sarawak
VS5 ..... Brunei
VS6 ..... Hong Kong
VS9 ..... Aden & Socotra
VS9 ..... Kamaran Is.
VS9 ..... Maldive Islands
VS9 ..... Sultanate of Oman
VU ..... Andaman and Nicobar Islands
VU ..... India
VU ..... Laccadive Islands
XE, XF ..... Mexico
XE4 ..... Revilla Gigedo
XT2 ..... Voltaic Rep.
XW8 ..... Laos
XZ2 ..... Burma
YA ..... Afghanistan
YI ..... Iraq
YJ ..... (See FU8)
YK ..... Syria
YN, YN0 ..... Nicaragua
YO ..... Roumania
YS ..... Salvador
YU ..... Yugoslavia
YV ..... Venezuela
YV0 ..... Aves Island
ZA ..... Albania
ZB1 ..... Malta
ZB2 ..... Gibraltar
ZC4 ..... Cyprus
ZC5 ..... British North Borneo
ZC6 ..... Palestine
ZD1 ..... Sierra Leone
ZD2 ..... Nigeria
ZD3 ..... Gambia
ZD6 ..... Nyasaland
ZD7 ..... St. Helena
ZD8 ..... Ascension Island
ZD9 ..... Tristan da Cunha & Gough Islands
ZE ..... Southern Rhodesia
ZK1 ..... Cook Islands
ZK1 ..... Manihiki Islands
ZK2 ..... Niue
ZL ..... Auckland Is. & Campbell Is.
ZL ..... Chatham Islands
ZL ..... Kermadec Islands
ZL ..... New Zealand
ZL5 ..... (See CE9, VP8)
ZM6 ..... British Samoa
ZM7 ..... Tokelau (Union) Islands
ZP ..... Paraguay
ZS1, 2, 4, 5, 6 ..... Union of South Africa
ZS2 ..... Prince Edward & Marion Islands
ZS3 ..... Southwest Africa
ZS7 ..... Swaziland
ZS8 ..... Basutoland
ZS9 ..... Bechuanaland
3A ..... Monaco
3V8 ..... Tunisia
4S7 ..... Ceylon
4W1 ..... Yemen
4X4 ..... Israel
5A ..... Libya
5N2 ..... Nigeria
5R8 ..... Malagasy Rep.
5T ..... Mauritania
5U7 ..... Niger Rep.
6W8 ..... Senagel Rep.
6O2 ..... Somali Rep.
9K3 ..... Kuwait/Saudi Arabia Neutral Zone
9M2 ..... Malaya
9N1 ..... Nepal
9Q5 ..... Rep. of the Congo
9U5 ..... Ruanda-Urundi
..... Aldabra Islands

Annual ARRL Novice Roundup Competition

NOVICES, this is your one and only opportunity to participate *as a Novice* in your own operating activity, the Eleventh ARRL Novice Roundup Competition. You're only a Novice once, you know, so don't miss this chance to operate in this contest for Novices. The Novice Roundup begins on Saturday, Feb. 3, 1962, at 1800 local time, and runs *through* Feb. 18, Sunday 1800 local time. Operating, listening, and logging time must not exceed 40 hours.

ROUNDUP PERIOD

Starts	*Ends*
Feb. 3	Feb. 18
6:00 P.M.	9:00 P.M.
Local Time	Local Time

How to Participate

Just get on the air any time during the two week period and contact as many Novices and non-Novices as possible, exchanging QSO number, and ARRL section. Non-Novices work only Novices, of course. "CQ NR" means CQ Novice Roundup and you can either answer such a call or call "CQ NR" yourself to get contacts. Here's an example. KNØBPO in Minnesota hears KN1QFC in the Western Massachusetts section calling CQ NR.

CQ NR CQ NR CQ NR DE KN1QFC KN1QFC KN1QFC K

KN1QFC KN1QFC DE KNØBPO KNØBPO KNØBPO AR

KNØBPO DE KN1QFC R HR NR 3 WMASS BK

KN1QFC DE KNØBPO R HR NR 1 MINN BK

KNØBPO DE KN1QFC R TNX ES 73 SK DE KN1QFC

On his next contact KNØBPO would send NR 2 (meaning contact number 2) then NR 3, NR 4, etc.

Scoring

A certificate is awarded to the highest Novice scorer in each ARRL section. Complete results will be in *QST* including the scores of those non-Novices that enter as well. To obtain your final score simply add the total of your NR QSOs to the highest w.p.m. from your Code Proficiency certificate. Multiply the sum by the number of *different* ARRL sections (see page 6, this *QST*) worked during the contest. That CP certificate really helps out your score, and you still have time to qualify, so don't miss out. Full details on the Code Proficiency Program are on page 85, this *QST*.

Novices should keep a look out just above and below the Novice frequencies (3700–3750 kc.; 7150–7200 kc.; 21,100–21,250 kc.; 145–147 Mc.) for the higher-power Generals.

Log forms like the one in the sample are yours for the asking simply by writing to: ARRL Communications Dept., 38 LaSalle Road, West Hartford 7, Conn. Study the rules below carefully, and then stand by for the fun of your Novice career, the ARRL Novice Roundup Competition! But don't forget to send in a copy of your log to make your entry official; logs must be postmarked by March 3.

(Continued on page 142)

SUMMARY OF EXCHANGES ARRL NOVICE ROUNDUP

Call. KNØBPO.. Section... MINN.....
(See page 6 QST)

BAND	TIMES ON OR OFF AIR	DATE, TIME OF CONTACT	MY NR SENT	MY SECTION	HIS NR RCVD	HIS CALL	HIS SECTION	NUMBER EACH NEW SECTION AS WORKED
80	1800	FEB. 3						
		1803	1	MINN.	1	KNØAKM	MINN	1
		1815	2		3	KN9WRX	ILL	2
	1835	1820	3		2	KN9ZDL	ILL	
15	1400	FEB. 6						
		1412	4		15	KN7MNL	NEV	3
	1425	1418	5		7	KN1QFC	WMASS	4

Summary: (Enter below on last sheet used)

Bands used.....80,15.....; Nr. diff. stns. wkd..5.....; Nr. diff. sections...4.....
Total hours operation....1:00.....; Code Proficiency award credit.....10.....w.p.m.
Type transmitter (tube line-up if home-built).....
Receiver.....; Antenna.....

SCORING:

.....5....QSOs plus....10....c.p. points times....4.....sections equals 60

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

Signature and call.....
Address.....
.....

This is a sample log form that must be used by all contestants and also shows how to score. You can obtain these forms free by writing to ARRL.

Choosing An Antenna

BY LEWIS G. McCOY,* W1ICP

As the title indicates, this article is written to help the newcomer decide on the kind of antenna to select for his station. Naturally, it would be impossible in a short article to discuss all the different antennas that could be used, as the number is large. However, several types are more common than others, and these are the ones that will be treated. Constructionally, antennas can be divided into two categories, horizontal and vertical. Let's talk about horizontal antennas first.

As the name implies, a horizontal antenna is one that is more or less parallel to the ground. The commonest form of antenna is a dipole. In amateur radio we usually think of a dipole as being a half wavelength long and fed in the center. Such an antenna is shown at Fig. 1A. It is not planned to overwhelm the reader with math, but there is one simple formula, for the length of a half-wave antenna, that every beginner should know. This is:

$$L \text{ (feet)} = \frac{468}{f \text{ (Mc.)}}.$$

In words, the length of a half-wave antenna in feet is equal to 468 divided by the frequency in megacycles. This formula is used for wire antennas at frequencies up to 30 Mc. For v.h.f. work, the factor generally used is 5540, which gives the answer in inches. That is,

$$L \text{ (inches)} = \frac{5540}{f \text{ (Mc.)}}.$$

The radiation pattern of a half-wave antenna is similar to a figure 8, as shown in Fig. 1B. The maximum radiation is broadside to the axis of the wire, with minimum radiation off the ends of the wire.

Antenna Impedance

There is one more point of importance about a half-wave antenna and that is what the impedance of the antenna is at the feed point. Before going further, let's explain the term "impedance" as it applies to antennas. The feed point of an antenna is where you attach the feeder. This point has certain properties which we have to take into consideration when we wish to put power into the antenna. These properties consist of the following:

1) *Ohmic resistance.* When r.f. energy is fed to an antenna, a certain amount is lost as heat in the wire itself and in any dielectric material in the antenna, such as insulators. This heat loss is due to the ohmic resistance.

2) *Radiation resistance.* This resistance accounts for the r.f. energy that is radiated from the antenna.

3) *Reactance.* Reactance can be expressed as an opposition to the flow of r.f. currents, but without loss of power. It is expressed in ohms, even though you cannot dissipate power in reactance as you can in resistance. These are the properties that go together to make up the impedance of an antenna. In a half-wave antenna the proportion of ohmic resistance to radiation

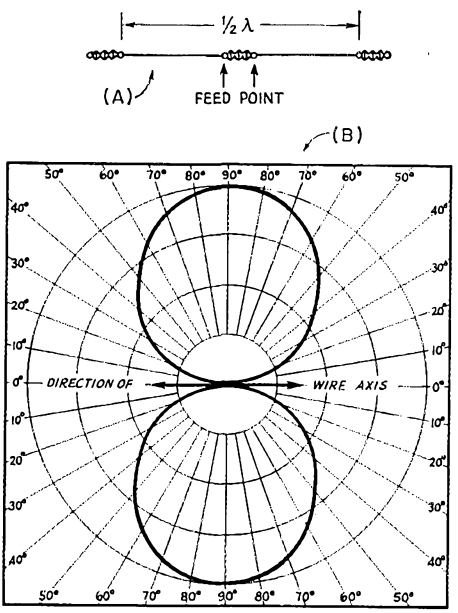


Fig. 1—(A) Diagram of a half-wave antenna. At (B) is the pattern of radiation from a half-wave antenna. The two lobes of radiation are broadside to the antenna axis.

resistance is usually very small, and any losses from ohmic resistance are negligible. If the antenna is resonant or "tuned" to the operating frequency, there will be no reactance present. If an antenna is too long or too short for the frequency, then it will have reactance.

The impedance of a half-wave dipole is approximately 70 ohms. This figure will vary, depending on the height of the antenna above ground. For single-band operation the antenna can be fed with either 50- or 70-ohm coaxial cable or 70-ohm Twin-Lead. Such an antenna is shown in Fig. 2A.

Note the statement above — "for single-band

* Technical Assistant, *QST*.

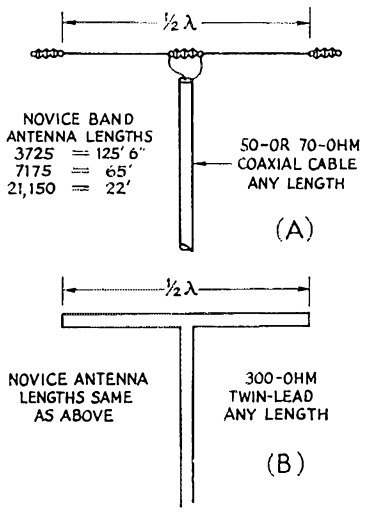


Fig. 2—(A) This drawing shows a coax-fed half-wave antenna. The lengths given are for typical Novice installations. The same lengths apply to (B), the folded dipole antenna. As explained in the text, the folded dipole can be made from 300-ohm Twin-Lead.

operation." When a half-wave antenna is fed with coax, the antenna impedance matches the impedance of the coax fairly well. However, let's see what happens to this antenna when it is operated at twice the frequency. Suppose for a moment that we have a half-wave antenna cut for the 80-meter band. The impedance of the antenna is about 70 ohms. Instead of using the antenna on 80, what happens when we feed a 40-meter signal to it? The antenna is not a half-wave on 40; it is "two half-waves in phase," and the feedpoint impedance becomes several thousand ohms. This means that we will have a very bad mismatch between the coax cable and the antenna, which also means that it may prove very difficult to load the amplifier in the transmitter and get power into the antenna.

Standing-Wave Ratio

There is one more point here that should be covered before we can actually discuss different types of antenna — the point is "standing-wave ratio."

The standing-wave ratio on a feed line is determined by the ratio of maximum r.f. voltage on the line to minimum voltage, or maximum to minimum current ratios. If a feed line is terminated in a load matching its characteristic impedance, the standing-wave ratio will be 1 to 1. For example, if we feed a 70-ohm half-wave antenna with 70-ohm coax, the s.w.r. will be 1 to 1 because the antenna impedance matches the line impedance.

However, suppose we use the coax to feed our half-wave antenna at twice the frequency, as in the example of an 80-meter dipole used on 40. Here the impedance is several thousand ohms and the mismatch becomes very large; consequently, a very high s.w.r. results.

Depending on the type of feed line used, a high s.w.r. can or cannot be important. If that statement appears confusing, you'll soon see why. Coaxial cable is a type of feed line that should not be used with a high s.w.r. because a considerable amount of your transmitted power can be lost in the line. When coaxial feed line is used in an installation where the s.w.r. is no more than 2 or 3 to 1 it is usually an excellent line to use, at least for frequencies below 30 Mc. For v.h.f. installations, a low-loss line should be used. However, when the s.w.r. is large, coax should not be used simply because coax is not classed as a *low-loss* line.

On the other hand, there are very-low-loss lines that can be operated with a large s.w.r. with only a negligible amount of power lost in the line. Open-wire feed line is such a line.

You can make your own open-wire line or use one of the commercial types that are available. You'll find that open-wire line is usually listed along with television antenna accessories in the parts catalogs. The line used for TV work is very satisfactory for amateur use.

If you want to build your own, there are a couple of methods for getting job done. E. F. Johnson Co. lists feeder insulators in their catalog. These are available for 2-, 4- or 6-inch separation of the feed-line conductors. Either No. 12 or 14 solid copper wire can be used for the conductors. A good choice is a line with 4- or 6-inch separation. The cost of the line goes up if you use 2-inch insulators, as they have to be installed every couple of feet to keep the conductors from twisting together. The 4- or 6-inch insulators can be used every four or five feet, thereby reducing the cost of the line. Another method is to make your own separators from polystyrene or plastic rod. This material is easy to drill and cut and makes good insulators. (Some hams use plastic hair curlers for insulators; so if your XYL isn't watching, you know what to do!)

Another low-loss line which can be used with a moderately-high s.w.r. is transmitting-type tubular 300-ohm Twin-Lead, such as Amphenol 214-076. This line is also available from most parts distributors. Another type (Amphenol 214-022) has two No. 16 conductors imbedded in a solid polyethylene dielectric with greater width than ordinary TV line. Receiving-type Twin-Lead can be used in low-power installations (75 watts or less). However, be sure when you buy your Twin-Lead that you get a "brand" name. There is some line available at bargain prices, but it is often really no bargain because the dielectric material is made from scrap plastic.

If you do a little thinking about our half-wave antenna you can see that it can be used as a multiband system if you choose the correct type of line. If you are interested in a one-band system with a half-wave antenna, then coax is a good choice. There is one exception where a single coax-fed antenna will work on two bands: A 40-meter half-wave operated on 15 meters will have an impedance close enough to 70 ohms so that the s.w.r. will not be large enough to cause high losses.

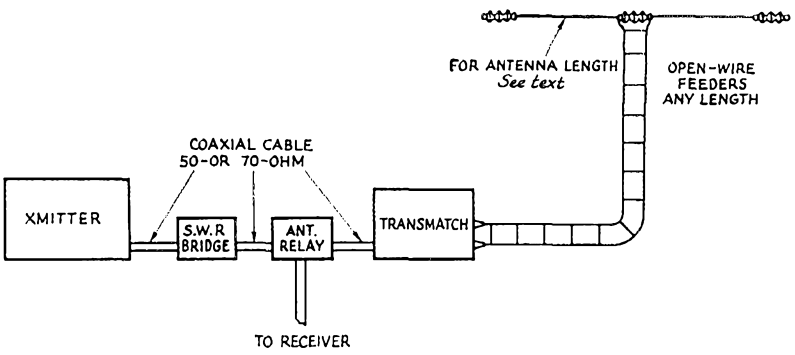


Fig. 3—This drawing shows the complete setup for a multiband antenna installation. The antenna relay or changeover switch should be installed as shown in the drawing, not in the open-wire side of the feeders.

However, for general multiband operation you should use a low-loss line such as the open-wire type.

You can also see that if an open-wire feeder — or any low-loss line — is used to feed a dipole antenna, the impedance of the antenna is no longer of great concern. If we don't have to worry about s.w.r. or matching, then we no longer have to be concerned about having our antenna an exact half-wavelength long. This in turn provides us with a method of making an all-band antenna fit the space available in our location.

A Multiband Antenna

A very simple method for making a multiband antenna is to first measure off the distance between your antenna supports and cut a wire that long. Fold the wire in two, cut it at the center and insert an insulator. Attach open-wire feeders, long enough to reach your shack, at the center. Put insulators on the ends of the antenna and raise it into place.

In order to use the antenna on all bands, you'll need a transmatch[1] at the transmitter. The transmatch is connected to the transmitter via a length of coax line. Such an installation is shown in Fig. 3. With this arrangement, any value of impedance at the transmitter end of the open-wire line can be transformed to 50 or 70 ohms.

Naturally, the reader will ask how short the antenna can be and still be effective on 80 meters, which is the lowest-frequency Novice band and would normally require the longest antenna. The answer is that while the antenna can easily be tuned to 80 meters even if it is very short, the efficiency will be low if the length is much below 60 feet. An antenna approximately 60 feet long will give a good account of itself on 80, and will work even better on the higher bands. Keep in mind, of course, that this is true only if the antenna is fed with open-wire line.

Multiple-Dipole Antenna

For those amateurs that prefer coax feed with multiband operation, a simple antenna is the multiple-dipole type. An antenna of this type is shown in Fig. 4. It consists of two half-wavelength dipoles, one for 80 meters and another for 40. This antenna can be fed with a single length of either 50- or 70-ohm coaxial cable. The system will work on 80, 40, 15 and 10 meters, and no matching network is required. However, it should be pointed out that a Novice should incorporate protection in such a system against radiation of harmonics, particularly the second harmonic, from 80 meters. For details on such protection, see the October, 1961, issue of *QST*.[2]

Folded Dipole

A popular antenna is the "folded dipole." This type is shown in Fig. 2B. There are two basic differences between a folded dipole and an ordinary dipole. First, the feed-point impedance of a half-wave folded dipole is approximately 300 ohms. Second, it has a slightly broader frequency response than a dipole. The folded dipole is a one-band antenna and separate ones are needed for each band.

It is quite easy to make a folded dipole using 300-ohm Twin-Lead for both the antenna and feeders. The antenna length formula is the same as for a dipole. To make one, simply cut a length of Twin-Lead to the antenna length and solder the wires together at both ends. At the center, cut one of the conductors (you must, of course, remove some of the polyethylene insulation) and "skin" back leads for about one inch. Connect your feed line to the two leads, solder, and then tape the joint. You'll need either a transmatch or balun coils to couple the antenna to the transmitter. Balun coils are designed with a 4 to 1 ratio, so using 300-ohm feed line, you would use 70-ohm coax to couple the transmitter to the

[1] McCoy, "A Wide-Range Transmatch," *QST*, November, 1961.

[2] McCoy, "A Novice Three-Band Antenna System," *QST*, October, 1961.

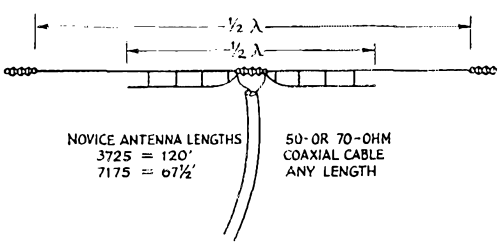


Fig. 4—This sketch shows a coax-fed multiband antenna system. A simple way to make the antenna is to use open-wire feed line of the TV variety. The insulators will keep the two antennas separated so they don't short to each other.

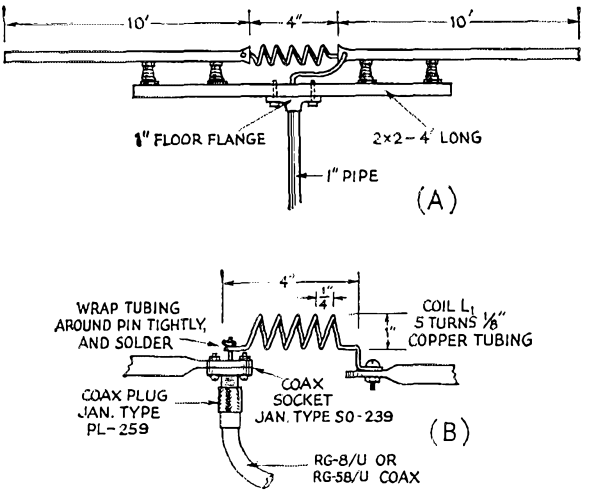


Fig. 5—Here are the constructional details for the 15-meter rotatable dipole, fed with coaxial cable. As shown in the drawing, the coax can be fed either down through the mast pipe, or, if preferred, outside the pipe.

balun. Baluns can be purchased "ready-made." Typical Novice-band antenna lengths are given in Fig. 2.

End-Fed Random Wire

Another popular antenna system is the end-fed wire, which is quite commonly — and often mistakenly — called a "long" wire. This antenna is usually connected directly to the output terminal of the transmitter and no feed line is used. The length of the wire will, of course, depend on the space the user has available. It is difficult to say what the impedance of a random wire is at the end, and in many cases loading of the amplifier in the transmitter may be difficult. If a random-length wire is to be used, it is a good idea also to use a transmatch to provide both matching at the transmitter and reduction of harmonic radiation. With a transmatch, this antenna can usually be made to work on any band, although if the antenna is very short, say, under 30 feet, it may prove difficult to operate on 80 meters. Also, a good earth ground should be connected to the transmitter.

Rotatable Dipole

On the higher bands — 20, 15, and 10 — a dipole is short enough so that it can be made from metal tubing. The tubing can be mounted on a mast and the assembly rotated. This gives you the opportunity to make use of the directivity in such an antenna and you can "beam" your signal in the direction you want. Because the antenna is bidirectional, you only need to rotate it 180 degrees in order to obtain full coverage.

An excellent 15-meter dipole is shown in Fig. 5. Two pieces of electrician's thin-wall steel tubing are used f r the elements. The tubing is ½ inch in diameter, 10 feet long, and is available from any electrical parts house. While a total length of 20 feet is slightly short for 15 meters, the antenna will have an impedance of approximately 50 ohms when tuned to resonance by means of a small loading coil in the center. This antenna offers a good match for 50-ohm coaxial cable, either RG-58/U or RG-8/U.

Fig. 5 is self-explanatory, but just a word about mounting the coax fitting on the antenna. Flatten the element in a vise or with a hammer and this will provide you with a mounting space for the coax fitting. One end of the coil is soldered to inner conductor pin on the coax fitting and the other end of the coil is held in place with a screw and nut. The height of the standoff insulators that support the elements above the 2 × 2 can be 2 to 4 inches, as the dimension is not critical. One convenient method of mounting the antenna is to use TV hardware. Wall stand-offs are available at low cost which will support the mast pipe and antenna. Also, a TV rotator can be used to rotate the antenna.

A Three-Band Rotatable Dipole

If desired, the same element material used in the antenna described above can be used for a

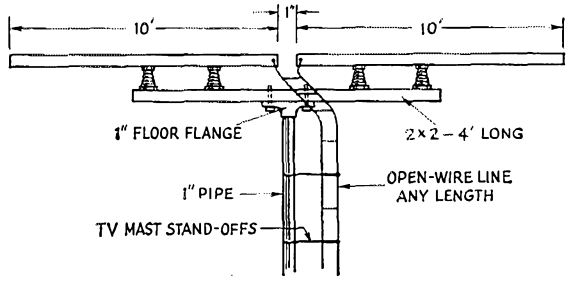


Fig. 6—A rotatable dipole for 20, 15, and 10. Construction details are similar to Fig. 5 with the exception of the feed line and coil at the center of the antenna.

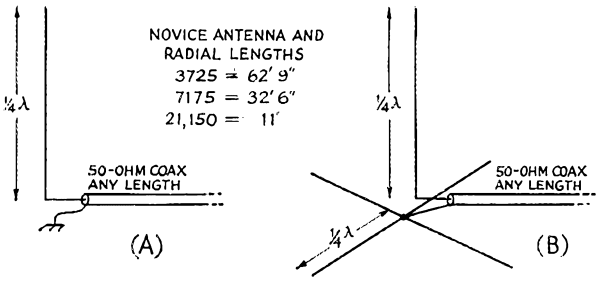


Fig. 7—At (A) is the simplest form of vertical. The ground connection shown at the outer braid should be made to a good earth ground. Shown at (B) is a ground-plane antenna. The four radials are each ¼ wavelength long and connect at the center.

three-band — 20, 15, and 10 meters — rotatable dipole. The entire assembly is the same as Fig. 5 except that the coax feed and coil at the center of the antenna are not used. Open-wire feeders are attached to the dipole as in Fig. 6. The feeders are connected to a transmatch which is used to tune the system to the band in use. Because only 180 degrees rotation is needed for full coverage, there is no problem in keeping the open-wire feeders from shorting to the mast. TV mast stand-offs can be used to hold the open-wire line away from the mast. Leave an extra few feet of feeder length where the line enters the shack. This extra length can be dressed away from the mast so that the line can swing around when the antenna rotates, but doesn't short to the mast.

Incidentally, the feed line can be any length, since all tuning and adjusting is done at the transmatch or antenna coupler. This antenna and its adjustment is essentially the same as the odd-length, center-fed, multiband antenna described earlier (Fig. 3). The main difference here is that you can rotate the dipole, taking advantage of its directivity.

Vertical Antennas

Some amateurs prefer vertical antennas because they take up less space. They have both advantages and disadvantages. On the credit side is the small amount of space required. Also, they are omnidirectional, radiating equally well in all directions. However, a vertical should be mounted in a spot where there are no nearby objects, particularly rain gutters or house wiring, which will detract from their performance. In other words, if you don't have an open field, the antenna should be mounted high, so as to clear nearby objects. Also, a horizontal antenna in its best directions will be better than the omnidirectional radiation from a vertical. A rotatable dipole, for example, can be expected to out-perform a vertical at nearly all times.

The simplest vertical antenna, a radiator ¼ wavelength long, is shown at Fig. 7A. The formula for length in feet is 234 divided by the frequency in megacycles. The impedance at the feed point is somewhere near 30 ohms so the vertical can be fed with 50-ohm coaxial cable and a fairly good match will result.

The antenna can be made from wire and suspended from above, but a better system would be to make the radiator from tubing. This can be either guyed or self-supporting, depending on its height. Mount the mast on a base insulator (a coke bottle makes a good insulator), and connect the inner conductor of the coax to the bottom of the antenna. The outer braid of the coax should be connected to a metal stake or ground rod driven into the ground at the base of the antenna. Like a coax-fed horizontal, such a vertical is essentially a one-band system. The exception is a 40-meter vertical, which can also be used on 15 meters.

Ground-Plane Vertical

One of the troubles with a vertical such as just described is that it may not operate very well with poor ground conditions. A way to get around this problem is to install your own ground system under the vertical. Such an antenna is called a "ground plane" and is shown at Fig. 7B. In this antenna the radiator is supported above at least four "radials." The antenna and each of the radials are ¼ wavelength long. The outer shield of the coax is connected to the junction of the radials. A fairly good antenna will result if the entire system is mounted high above the ground and in the clear. One method of doing the job is to mount the vertical on top of a tower or mast and then use four or more guy wires at the top of the mast. The guys can be of wire and should be ¼ wavelength long. Insulators should be used to separate the radial length from the rest of the guy. Even though the radials will slope downwards, the antenna will still work as a ground plane.

(*Continued on page 140*)

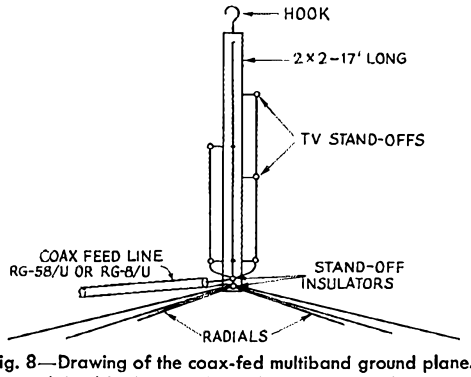
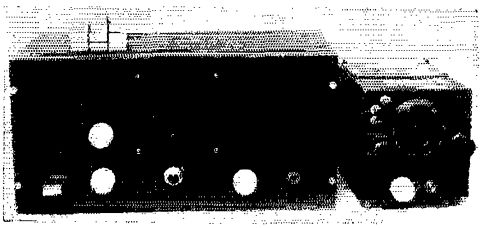


Fig. 8—Drawing of the coax-fed multiband ground plane. As explained in the text the radials are made from four-conductor TV rotator cable. A total of four radials are required for each band. Lengths of the antenna and radials can be determined from the formula given for vertical antennas.

A High-Performance Tuner for V.H.F. Converters



The intermediate converter is housed in a 7 × 14 × 8-inch cabinet. The tuning-capacitor knob is to the left of the 5-hole speaker opening. Lined up along the bottom from left to right are the crystal, r.f. gain control, panel lamp, audio gain control and headphone jack.

Improved Stability and Slower Tuning Rate for the Higher Frequencies

BY ALAN T. MARGOT,* W6FZA

In this system, the popular BC-453 surplus receiver is used as the main tuning element. The article is devoted to the construction of an intermediate converter which bridges the gap between the 14-Mc. output of many v.h.f. converters and the 190- to 550-kc. input range of the Command receiver. Complete adjustment procedure for the total system is included.

In recent years, serious-minded v.h.f. operators have been giving more attention to the lower-frequency portions of their receivers as well as to the front ends. For weak-signal work the qualities of rock-like stability, slow tuning rate, narrow pass band and accurate calibration have come to be just about as important as a low noise figure. These are also desirable features for s.s.b. reception. Several manufacturers have come out with receivers having these qualities, usually achieving them by breaking the bands into segments, each segment covering a few hundred kilocycles. Unfortunately, most of the receivers operating in this fashion have price tags in the $500.00 neighborhood.

For the benefit of those less familiar with v.h.f. DXing, the above receiver qualities pay off in these ways:

1) *Slow Tuning Rate.* It takes more signal strength for the signal to be discovered in the noise than for it to be "held on to," once it has been spotted. Weak signals are subject to various kinds of fading and bursting. The slower the tuning rate, the more likelihood of discovering a weak signal on the up-fades or bursts.

2) *Stability.* In dealing with signals that fade in and out of the noise, it is reassuring when a signal comes out of the noise at the same spot on the dial at which it disappeared. Constant retouching of tuning on weak signals leaves less concentration available for reading the signals, and promotes losing the signal in the noise.

3) *Narrow Bandwidth.* The narrower the bandwidth, the less the receiver noise. Decreasing the receiver pass band from 10 kc. to 2.5 kc. improves the signal-to-noise ratio by 6 db., or one S unit. Of course, the narrower bandwidth requires a slower tuning rate for the same "discovery" ability.

4) *Good Calibration* pays off in two ways. For skeds, it greatly simplifies finding the other station. Secondly, accurate frequency logging of DX stations makes identification easier in the future. For this reason, many stations hoping to be heard in far-off places pick one crystal frequency and stick to it.

The lowly BC-453 (surplus for around $15.00) possesses the above qualities to a high degree. With a suitable crystal-controlled converter to bridge the gap between v.h.f.-converter outputs and the 200-to-500-kc. range of the BC-453, these attributes can be put to work on 50 Mc., 144 Mc., and on up. Such an intermediate converter is the subject of this article.

Circuit

The converter shown here is designed for use with crystal-controlled v.h.f. converters having output in the 14-to-18-Mc. range. The circuit is shown in Fig. 1. The input and output circuits of the 6BH6 r.f. amplifier are continuously tunable over the 14 – 18-Mc. range. A signal in this range at the output of the r.f. amplifier is fed into two successive mixers through which the signal is converted to a frequency within the tuning range of the BC-453 (200 to 500 kc.). The same injection frequency is fed to both mixers from a single Pierce crystal oscillator using a 6AU6. Crystal frequencies are changed every 300 kc. to keep the converter output frequency within the tuning range of the BC-453. As an example, a 50-Mc. signal in the v.h.f. converter produces a 14-Mc. signal at the input to this intermediate converter. A 6900-kc. crystal in the oscillator produces a beat at 7100 kc. in the output of the first mixer. The same injection frequency of 6900 kc. beating with the 7100-kc. signal in the second mixer pro-

* Communications Engineering Co., 907 Third St., Porterville, Calif.

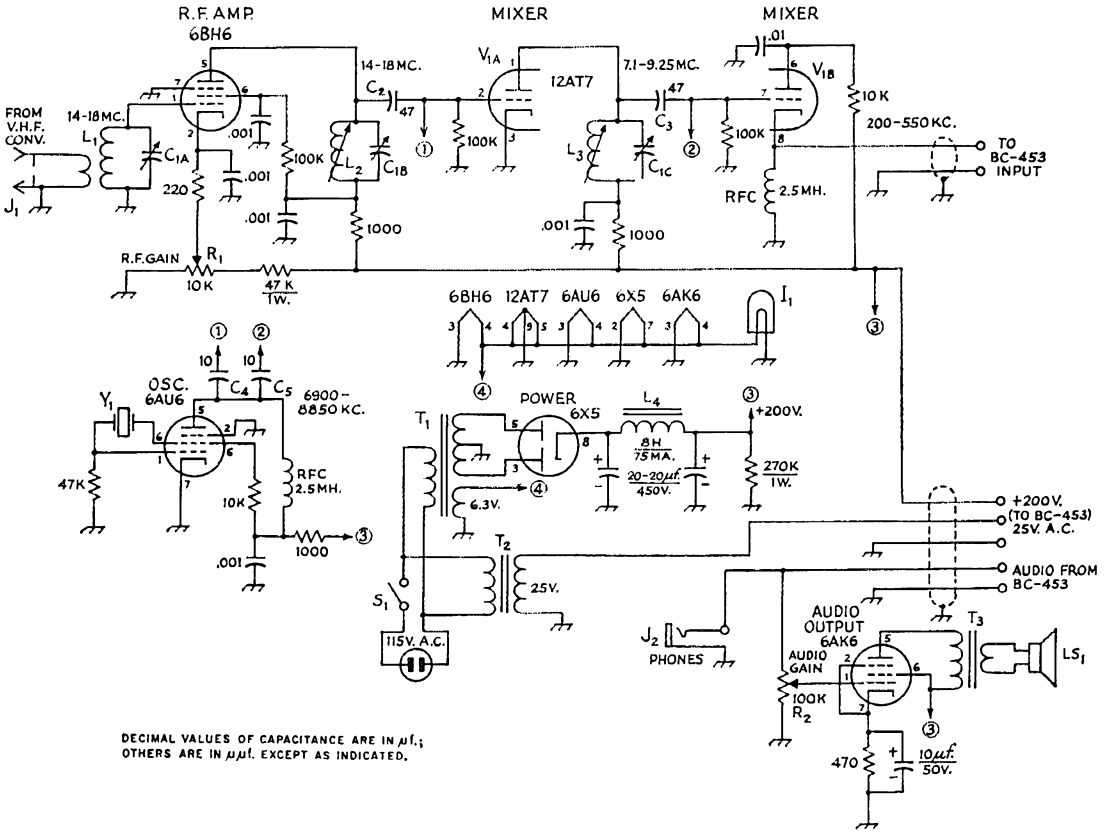


Fig. 1—Circuit of the intermediate converter. Capacitors not listed below are disk ceramic, except those marked with polarity, which are electrolytic. Resistances are in ohms and resistors are ½-watt composition unless indicated otherwise.

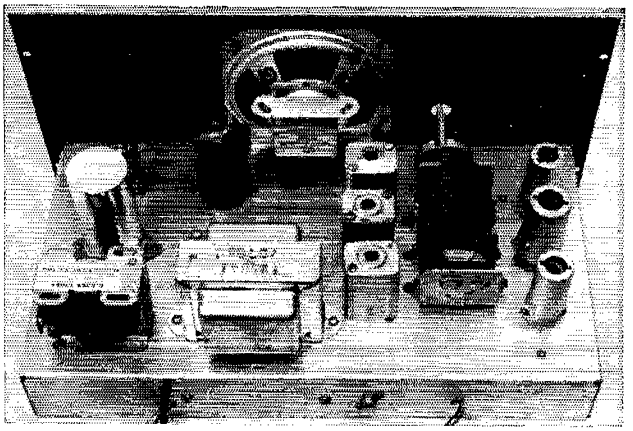
C_1—Three-gang variable capacitor, 150 μμf. or more per section (see text).
C_2, C_3, C_4, C_5—Mica or stable ceramic.
I_1—6.3-volt panel lamp.
J_1—Phono jack.
J_2—Open-circuit jack.
L_1—8 turns No. 22 enam., ½-inch diam., shunted by 45-μμf. mica or ceramic trimmer, on air-core form, or unshunted on ⅜-inch iron-slug form; 2-turn link over ground end.
L_2—Same as L_1, no link.
L_3—20 turns, same as L_2.
L_4—8-h. 75-ma. filter choke (Stancor C-1355 or similar).
LS_1—5-inch loudspeaker.
R_1—10,000-ohm control.
R_2—0.1-megohm control, audio taper.
S_1—S.p.s.t. on R_2.
T_1—Power transformer: 500 volts, r.m.s., c.t., 70 ma.; 5 volts, 2 amp. (not used); 6.3 volts, 2.5 amp. (Stancor PC-8403 or similar).
T_2—Filament transformer: 25 volts, 1 amp. (Stancor P-6469 or similar).
T_3—Output transformer: 10,000 ohms to voice coil.
Y_1—See chart.

duces a 200-kc. signal at the input to the BC-453. Similarly, a v.h.f. signal at 50.3 Mc. will produce a signal at 500 kc. at the input of the BC-453. A 50.4-Mc. signal would, of course, produce a 600-kc. signal, which is outside the tuning range of the BC-453. Therefore, the conversion oscillator frequency is changed by substituting a 7050-kc. crystal which, for a 50.3-Mc. signal, results in a signal of 200 kc. at the input to the BC-453. By changing the oscillator frequency according to the accompanying chart, the entire 4-Mc. range is covered in steps of 300 kc. Although a total of 14 crystals is required to cover the entire 4-Mc. input range, the cost will not be exhorbitant if surplus crystals, available at 50 cents each, are used. Also, many operators will not feel that complete coverage is necessary.

In this system, a range of 14 to 18 Mc. at the input to the converter results in a frequency range of 7.1 to 9.25 Mc. in the output of the second mixer. Since the ratio of minimum to maximum frequencies is essentially the same in both circuits, tuning of the circuits will track if the tuning capacitors are identical.

The second mixer stage is in the form of a cathode follower to provide low-impedance output to match the low-impedance input of the BC-453. The gain control in the r.f. stage permits the input signal from the v.h.f. converter to be adjusted to the proper level.

The chassis also includes a supply providing power for both this converter and the BC-453, and an audio output stage. The latter is necessary to provide enough amplification so that the r.f.



Chassis view of the intermediate converter unit. A 7 × 13 × 2-inch aluminum base provides plenty of room for components. The r.f. tubes, triple-section tuning capacitor and shielded coils are grouped to the right. Power-supply components and the 6AK6 audio stage are to the left. The output transformer is mounted on the speaker.

gain control of the BC-453 can be run about halfway open. In this region there is enough b.f.o. injection for good c.w. and s.s.b. sensitivity.

Construction

The construction of the converter is not critical as to detail. Most of the essentials will be evident from the photographs. The tuning capacitor C_1 may be any triple-gang capacitor having a maximum capacitance of 150 $\mu\mu$f. per section or more, so long as the sections are identical. I used a broadcast-receiver replacement unit having about 365 $\mu\mu$f. per section. In any case, only a small portion of the total capacitance range will be used.

The only critical point in regard to the coils is that L_3 should have four times the inductance of L_1 and L_2 for accurate tracking. If air-core forms are used, the coils should be shunted by 0–45-$\mu\mu$f. ceramic or mica trimmers. Trimmers are unnecessary if iron-slug forms are used. With either type of form, the coils should be individually shielded.

BC-453 Conversion

This matter has been dealt with many times in print, and the procedure is the same as applied to other receivers in the ARC-5 line, with only a couple of exceptions. The subject was covered quite well in the November 1960 issue of *QST*.[1] The wires carrying B+, ground, and 24 volts a.c. can be soldered to the corresponding dynamotor terminals at the rear of the chassis, and the audio pair can be connected as shown in Fig. 2. A little better match, and consequently a little more audio, can be obtained by cutting the wire off the audio terminal in Fig. 2, and connecting a 0.01-μf. capacitor from it to the plate contact of the BC-453 output transformer. In this case, the little front panel was removed from the BC-453, and both extruded aluminum cups that mount the control plug and socket were drilled off and pulled out. It was necessary to clip the wires off the back of the socket first, saving the green one for the r.f. gain control. The rest of the wires were taped and tucked away.

[1] McCoy, "50- and 144-Mc. Reception at Low Cost," page 39.

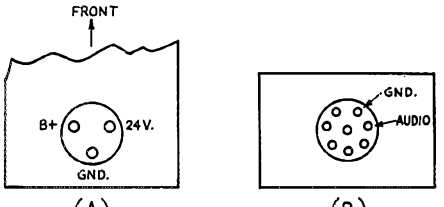


Fig. 2—A—Sketch showing top view of BC-453 dynamotor connections. B—Rear view of audio connections.

The r.f. gain control, mode switch and padder were mounted on the little panel before it was bolted back on the front. Mount the padder as rigidly as possible, with stiff wire.

The mode switch (see Fig. 3) is a d.p.d.t. toggle switch with a neutral "off" position, which can be obtained in hardware stores. When making the connections shown, check the switch with an ohmmeter and orient the switch so that the handle is up for u.s.b. and down for l.s.b. If the trimmer C_6 appears to be connected for the wrong sideband, it is because the local oscillator in the BC-453 operates on the high-frequency side of the signal.

The dial of the BC-453 was remarked with a scale running from 0 to 350, in steps of 50. Then, each of the converter crystals was marked for the low-frequency end of the frequency range on which it is used. As examples, the 6900-kc. crystal is marked "14,000 kc.," and with this crystal in place, the BC-453 will respond to signals in the range of 14,000 to 14,350. The next crystal, 7050 kc., is marked "14,300 kc.," and the BC-453 then covers the range of 14,300 to 14,650 kc.

Tuning Up

Check out the BC-453 first by cranking up the audio and r.f. gain controls and listening for noise. The noise should increase with the b.f.o. switch in the up and down positions. By connecting a short length of wire to the "A" terminal on the panel of the BC-453, it should be possible to hear broadcast stations at the high-frequency end of the dial.

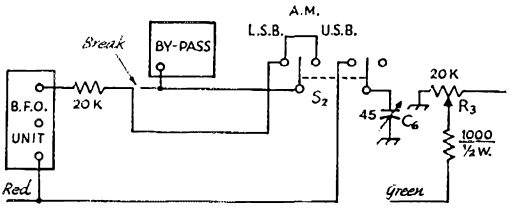


Fig. 3—Diagram showing alterations in the b.f.o. circuit of the BC-453. C_6 is a 7-45-$\mu\mu$f. mica or ceramic trimmer. R_3 is a 20,000-ohm control. S_2 is a d.p.d.t. toggle switch with center off position.

Next, change the switch on the front of the BC-453 from "A" to "L" and connect the leads from the output of the converter to the "L" terminals, with the ground wire on the lower terminal.[1] Plug in the 6900-kc. crystal, turn up the converter gain and tune in a strong 14,000-kc. signal. A 14,000-kc. signal from a v.f.o. or crystal stage will show up at 0 kc. on the revised BC-453 dial, or at 200 kc. with the original calibration. Rotate the three-gang capacitor in the converter for maximum signal. If a peak is found (about midway on the capacitor), arrange for a fairly weak 14-Mc. signal. Now try to peak up the slugs (or trimmers). If all the slugs peak the signal in their normal travel, alignment is complete. If one slug starts to peak with the slug completely out (or the trimmer completely open), adjust C_1 to a slightly lower capacitance and start over. If one circuit starts to peak with the slug completely in (or the trimmer at maximum), adjust C_1 to a slightly higher capacitance and repeat the process. If a position on the capacitor cannot be found where all three slugs will peak, it will be necessary to prune the coils until this is so. Remember that the absolute inductance is not important, so long as $L_1 = L_2 = \frac{1}{4} L_3$.

CRYSTAL CHART

Tuning Range Freq. (Mc.)	Crystal Freq. (kc.)
14.0–14.35	6900
14.3–14.65	7050
14.6–14.95	7200
14.9–15.25	7350
15.2–15.55	7500
15.5–15.85	7650
15.8–16.15	7800
16.1–16.45	7950
16.4–16.75	8100
16.7–17.05	8250
17.0–17.35	8400
17.3–17.65	8550
17.6–17.95	8700
17.9–18.25	8850

B.F.O. Alignment

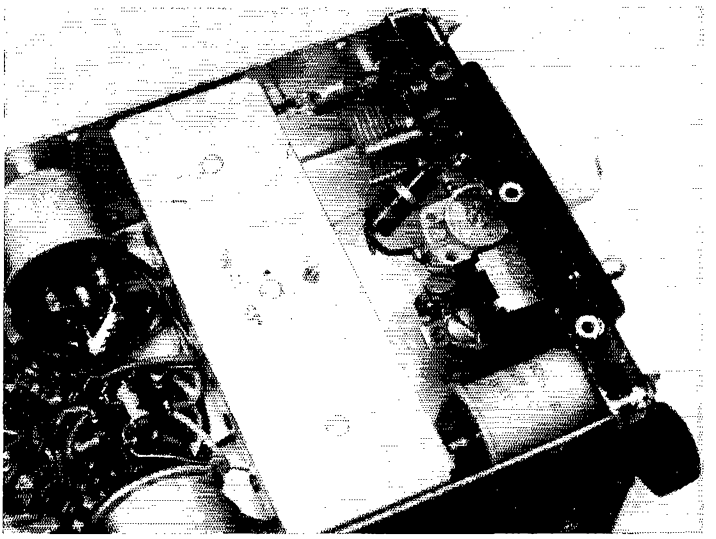
The b.f.o. can be lined up with any signal that is about an S unit stronger than the noise. Tune in the signal "on the nose" with the mode switch in the neutral or a.m. position. The correct point can be found by rocking C_1 back and forth across the signal and stopping when the noise is at its lowest pitch. With S_2 turned up to the u.s.b. position, turn the screw-driver adjustment on the side of the BC-453 (at the b.f.o. can) for a beat note of about 1 kc. Zero beat should now appear about a kilocycle *higher* on the dial. If this is not so, repeat the process, swishing the b.f.o. through zero beat to the same pitch on the other side, and check again. Now switch to l.s.b. and repeat the entire process, adjusting the b.f.o. this time *with the padder* C_6 to about the same pitch on the other side of zero beat. Double check to make sure that zero beat appears about a kc. *lower* on the dial than zero beat when switched to l.s.b. It will be necessary to go through this procedure several times, till you can tune in a signal on a.m., and then hear about the same pitch on both u.s.b. and l.s.b. Don't be disturbed if the noise sounds a little different on u.s.b. and l.s.b. when no signal is being received; this is caused by an unsymmetrical band pass. Notice that the beat note is many times stronger on one side of zero beat than on the other.

Operation

The BC-453 unit used here can be badly overloaded (as evidenced by obvious distortion) if its gain control is set for more than 50 per cent of maximum gain. So, in the earlier stages of operation, it will be well to stay below this limit. With the intermediate converter gain turned well up (R_1 advanced), and with a v.h.f. converter plugged in, two noise peaks should be heard fairly close together as C_1 is turned through its range. *Always use the peak on the low-capacitance side.* This is easy enough to do if the operator makes a habit of swishing through both peaks and stopping on the low-C one (the other is the undesired image). If the gain control on the intermediate converter is set too low, the system noise figure will deteriorate, so it should be set as high as possible without overloading the BC-453, and may need resetting with each signal. When tuning across a segment it will be necessary to retune the intermediate converter every 50 kc. or so. If there is any question as to whether things are functioning normally, disconnect the input to the intermediate converter temporarily. The noise in the speaker should drop by 80 per cent or more. This means the v.h.f. converter noise figure is dominating, as it should. Using the above procedure, no birdies have been noticed here. However, if the intermediate converter is detuned, or if it is mistuned to a beat with a harmonic of the converter oscillator, numerous birdies can appear.

With the tubes and coils shielded, no i.f. feedthrough has been noticed in several weeks of

[1] If the receiver does not have this dual-input arrangement, simply use the existing antenna terminal and chassis ground.



Bottom view of a portion of the BC-453 chassis showing the installation of the mode switch and associated components.

operation. Image rejection has been satisfactory. In that time, no images have been found with v.h.f. converters connected, and only a few strong commercials have come through as images while tuning the 14-Mc. band. Images can easily be recognized because the signal appears on the wrong side of zero beat, as compared to desired signals.

Many refinements could be added to this basic unit, such as crystal switching, audio filters, noise silencers, and a.v.c. They will allow avenues of experimentation for the builder, while he has the use of this tuner.

Calibration

With the circuitry shown, the 14-Mc. calibration will be within a kc. or so, provided your BC-453 has not had rough treatment. However, along with the owners of 75A-4s and 75S-1s, you are now at the mercy of the overtone crystals in your v.h.f. converters. There is no easy way to compensate for the 5-kc. error, or greater, found in many v.h.f. converters. We tried changing the BC-453 oscillator padder and trimmer, but with little success. The 6AU6 oscillator could be rebuilt into a VXO type of oscillator, but this would destroy the simplicity. Changing the location of the calibration marker would correct only one end of the dial, since the calibration is not linear. It appears that operating on the v.h.f. converter oscillators is a possible approach. We have a friend who has bought three crystals for his two-meter converter, and still has an error. Until we get time, however, we are making a mental correction of — 1 kc. on 50 Mc., and + 5 kc. on 144 Mc.

For weak-signal work, this unit stands up to the $500.00 receivers, and is out in front of the less-expensive ones. So it is ideal for the v.h.f.-minded ham who, like me, has "Collins" tastes and a "Command Set" pocketbook. The prospective builder should be warned, however, that this is a specialist's receiver, and large tuning excursions become tedious. It is definitely not for the casual v.h.f.-er who likes to swish across 3 or 4 megacycles looking for S7 or better a.m. signals.

With a little care in buying, the parts for this unit can be purchased for less than $50.00, the BC-453 included. Since many of the parts are of junk-box type, and most of the values are not critical, it could probably be built for much less. So if you build it, would you do us a favor? Take the $450 or so you've saved, and put a kw. on c.w. and s.s.b. on 6, 2, and 220, and emit some respectable signals! QST

Strays

The following items of gear were stolen from the station of WA2JPJ on the night of Nov. 3. A Gonset Mobile receiver G-66B, a Gonset mobile mike, a transistorized power supply, and a crystal marker-calibrator. The serial number of the receiver is not known, but it can be identified by the fact that its power connector has been modified from the original to an octal male connector mounted on stand-offs.

(Hint — why doesn't everyone reading this rush right out and make a list of the serial numbers of his gear — you never can tell when this info might be handy.)

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Most hams don't have to be led, but K6LED is president of the Antelope Valley ARC and W6LED is president of the United Radio Amateurs of San Pedro. — *W6MLZ.*

Close-Spacing the W3QEF Quad

The boomless "spider" type of support for multiband quad elements, originated a few years ago by W4NNQ, and used later by W3QEF in his single-feed version, has solved constructional problems for many a booster for the cubical. Reducing the element spacing in the design described here by W7BTB results in increased ruggedness and a smaller turning radius without sacrificing gain.

Reduced Dimensions for a Popular Three-Band Design

BY IRVIN D. KRIDLER,* W7BTB

In common with many others, the author was attracted by the low cost of the quad antenna, and the excellent results that are invariably reported by those who use them. In reviewing the many designs that have been published, the three-band arrangement described by W4NNQ [1] seemed particularly attractive from the construction viewpoint, since no boom is required. The spreaders are mounted in a central welded "spider" at the top of a rotating mast. An electrical feature of the design is that it provides constant element spacing (in terms of wavelength) on all three bands which, in theory at least, should result in a more constant feed-point impedance in going from band to band. Later, W3QEF successfully used a similar design with a single common transmission line feeding the three driven elements in parallel.[2]

In both of these arrays, an element spacing of about 0.2 wavelength was used. However, further search of published material revealed several designs using a spacing of 0.125 wavelength or less,[3,4,5] and Orr[6] shows curves indicating that maximum gain is obtained at this spacing, with a feed-point impedance of about 70 ohms.[7] Structurally, this reduction in spacing is worth considering because it results in slightly shorter spreaders (where every inch of additional length reduces the mechanical stability), and less tendency for the spreaders to bend under the tension of the element wires because of the more nearly vertical aspect of the spreaders. In addition, the resulting "turning radius" is considerably smaller. The design adopted subsequently is the single-feed-line arrangement of W3QEF but with closer element spacing. The completed dimensions are 18 feet 4 inches wide, by 18 feet 4 inches high, by 8 feet 7 inches deep.

The Spider

The closer element spacing requires an alteration in the angles used by either W4NNQ or W3QEF in constructing the spider. The jig shown in Fig. 1 was made up to facilitate accurate orientation of the component pieces during the welding process. First, the base (Fig. 1A) was cut from a piece of ¾-inch plywood. A hole to clear 1¼-inch I.P.S. iron pipe was drilled to a depth of ⅜ inch at the exact center of the base. Then the diagonal slots were cut to the same depth. Next, four triangular pieces of ⅛-inch hardboard were cut, as shown in Fig. 1B, and these pieces were glued in the slots, with their vertical edges ⅞ inch from the center of the hole to provide a loose fit to the 1¼-inch pipe. Additionally, right-angle blocks were glued to the base in the 133-degree spaces to maintain the pipe in a vertical position in respect to the base.

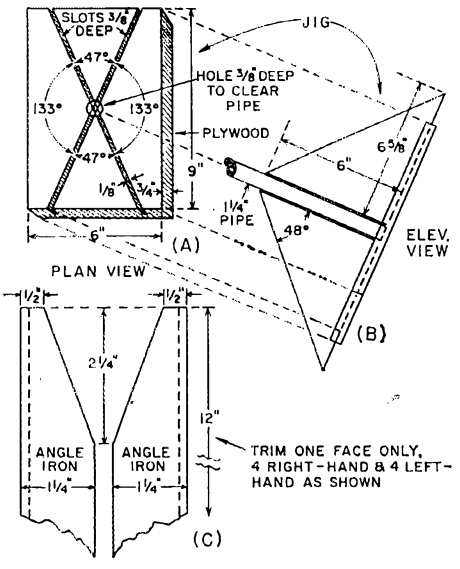


Fig. 1—A—Dimensions of the jig base. B—Jig Assembly. C—Angle-iron spreader supports.

* 4128 Kitsap Way, Bremerton, Wash.

[1] Leach, "A Three-Band Quad Antenna System," *QST*, April, 1957.

[2] Hess, "Single-Line Feed for Tri-Band Quads, *QST*, August, 1959.

[3] Pomeroy, "A Tri-Band Quad," *QST*, September, 1956.

[4] Fehrenbach, "All-Metal Quad for 15 Meters," *QST*, March, 1961.

[5] Adolph, "Three-Band Quad for Field Day," *QST*, April, 1961.

[6] Orr, *All About Cubical Quad Antennas*.

[7] As with other types of arrays, the feed-point impedance will be influenced by such factors as height above ground and tuning of the parasitic element as well as the element spacing. — *Ed*

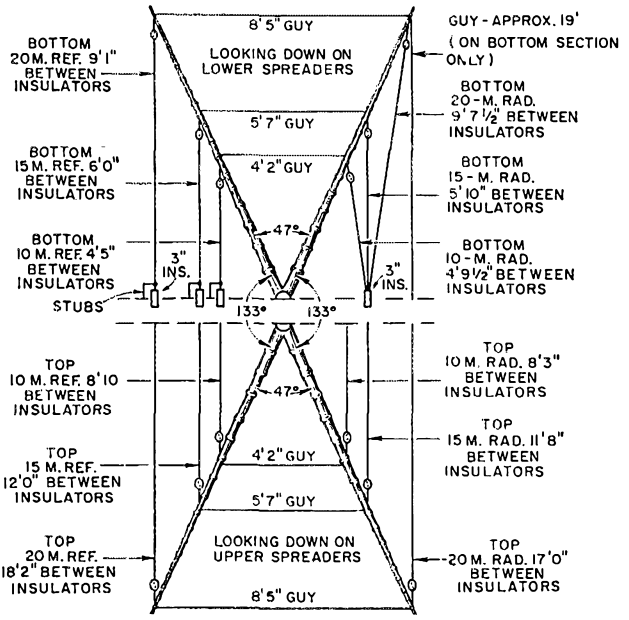


Fig. 2—Sketch showing a combination view of the top and bottom construction. The upper half of the sketch is a view looking down on the lower spreaders, while the lower half is a view looking down on the upper spreaders. The missing half in each case is a reflection of the half shown. Stranded antenna wire (Belden No. 8000) was used for the elements. After stringing the element wires, all spreaders were given a coat of weatherproofing varnish.

Eight 12-inch lengths of 1¼ × 1¼ × ⅛-inch iron angle stock were cut and trimmed (one face only), four right-hand and four left-hand, as shown in Fig. 1C. (The face not visible in the sketch falls in either of the two 133-degree spaces, so no trimming is required.)

With an 18-inch length of the 1¼-inch pipe placed upright in the jig, one of the angle pieces was placed with the valley balanced over the diagonal edge of one of the triangular jig members, and with the trimmed end tight against the pipe. A right- or left-hand angle piece should be chosen, depending on which will bring the untrimmed face in one of the 133-degree spaces. When the angle piece was accurately placed, it was spot-welded to the pipe. The three remaining angle pieces were added in a similar manner. Then the pipe was inverted in the jig, and the other set of four angles was spot-welded. With all eight angle pieces in place, the various angles were checked for accuracy and, when found satisfactory, the permanent welding was completed. The 1¼-inch pipe will fit perfectly over a 1-inch I.P.S. iron-pipe mast.

Assembling the Antenna

To assemble the beam, an area of at least 20 feet square, clear of all obstructions, is required. The spider was placed on the ground with the pipe parallel to the ground and with one of the 133-degree sides facing ground, the other 133-degree side facing upward. Four 14-foot bamboo poles were secured to the upper four angles, with shimming between the poles and the angle irons as necessary to correct any deflection from the proper angles. Galvanized iron strap, perforated the entire length with holes to clear ¼-inch bolts, was used to secure the bamboo poles to the spider. This strap is inexpensive and is found in most hardware stores.

All element wires were measured to the total lengths which may be determined by inspection of Figs. 2 and 3, adding three inches for each tie point (six tie points for each element — the four corners plus two at the feed or reflector-stub points). It will be noted that the lower strands of the 10- and 20-meter driven elements have total wire lengths greater than the lengths of wire in the top and side strands. On the other hand, the total length of wire in the 15-meter driven element is the same on all four sides. The top and sides of the 10- and 20-meter elements were shortened equally to allow for the extra length required to bring the open ends of the lower strands of these elements to the common insulator which is placed at the center of the 15-meter driven element. Egg insulators were placed at the corner points, tying them on with nylon cord. When the job is finished, there will be approximately 10 inches of line between the spreaders and the insulators of the 20-meter elements, 6 inches at the 15-meter elements and 5 inches at the 10-meter elements. Additional allowance should be made for tying and final squaring up.

The reflector elements were strung first, terminating each of them in a three-inch insulator at the center of what will be the bottom strand where the tuning stub is to be attached. At the four corners, the wire was run through the eye of the egg insulator and then the insulator was given two twists and the wire then soldered to prevent any possible slippage. Fig. 3 shows how the elements (driven or parasitic) are spaced along the spreaders.

With the reflector elements in place, an 18-foot length of 1-inch I.P.S. iron-pipe mast was at-

tached to the spider by drilling and tapping for three ¼-20 machine screws. The open ends of the mast and spider were sealed with plastic tape. Then the assembly was propped up 5 or 6 feet off the ground while the second set of spreaders was attached, and the radiator elements were strung from underneath. The tie points for the driven elements require about 12 inches of nylon line for the 20-meter element, 6 inches for the 15-meter element and 10 inches for the 10-meter element. The open ends of the three elements were bunched together on each side and the two bunches joined with a 3-inch insulator. The 70-ohm line (Belden No. 8222) was then anchored to the insulator and the ends connected to the radiator terminals. This line is very light in weight and has proved to be entirely adequate for the 150-watt power level in use. A 1-to-1 balun is used between the line and the DX-100.

The dimensions used are the same as tabulated by Orr,[6] except that the length of each reflector was increased by 3 per cent, and the tuning stub shortened correspondingly. The stubs should be adjusted for either maximum forward gain or, preferably, for minimum backward radiation as indicated by a field-strength meter. The latter point is sharper and therefore more easily recognized.

Results obtained with this antenna have been most gratifying. Comparative reports indicate that the performance is on a par with that of most of the 3-element Yagis in the area.

In conclusion, I want to acknowledge the invaluable assistance given by W7AMC, W7HMA, K7HZW, W7LKB, and W7UUO in various phases of the project, and by KL7AF in supplying the bamboo poles.

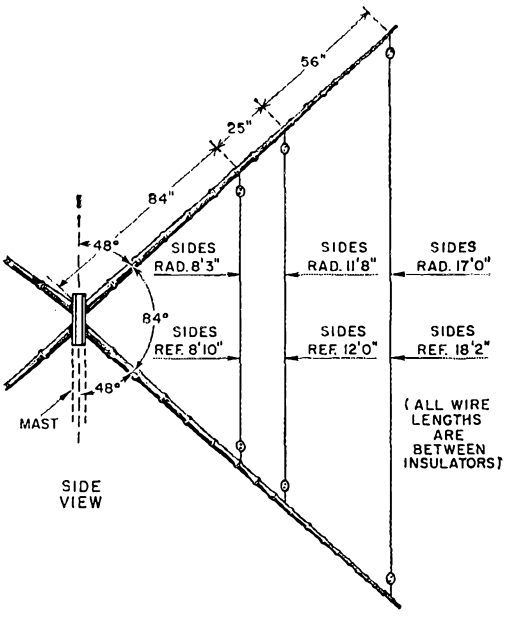


Fig. 3—Side view showing the spacing between elements. Opposing elements, not shown, are similarly spaced.

• New Apparatus

Jackson Brothers

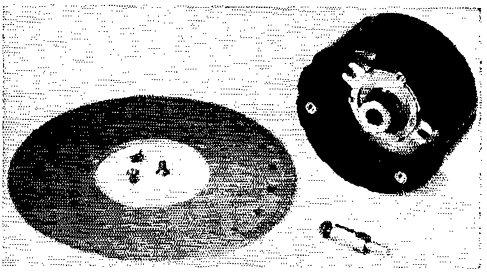
Ball Drive Dial

ACTIVITY in the development of dials and drives as separate components seems to be confined to Great Britain nowadays. The dial shown in the photograph, a smooth-acting and inexpensive (about four dollars in the U. S.) ball-bearing planetary-drive device, is made by Jackson Brothers Ltd. of London, England. It is distributed in this country by Arrow Electronics, Inc., 64 Cortlandt St., New York 7, N. Y.

The dial knob measures about 2¼ inches in diameter and the dial skirt is 4 inches in diameter. The skirt is marked from 0 to 100 (reading counterclockwise) over 180 degrees of the dial. The planetary drive mechanism has a ratio of about 6 to 1 and is designed to mate with ¼-inch shafts.

In the photograph is a partially disassembled dial which shows the major parts. The circular skirt plate mounts to the three spacers projecting out from the planetary. The black plastic knob is held fast to the assembly by a single screw.

Two holes are required to mount the dial, one for the shaft of the component to which the drive is to be fitted and the other for an anchor pin



shown at the bottom right of the photograph. The holes are located ⅝ inch apart. The anchor pin is attached to the panel and the drive assembly is slid over the component's shaft. At the same time, the anchor lug (either one of the two "ears" protruding out from the planetary) is placed over the anchor pin which is projecting from the panel. The drive unit is fixed in the desired position and then locked to the shaft by two set screws. The entire dial is supported by the component's shaft and, when the dial is manipulated, the planetary works against the anchor pin which floats in the anchor lug slot. The anchor pin makes a tight fit with the anchor lug slot, and no backlash was noticed in the drive, but it probably would provide more mechanical stability if two anchor pins were furnished — one for each anchor lug. Only one anchor pin is furnished with the dial.

— *E. L. C.*

Hints and Kinks For the Experimenter

G.D.O. MODULATOR

THE circuit in Fig. 1 shows a compact, audio tone generator for modulating a vacuum-tube grid-dip oscillator. It features low current drain and in most cases, can be constructed small enough to be installed right into the g.d.o. box.

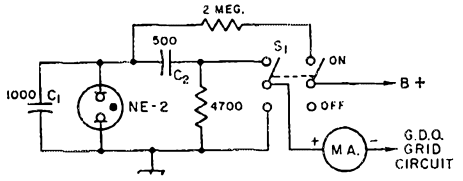


Fig. 1—W1BHD's g.d.o. modulator.
S_1—D.p.d.t. toggle or slide switch.

Tone range will vary with different values of C_1 and C_2; the ones shown give about a 600-cycle tone. Most g.d.o. indicating meters are in the grid circuit of the tube with the plus side of the meter grounded. The plus lead is lifted from ground and connected as shown in Fig. 1. The d.p.d.t. switch, S_1, controls the B plus to the modulator and, when in the off position, returns the g.d.o. to normal operation

— *Melvin H. Dunbrack, W1BHD*

SIMPLE CODE-PRACTICE OSCILLATOR

A CARBON microphone, 4½-volt battery and speaker can be connected as shown in Fig. 2 and used as a code-practice oscillator. Place the microphone near the speaker so that when the

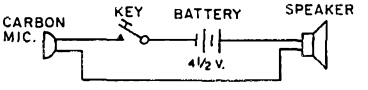


Fig. 2—A simple code-practice oscillator. The battery can be several flashlight cells connected in series.

key is closed the system will "feed back" and give an audio tone. The pitch of the tone can be changed somewhat by changing the distance between the speaker and microphone.

— *Ted Gisske, KN9IMM*

AUDIO AND HI-FI INTERFERENCE ELIMINATION

THE schematic in Fig. 3 of an audio amplifier input stage should be familiar to amateurs and TV technicians, except for the suggested revisions shown in heavy lines.

Most a.c.-d.c. or series string filament type receivers use a 0.05-μf. bypass capacitor across the power line to prevent hum or power frequency modulation of received signals. When negative is above chassis ground, an additional 0.1-μf. capacitor is used between negative and chassis. These should be checked and replaced if necessary to make certain the power line is properly bypassed.

Remove all leads connected to the control grid of the first audio tube. Insert an 82,000-ohm resistor, R_2, between these leads and the tube grid terminal. Replace R_1, which is usually a 5-10-megohm unit, with a 2-megohm resistor. Connect a 500-μμf. mica or ceramic r.f. bypass capacitor, C_1, at the junction of the resistors, and a 1000-μμf. capacitor, C_2, across the heater circuit as shown. Keep leads short and shield any long grid lead. The resistor does not affect the normal operation of an audio-frequency amplifier.

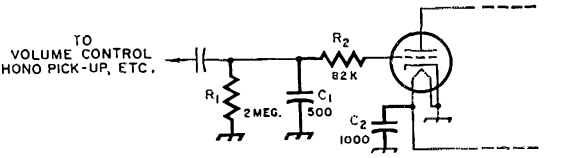


Fig. 3—Audio input stage with revisions shown in heavy lines.

Bypassing either side of the power line with a 0.01-μf. disk ceramic capacitor to the point where the power cord enters each piece of equipment is considered a necessity. Many hi-fi amplifiers lack such protection, in addition to being susceptible to reception of undesired radio signals through speaker leads and input wiring. Occasionally, it may be necessary to bridge cathode or plate lead electrolytic capacitors with a disk ceramic capacitor to act as an r.f. bypass.

In the case of hi-fi amplifiers, some care should be exercised so as not to reduce desirable high audio frequencies, while eliminating radio frequencies.

— *Arthur L. Cavar, K8JHZ*

DIPOLE TIE POINT

FACED with the necessity for using the top of a rotary beam mast as one tie point for a dipole antenna, I made use of an empty tin can and a TV strap stand-off insulator. The tin can, which measured about 6 inches high and 2½ inches in diameter, had one end removed. The stand-off insulator strap was tightened around the can, the dipole tied to the stand-off screw-eye and the can slipped over the top of the rotating mast. The can acts as a bearing and keeps the dipole from shifting position when the beam is rotated.

— *Nat Capon, WA2PHF*

FILAMENT PROTECTOR CIRCUIT

A MAJOR limitation on the life of a vacuum-tube is the mechanical strain in the filament during warmup. When the filament wire is cold, it has about one fifth its operating temperature resistance and the application of full filament voltage results in undesirably high current and rate of heating.

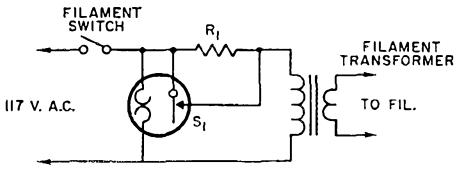


Fig. 4—Filament protector circuit.

R_1—See text.
S_1—Amperite type 115NO10T thermal delay relay.

The diagram in Fig. 4 shows a simple device to protect the filament from current surges — an Amperite 10-second-delay relay S_1 connected in the primary circuit of the filament supply. Resistor R_1 is in series with the transformer and limits the current to the filament. After a delay of a few seconds (time enough for the temperature and resistance of the filaments to rise) the relay shorts out R_1 and full voltage is applied to the filaments.

The value for R_1 is found by

$$R_1 = \frac{10{,}000}{P_f}$$

where P_f is the rated filament power. The power rating of R_1 should be about $\frac{P_f}{20}$.

This system will give the filament about 10 per cent rated voltage initially, rising to about 50 per cent at 10 seconds and full voltage when the relay closes.

— *John Sankey, VE2ARH*

PUSH-BUTTON SEND-RECEIVE

THE circuit shown in Fig. 5 was originally developed for use by the handicapped. However, it is a convenient method of going from transmit to receive and can be used with almost

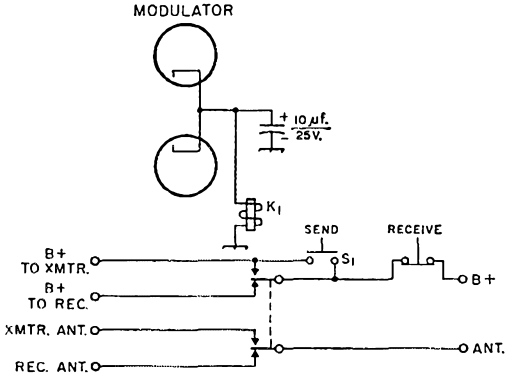


Fig. 5—W6PIV's push-button send-receive circuit.
K_1—Surplus 24-volt relay.
S_1—Normally-open push-button switch.
S_2—Normally-closed push-button switch.

any phone transmitter-receiver operating from a common power supply. The relay, K_1, is a surplus 24-volt unit with a resistance of about 300 ohms. The relay coil doubles as the cathode resistor in the modulator circuit, in my case, a pair of 6V6s. When the send switch, S_1, is pressed, modulator cathode current will flow and close the relay. When the receiver switch, S_2, is pressed (and opens the B-plus circuit), the relay drops out and switches back to the receive condition.

— *Ken Blaney, W6PIV*

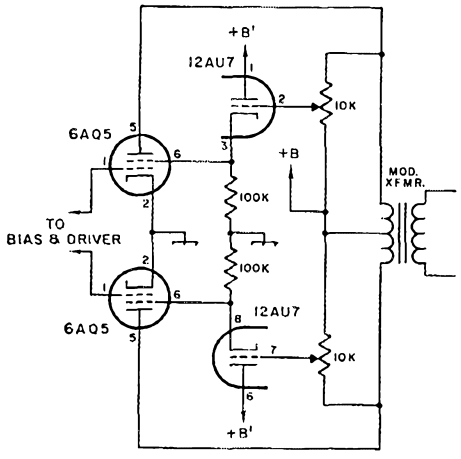
LOG PROTECTION

IF you write your log in pencil or ball-point ink, spray each finished log sheet with clear lacquer spray to keep the writing from smearing.

— *Robert Tidd, WV2TMM*

MORE ON THE "ULTRA-LINEAR" MODULATOR

W2HTN gave some excellent ideas for improving the quality of modulation equipment in his *QST* article.[1] He also mentioned that "The problem, however, is finding a suitable modulation transformer. . . ." A circuit by I. F. Barditch, in *Radio Electronics*, June, 1959, does away with the transformer problem and, with some experimentation, can be adapted for modulator service. The diagram in Fig. 6 shows



Experimental circuit for an ultra-linear modulator. The 12AU7s are used in a feedback circuit so that transformer taps are not needed.

a typical circuit using the Barditch scheme. Conventional circuitry is used up to the 6AQ5 power-amplifier stage. The voltage at B-plus prime should be about 150 volts, more than that at B plus. However, I found that about 100 additional volts seems to work all right. The circuit lends itself to experimentation since the power-amplifier tubes can be operated as straight pentodes, as triodes, or as something in between, merely by varying the 10,000-ohm potentiometers. Somewhere in this region, ultra-linear operation will be achieved without having to resort to a special transformer.

— *Morris Bealle, K3INF*

[1] Voss, "An Ultra-Linear Modulator," *QST*, October, 1961, p. 57.

Paul M. Segal — A Tribute

It is impossible to do full justice in recording 37 years of Paul Segal's devoted service to the cause of the American Radio Relay League, as he leaves the post of General Counsel.

Long-time readers of QST will, especially from the depths of their experiences in the earlier, more critical times of amateur radio's development, realize the inadequacy of these words. We only hope that, despite this handicap, newer amateurs will gather some measure of understanding of PMS' leadership and contributions to our League; more, to the very existence of ham radio as we know it today.

IN 1924 a young attorney from Denver became the first director of the Rocky Mountain Division under the League's then-new representative constitution. Though his earliest radio experiments were in 1911 the new director had been licensed as 9EEA less than two years and he had been a member of the League only for a similar period.[1] Yet almost immediately, the young amateur, Paul M. Segal, began to demonstrate the genius which was to serve the League in such grand measure and was also to carry him to the top echelon in the ranks of attorneys specializing in communications law.

Only a month after Paul attended his first board meeting, he presented his first legal opinion for the League, a learned brief analyzing the duties and powers of the Secretary of Commerce to regulate amateur radio under the Radio Act of 1912 which, though made hopelessly obsolescent by the development of radio during and after the first World War, was still in 1924 the only law of the land concerning radio. Possession of this brief must have greatly improved the bargaining power of the League's representatives during that period when the only real control of radio was exercised by "gentlemen's agreements" formulated in the Hoover conferences.

Soon, Segal was being called upon by the board and officers of the ARRL to answer other questions: Could the League invest money in common stocks? Could a director name a proxy to represent him at a board meeting? (His answers: "Yes, but . . ." to the first one, recommending municipal bonds as a better investment for an organization like ours in the market of the late twenties; in the second, "No," the members had specified an individual to represent them, and he cannot delegate his powers to a proxy except on a specified issue known in advance.)

In the middle twenties, a number of communities all over the country passed ordinances restricting, licensing, taxing or prohibiting operation of amateur radio stations. The board grew concerned about this harassment and asked Segal to pick out a test case to defeat these ordinances once and for all. The first case he picked, involving Portland, Oregon, collapsed after Segal had filed suit in Federal Court, when the town fathers amended their ordinance so that it would not apply to any stations licensed by the federal government. Segal then brought suit against the city of Wilmore, Kentucky, and its chief of police, J. W. Grimes, on behalf of R. B. Whitehurst, 9ALM, seeking to overturn the city's ordinance requiring a license costing $100 a year for the operation of an amateur radio station within the city. After several weeks of intensive on-the-scene effort in Kentucky, Segal had the case blocked out to his own satisfaction and went back home to Denver, leaving a local attorney to mop it up. In September, 1927, Judge A. M. J. Cochran of the U. S. District Court for Eastern Kentucky handed down the decision: amateur radio is interstate commerce, even though no compensation is involved and even within a single state because of its effect on other communications between states, and as such must be regulated only by the federal government. The case, known as *Whitehurst vs. Grimes*, is today a cornerstone of amateur defense against local attacks on our right to operate.

In 1928 the Board recognized in name what had been true in fact, appointing Paul M. Segal as General Counsel of the League. A year later, Segal was called to become Assistant General Counsel of the old Federal Radio Commission, and resigned as the League's counsel. But after nine months in Washington, Paul felt cramped and stifled by his work as a civil servant, finding his sympathies with the applicants for licenses more often than with the regulators. He left the commission in 1930 and went into the private practice of communications law in Washington. Naturally, he was promptly re-appointed as General Counsel of the League. He had been consistently re-elected every two years by the members of the Rocky Mountain Division to serve as their director, even during his time with FRC. But in 1931, having established himself permanently in Washington, he did not run for re-election.[2]

There is scarcely a phase of amateur radio where Segal's influence has not been felt. He participated actively in the Madrid Radio Conference, 1932, and to a lesser degree in other international radio conferences. He has given

[1] While Paul was studying law in Denver, he worked for one of the local broadcasting stations. Late at night, after the station went off the air, in its broadcasting capacity, Paul put it back on the air as a ham station!

[2] Paul became W3EEA in Washington, and operated his station remotely — controlling it with a 3½-mile private landline!

rulings on the internal structure of the League which have stood the test of time. He was largely responsible for the 1951 Articles of Association, which are the present constitution of the ARRL. He successfully defended the U. S. amateurs' right to handle message traffic, notably during the early 1930s, securing the broad interpretation of permissible messages under which we still operate: that any message not otherwise in violation of the Communications Act may be handled by amateurs so long as none of the amateurs handling it have any pecuniary interest in the message. He has established through cases which reached the Supreme Courts of New Jersey and Pennsylvania that the erection and maintenance of an amateur radio tower is a use customarily incidental to residential use of property and therefore should be permitted under even the tightest zoning codes. Segal has even reached into the area of operating ethics: his work, "The Amateur's Code," is today the accepted standard and it has appeared in every edition of *The Radio Amateur's Handbook* since 1927.

Paul Segal's official service to the League has come to its end. But in offering this brief tribute to his 37 years of brilliant effort on behalf of us amateurs and our League, we are sure that from time to time we will hear his sometimes pungent, occasionally irascible, often witty and always valid comments on the right way to do things. We wish him well as he dismounts from the warrior's saddle. QST

[EDITOR'S NOTE: A subsequent issue of *QST* will introduce to members the League's new General Counsel, Robert M. Booth, jr., W3PS.]

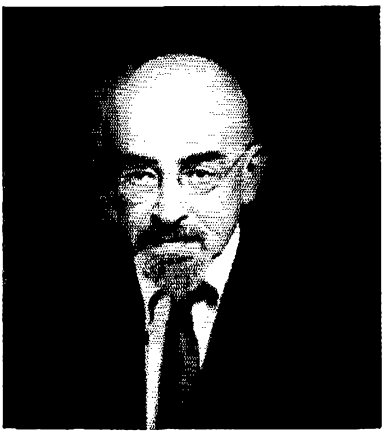
THE AMATEUR'S CODE

• ONE •

The Amateur is Gentlemanly . . . He never knowingly uses the air for his own amusement in such a way as to lessen the pleasure of others. He abides by the pledges given by the ARRL in his behalf to the public and the Government.

• TWO •

The Amateur is Loyal . . . He owes his amateur radio to the American Radio Relay League, and he offers it his unswerving loyalty.



• THREE •

The Amateur is Progressive . . . He keeps his station abreast of science. It is built well and efficiently. His operating practice is clean and regular.

• FOUR •

The Amateur is Friendly . . . Slow and patient sending when requested, friendly advice and counsel to the beginner, kindly assistance and cooperation for the broadcast listener; these are marks of the amateur spirit.

• FIVE •

The Amateur is Balanced . . . Radio is his hobby. He never allows it to interfere with any of the duties he owes to his home, his job, his school, or his community.

• SIX •

The Amateur is Patriotic . . . His knowledge and his station are always ready for the service of his country and his community.

— Paul M. Segal

Aside from experimental attempts at using Earth satellites for ham contacts, how practicable is it to set up a "spacecom" system that will be useful for everyday amateur communication? In this, the third and final article of a series begun in November QST, the author attempts to arrive at some answers based on present-day technology.

The Feasibility of Amateur Space Communication

The Problem—and Some Crystal-Ball Solutions

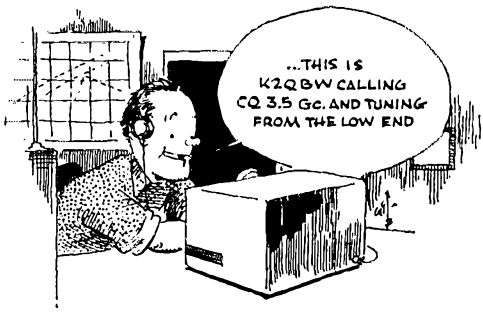
BY RAPHAEL SOIFER,* K2QBW

FROM our discussion of the signal-to-noise ratio (s.n.r.) as the key to amateur space communication, we found that variables can and do compensate — e.g., if economic or other factors prevent us from exploiting one parameter to the fullest, we could then improve another somewhere else in the system so as to make up the difference.[1] Of course, the end result will not be as good as if we had improved both factors, but then we beggars can't be choosers.

We went on from there to take a closer look at these parameters individually: first the noise components affecting the receiver, then the various factors involved in the "master signal equation" discussed in the second article. Except for satellite scatter, in which a frequency-dependent effective scattering cross-section sometimes compensates for the losses incurred by using lower frequencies, our analysis has shown that amateur space communication would work best in the bands from 1.215 to 10.5 Gc. But since satellite scatter is a sporadic phenomenon with a low duty cycle, we will be safe in leaving our optimum range stand as is.

The various mechanisms which have been proposed to perform the relay function in space have already been treated, although somewhat sketchily. At this time, it might be helpful to consider a specific example of amateur communication in a microwave band and compare each of these systems to see which, if any, could be of use to us.

In order to make this a reasonably true example, let's try to pick our band somewhere in the middle of our optimum range. Well, let's see. There are three bands in the current allocations table falling into this mid-range category, viz., 2300–2450 Mc., 3500–3700 Mc., and 5650–5925 Mc. But wait! What's the footnote say? Ohhh. It says that the frequencies 2450 Mc. and 5850 Mc. have been allocated for use as industrial, scientific, and medical channels. That means that over a goodly portion of those two bands, we amateurs have to accept whatever interference we get from radar speed traps, microwave heating and cooking equipment, and other motley devices. Of course, that situation, while current law, is not necessarily permanent. But, in any event, let's play safe and pick 3500 to 3700 Mc. as the band we want to play with hypothetically.



The systems we will be considering typically cost fair-sized chunks of our national space budget. It would not be realistic to suggest the expenditure of such sums for anything less than a global, broad-band communications system which could be used by individual amateurs in their normal pattern of operating — in a phrase, an artificial ionosphere, one which would always work and never break down.

Commercial vs. Amateur

This simple-sounding requirement actually puts the amateur at a great disadvantage when compared with the point-to-point communication services. Let's look at their position: They do not have 300,000 potential independent base stations, but rather a mere score or so, which happen to be under their direct control. This means that they can employ high-gain directivity at the satellite antenna (assuming active repeater operation) to beam signals directly at the receiving point. Or, if passive reflection is used, the flat-plate approach might work well, since they are only interested in a circuit between two specified points, rather than the global illumination which would be required were we to keep our amateur DX hounds happy.

*3 Ames St., M.I.T., Cambridge 39, Mass.

[1] Soifer, "Space Communication and the Amateur," *QST*, November, 1961.
Soifer, "The Mechanisms of Space Communication" *QST*, December, 1961.

They have other advantages as well. Since they can concentrate their funds into a small number of stations, each station can be equipped with the utmost in technical sophistication. Sixty-foot horn antennas would be the rule, followed by maser amplifiers. Of course, no need to keep under 1 kw.; this is commercial radio. By our compensation-of-variables principle, this all means that so much technical improvement can go into the ground-support equipment, because of the point-to-point nature of the service, that the designer can well afford to keep the equipment in orbit to an absolute minimum. If he is using active repeaters, he probably would not need more than a few dozen watts of power for the entire satellite. This cuts down enormously on launch weight, and would thus keep the booster men happy. Similarly, if he were using orbital scatter, he could drastically reduce the number of dipoles, and so bring cheer to the hearts of radio astronomers as well as rocketeers, for dipoles by the billion are not lightweight.

Enough of the happy side of life. Now for our side. . . .

We are looking for a system which, essentially, would provide a foolproof artificial ionosphere for the 3500-Mc. band, one which would be accessible for use by what we would consider as the amateur station of the near future. This station might employ, say, an eight- or ten-foot dish, a parametric (but not maser) amplifier for reception, and maybe 100 watts of power output. Gain, to this man (call him WB2XYZ), is precious; he has too little already, so he dare not lose any more by poor aim. He therefore would not like any system requiring him to track moving satellites, since there is no foreseeable method of giving him the reliable electronic tracking he would need at anywhere near what he would be prepared to pay. Of course, breakthroughs can and possibly will occur, but since we are 1962 amateurs trying to project present technology, we will assume that none have occurred and therefore restrict ourselves to systems not requiring tracking methods any more complex than those used for moonbounce.

What Are the Possibilities?

This rules out all the low-orbit schemes which have been put forward for commercial radio, such as the fifty-random-orbits approach of Bell Laboratories. From their position, the system would be sound enough — there would be a satellite somewhere in the sky at all stations and at all times. However, it would not appear stationary, so to make use of it the antenna would have to track automatically. Looking at it from our point of view, the best performance we could hope for, using our 1962 rotary-beam (or dish) approach, would be the sort of short, fleeting contact experienced in a good meteor shower. The satellite would pass through the major lobe of our antenna so fast that ragchewing would be impossible. This is clearly unsatisfactory. In fact, the best approach would involve a relay point which seems motionless from the ground. This would require no tracking at all, and has the added advantage of permitting us to construct fixed antennas somewhat higher in gain than if we had to move them about.

In comparing systems within the above framework, we can conveniently ignore noise effects, since these do not change with the nature of the

relay point. Of course, in evaluating performance on an absolute basis (will it work?) noise must be considered as before. In our relative comparison, we can also ignore transmitter power and ground gains, since these obviously remain fixed. The remaining parameters, those relating to what happens between the time the signal leaves the transmitting antenna and arrives at the receiving antenna, are commonly lumped together under the general name, "path loss."

Let's look at the cheapest system, moonbounce. It has the obvious advantage that the moon is free, and no launchings would be required. When the various factors discussed in the second article are plugged into the equation, we come out with a 3700-Mc. path loss of 269 db. for two stations on earth. Actually, the figure might be a bit greater than that, because of random local factors, but our estimate cannot be too far wrong. When noise and the other factors are added in, we find that this path loss gives us even more marginal communication with our WB2XYZ-type stations than W1BU and W6HB had on 1296 Mc., when, with monumental effort, they succeeded in pulling out enough signal to tell if it were on or off. Of course, the amateur moonbounce art has progressed to the point that s.s.b. is now being attempted, but this involves kilowatt klystrons with dishes much larger than the one we have in mind. So we conclude that although, for the stations with substantially better than typical equipment, moonbounce will be useful to some degree, it simply cannot provide strong enough signals (or, more accurately, high enough values of s.n.r.) with our typical stations to be the complete answer to our problem.

If we now accept our "best-approach" thesis about the desirability of "stay-put" synchronous orbits (i.e., orbits at about 22,000 miles altitude above the equator), it quickly becomes apparent that passive reflectors will never do. Such a

reflector would have to be hundreds of miles in diameter to produce usable s.n.r.'s.

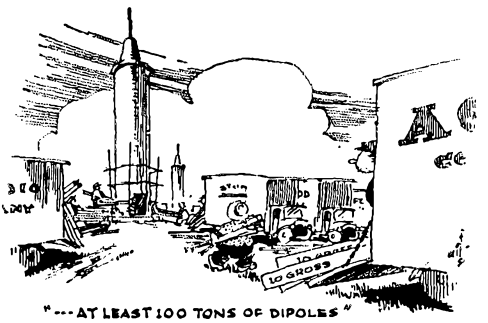
Satellite scatter will be of no help either. At 3500 Mc., the effective area *Cs* reduces to simply that of the satellite itself, so the problem reduces to one of passive reflection.

Let's now take a look, for a change, at something which has a chance of working. Consider a belt of half-wave dipoles, 3000 miles above the equator, cut for 3700 Mc. At vertical incidence, we would require about 2.1 billion dipoles, or about 950 pounds, in this belt to equal the 269-db. path-loss figure for moonbounce. This figure is obtained from the approximate formula

$$Cs = 0.22\ n\lambda^2\ \frac{360^\circ}{\theta},$$

where Cs = Effective scattering cross-section
n = Number of dipoles in the belt
θ = Angular fraction of the complete belt illuminated.

If we assume non-vertical incidence — say, a New York-to-London path — it might require 2500 pounds. Unfortunately, the altitude cannot be reduced much below the 3000-mile figure, in order to permit long-range work. Remember, both stations have to see it. The possibilities of this system arise from the fact that increasing the signal returns is simply a matter of putting up more dipoles. Keeping in mind the requirements we set forth previously, we can calculate that an amateur dipole belt, to be useful, would have to consist of at least 100 tons of dipoles. By 1962 rocketry standards, this is out of the question. By 1970 standards, who knows?



"---AT LEAST 100 TONS OF DIPOLES"

We recall from the discussion in the second article that an equatorial dipole belt, by virtue of its continuity, appears motionless in space to a ground observer, regardless of altitude. So, we would not have to track it. All we have to do is figure out how to launch enough of it, without causing harmful interference to other services.

So far, we have the following: Moonbounce works now, but not very well, and natural limitations prevent improvements. Passive reflection cannot work at all, because of our inability to track low-flying satellites with large dishes. Orbital scatter has possibilities, but is a thing of the future. We have yet to consider active repeaters.

Active Repeaters

Our lack of tracking capability restricts us to the so-called "syncom" approach, in which three repeaters are spaced at equal distances along a synchronous equatorial orbit. The fact that the earth does not look very large from 22,000 miles out allows us to employ some directivity (21-db. gain, to be exact) in the satellite antenna without sacrificing coverage.

One way of approaching the problem of satellite design is shown in Fig. 1. An 18-inch dish (yielding 21-db. gain) receives signals from the lower half of the band. These signals are then heterodyned down to 20-110 Mc., and amplified. Now, we would like these signals to be retransmitted in the upper part of the band. When we realize that 110 Mc. looks like audio to a 3.7-Gc. carrier, the method suggests itself: s.s.b. The 3605-3695-Mc. output is then amplified and retransmitted to earth, picking up another 21 db. of antenna gain.

This looks simple, until we realize that the 90-megacycle bandwidth we are playing with may ultimately contain 50,000 to 100,000 amateur signals, each of which must come out stronger than the noise in the receiver. The power output of our satellite final must be enough to get *all* these signals home, plus some received noise. Actually, one good test of the system's effectiveness will be whether the satellite's retransmitted noise from the lower half of the band can overshadow the noise picked up in the ground receiver. If, when the satellite is turned on, the noise level in your receiver goes up by 6 db. or more, you have won the game, because you know that any signal reaching the satellite intact (i.e., copiable) will be copiable at your QTH. To do this, the satellite should be capable of running at least ten kilowatts power output. Remember, that 10 kw. may be divided 100,000 ways!

With present technology, such a satellite will have to incorporate a power source capable of supplying a minimum of 30 kw., c.c.s. If a satellite-to-satellite relay subsystem is added, make that 40 kw.[2] Such power consumption requirements would drive a present-day engineer into a severe state of shock. We can't do it yet. Commercials, as we have noted, get around the problem by using larger antennas, higher ground power, low-temperature receivers, and point-to-point directivity, all of which are impossible insofar as we are concerned. They will, therefore, get their lower-powered synchronous satellites up first. Eventually, perhaps with the aid of nuclear power, we, too, will be able to join them.

Relaying

We have thus far been talking largely about "ultimate" systems. These are systems that will enable the main stream of amateur radio to move

[2] One such subsystem would require an additional transmitter of about one kilowatt output on 35 Gc. to be installed in each satellite. Since efficiencies are much lower in this part of the spectrum, the 10-kw. boost in satellite power is needed. Note that 35 Gc. is chosen because of the high antenna gains available at this frequency.

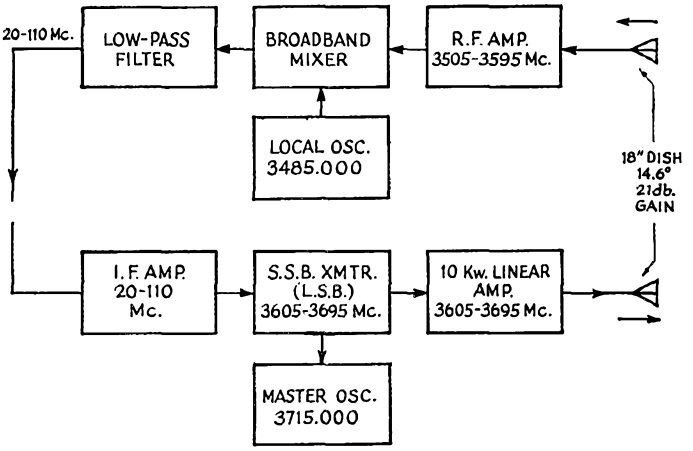


Fig. 1—Broad-band synchronous repeater, 3500–3700 Mc.

confidently into the microwaves, away from 40-meter QRM, QSB, blackouts, s.w.b.c., and what-else-have-you which disrupts today's activity. The band will be open, not just at certain times, but *all the time*. We have noted, with regret, that no system available today represents this ultimate goal. However, the goal is there, spurring us on to the day when we will indeed make DXCC, without strain or pain, on 3500 Mc.

This wonderful future is, of course, dependent on the development of space relays. Only by this means is it possible to utilize these frequencies effectively over long distances. We have seen that space communication is a Siamese twin, as it were, of microwave technology. You simply cannot have one without the other. Developments in microwave technology will hasten the day of space communication, which, in turn, will hasten the day of substantial use of our microwave bands. This, in turn, will quicken the pace of microwave development, which will make possible still better space communications systems, which will lead to still more use of our microwave bands. It's like a chain reaction. It takes a good hard push to get it started, but once it gets going, there's no stopping it!

Our present efforts along these lines are aimed at providing that push. For example, we have been reading for some time now about amateur radio's project to construct and launch experimental beacons leading to our first active repeater. OSCAR would not be in a 24-hour orbit; meaning that it requires a tracking system. In addition, we have seen that the frequency, 145 Mc., cannot be considered optimum from either a noise or a propagational standpoint. By the technology and amateur practice of 1962, it is a reasonable frequency, but it is generally recognized that repeaters of the future will be using much higher frequencies. Project OSCAR's value is that, as a first step, it will establish in principle that an amateur-band satellite can be launched, thus paving the way for the more sophisticated microwave repeaters or dipole belts to follow and carry the load of amateur radio's future.

Here at M.I.T., the Office for Satellite Scatter Coordination is busily making use of the existing operational system of reflection by satellite ionization phenomena. Through amateur experimentation, we are trying to learn more about its causation. Just as important as this goal is the fact that satellite scatter is *here now*, the equipment for it is *here now* in perhaps 50,000 American ham shacks, and it thus represents an excellent medium for building interest and enthusiasm for space communications among the amateurs of today. The dividend will be twofold: We will gain, through satellite scatter, an effective weak-signal communications system useful in the 14-, 21-, 28-, 50-, and possibly 144-Mc. bands for medium- to long-range communication, and we will also build up a pool of experienced amateurs trained in satellite techniques, invaluable when the time comes for the move to the microwaves. We might also make some breakthroughs in the tracking problem. Again, who knows?

Likewise, the Rhododendron Swamp V.H.F. Society and its counterparts using 1296-Mc. moonbounce are contributing greatly to this push. At the present time, responsibility for adapting microwave technology to amateur practice rests largely in the hands of the moonbounce boys. It is through this combined effort, pushing satellites and space on the one hand, microwaves on the other, that the chain reaction will be got going.

The Amateur of the Future?

The chain reaction toward space will not be without its effects on the individual amateur. Throughout our history, every technological change has brought with it an increase in level of the technical understanding required. We have come a long way from the days (no doubt within the memory of many readers) when a four-tube superhet was considered a project for experts, to be attempted only by the brave and the foolish. Luckily, enough "fools" did build them, so that we now are confronted by triple conversion and mechanical filters. It will be another giant step from the s.s.b. transceivers of today to the microwave stations of the future, but we will get there. Some already have.

Not that s.s.b. won't survive. As you remem-

ber, we used it in our hypothetical satellite. With very few exceptions, concepts in radio are not discarded. They are exploited to evolve new concepts and new systems. S.s.b. will still be with us, but you won't recognize the package.

Something else will remain with us, too. Inasmuch as it has the narrowest bandwidth and the lowest s.n.r. requirements, the first contact using each new space communication system that comes along will probably be made on c.w., as was the case with satellite scatter and moonbounce. The skill of the receiving operator at weak-signal reception; i.e., the art of "digging stations out of the mud," can have a great effect on the minimum required s.n.r. for any specified degree of reliability. This is where effectiveness can be bought most cheaply, for it does not cost a cent to train a good amateur operator. In general, the higher one's receiving speed, the more instantaneous his character recognition is likely to be, and the better he will prove to be as a weak-signal operator. In fact, the best such men are those able to think directly in code, without the necessity for mentally translating into English. It is no accident that the great achievements in amateur communication have as a rule been made by "old c.w. hands who ragchew easily at 40 w.p.m." This quote, incidentally, was taken from the *QST* description of W6NLZ and KH6-UK. Enough said.

If asked to gaze into my fogged crystal ball and predict the course of events, it would probably go something like this: Moonbounce, already achieved at 1296 Mc., will be attempted higher and higher in the spectrum, at least until the 10-Gc. DX record has been set via the moon. Satellite scatter will continue, with a possible new emphasis on 50 and 144 Mc., as more v.h.f. men become familiar with it. Some fragmentary QSOs will probably also be made using low-flying passive reflectors, such as ECHO II to be launched late this spring. The better-equipped 2-meter stations will probably be able to use this for fast new states. In addition, it will undoubtedly expose many of them to satellite scatter as it passes through regions of high ionization density, and they begin to wonder why the signals got stronger. ECHO II, by the way, is slated as a one-shot, designed to test the effect of drag on a large balloon. Other passive reflectors are to be high-altitude.

Experience of amateurs with "partial" space communications, such as ECHO II and OSCAR, will undoubtedly whet their appetites for the real thing. And, if my guess is right, the moonbounce men will be right there, with the microwave gear all developed and ready to go. From then on, we will gradually increase in complexity and sophistication, until the day finally arrives when we are in possession of a chain of synchronous microwave repeaters, and perhaps some scattering dipole bands, too, capable of virtually 100 per cent reliability, and able to support the full use of our microwave bands for long-distance communication.

So much for communication between two points on earth. What about beyond? Will there be no amateurs on the expeditions we will be sending to the moon and the planets? We all know better than that. There waits in West Hartford an imposing piece of modern sculpture, reserved before World War II for the first amateurs to make two-way contact on our bands between Earth and Mars.[3] The chain reaction we spoke of earlier will most assuredly make such a contact possible. And when the time for the trophy's award comes, most likely well after 1980, you can bet that I will be in there trying. Will you? QST

[3] See page 17, *QST*, December, 1957.

Silent Keys

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

W1OE, Harold W. Bean, Penacook, N. H.
W1RFN, Fred E. Carey, Burlington, Mass.
W1RUI, Paul H. Jordan, Beverly, Mass.
W2ALB, Gerald M. Seller, Queens Village, N. Y.
W2BBI, George D. Campbell, Pelham, N. Y.
K2BFB, Fredric W. Wright, Cayuga, N. Y.
W2BFD, John E. Williams, Woodside, N. Y.
K2KRE, William P. Black, jr., Jersey City, N. J.
W2LST, Dominick H. Ferrari, Oakland, N. J.
K2MFF, John S. Remeczky, Bayonne, N. J.
K2PTG, William G. Norton, Minotola, N. J.
K2QYN, Aldo M. Moirano, North Bergen, N. J.
K2RGS, Robert O. Truman, Upper Montclair, N. J.
K2RI, ex-W7RM, Don Harris, Staten Island, N. Y.
W3SPN, Lewis T. Dunbar, Bristol, Penn.
W4AHK, Harvey K. Glass, Eustis, Fla.
W4ANH, Ward F. Curley, Penellas Park, Fla.
W4CAX, Alfred A. Stuart, Orlando, Fla.
W4DNA, Joseph Dawson, Prichard, Ala.
W4DV, William M., Harison, Augusta, Ga.
W4EQN, Vernon S. Parks, Winter Haven, Fla.
K4MEQ, Douglass L. Zeigler, Birmingham, Ala.
K4QMM, Sherley L. Hutcherson, Alexander City, Ala.
W4RFN, Glenn H. Kelley, Whitesville, Ky.
K5ZPA, Robert G. Higley, Albuquerque, N. Mex.
ex-K6BT, John O. Oldaker, Kailua, Calif.
W6BZF, Benjamin C. Brown, Bonsall, Calif.
W6JH, Leigh H. Slocum, San Diego, Calif.
K6MWT, Dr. Joe L. Campbell, Downey, Calif.
K7CZV, George W. Walker, Pocatello, Idaho
W7DSO, William P. Riley, Scottsdale, Ariz.
K7EBB, P. R. Nichols, Salt Lake City, Utah
W7EEH, Finlay G. Carruthers, Missoula, Mont.
W7FMT, Francis W. Rice, Everett, Wash.
W7JFB, Miriam F. Brown, Mukilteo, Wash.
W7NTE, Phillips A. Channell, Longview, Wash.
K8WDY, Virgil C. Verner, Youngstown, Ohio
ex-W9CXJ, Milo E. Miller, LuVerne, Iowa
W9ESP, Frank Taylor, McLeansboro, Ill.
K9HBU, Robert G. Edsall, Bloomington, Ind.
W9JBH, Harry J. Quandt, Waukegan, Ill.
W9TWO, Ernest A. Ruling, Peoria, Ill.
W9IDO, Donald E. Wood, North Platte, Neb.
W0NYP, William S. Clarke, St. Charles, Mo.
GI2FDL, J. Wallace, Bangor, Co. Down, Northern Ireland
GI5ZY, Tommy Smith, Whitehead, Northern Ireland
VE3WI, William R. Story, North Colbalt, Ont., Canada
VE7QE, William T. Rogers, Sidney, B.C., Canada
VE7ZI, M. Clair Watts, Sidney, B.C., Canada
VP2MB, John E. Burke, Montserrat, B. W. I.
ZL4AK, William L. Shiel, Dunedin, New Zealand

More on the Electromonimuter

Modifications for Common-Cathode and Blocked-Grid Keying Systems

BY ERNEST H. ADOLPH,* K8WYU

The desirable features of the keyer/monitor unit described by K8WYU in an earlier article have been quickly recognized by the numerous hams who are asking how the Electromonimuter can be applied to other types of keying systems. Part of the answer lies in a new use for transistors as low-resistance keyers.

The author has been very gratified at the considerable interest aroused by a previous article[1] describing the "Electromonimuter," a combination electronic key, side-tone oscillator, receiver muter, and v.t. keyer. The original described in that article was designed specifically for use with transmitters using cathode keying in an amplifier circuit, and assumed a continuously running oscillator. Thus, it was not well suited to break-in operation. Many inquiries have been received asking how the circuit might be modified for use with other keying systems, particularly those permitting break-in operation.

Oscillator-Amplifier Keying

Some manufactured transmitters, especially the earlier models, and many homemade transmitters, employ a keying system in which an external or internal v.f.o. is keyed simultaneously with one or more amplifier stages, all stages being keyed in a common cathode lead. When an attempt was made to use the Electromonimuter with keying systems of this type, it was found that many transmitters would key improperly, or not at all. The reason for this may be explained as follows: With cathode keying, the voltage drop across any resistance introduced in the cathode circuit by the keying system is applied as cathode bias to the keyed stage or stages. With a vacuum-tube keyer, such as used in the Electromonimuter, the resistance of the keyer tube (with the key closed) is sufficient to develop a drop of several volts across it. Although this drop may be insufficient to affect seriously the operation of an amplifier, which normally operates with appreciable biasing voltage anyway, the drop in many cases is great enough to keep the v.f.o. from functioning, since the v.f.o. normally operates with a very low biasing voltage.

V.F.O. Keying in the Negative H.V. Lead

If one does not mind digging into the v.f.o. portion of his transmitter, this difficulty can sometimes be overcome by lifting the bottom end of the v.f.o. grid leak from ground, and connecting it instead directly to cathode. With this connection, the keyer-tube drop does not appear as bias at the v.f.o. grid. However, this operation is not always as easy a job as it sounds, since external v.f.o. units, or the built-in v.f.o.s of many manufactured transmitters, are often buttoned up tight and the grid leak so buried as to make this simple operation a task of major proportions. Also, some v.f.o.s will continue to oscillate at very low plate voltage, making it impera-

* 377 Franklin Court, Worthington, Ohio.

[1] Adolph, "The Electromonimuter," *QST*, August, 1960.

tive that the keyer tube cut off completely. With the low-μ tubes that make the best keyers, cutoff requires a biasing voltage almost equal to the plate voltage.

Transistors as Keyers

An alternative, of course, is to reduce the resistance of the keying device. Of the vacuum tubes that might be used as a keyer, the 6080/6AS7GA used in the original version of the Electromonimuter has as low an internal resistance as any — about 150 ohms at zero bias with the two sections in parallel. However, this order of resistance is still sufficiently high to stymie most v.f.o.s, even if the drop due to amplifier cathode current is eliminated by using a separate keyer tube for the amplifier.

But how about transistors? Their low internal

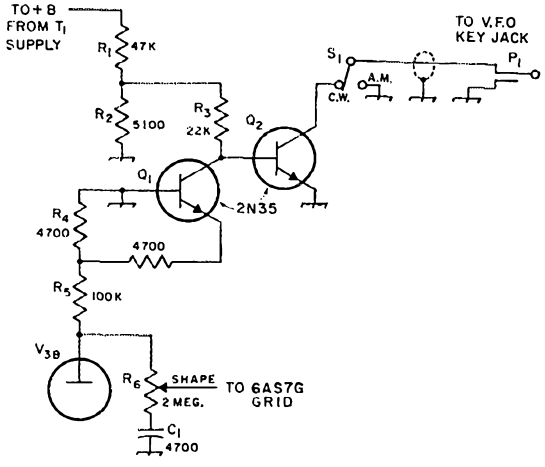


Fig. 1—This modification is for transmitters that normally key a v.f.o. and amplifier simultaneously in a common-cathode circuit. Resistances are in ohms and resistors are ½ watt. P_1 is a plug to fit they key jack of the v.f.o. S_1 is an s.p.s.t. toggle switch. Other component designations are for text reference purposes.

resistances should make them as ideal in keyers as they are in other switching devices. The only problem left is to find some way of fitting them into the circuitry of the Electromonimuter. The modification worked out is shown in Fig. 1. Q_1 functions as a polarity-inverter to provide Q_2, the keyer, with an actuating voltage of the correct polarity. When V_{3B} is cut off (key closed), the base and emitter of Q_1 are at ground potential, and the collector-emitter resistance is high. The base of Q_2, connected to the voltage divider R_1R_2 through the series resistor R_3, is positive in respect to its emitter. Therefore, the collector-emitter resistance of Q_2 is low, and the oscillator is keyed. When the key is opened, V_{3B} draws plate current through R_4, causing the emitter of Q_1 to go negative in respect to the base. The collector-emitter resistance of Q_1 is reduced, essentially grounding the base of Q_2. The collector-emitter resistance of Q_2 is then high, and the v.f.o. is "unkeyed." The 6AS7 keys the transmitter amplifier and the auxiliary side-tone and muter circuits as in the original model.

This modification requires a separate connection to the v.f.o. cathode. With an external v.f.o., this connection is available at the key jack with which most external v.f.o. units are equipped. In the case of the built-in v.f.o., it will be necessary to trace down the v.f.o. cathode lead, separate it from the normal common keying lead, and bring it out to a new terminal or jack. In most cases, this will be a simple job compared to changing the grid-leak return as suggested earlier. Starting at the "hot" terminal of the key jack, follow the lead back to the point where the v.f.o. cathode lead joins the keying lead (if this connection is not right at the jack), disconnect it, and extend the v.f.o. cathode lead to a terminal or jack.

Differential Effect

When this combination was first tried out, an unanticipated bonus was noticed. With the particular values used, there is a time differential between operation of the v.f.o. and actuation of the remainder of the transmitter that results in proper sequencing to produce differential keying. The action may be explained by referring to the circuit of Fig. 1 and the chart of Fig. 2.

When the key is open, V_{3B} conducts, causing a voltage drop across the voltage divider R_4R_5 such that the 6AS7 is biased toward cutoff, and Q_1 is biased to conduct, in turn causing Q_3 to be cut off.

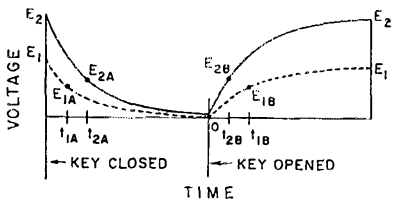


Fig. 2—Graph illustrating the manner in which differential keying is obtained. The oscillator turns on at time t_{1A} and off at t_{1B}, while the amplifier turns on at the later time t_{2A} and off at the earlier time t_{2B}.

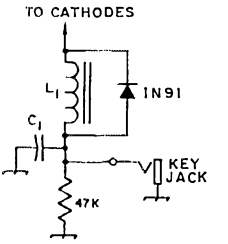


Fig. 3—The 1N91 diode is used to suppress transients caused by the keying filter C_1L_1. The resistor in this instance is the one supplied as standard in the Viking Challenger.

When the key is closed, V_{3B} is cut off, but the voltage drop across R_4R_5 cannot disappear immediately because of the charge on C_1. This charge is represented by E_2 in Fig. 2. At the same time, the bias on Q_1 is at some lower value E_1, because the emitter is tapped down on the voltage divider. As the charge on C_1 is dissipated, the two voltages will fall approximately as indicated by the two curves of Fig. 2. The resistances of the voltage divider are so proportioned (relative to respective cutoff characteristics) that E_1 will fall to a value of E_{1A} (the voltage at which Q_1 cuts off, in turn causing Q_2 to conduct) before E_2 falls to E_{2A} (the voltage at which the 6AS7 starts to conduct. This turns the v.f.o. on ahead of the amplifier.

When the key is opened again, $V_{3\pi}$ conducts, causing a voltage drop across R_4R_5, but the two voltages cannot immediately rise again to E_1 and E_2 because of the shunting effect of C_1 as it charges. As the two voltages rise, E_2 will reach E_{2B} and turn off the amplifier before E_1 reaches E_{1B} to turn off the oscillator.

V.F.O. — Exciter Keying

In one system of keying that has been popular in manufactured transmitters in the past and that is still maintained in some current models and many home-built rigs, a built-in v.f.o. and one or two low-power exciter stages are keyed simultaneously in the common cathode circuit. The final is usually not keyed but is protected with a screen clamper tube. A transistor may be used to key systems of this type provided that the transistor has a collector voltage rating exceeding the open-cathode voltage as read on a high-resistance voltmeter connected across the key jack,[2] and a collector current rating above the cathode current that flows with key closed. In this case, C_1, R_1 and the 6AS7 of Fig. 1 will be omitted, and Q_2 will key all stages. The keying lead of the Electromonimuter is connected to the collector of Q_2 in parallel with the transmitter key plug.

Transients

Most transistor ratings are absolute maximums for even instantaneous intervals. Semiconductors as a rule do not have the ability that vacuum tubes possess to withstand brief excesses of voltage or current. Therefore it is important to

[2] See "Technical Topics," *QST*, December, 1961.

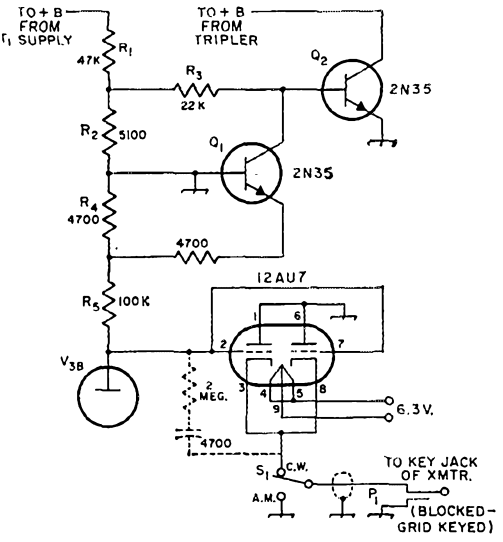


Fig. 4—This modification is for use with transmitters employing a blocked-grid keying system. Resistances are in ohms and capacitance is in $\mu\mu$f. Resistors are ½ watt. P_1 and S_1 are the same as in Fig. 1. Other component designations are for text reference purposes.

avoid transient peaks above the transistor ratings. In an initial attempt to key the author's Viking Challenger with a transistor, the transistor burned out as soon as the mode switch was turned from stand-by to operate, although the steady-state voltage of 65 volts, measured across the built-in 47K resistor with which the Challenger comes equipped, was within the rating of the transistor. The cause was traced to the built-in keying filter supplied with the Challenger. The transient was suppressed by connecting a diode across the keying-filter inductor as shown in Fig. 3 and no further trouble has been experienced. The transistor Q_2, a 2N1311 (made by General Transistor), rated at 75 volts, keys both the Chellenger (tubes operating at 650 volts) and an external WRL 755-A v.f.o. simultaneously.

Grid-Block Keying

Most of the later-model manufactured transmitters use some form of blocked-grid keying. Transmitters using this type of keying seldom require the character shaping which is normally the chief reason for using a vacuum-tube keyer, since adequate shaping is provided by the transmitter circuitry itself. However, if the transmitter is to be keyed through the Electromonimuter system, a linkage of some sort must be provided, and the vacuum-tube keyer arrangement will serve the purpose conveniently.

This modification is shown in Fig. 4. In this application, where the keyer tube is not required to handle a large current, a tube such as the 12AU7 is preferable, since plate current will be cut off at a much lower biasing voltage than that required to cut off a tube like the 6AS7. With V_{3B} cut off (key closed), bias on the keyer tube will be in the vicinity of zero, and the plate-cathode resistance will be low enough to key the transmitter. When the key is opened, V_{3B} conducts, and the drop across R_5 will be applied as bias to the keyer tube.

To cut off the keyer tube completely, as is required to arrive at a key-open condition for the keyed transmitter, it is necessary that the drop across R_5 be 20 to 30 volts greater than the blocking voltage supplied in the transmitter. (The net biasing voltage at the grid of the keyer tube is the difference between the voltage drop across R_5 and the voltage from the transmitter keying system.) With the original arrangement, the voltage drop across R_5 is about 140 volts which is sufficient for transmitters using blocking voltages of 110 to 120 volts or less. If the transmitter blocking-voltage supply delivers more than this, it will be necessary to increase the plate-supply voltage for V_{3B} correspondingly. In this modification, the transistors key the auxiliary circuits of the Electromonimuter. If more shaping than that provided by the transmitter keying circuit is desired, it can be added as shown in the dashed lines of Fig. 4.

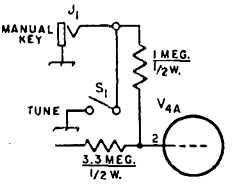


Fig. 5—Modification for the use of a straight key with the Electromonimuter. J_1 is an open-circuit jack. S_1 is a s.p.s.t. toggle switch.

Fig. 5 shows a simple change to the original Electromonimuter circuit to provide for the use of a straight key with any of the above modifications. S_1 is a means of turning on the transmitter without closing the key.

With either of the two keying modifications described, break-in operation may be achieved either by using a separate receiving antenna, with no change-over required, or by installing an electronic t.r. switch. For general operating, a receiving antenna consisting of 50 feet or so of wire, separated from the transmitting antenna as far as practicable, will give excellent results. QST

Strays

According to the records kept by our W1ZJE, something most unusual has happened this month. For the first time since 1944, we have in our Station Activities columns a report from each and every section. Well done, SCMs!

—···—

Along about Christmas-time W4AZK seats a youngster on his lap and calls "CQ Santa Claus." Another understanding ham replies in the guise of Santa, and then the youngster can talk directly to Santa Claus and relate his Christmas wishes.

• Recent Equipment —

Heath Pawnee 2-Meter Transceiver Kit Model HW-20

ONE of the joys in amateur radio is the feeling of accomplishment when a constructional project is finished and working. The fun is not restricted to the technician who builds strictly home-built gear; it can also be enjoyed by the beginner and nontechnical ham in the form of a well-engineered kit. The HW-20 certainly falls into this category, and although a challenging letter accompanies the kit, reminding the purchaser that the kit is recommended for the "experienced kit builder," the Pawnee is really no more difficult than any other kit. It just contains more parts, more steps, requires more time, and, of course, infinitely more patience!

The HW-20 (Pawnee) is one of two v.h.f. transceiver kits, the other being the HW-10 (Shawnee). The HW-10 covers the frequency range of 49.8 to 54 Mc., and the HW-20 covers from 143.8 to 148.2 Mc. Except for the frequency coverage, both models are more or less the same in circuit features, power requirements, and panel layout.

Designed for either mobile or fixed-station use, the Pawnee is a complete 2-meter station which can be operated on a.m. phone and — much to the delight of our v.h.f. editor — has a b.f.o. and provision for c.w. keying.

Receiver Section

A block diagram of the receiver section of the HW-20 is shown in Fig. 1. The receiver starts off with a broad-band cascode r.f. amplifier, V_1, a 6BS8. A parallel-tuned trap in the input circuit is tuned to reject i.f. images and the amplifier output is transformer-coupled to the first mixer, giving the receiver's front end a high order of i.f. signal and image rejection. An r.f. gain control is located in the cathode of V_{1A} to control the sensitivity of the r.f. amplifier. The broad-band characteristics of the r.f. amplifier make tuning controls unnecessary in this stage.

A 6EA8 triode mixer, V_{2A}, combines the r.f. signal and oscillator voltage. The oscillator, V_{2B}, which is voltage regulated and crystal controlled, operates at 61 Mc. in an overtone circuit. The 61-Mc. tank circuit is in the screen grid, and a second tuned circuit at 122 Mc. is in the plate circuit. Through electron coupling in the oscillator tube, the second harmonic of the crystal frequency is picked off in the plate circuit, and this energy is capacity-coupled to the grid circuit of the first mixer, V_{2A}. The resulting first i.f. signal is between 22 and 26 Mc. To insure low-impedance r.f. paths, the r.f. amplifier, first mixer, and crystal oscillator are all mounted on a silver-plated subchassis (see photographs) which is completely enclosed by shielding.

The 22- to 26-Mc. output of the first mixer is heterodyned to the second i.f., 2 Mc. in the pentode section of the 6EA8 second mixer, V_{3A}. The tunable oscillator, the triode section of the same 6EA8, operates 2 Mc. lower than the first i.f. A temperature-compensated Clapp oscillator circuit is used, along with voltage regulation, to insure stable operation. The oscillator tuning capacitor is part of a three-gang RCVR TUNE variable capacitor which also simultaneously tunes the first-mixer plate circuit and the second-mixer grid circuit. The tuning capacitor is mounted on the chassis with its shaft at right angles to the front

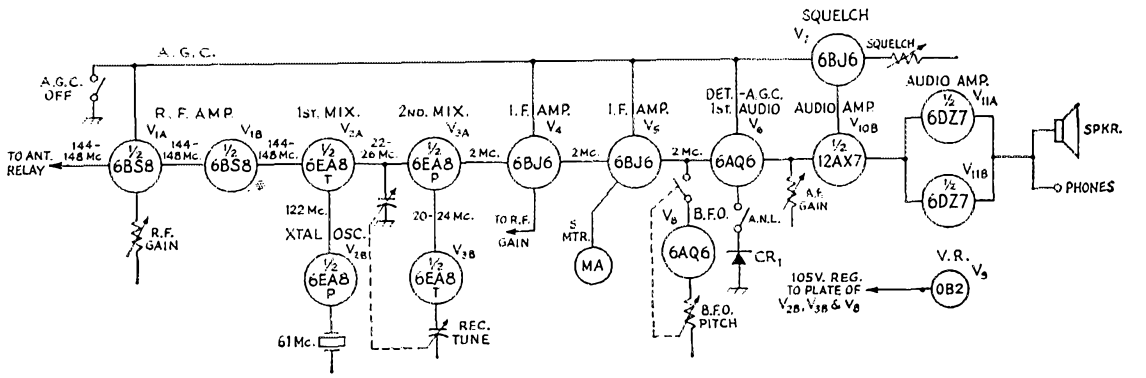


Fig. 1—Block diagram of the receiver section of the HW-20.

panel and is driven, along with the dial pointer, by a system of strings and pulleys. The dial pointer moves laterally along an illuminated slide-rule dial which is calibrated for receiver frequency at the bottom and v.f.o. frequency at the top.

Two 6BJ6s, V_4 and V_5, amplify the 2-Mc. output from the second mixer. Six tuned circuits give an i.f. selectivity of 15 kc. at 6 db. down. The cathode of the first i.f. amplifier is in the r.f. gain-control circuit. A relative signal-strength meter is in the plate circuit of the second i.f. amplifier.

A diode section of V_6, a 6AQ6, is used for detection and for developing a.g.c. voltage. A.g.c. is applied to the r.f. amplifier, first i.f. amplifier and a squelch tube, V_7. The a.g.c. line can be grounded by a panel slide switch. A silicon diode, CR_1, connected across the detector load, is used as a noise limiter. It can be turned on or off from the panel by a push-pull switch.

As mentioned earlier, provisions are included in the Pawnee for c.w. operation. The b.f.o. circuit is shown in Fig. 2. The Hartley oscillator, which can be tuned through the passband of the 2 Mc. second i.f., is controlled by varying the back bias on a silicon diode, CR_2, which exhibits a capacitance change with a bias change. This scheme has been used before in Heathkits [1] but only in all-semiconductor circuits. The b.f.o. PITCH control, R_1, located on the front panel, varies the bias on the diode and sets the oscillator frequency. This control also has a push-pull switch which turns the b.f.o. on or off. Output from the b.f.o. is capacity-coupled to the diode detector. The diode, CR_2, comes already wired inside the b.f.o. transformer can.

Audio in the HW-20 receiver is first amplified in the triode section of the 6AQ6, which drives another triode stage, V_{10B}. A 6DZ7 dual pentode (the 6DZ7 is a tube commonly used in stereo amplifiers) in Class AB_1 push-pull furnishes about 3 watts of audio for the built-in speaker. The audio circuits incorporating V_{10B} and the 6DZ7 are common to both the receiver and transmitter sections of the Pawnee. Most of the switching between the two sections is done by a relay which is controlled by the push-to-talk switch on the microphone. The squelch tube, V_7, is also part of the audio system. It operates from the a.g.c. line and quiets the receiver by biasing off audio amplifier V_{10B} in the absence of a signal. The squelch threshold is adjusted by a panel SQUELCH control. This control is also a push-pull switch that turns the noise limiter on or off.

[1] "Recent Equipment," *QST*, December, 1960, p. 32.

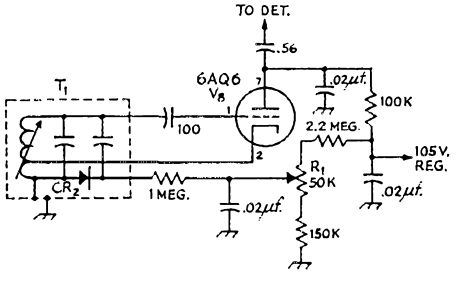
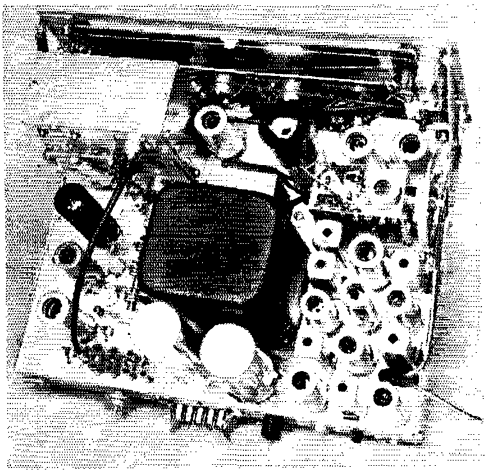


Fig. 2—Back bias on a silicon diode, CR_2, is used to tune the b.f.o. in the HW-20. Unless otherwise indicated, capacitances are in μμf., resistances are in ohms, resistors are ½ watt.



Getting a complete 2-meter transmitter-receiver on a 10 × 12 chassis requires compact arrangement of the components, as demonstrated in this top view of the HW-20. The shielded box at the upper left of the photograph is the v.f.o. assembly. Transmitter-exciter stages are gang-tuned along with the v.f.o. through a system of gears visible at the bottom of the v.f.o. box. V.f.o. output is fed through the coaxial cable coming out from the top of the v.f.o. box, and is terminated with a phono plug which goes into a jack adjacent to the crystal sockets at the rear edge of the chassis. Power-supply components are in the center foreground, and the receiver section is at the right.

The main tuning capacitor can be identified by the large pulley at the right edge of the chassis. It is string-driven from the front panel through a system of smaller pulleys. The object mounted on top of the tuning capacitor is a screwdriver-adjusted potentiometer which is used to "zero" the S meter.

Transmitter Section

Nine tube sections are used in the r.f. and speech portion of the HW-20. The block diagram in Fig. 3 shows the lineup and job performed by each tube. The Pawnee's transmitter frequency can be controlled either by a built-in v.f.o. or by any one of four crystals (crystals are not furnished). A four-place crystal socket is accessible at the rear of the chassis and requires crystals in the 8-Mc. range. The desired crystal (or v.f.o.) can be switched into the circuit by a 5-position front-panel rotary switch.

The 8- to 8.22-Mc. v.f.o., V_{12} in Fig. 3, is a Clapp circuit which has been isolated both mechanically and electrically from the rest of the transmitter. All of the v.f.o. components are bottled up in a shielded compartment (see photographs) and all leads except for the r.f. output leave the compartment by way of feed-through capacitors. The frequency-determining components are mounted on a heavy subpanel heat-sink plate. One interesting thing Heath has done to

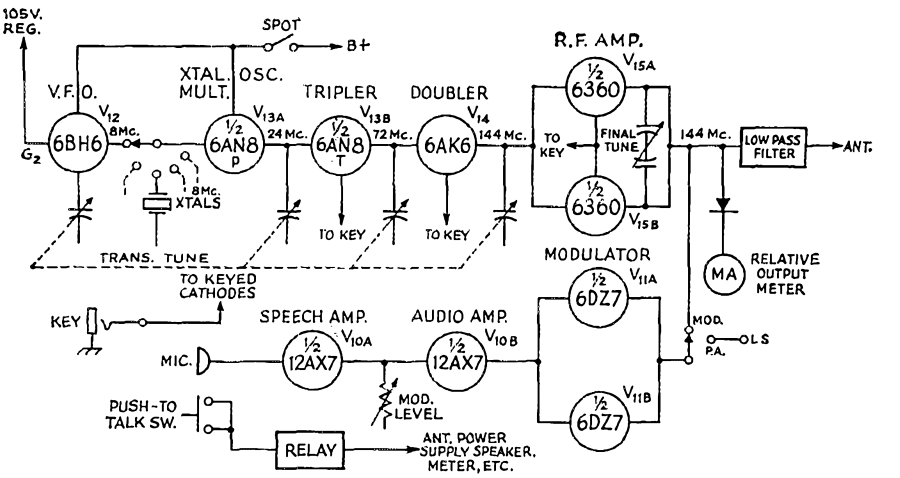


Fig. 3—Block diagram of the transmitter section of the HW-20.

stabilize the oscillator is to put the v.f.o. tube, V_{12}, *inside* the v.f.o. compartment. The idea is that the tube will bring the compartment up to temperature quickly and hold the temperature more or less constant. Included in the v.f.o. tuned circuit is a variable differential capacitor with fixed temperature-compensating capacitors connected to each stator. This differential capacitor can be set for various amounts of temperature compensation, depending upon the environment.

The v.f.o. tuning capacitor is a double-bearing variable, coupled to the panel XMTR TUNE control and dial pointer by strings and pulleys. The capacitor's shaft extends out the back of the v.f.o. compartment, where a combination of gears connects it to a three-gang variable capacitor which tunes several following stages. This feature allows for single-knob tuning of all the transmitter stages up to the final r.f. amplifier.

When crystal control is desired, the v.f.o. is switched out of the circuit and V_{13A}, the pentode section of a 6AN8, operates as an 8-Mc. Pierce oscillator. The plate circuit of this stage resonates at three times the crystal frequency (24 to 24.666 Mc.) and is tuned by one section of the three-gang capacitor. In the v.f.o. position, this stage operates as a tripler. A panel slide switch, labeled SPOT, applies voltage to V_{12} and V_{13A} for zero beating.

The triode (B) section of V_{13} triples the 24-Mc. signal to the 72-Mc. range. Its plate circuit is tuned by the second section of the three-gang XMTR TUNE capacitor. This stage is cathode-keyed along with the doubler, V_{14}, and the final r.f. amplifier. The doubler brings the signal up to the operating frequency in the 144- to 148-Mc. range. Its plate circuit is tuned by the third section of the XMTR TUNE capacitor.

A 6360 operates Class C push-pull in the final r.f. amplifier. It, too, has its own shielded compartment for isolation, and extensive filtering and bypassing is used on all of the d.c. leads entering the compartment. The final amplifier stage is cathode-keyed. A 100-ohm cathode resistance protects the tube in case of loss of drive. Aside from the already-mentioned single-control XMTR TUNE knob, the final-amplifier plate-circuit tuning control, FINAL TUNE, is the only other control used in tuning the transmitter. Once it is adjusted for maximum transmitter output, it isn't necessary to change it for frequency excursions of up to about 500 kc.

The same meter used for relative signal strength in receiving is used for indicating relative transmitter output when transmitting. A semiconductor diode rectifies a sample of r.f. from the final-amplifier tank circuit and applies it to the panel meter.

Output from the final amplifier is link-coupled to the antenna circuit, and it is possible to vary the coupling by means of an adjustable link and a capacitor between the link and ground. Adjustments are made through panel holes behind the XMTR TUNE knob, which must be removed for this purpose. Once these controls have been set for a particular load (50 to 70 ohms) they usually do not need further adjustment.

Power input to the 6360 final amplifier is about 18 watts. Efficiencies of 50 per cent or better are obtainable on both phone and c.w. Our model measured about 10 watts output on c.w. and 9 watts on phone, using a Bird wattmeter and a non-reactive 50-ohm load.

A low-pass filter in the r.f. output circuit suppresses harmonics and other spurious radiations. Its cutoff frequency is about 152 Mc.

Speech Section

Tubes V_{10B} and V_{11}, the audio stages of the receiver, are also part of the speech section in the transmitter. In addition, V_{10A}, a triode section of a 12AX7, operates as a microphone speech amplifier for the high-impedance ceramic microphone furnished with the kit. Output from the speech amplifier drives V_{10B}, which is followed by the 6DZ7 push-pull modulator, operating Class AB_1. A combination output and modulation transformer matches the amplifier either to the

Class C r.f. load (transmit) or to the low-impedance built-in speaker (receive).

The audio section can also be used with an external speaker as a public-address system. This change is made by a combination push-pull switch/potentiometer located on the rear of the chassis. The switch gives a choice between either p.a. or modulator output, and the potentiometer, located in the circuit between the speech amplifier V_{10A} and the audio driver, V_{10B}, is an audio gain control for the speech section. About 10 watts of audio is available as a modulator, and about 15 watts as a public-address system. The various output levels are determined by the value of B-plus voltage applied to the 6DZ7 stage.

All of the switching between transmit and receive is done by the built-in relay, which is controlled by the microphone push-to-talk switch.

Power Supply

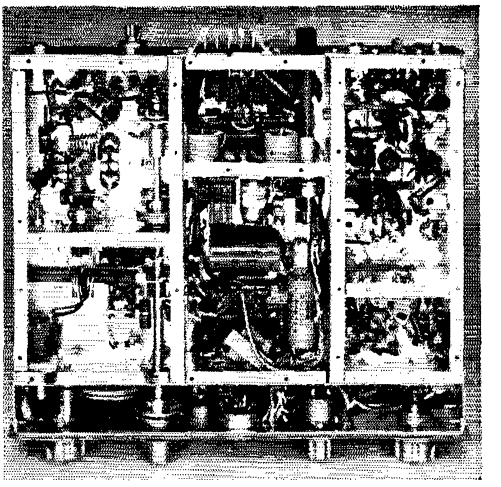
The Pawnee can be operated either from the 117-volt a.c. line, or from 6 or 12 volts d.c. In the case of d.c. operation, either positive or negative may be grounded. The three-way vibrator power supply is well filtered for hash elimination. The stepped-up voltage is rectified in a bridge circuit with semiconductor diodes. Two output voltages are developed in the supply, 125 volts d.c. for the receiver and audio sections and 250 volts d.c. for the transmitter and modulator. There is also 105 volts regulated for use on all the oscillators.

Two power cables plug in a socket at the rear of the Pawnee. One cable is wired for a.c. operation and the other is wired for either 6- or 12-volt d.c. operation. Heath furnishes an external heavy-duty relay that mounts close to the car battery and remotely controls the high current to the unit. The relay will work on both 6 or 12 volts since a dropping resistor is used in series with the relay coil on 12 volts.

Adjustment — Calibration — Operation

The Pawnee is housed in the familiar Heathkit two-tone green cabinet. There is a yoke-type mounting for mobile operation so that the unit can be hung from the dash or supported from below on the transmission hump. The microphone clip can be attached to either side of the cabinet for the operator's convenience. The built-in speaker faces out through the perforated side of the cabinet.

Arranged along the rear of the cabinet are the r.f. output connector (SO-239 type), key jack, a ground stud, power cable connector, modulator level and push-pull modulator/public address switch, phones jack (automatically disconnects the speaker when the phones are inserted), modulation monitor slide switch (provides for monitoring on-the-air modulation through the phones), and phono jack (for connecting an external speaker for the p.a. feature). A Fahnestock clip on the back of the cabinet makes a convenient holder for an Allen wrench (furnished) which fits the Allen screws in all the panel knobs.



The HW-20 chassis is divided into six compartments which are visible in this bottom view. The compartment at the lower right houses the receiver's front-end circuits, which are mounted on a silver-plated subchassis; at the top right is the remainder of the receiver except for its audio stages. The two center sections of the chassis contain the power supply, receiver audio, transmitter audio, and relay switching circuits. At the upper left is the transmitter's oscillator, multiplier and driver stages, and at the lower left is the final r.f. amplifier stage. The chassis bottom plate has been removed for this photograph.

Total time spent on the Pawnee kit, including the alignment time, ran well into 70 to 80 hours. Of course, this includes a good many hours spent in just going over the instruction manual *before* starting the kit. Except for a couple of minor errors in the manual (in the pictorial drawings), the kit went together without any real difficulties. If it were necessary to pick out the most difficult part of the project, our choice would probably be the operations related to stringing the dial cord on the various pulleys and then attaching the front panel to the chassis. Any other complaints about the constructional side of the kit would hold true for all kits in general. Such items as hardware, gears, shafts, bushings, clamps, etc., are difficult to identify since they are usually all dumped into one sack — the machine screws, nuts and washers alone are divided into half a dozen types!

Some interesting time savers are included in this kit. Screw holes on the chassis bottom plate are used as a jig for making up the correct dial cord lengths. Several long screws are temporarily placed in specific holes in the bottom plate. The dial cord is then strung between the projecting screws and the ends tied together. This results in a dial cord loop of the proper length. Another cute gimmick furnished with the kit is a plastic nut starter which, when a small metal insert is attached, doubles as an alignment tool!

Alignment of the receiver and transmitter is a simple operation even with modest test equipment. The instruction manual outlines several alignment procedures to suit the ability and test equipment of the owner. Receiver-alignment

methods include one where a v.t.v.m., sweep generator, wide-band oscilloscope and a signal generator are used. An alternate method is one that requires only a v.t.v.m. and involves using the transmitter section of the Pawnee for the signal generator. Transmitter alignment is straightforward and, if the instructions are followed to the letter, does not present any difficulty.

Probably the most tedious operation is the v.f.o. calibration and temperature-compensating adjustments. It may take several hours over a period of days or weeks to get the desired temperature stability. Our unit could be adjusted for stable operation during the first 30 to 45 minutes after a cold start, but would then begin to drift considerably. On the other hand, it could be set for long-term stability, but would drift for the first hour or so.

This writer was somewhat disappointed with the performance of the rather primitive noise limiter. Although a shunt diode limiter of this type does give some effective limiting, it does not measure up to the other outstanding features of the unit. In our unit, the various sections of the transceiver are so well shielded that in the SPOT position there was not enough oscillator signal getting back to the receiver, so that it was difficult to hear the "spot" signal for zero beating.

The c.w. keying of the transmitter — even with v.f.o. control — is surprisingly stable. That there are provisions for keying and c.w. reception at all is enough reason for congratulating the manufacturer.

On the air reports concerning the "sound" of the Pawnee almost invariably laud the excellent speech quality of the unit. —*E. L. C.*

Heath HW-20 2-Meter Transceiver

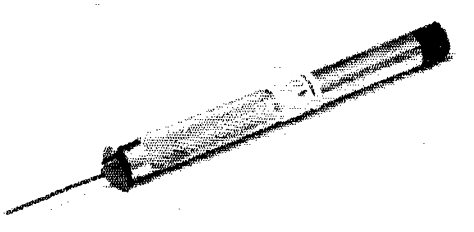
Height: 6 inches.
Width: 12 inches.
Depth: 10 inches.
Weight: 30 pounds.
Power requirements:
Input voltage
6.3 v.d.c., 12.6 v.d.c., 117 v.a.c.
Transmit 11.5 amp. 7.5 amp. 120 watts.
Receive 8.5 amp. 4.5 amp. 60 watts.
Price class: $200.
Manufacturer: Heath Company, Benton Harbor, Mich.

• *New Apparatus*

Twirl-Con—An Aid to Neater Wiring

IT'S not what it looks like, but it is a handy device for use in wiring and servicing radio equipment. Its name, *Twirl-Con*, is descriptive of the tool's purpose. You hold the knurled portion of the handle between your thumb and first fingers, feed a wire through the slot in the hardened-steel end, and then twirl the handle while keeping tension on the wire in the other hand. This coils up the wire so that it can be slipped over another similar wire, or over the remaining stub of the lead of a defective component that has been clipped out of the equipment being serviced.

A simple idea, but it can speed up wiring and servicing of equipment, and make a neater job of it. Particularly in the latter work, removing a component for test or replacement is often a messy job. Where several wires are soldered to a single terminal, damage may result from an attempt to unwrap soldered leads. Parts soldered to terminal boards often have only about ⅛ inch of lead exposed. Once this is cut, reconnecting is all but impossible, yet parts often must be lifted at one end to check for continuity or shorts. The Twirl-Con provides a simple and quick method of replacing such connections, or installing a new part. You merely twirl yourself a little sleeve of wire, slip it over the ends of the leads to be connected, and solder. Surplus wire can be left on the twirl for holding during the soldering, and then slipped off.



Twirl-Con is made by Henry N. Dittrich, W5IVU, 1101 N. East St., Edna, Texas, in two sizes, for No. 18 or No. 20 wire.

— *E. P. T.*

Strays

Not convinced yet that GMT is what you should use for your operating schedules? Then answer this quickly, without looking it up. If a ham in Hawaii told a ham in Anchorage that he'd work him again at 1000 local standard time, what would the schedule time be in Anchorage?

(Both Anchorage and Hawaii are on Hawaiian Standard Time.)

Several members of a radio club at the University of Illinois spent all one afternoon putting up a new antenna. Just after making the final connection to the transmitter, it was discovered that not a single one of them had a valid license. Better check the expiration date on *your* license, OM!

A 160-Meter Converter for 80-Meter Receivers

Several current manufactured receivers as well as a good share of home-brew jobs do not include the 160-meter band. This easily-built converter unit puts a much-neglected part of the ham spectrum within the tuning range of any receiver covering the 80-meter band.

Compact Fixed-Tuned Unit Covering the Lowest-Frequency Amateur Band

BY PHILIP E. HATFIELD,* W9GFS

INSPECTION of the frequency range of some amateur-band receivers might indicate that there is no band lower in frequency than the 3.5- to 4-Mc. band. While it is true that there isn't *much* space at the lower frequencies, still there is considerable activity in the tiny segments of the 160-meter band shared by amateurs and Loran.

"Up" Converter

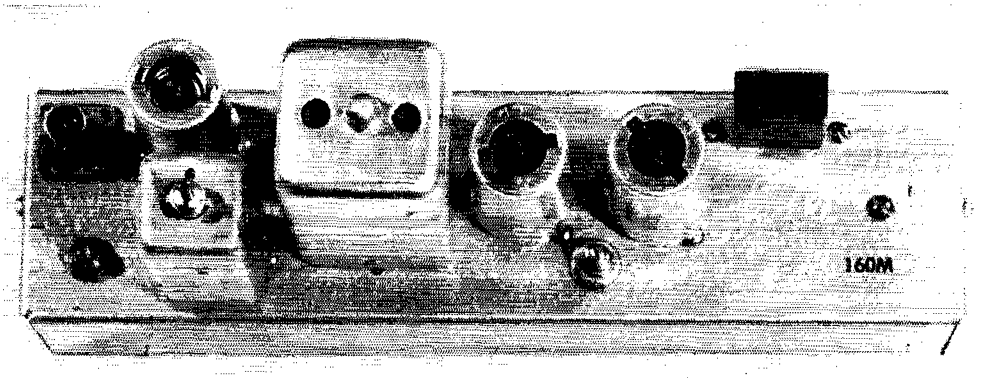
A converter can be constructed to make these receivers operate in the 160-meter band by converting the 160-meter signals *up* in frequency to the 3.5-Mc. band instead of down in frequency as is done in most converters. Normally, the i.f. output frequency of a converter is lower than the input frequency. This is done to utilize some of the advantages of a low i.f. frequency. However, a converter can be designed to produce beat notes higher in frequency than the input signal just as well as lower. An example is the BC-348 receiver which has an i.f. frequency of 915 kc., but includes the range of 200 to 500 kc.

The principle of converting up in frequency was used in the converter to be described. This converter was constructed to extend the frequency range of the receiver described in an earlier issue,[1] but it can be used with any receiver covering the 3.5- to 4-Mc. band.

A second departure from convention in this converter is to use fixed-tuned circuits in the r.f. amplifier and mixer at the rather low frequencies involved. This would not be practical if the old 160-meter band were to be covered, but a 25-kc.

* Receiving Tube Dept., General Electric Co., Owensboro, Ky.

[1] Hatfield, "Unit-Type Receiver Construction," *QST*, December, 1961.



The 160-meter "up" converter. The particular physical arrangement shown here is designed to fit into a previously described unit-section type receiver. The "loopstick" used in the input circuit is mounted in the small can between the trimmer capacitor and the i.f. transformer which couples the r.f. stage to the mixer. Mixer and oscillator tubes, slug-tuned oscillator coil and crystal are to the right. The foundation is an 8½ × 2⅛ × 1⅝-inch interlocking-type box (LMB 850).

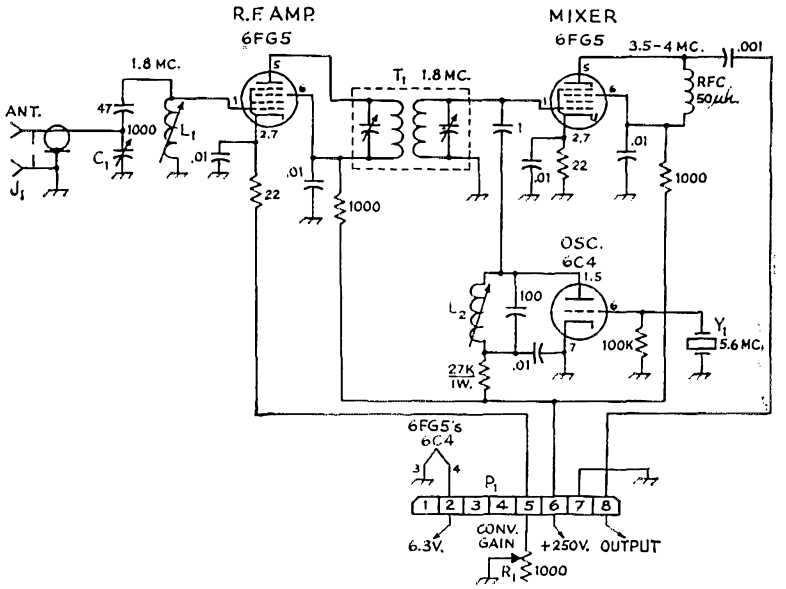


Fig. 1—Circuit of the 160-meter converter. Resistances are in ohms and resistors are ½ watt unless indicated otherwise. Fixed capacitors of less than 0.001 μf. are mica; others are ceramic. Decimal values of capacitance are in μf; others are in μμf. except as indicated.

C_1—250-1000-μμf. (approx.) compression-type trimmer.
J_1—Chassis-mounting coax receptacle.
L_1—Approx. 200 μh. (broadcast-band "loopstick").
L_2—Approx. 8 μh. (CTC LS-3 10-Mc. coil).
P_1—Octal chassis-mounting plug.
R_1—1000-ohm control (in receiver).
T_1—1500-kc. mica-tuned i.f. transformer, 10 turns removed from secondary (Merit BC313).
Y_1—See text.

band segment can be very satisfactorily covered in this manner.

The physical layout of the converter illustrated was dictated by the necessity for matching it with other plug-in converters for the receiver mentioned previously. In this arrangement the converter obtains filament and plate voltages through an octal plug mounted on the bottom of the converter. However, almost any chassis or box can be used for the converter, and a small power supply may be built in if no means of taking power from the receiver is available.

Tubes

The circuit of the converter consists of an r.f amplifier, a mixer, and a crystal-controlled oscillator. Both the r.f. amplifier and mixer tubes are 6FG5s. This relatively new General Electric tube is a "shadow-grid" beam pentode and has several advantages in amateur usage that merit a short discussion here.

The 6FG5, unlike other pentodes, has an additional grid, placed between the control grid and the screen, and connected to the cathode. This additional grid reduces the ratio of screen to plate current and makes it practical to operate both the plate and screen at +250 volts. Use of the same voltage on plate and screen reduces the number of dropping resistors and bypass capacitors required. In addition, the transconductance of 9500 micromhos makes the tube a better performer than many commonly used pentodes. While not of importance at 160 meters, the low screen-to-plate-current ratio reduces partition noise and makes the 6FG5 attractive also at v.h.f.

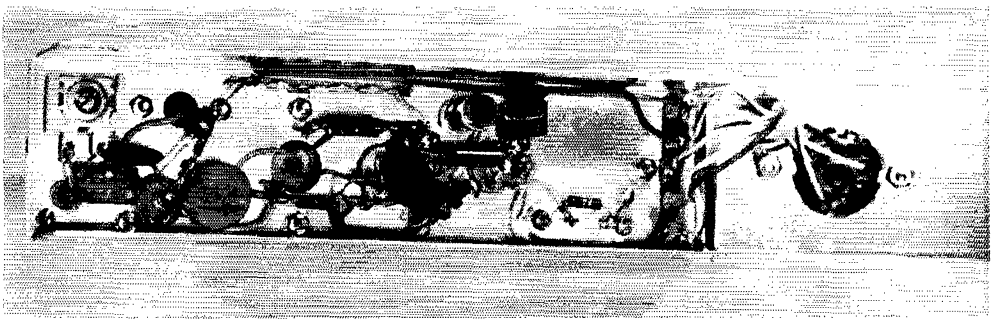
Circuit

The input circuit of the converter, patterned after the one used in the once popular R-9'er,[2] was designed to match the 50-ohm link used between the receiver and an antenna tuner; a conventional inductively coupled input circuit could just as well be used. This could be done by winding a few turns of wire as a primary on the broadcast band "loopstick" used as the input-circuit inductance. Interstage coupling between the r.f. amplifier and the mixer is through a 1500-kc. i.f. transformer. A compression-trimmer-tuned transformer was used and no difficulty was encountered in tuning the primary to 160 meters, although turns had to be removed from the secondary coil. An r.f. choke was used in the plate circuit of the mixer for simplicity. The crystal oscillator is conventional and uses a slug-tuned coil for the tuned circuit.

Crystals

Since it is very difficult to prevent signals at 3.5 to 4 Mc. from leaking through with such a converter arrangement, some assistance may be had from proper selection of the crystal frequency. For example, if you are interested in c.w. only, pick a crystal that will make use of the phone portion of the 3.5- to 4-Mc. band for the tunable i.f. system. In this way you will avoid calling

[2] "The R-9'er," *GE Ham News*, Nov.-Dec., 1946.



Converter with bottom cover removed. The input-circuit trimmer capacitor is in the upper left-hand corner. L_2 is to the right of the tie-point strip, upper center. The power connector is set in the bottom cover.

those very weak signals that may turn out to be operating in another band. Of course, if you are interested in phone, pick a crystal frequency that puts you in the c.w. portion of the 3.5- to 4-Mc. range. In addition, a simple low-pass filter may be placed between the antenna and the converter.

Two-Segment Coverage

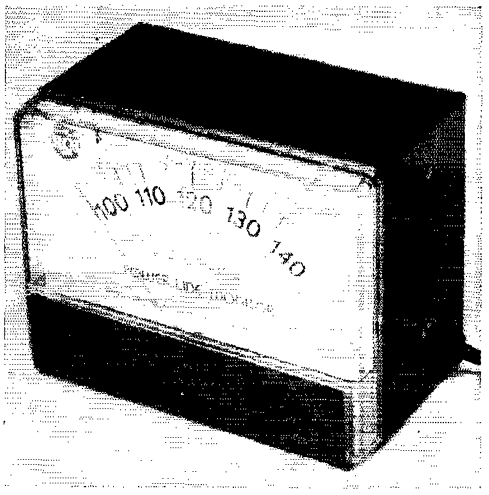
If you wish to cover both segments of the 160-meter band presently available, several modifications of the converter are possible. One method would be to use replacement broadcast coils for the input and mixer circuits with a two-gang capacitor to tune both coils to the desired segment of the band. Here it might be necessary to remove a few turns from the secondaries of the coils, although if slug-tuned coils were used, sufficient range might be available. Coverage of the two segments could also be obtained by switching trimmer capacitors across the broadcast coils. In either case, it would not be necessary to switch the crystal.

The idea of converting up in frequency may be extended to even lower frequencies than was done in this 160-meter converter. For example, a converter could be designed to cover the frequencies in the vicinity of 500 kc. to allow reception of the ship and coastal c.w. traffic. Coverage of still lower frequencies is undoubtedly possible. QST

• *New Apparatus*

RCA Power-Line Monitor

THE RCA Power-Line Monitor (Model WV-120A) should make a handy instrument around the shack and be especially useful for field days or wherever emergency power is being used. Its purpose is to monitor line voltage and it is accurate to plus or minus 2 per cent at 120 volts.



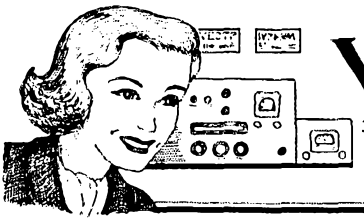
This one instrument can be used on circuits of 100 to 140 volts with frequencies ranging from 25 to 400 cycles per second.

The meter movement is a moving-vane type which indicates r.m.s. values (unlike the peak readings of a v.t.v.m.). Even distorted waveforms, such as those from transistor power supplies and inverters, will read true r.m.s. values. The meter is slightly damped but not enough to cover up quick line-voltage fluctuations.

The instrument measures 3 by 4 by 5 inches and has an expanded scale with 120 volts at center scale. This value is printed in red as a sort of reference standard. Mounting holes are provided on the rear of the case so the meter can be hung in a location that gives the best visibility. The clear plastic face of the meter has been treated with antistatic solution to prevent static charges from forming on the meter case and causing the pointer to stick. — *E. L. C.*

Strays

Any U. S. or Canadian amateur who was born in the United Kingdom — please contact Will Schuman, WA6GLF, 111 W. Hillcrest Blvd., Monrovia, Calif.



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

OUR TENTH ANNIVERSARY

YL NEWS AND VIEWS became a feature of *QST* ten years ago this month! It was the January 1952 column that marked the introduction of a section in *QST* each month sacred to YLs only. If we might be pardoned for indulging in a bit of self-praise on this auspicious occasion, we would let out a boisterous, immodest, miladylike cheer "Hurrah for the YLs of amateur radio!" But quickly retreating to the more immutable facts of a ten year history, let's ponder what has been "The YL Story" for the past decade.

It all began in May 1951 at the annual meeting of the ARRL Board of Directors, when it was "VOTED that the Editor of *QST* be instructed to have prepared (by a qualified licensed female amateur) a monthly column devoted to YL amateurs and their interests, said column to be included in *QST* not later than January, 1952." And with the launching of the YL column as prescribed, through the media of the printed word on an international scale, more and more women were to discover ham radio and choose it as their own.

There are probably at least ten times as many women amateurs today as there were ten years ago. While exact figures are hard to come by, in 1952 there were probably only several hundred YLs — today there are several thousand. The January 1952 column listed a total of six nets for YLs only — our Nov. 1961 column carried a listing of 40 different nets. Ten years ago there were only four YL clubs, including the YLRL. Today there are 30 YL clubs, with membership in the YLRL skirting one thousand.

The YL activity level has been high — in contests, certificates, get-togethers and conventions, in participation in Field Day, in special events such as the All Woman Transcontinental Air Race, Olympic operations at Squaw Valley, etc., as well as, of course, in nets and clubs, both YL and YL-OM.

The amount of traffic handled during the past decade by some of our YLs has been almost too staggering to comprehend. Month after month since 1949 Mae Burke, W3CUL, has repeated the highest of BPL honors among all amateurs. Several other YLs including W2KEB, W0KJZ, W6QMO, W0LZG, W0KQD, and W2RUF have handled enormous loads of traffic year after year.

Special awards and citations of many kinds have been issued to various YLs, from the Edison Award in 1956 to W3CUL to plaques and certificates issued by the military for years of schedules with servicemen. Additional special Edison Award citations, public service awards, club awards, magazine awards — many have been tendered to many YLs for outstanding service. All of these are within the periphery of ham radio, and we say nothing of the accomplishments of our YLs outside of the hobby — as authors, artists, engineers, teachers, nurses, pilots, yes — even as beauty queens and astronauts. (We have officially one of each in the last two categories!)

Lest we seem to be back to horn-blowing again, we'll cease and desist right now and look only ahead to another ten years that could be ten times greater than the past ten years if we do our part to help make it that way.

—···—

Over the past ten years approximately 650 photographs of YLs have appeared in this column. Some of these were group photos featuring anywhere from 3 to 4 to as many as 91 YLs. Lots of YLs — no matter how you look at them!

—···—

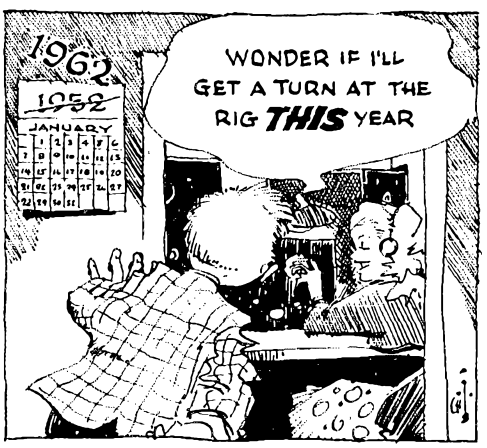
Here's How

Attention all YL clubs interested in a good idea for the program of a club meeting! An October meeting of the Los Angeles YLRC proved so interesting and worthwhile to all who attended that a report of the event was passed along for the possible benefit of other YL clubs.

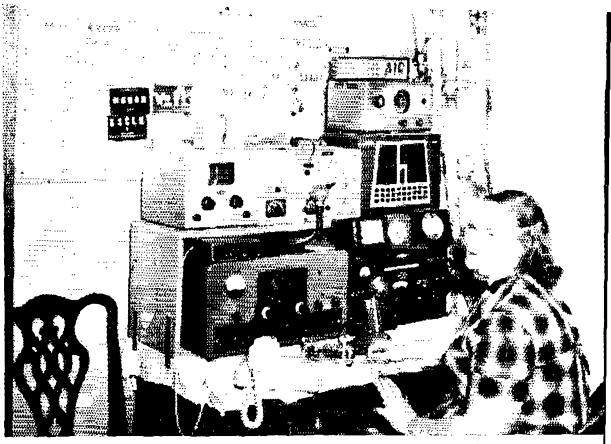
In celebration of its fifteenth anniversary on Oct. 26 the Los Angeles YLRC was one of the first two or three YL clubs organized) at a luncheon at Schaber's Cafeteria in downtown Los Angeles, the program committee featured a double-barrelled "Here's How" theme. Designed not only to interest new and would-be hams, the program was also planned to show already-licensed members new ways to enjoy the hobby.

At two parallel tables were seated the club officers and a panel of "experts." Guests and club members sat at small

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



Visiting DX YLs Denise, VK1YL, and Susan, VQ2WZ, were guests of honor at a special luncheon of the N. Y. C. YLRL, arranged by Ruth, W2OWL, and Dot, K2DPN. The trips to the U. S. which coincided were pleasure for Susan and her OM, VQ2WX, and business for Denise and OM, VK1ATR/VK5RN. (Photos courtesy W2EEO)



Newcomer Faith Wedge, K1OYM, of Bristol, Conn., finds DX her main ham interest. Licensed just a few months, Faith already has 40 countries confirmed.

tables to the rear. Each panel member presented a "Here's How" talk on the subject closest to her main interest in ham radio.

W6DXI led off with "Here's How the YLRL was organized." W6CEE exhibited YL certificates and told "Here's How to get them." Veteran contest operator W6QGX suggested to newcomers "Here's How to enter a contest and how to keep a log." W6JZA recommended nets and how to participate in them. Leading YL DXer W6HUA was enlightening with her "How of DX." S.s.b. enthusiast K6KCI rapshodized on the joys of sideband operation and keytwitcher K6BUS extolled the virtues of c.w. The "Here's How" of traffic handling was discussed by WA6CKR right down to a message word count. Would-be hams were briefed on "Here's How to become a ham," with helpful suggestions for getting started.

Clubs casting about for a program with some real meat in it would do well to consider arranging a similar production.

The Los Angeles YLRC program was arranged by K6OAI — the information was via Publicity Chairman W6QVK.

COMING EVENTS

YL-OM Contest — The thirteenth annual, conducted by the YLRL. Phone section — 1800 GMT, Sat. Feb. 24 through 0500 GMT, Monday, Feb. 26, 1962. C.w. — 1800 GMT, Sat. March 10 through 0500 GMT, Mon. March 12, 1962. 35 hours total operating time. Rules will appear in the February column.

Annual California YL Get-Together — March 30–31, and April 1, 1962. Only the date has been set at this writing — details given later.

12th Midwest YL Convention — May 18–19, Flint, Michigan. Esther Stuewe, W8ATB, G-4098 E. Atherton Rd., Flint, Chairman. Registration $2.00 in advance to W8ATB.

Ladies Day — The second Monday of each month is reserved for just plain YL ragchewing on all the bands. Let the laundry go in favor of a fun day of YL QSOing.

Those Popular YL Certificates

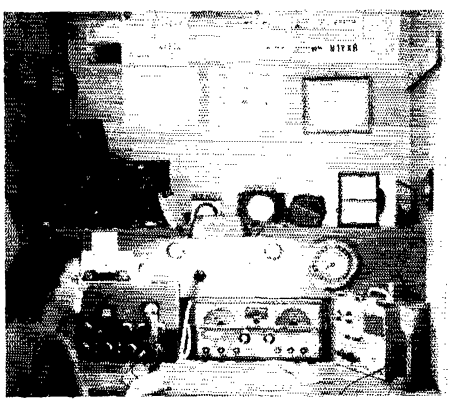
The following information concerning the various certificates offered by the Young Ladies Radio League is given according to the rules printed in the new YLRL Directory, revised to Sept. 1961.

Worked All States YL — Issued for a contact with a duly licensed YL in each state of the 50 United States of America. District of Columbia may be substituted for Maryland. ARRL "Single Community" rule applies. No time or band limitations. Send QSLs and alphabetically-by-state list showing call, date, band and whether A1 or A3. Include postage for return of cards by 1st-class mail. Custodian, Grace Ryden, W9GME, 2054 N. Lincoln Ave., Chicago 14, Ill.

Worked All Continents YL — Issued for contact with a duly licensed YL on each of the six continents. All contacts must be made from within a 25 mile radius of original location. Send QSLs and list to Barbara Houston, K5YIB, P.O. Box 652, Richardson, Texas.

YL Century Certificate — Issued for contact with 100 different YLs. All contacts must be made within 25 mile radius of the original location. Send list in alphabetical order by operator's last name, showing operator's full name, call letters and date of contact. Enclose postage for return

(Continued on page 146)



Maxine Andrews, K1OGU, (left) and Mary Goulart, K1NZK, (right) are "the first and only two YL radio operators in the history of Plymouth, New Hampshire." Both licensed as conditional class in March '61, Maxine and Mary have been obliging with many a N. H. YL contact on 15 and 75, phone and c.w.

Happenings of the Month

Election Results

VE Third-Party Traffic

160 Expansion Requested

Examination Schedule

ELECTION RESULTS

The contested portion of the ARRL autumn elections has resulted in re-election of five directors and three vice-directors who faced the ballot box.

In the Atlantic Division, **Gilbert L. Crossley, W3YA/W3DKN,** received 3368 votes to 1292 votes for Robert C. Stewart, K2PKL, to continue as director. **Noel B. Eaton, VE3CJ,** rang up 1466 votes against the 262 cast for Donald M. McVicar, VE2WW, in the Canadian Director contest. **Dana E. Cartwright, W8UPB,** was re-elected as director of the Great Lakes Division, garnering 2903 votes to 734 for Michael Atlas, jr., W4MDB. In the Midwest Division, 1675 ballots were cast for director **Robert W. Denniston, WØNWX,** as against the 682 cast for Charles O. Gosch, WØBUL. Pacific Division voters kept **Harry M. Engwicht, W6IIC,** as director; the tally was 1819 for him, 637 for Larry M. Reed, W6CTH.

The League's only woman vice director, **Mrs. Martha J. A. Shirley, WØZWL,** was re-elected in the Dakota Division by 438 votes to 313 for John W. Sikorski, WØRRN. **Robert B. Cooper, W8AQA,** continues as vice director of the Great Lakes Division, edging out John E. Siringer, W8AJW by 1919 to 1707. In the Midwest Division, **Sumner H. Foster, WØGQ,** continues as vice director, having received 1468 votes to 886 for Raymond E. Baker, WØFNS.

The office of vice director in the Canadian Division, vacant since Noel Eaton became director in May, 1960, will be filled by **Colin C. Dumbrille, VE2BK.** Mr. Dumbrille received 981 votes to 384 for Rowland C. E. Beardow and 362 for C. V. Waters, VE7ALR. The new vice director was first licensed in 1934, when he was fourteen. He's a past president of the Montreal Amateur Radio Club and has served as an emergency coordinator. He also holds a supplementary reserve commission as a major in the Royal Canadian Signal Corps. Mr. Dumbrille lives in Baie d'Urfee, Quebec, and is controller of DuPont of Canada, Ltd.

These officers, as well as those who were previously declared elected as the only eligible candidates (see page 76, November *QST*), begin their new two-year terms at noon on January 1, 1962. Sharp-eyed readers may note a difference between the figures shown here and those transmitted from W1AW and other bulletin stations; the figures in the bulletin were incomplete, through an unfortunate error on the part of headquarters.

THIRD-PARTY TRAFFIC VE/VO TO YV

Canada signed a third-party agreement with Venezuela on Wednesday, November 22, in Caracas, and promptly put it to work with an exchange of greetings through YV5AJ and VE3ATU, with YV5GW and VE3ANL as standbys and QRM-chasers. The Canadian Secretary of State for External Affairs, the Honourable Howard Green, read the following message to Dr. Marcos Falcon Briceno, Foreign Minister of Venezuela:

"It is with great pleasure, Mr. Foreign Minister, that I take this opportunity of extending to you, to the Government you represent, and to the Venezuelan people, the friendly greetings of the Government and people of Canada. For me, it is a novel experience to exchange greetings of this kind over an amateur radio hook-up. This exchange of greetings will draw attention to the need for the people of the world to converse with each other, to get to know each other better, and will draw particular attention to the valuable exchanges of ideas which take place daily among those international ambassadors of goodwill, the radio amateurs, or "ham" operators, of the world.

"It is because of the useful, interesting and constructive work they are doing that the Canadian Government takes particular pleasure in the conclusion of the Agreement between our two Governments signed in Caracas today, which will permit the radio amateurs of our two countries to extend the scope of their operations by passing third-party communications of a technical and personal nature. The Agreement will be particularly welcomed by the radio amate r operators of our two countries, many of whom will be listening in on this frequency today. May I express the hope that the Agreement signed today in Caracas will permit them to assist in broadening the base of the already excellent relations which exist between our two countries. Lastly, I wish to take this opportunity to extend my own personal greetings to you."

At the signing: Mr. Green and Dr. Egana.

Dr. Falcon Briceno responded in kind from Caracas:

"It is with great satisfaction that I make use of this means of communication with Your Excellency, as it not only signifies the coming into force of the arrangement for the transmission of messages to third persons through radio amateurs, which Mr. Ross and I have just signed, but is, as well, another demonstration of the tradition ties of friendship that unite the peoples of Venezuela and Canada.

"This arrangement offers to thousands of radio amateurs of both countries the opportunity of obtaining something which the whole world seeks; a better understanding among men, based on mutual respect and the desire to share their happiness as well as their misfortunes.

"I wish to take this opportunity to express my very best wishes for the happiness and prosperity of the Government and of the people of Canada, and for the personal well-being of Your Excellency."

The Venezuelan Ambassador to Ottawa, His Excellency Dr. Manual R. Egana, then came on the mike at VE3ATU with an informal greeting to the Canadian Charge d'Affairs in Venezuela, Mr. A. D. Ross.

The ceremonies took place on 20-meter a.m. and received full coverage from the Canadian Broadcasting Corporation and the press. Director Eaton was present, representing ARRL.

The agreement with Venezuela, which will allow Canadian and Venezuelan amateurs to exchange third-party messages provided that the amateurs receive no direct or indirect compensation, and that messages are of a technical or personal nature such that recourse to the public telecommunications service is not justified, is the second such agreement Canada has signed, the only previous one being that with the United States. The Canadian government is negotiating similar agreements with a number of other countries at present.

THE AMBASSADOR TO LEBANON

Hams have often been called "Ambassadors of Goodwill" but now we are proud to announce that a long-time League member *is* an ambassador. On October 27, 1961, the President announced the appointment of Armin H. Meyer, W3ACE, as Ambassador to Lebanon. Mr. Meyer, a career diplomat with 18 years experience in Middle Eastern affairs, has most recently been Deputy Assistant Secretary of State for Near Eastern and South Asian Affairs. Prior to that, at various times he has been stationed in Cairo, Baghdad, Beirut and Kabul, Afghanistan.

Mr. Ambassador, W3ACE.

Mr. Meyer was first licensed as W9ACE about 30 years ago in Lincoln, Illinois, and since then has held the calls W8QXM, W8WVP, W3ACE and a few DXotic calls such as OD5AX, which we understand is still available for re-assignment to Mr. Meyer. He holds a Master's Degree from Ohio State and an honorary LLD degree from Capital University of Columbus, Ohio, where he did a part of his undergraduate work and later served as Dean of Men. He has also received the Commendable Service and Meritorious Service awards from the Department of State. He will be accompanied to Lebanon by his XYL, Alice, and 11-year-old harmonic Kathleen. We wish him all the best in this important assignment.

SSB POWER IN CANADA

At the request of Canadian Director Eaton, the Department of Transport has released its definition of plate power input as it applies to single-sideband transmitters. Except for specification of 750 watts as the top instead of 1000, the definition is practically word-for-word with that of the FCC (page 14, *Single Sideband for the Radio Amateur*). The text follows:

"Section 44 of the General Radio Regulations, Part II, contains a tabulation of the frequency bands and types of emission which may be used by stations in the Amateur Experimental Service. It should be noted that the *emission* designator A3 is construed to include all forms of amplitude modulated radiotelephone emissions, including double sideband emission, e.g., full carrier (A3H), reduced carrier (A3A), suppressed carrier (A3J), also independent sideband (A3B). With regard to bandwidth, amateur stations using amplitude modulated double sideband (or independent sideband) emissions are permitted a bandwidth of 6000 cycles (plus-minus 3000 cycles), whereas with single sideband the equivalent bandwidth is only 3000 cycles.

"Section 46 of the General Radio Regulations, Part II, provides that the d.c. power input to the plate circuit of the final amplifier stage shall not exceed 750 watts (unless further restricted by Section 45) and Section 60 thereof requires that meters of "standard accuracy" shall be permanently installed where the d.c. power input of an amateur transmitter exceeds 400 watts. Noting that these restrictions relate to the basic types of emission designated in Section 44, it has been decided to interpret the limitation of Section 46 *with respect to single sideband suppressed carrier emissions* in the following manner —

> "The d.c. power input to the anode circuit of the radio frequency stage supplying power to the antenna system of a single sideband, suppressed carrier transmitter, as indicated by the plate voltmeter and plate milliammeter, shall not exceed 750 watts on voice peaks, provided the plate meters used have a time constant not in excess of approximately 0.25 second (readily obtainable) and the linearity of the transmitters has been adjusted to prevent the generation of excessive sidebands.
>
> "*Note:* The foregoing principle, of course, applies equally to the power limitations contained in Section 45 of the subject Radio Regulations."

LEAGUE REQUESTS EXPANDED 160-METER PRIVILEGES

During World War II a new radionavigation device was developed which would, more accurately than any previous navigational aid, show the true location of a ship or aircraft on the high seas. The system was, of course, very hush-hush at the time, and space in the medium-wave bands had to be found for it as quietly as possible. Since amateurs were off the air for the duration,

160 meters was the logical place for Loran, as it was called.

The device proved so useful that plans were made for it to be used by civilian ships and planes as well as by the military. Therefore, Loran was given priority in the frequencies 1.8–2.0 Mc. at the Atlantic City ITU Conference in 1947; however, at the urging of the League, the U. S. delegation successfully proposed that provision should be made for sharing of the band by the amateur service on a non-interference basis. In 1949, FCC made the band available to us, with stations in the east using 1800–1825 and 1875–1900 kc., and those in the west using 1800–1925 and 1975–2000. But starting in 1956, the continuing expansion of Loran made necessary certain restrictions in the amateur sharing arrangement. The two inner segments were withdrawn, and amateurs in the southeast lost their 160 privileges.

At the direction of the Board, the headquarters has kept in regular and frequent touch with government agencies involved in the operation of Loran, looking toward reinstatement of earlier privileges. It now appears that the need of the Loran service for protection from interference has changed in some degree. Consequently, the Executive Committee of the League has ordered that a petition for a formal restudy of the relative needs of the Loran and amateur service be filed with the Federal Communications Commission.

The text of the League filing is on page 144.

EXAMINATION SCHEDULE

THE Federal Communications Commission will give Extra and General Class amateur examinations during the first half of 1962 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified with the Engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque, N. M.: April 7, at 11:00 A.M.
Anchorage, Alaska, 53 U. S. Post Office Bldg.: By appointment.
Atlanta, Georgia, 718 Atlanta National Bldg., 50 Whitehall St., S.W.: Tuesday and Friday at 8:30 A.M.
Bakersfield, Calif.: Sometime in May.
Baltimore 2, Md., 415 U. S. Custom House, Gay and Water Streets: Monday and Friday, 8:30–10:00 A.M. and by appointment.
Bangor, Me.: May 9.
Beaumont, Texas, 301 P. O. Bldg.: By appointment only.
Billings, Montana: Sometime in May.
Birmingham, Ala.: March 7, June 6, 1:00 P.M.
Boise, Idaho: Sometime in April.
Boston, Mass., 1600 Customhouse: Wednesday through Friday, 8:30 A.M. to 10 A.M.
Buffalo, N. Y., 328 P. O. Bldg.: 1st and 3rd Fridays.
Charleston, W. Va.: Sometime in March and June.
Chicago, Ill., 826 U. S. Courthouse: Friday.
Cincinnati, Ohio: Sometime in February and May.
Cleveland, Ohio: Sometime in March and June.
Columbus, Ohio: Sometime in January and April.
Corpus Christi, Texas: March 8, June 7.
Dallas, Texas, 401 States General Life Insurance Bldg.: Tuesday.
Davenport, Iowa: Sometime in January and April.
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays, 8 A.M.
Des Moines, Iowa: Sometime in March and June.
Detroit, Mich., 1029 Federal Bldg.: Wednesday and Friday.
El Paso, Texas: June 14.
Fairbanks, Alaska: Sometime in May.
Fort Wayne, Ind.: Sometime in February and May.
Fresno, Calif.: Sometime in March and June.
Grand Rapids, Mich.: Sometime in January and April.
Hartford, Conn.: March 14.
Honolulu, Hawaii, 502 Federal Bldg.: Monday through Friday.
Houston, Texas, 326 U. S. Appraisers Bldg.: Tuesday.
Indianapolis, Ind.: Sometime in February and May.
Jackson, Miss.: June 6.
Jacksonville, Fla.: April 20.
Juneau, Alaska, 6 Shattuck Bldg.: By appointment.
Kansas City, Mo., 3100 Federal Office Bldg.: Thursday and Friday, 8:30 A.M. to 1:00 P.M.
Klamath Falls, Ore.: Sometime in May.
Knoxville, Tenn.: March 21 and June 20, 1:00 P.M.
Little Rock, Ark.: February 7, May 2, 1:00 P.M.
Los Angeles, Calif., 849 So. Broadway: Wednesday, 9:00 A.M. and 1:00 P.M.
Louisville, Kentucky: Sometime in February and May.
Marquette, Mich.: May 9, 10:00 A.M.
Memphis, Tenn.: January 11, April 5, 8:30 A.M.
Miami, Fla., 312 Federal Bldg.: Thursday.
Milwaukee, Wisc.: Sometime in January and April.
Mobile, Ala., 419 U. S. Courthouse and Customhouse: Wednesday by appointment.
Nashville, Tenn.: February 7, May 2, 1:00 P.M.
New Orleans, La., 608 Federal Bldg., 600 South St.: Monday through Wednesday; code tests Monday at 8:30 A.M.
New York, N. Y., 748 Federal Bldg., 641 Washington St.: Tuesday through Friday.
Norfolk, Va., 402 Federal Bldg.: Monday through Friday except Friday only when code test required.
Oklahoma City, Okla.: January 18, April 12.
Omaha, Nebr.: Sometime in January and April.
Philadelphia, Pa., 1005 New U. S. Customhouse: Monday through Wednesday, code tests 8:30–10:00 A.M.
Phoenix, Ariz.: Sometime in January and April.
Pittsburgh, Pa.: Sometime in February and May.
Portland, Maine: April 10.
Portland, Ore., 201 U. S. Courthouse: Friday, 8:45 A.M.
Rapid City, S. D.: May 12, 8:00 A.M.
Roanoke, Va.: April 7.
St. Louis, Mo.: Sometime in February and May.
St. Paul, Minn., 208 Federal Courts Bldg.: Friday, 8:45 A.M.
Salt Lake City, Utah: March 9, June 8, 1:00 P.M.
San Antonio, Texas: February 8–9, May 3–4.
San Diego, Calif., Fox Theater Bldg.: Wednesday, by appointment.
San Francisco, Calif., 323-A Customhouse: Friday.
San Juan, P. R., 323 Federal Bldg.: Friday.
San Pedro, Calif., 356 W. 5th St.: Wednesday, 8:00 A.M.
Savannah, Ga., 214 P. O. Bldg.: By appointment.
Schenectady, N. Y.: March 14–15, June 13–14, 9 A.M. and 1:00 P.M.
Seattle, Wash., 806 Federal Office Bldg.: Friday.
Sioux Falls, S. D.: March 20, June 19, 10:00 A.M.
Spokane, Wash.: Sometime in April.
Syracuse, N. Y.: Sometime in January and April.
Tampa, Fla., Room 201, 221 N. Howard Ave.: By appointment.
Tucson, Ariz.: Sometime in April.
Tulsa, Okla.: February 15, May 17.
Washington, D. C., 718 Jackson Place, N.W.: Tuesday and Friday; code tests 9:30 A.M. and 1:00 P.M.
Wichita, Kansas: Sometime in March.
Williamsport, Pa.: Sometime in March and June.
Wilmington, N. C.: June 2.
Winston-Salem, N. C.: February 3, May 5.

NOTE: Only General Class and Amateur Extra Class license examinations are given at FCC offices and examining points listed above. All examinations for Novice, Technician and Conditional Class licenses are conducted by volunteer supervisors.

(Continued on page 144)

Protect That Invention

Basic Information About the U. S. Patent System

BY KARL B. KELLER,* K3QVT (ex-W9JAI)

THE history of amateur radio has been one of invention. Through accident and through individual research, members of the amateur fraternity have been responsible for many important innovations in the electronics arts. But it is probable that many amateurs are not aware of the nature of the Patent System in the United States as a means of protection for invention.

Do you have a new or novel circuit on the drawing board, a new component design, or a brainstorm that has not reached the practical stage? Would you like to have that invention make money for you? Of course, you can immediately hunt around for someone who will buy the invention, but why not protect yourself? You can, by government-issued "Letters Patent," commonly called a patent.

By a provision in the Constitution, the United States government will issue a patent to a first inventor, giving him the right to the sole use and benefit of the invention for 17 years from the date of issue of the patent. This protection from "infringement," or use by others, has been very valuable to inventors such as Edison, Bell and DeForest, in addition to countless John Does. Perhaps it can be valuable to you.

Patentable Inventions

You may ask, "What sort of discovery can I patent?" This article is too short for a detailed description of patentable subject matter; many court decisions are devoted to that issue. Probably the best way to outline the areas of patentability is to list some types of inventions which are not patentable.

Patents are not issued for inventions which are not useful, such as devices which are inoperative, which are useful only for immoral purposes, or which are useful only for deceiving the public. Patents are not issued for mental processes, for methods of doing business, or for methods of solving mathematical problems.

The most common criterion of patentability rests in the law that the invention must be new, and not previously in public use or on sale more than one year before the date of application. Further, the invention must not have been previously patented or described in a printed publication more than one year before application. The applicant must swear that he is the true inventor — in other words, that he is not trying to obtain a patent for another's discovery. If, after invention by the applicant and true inventor, he finds that the invention is described in a magazine article or other publication, he must file an application within one year, or there will be a presumption of dedication to the public. For these and other reasons, it is wise to make application for a patent as soon as possible after the invention reaches the practical stage.

Another limitation upon patentability is that a patent cannot be issued for an improvement, modification or change in a previous invention which would have been obvious to "one skilled in the art," that is, a person familiar with the subject matter involved.

These negative rules are used by patent examiners in the U. S. Patent Office to decide whether invention is in fact present in an application. It would be obviously unjust to allow patent rights to an applicant for a matter of common knowledge or for a development disclosed by another in a magazine article or in a previous patent.

Patents are also available for some types of plant improvements and for ornamental designs. Information about these types can be found in the references listed at the end of this article.

The Application

It is necessary for the inventor to make application for a patent to the U. S. Patent Office. The application must include a specification, drawings if the invention can be illustrated, and claims pointing out and distinctly claiming the invention. In addition, an oath, a petition and a filing fee of $30 (plus $1 for each claim in excess of 20) must be included.

The claims are the heart of the application and subsequent patent. They identify the invention and define the limits of the applicant's protection by the patent. Thus, they are of commercial significance to the inventor. The claims should be drawn to cover the invention disclosed in the specification and drawings, but should not be so broad as to define or "read upon" another's invention.

Applications are kept secret by the Patent Office, and the invention is not made public until a patent is issued.

*3445 38th Street, N.W., Benning 316, Washington 16, D. C.

A portion of the Search Room in the Commerce Building in Washington, where copies of all issued patents are available to the public. Bound copies of foreign patents and a vast collection of scientific literature are also housed in the building.

How to Apply for a Patent

Let's assume that you have an idea which you think might be patentable. There are two methods of approach. Probably the best and most successful prosecution can be had by retaining a registered patent attorney. He will know how to take care of the necessary formalities, and can probably draw claims to the invention which will give the best protection obtainable.

It is also perfectly possible for you to prosecute your own application. To follow this method of attack, you should obtain copies of the government references mentioned at the end of this article. Careful study of them will indicate the proper procedure to follow in drafting the application.

The specification and drawings should be drafted carefully, so that the examiner and others who will later be interested in the invention can readily understand the disclosure. In doing this, it is important for the applicant to know the exact area of his invention, and to know how the invention is patentably different from similar inventions. A search of prior patents in the field, as mentioned in the references, is necessary to this end. And a study of the recent patents turned up in the search will give a better idea of successful form and style in the specification and claims.

Examination of Applications

The completed application is submitted to the U. S. Patent Office, where it will be sent to an examiner. About 1600 applications are received each week, and the work load of each examiner is quite heavy. It takes about six to twelve months before the application comes up for action.

The examiner's job is to investigate the "prior art," as previous literature in the applicant's field of invention is called, to check over the technicalities of the application to see that it meets required standards, and to write an official response to the inventor or to his attorney.

The claims may be allowed, or they may be rejected for reasons given by the examiner. The inventor or his attorney then has six months to respond to the examiner's comments, offering arguments to his decision if it is adverse, and amending the specification or claims to overcome possible objections. The examiner receives the applicant's answer and reconsiders the case.

This process continues until it is clear that the invention is patentable, in which case the applicant is notified that a patent can be issued. If the examiner considers that the invention is not new and is therefore unpatentable, the applicant is given a final rejection, from which an appeal can be taken.

The average time from the date of application to the date of issue is about 3 to 3½ years, and upon the allowance of all pending claims, the inventor must pay a final fee of $30 (plus $1 for each allowed claim in excess of 20). The patent is then issued.

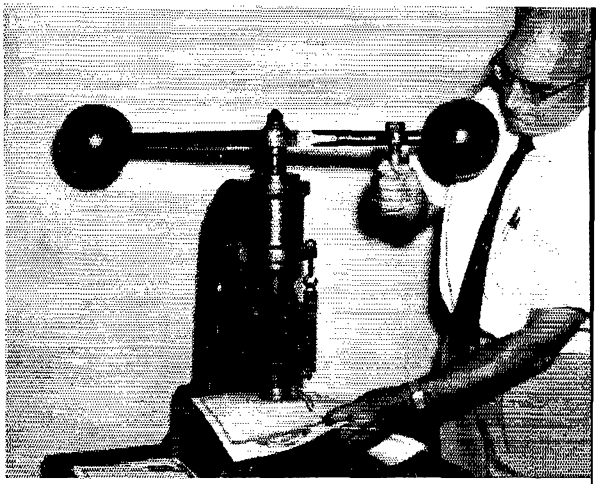
Patents are issued every Tuesday, and one figure of the drawing and one claim of each issued patent is published in a volume called the *Official Gazette*. From that time on, the patent is a matter of public record, and copies can be obtained by anyone. But the inventor still has the right to protect his "monopoly" on the use of his invention.

Protection

From the date of issue, the patentee is protected against infringement for 17 years. The patent cannot be renewed. The government does not undertake to protect the inventor; in cases of infringement the inventor must bring a civil suit to protect his rights. But a valid patent will be evidence that the inventor has this right to exclusive use.

The patent may only be of prestige value, or it may be financially rewarding. That depends upon the subject matter and the ability of the inventor to find a market for his idea. Patent rights are similar to property rights, and are legally assignable. The terms of an assignment are, of course, a matter to be settled between the parties involved. The government places no special restrictions upon the assignment of patent rights, though records of assignments are kept by the Patent Office and are mentioned in copies of the patents.

So if you have an idea which seems to lend itself to a patent, go to it! More than three million patents have been granted, and the results have been good, both for the inventor and for the country. QST



An original copy of a patent is being given the official seal, as one of the steps leading to the issue of the patent.

References

Publications obtainable from the U. S. Patent Office, Washington 25, D. C., by remittance payable to the Commissioner of Patents:

Patents, as issued. Order by patent number or inventor's name and date of issue. 25¢ each.

Publications obtainable from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., or the nearest field office of the U. S. Department of Commerce.

General Information Concerning Patents, for the layman. 15¢ each.

Guide for Patent Draftsmen, giving office requirements for drawings. 15¢ each.

Patent Attorneys and Agents Available to Represent Inventors Before the United States Patent Office. 35¢ each.

Patent Laws, governing the issuance of patents. 30¢ each.

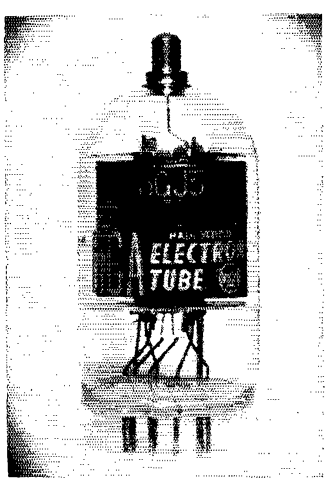
Patents and Inventions — An Information Aid for Inventors basic information. 15¢ each.

Rules of Practice of the United States Patent Office in Patent Cases, rules of the Commissioner of Patent, enacted under statutory authority.

• *New Apparatus*

New Baseless Tube Design

A NEW tube base, called "Novar," announced by RCA should be of special interest to amateurs. Initially, the Novar line will feature TV tubes that previously had octal bases, and will include several horizontal output tubes which have found application in amateur transmitters and modulators. Instead of the octal bases formerly used for these types, the Novar has a low-loss glass button stem base similar to the miniature tube base variety. Not only does this new base result in a less expensive tube, but lead length is reduced so that the tubes should have much better r.f. characteristics than their octal counterparts. The 9-pin Novar base tube shown in the photograph has been designated a 6GJ5 and is electrically similar to the 6GW6 horizontal output tube. Other types to be announced will include one that has characteristics similar to the popular 6DQ5.



It is a little difficult to get an idea of the physical size of the Novar base from the photograph, so here are a few statistics: The nine pins, which are spaced 0.216 inch apart, are arranged on a 0.687-inch diameter circle and will require a special Novar socket (Cinch 149-19-00-037). The sockets should be available from dealers at almost the same time the tubes are. Envelopes used with the Novar base include the T9 and T12 types. The over-all height of the tube shown in the photograph from the bottom of the pins to the top of the plate cap is about 4½ inches and measures about 1½ inches in diameter.

—*E. L. C.*

Strays

Let's all get behind Senate Bill 2361 and push! See pages 9 and 73 of October *QST*.

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* W1FZJ

SIX-METER SUNSPOTS AND SPORADIC *E*

NOT long after the sunspot count started to decline someone suggested an article entitled "The Rise and Fall of Six Meters." Somehow, somewhere, somebody got the idea that six meters would never again be open for any kind of DX except ground wave after the sunspots declined to the point where the F_2-layer m.u.f. no longer reached 50 Mc. Suffice it to say that notions like this were not entertained by anyone who had any experience with 50 Mc. However, we must face the fact that there are licensed radio amateurs who don't have a background in radio propagation nor the experience as amateur operators to be able to evaluate the meaning of sunspot count decline. To many of these more-or-less newcomers to the v.h.f. ranks, the startling sporadic-*E* openings exhibited by the 50-Mc. band during the last spring and summer seasons proved that the prophets were not only without honor but didn't know what they were talking about. To the extent that they question the ability of anyone to predict the amount or intensity of the sporadic-*E* openings on 50 Mc. they are certainly correct.

All the so-called "old-timers" have various rules of thumb to predict the probable behavior of 50 Mc. in the coming years. Few of them, however, have any feeling of security in their predictions. For while it is safe to predict the probable F_2-layer maximum usable frequencies, as a result of sunspot activity, such predictions are not intended in any way to reflect on the likelihood of sporadic-*E* openings.

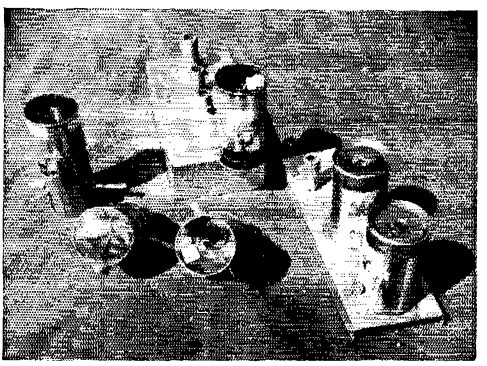
I am not about to enter a discourse on the various methods of wave propagation. If you are not in possession of the ARRL *Antenna Book*, you should be. If you are, and you have not read the first chapter on wave propagation, you should have. If you did, a discussion of the matter is not required. If you didn't, do. In any event, suffice it to say that propagation which is directly affected by sunspot activity is to a considerable extent entirely predictable. Propagation by the means of sporadic *E* is by definition "unpredictable."

If you are a real experimenter and keep records for many years (as, for instance, W1DEI), you can quite probably readily prove that sporadic *E* occurs most often when the sunspots are low, or occurs most often when the sunspots are high, or occurs most often in the in-between periods. Or to put it another way, you can prove almost anything about sporadic-*E* propagation except how good will it be next spring. One thing is certain, there have been years when sporadic-*E* propagation has been relatively poor. And then there have been years like last year. Also, we must face the fact that sporadic *E* is the principal type of propagation which will allow relatively long distance communication on 50 Mc. until the next sunspot peak comes around.

Now as long as we're stuck with sporadic *E* as our prime long-distance propagation medium, it would seem that a small amount of familiarization would be in order. In the first place if you wish to make the most of sporadic-*E* propagation you must be prepared to use it to its maximum when it does occur. Sporadic-*E* ionization is present much of the time. It accounts for many of the good contacts which are enjoyed on the lower frequency bands. Ten-meter enthusiasts are inclined to call this type of propagation "short skip." Seventy-five-meter enthusiasts are wont to say "Gosh, the band was good last night, wasn't it!" Unfortunately, on 50 Mc. the intensity of ionization required to provide good solid contacts with relatively low-power equipment is such that only rarely do the right conditions present themselves, except during the May-June-July period. Now if you're a W1LUN type you put up a bigger antenna and run a little more power, and keep right on talking to Florida. (This is known as "do-it-yourself" type sporadic *E*.)

Now you don't have to run a kilowatt, put up a 64-element beam and go over to c.w. in order to maintain communications on six meters. On the other hand, optimum results on 50-Mc. sporadic-*E* propagation cannot be obtained with 10 watts into a halo. In fact, the maximum use of sporadic *E* requires the best antenna you

* P. O. Box 334, Medfield, Mass.



Can you pick 'em out? W6TZJ can—he sent us the photograph. Two objects on the left: 3700 polaplexers. Coax tank in center for 220-Mc. TVI. 220-Mc. converter toward top. Object on right is experimental 2-meter converter. Those aren't objects, they're beer cans—I can tell!

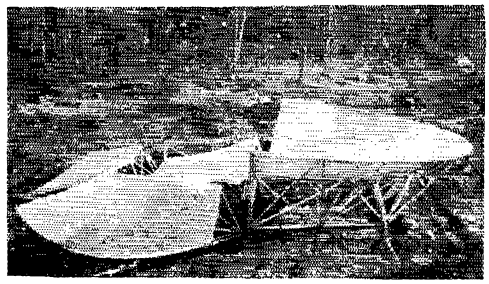
can possibly put up. Despite some ill-founded rumors to the contrary, a low-angle of radiation is very desirable for long-haul sporadic-*E* propagation. This would tend to favor some type of stacked antenna. I do not wish to enter into the pros and cons of so-called long yagis versus so-called short yagis. However it is pretty easy to stack two four- or five-element beams, and a boom long enough to do justice to eight or ten elements is a pretty unwieldy affair.

In any event, whatever your choice, the sporadic-*E* season is the time to have your best antenna up. And don't forget the minor E_s season is just around the corner. Just to prove that sporadic *E* is always with us, pay close attention to the propagation conditions during the coming v.h.f. Sweepstakes. (January 6 and 7 — see page 20, December *QST*). The unusually high activity which always occurs during this annual event guarantees that even the slightest patch of sporadic *E* will be taken advantage of. Incidentally, if anyone is interested in getting a multiplier from eastern Massachusetts by way of six or two meters, W1HOY is open for schedules. If you are interested please drop a card as soon as possible, as time is short.

50 Mc.

A short note from Carl Milner, W1FVY, informs us that he has now taken over Bob's place as six-meter operator at KL7FLC, ice island "Arlis II." Carl included a digest of the stations worked by KL7FLC from August 31, 1961 until October 28, 1961. This included one or more contacts with the following stations: KL7AUV, KL7CUH/m, VE8BY, VE6IP, VE8CM and W6VTE/KL7. Pete, VE8BY, at Yellowknife, holds the record with thirteen contacts with KL7FLC out of their total contacts of twenty-four. Seems that they are having trouble with the automatic keyer on "Arlis II" and VE8BY heard them several times when he could not make sense of the transmissions being sent. VE4TX has also heard KL7FIC but no contact as yet. Cliff sez that on the morning of October 29 at 0450–0453 and 0502–0504 GMT he heard the code wheel with highest signal peaking about S3. Cliff's log of October 1 makes interesting reading? 0250–VE8BY's code wheel, 5-9-9; 0258–CQ de K2DS? and unidentified Michigan station; 0302–CQ de K3HNP; 0318-0339-QSO VE8BY, his 220 watts 5-9-9, my 20 watts 5-3-9; 0542-0603-QSO VE8BY his 200 watts 5-9-9, my 20 watts 5-8-9; 0612-VE6IP de W7EGN (EGN heard VE8BY); 0615-CQ de KØUDZ2-1-9; 0622-0641-QSO VE8BY, 5-9-9 and 2-1-9/5-9-9. During these QSOs Pete passed along the information that both he and KL7FLC got into VE6 during the contest and that they had been having regular contacts between Yellowknife and Arliss II.

W8OWE, Lonnie Hawkins, is another station to be looking toward the north for on 50 Mc. Lonnie is now working in Adak, Alaska, and will be there for about one year, according to W8MBH. He expected to be set up on 50 Mc. by the first week of November and will be running 400 watts on cw. From Spenard, Alaska, Jack Reich, KL7AUV, reports his contacts with KL7FLC and has the following information concerning the contacts: "One unusual factor in these reports is that all are subject to QSB and most of the c.w. contacts were unusual in that there appeared to be a multiple-path signal with some frequency shift on one path. In other words, two distinct signals were present, about 500 cycles apart. These signals appear to be approximately the same strength and were keyed identically in time — at least as far as the ear could determine." Jack also corrects information printed in this column when we said that he had had several contacts in the southeastern states earlier this summer. Seems that these must have been bogus contacts as Jack's last stateside contact was into California during an *Es* opening in 1959. He's almost as sorry about it as those stations who thought they finally had an Alaskan contact.



Assembling a 28-foot dish at the R.S.V.H.F.S.

A number of aurora reports also received from the 50 Mc. portion of the v.h.f.ers; for instance K1LPL in Rhode Island says that he noticed several weak openings during the auroral sessions of October 2 and October 28. K1LPL is one of many working on converters and is finding out that his nuvistor converter for six and two meters is now finding signals which previously were too weak to read or just not there. K1JQT, Westminster, Massachusetts, reports a very good auroral opening on September 30 when he heard WØTTI and K3HRM. Phil sez he heard many ones and twos calling stations in Pennsylvania, West Virginia, Virginia, Missouri, Illinois, Indiana, Ohio, Maryland and Delaware, but he was unable to work any of 'em. Phil is also interested in starting a teen-age net on 50 Mc. Anyone interested get in touch with him. Walt McUmber, W8BAN, mentions that while there isn't much to report concerning 50 Mc., he did catch a nice auroral opening on October 19 and a brief *E* opening on October 28. Walt is trying to get a lot of operating done while the band has calmed down, as he doesn't get much chance at the rig when the band is open. His XYL, Edna, K8YKW and the jr. op, Bill, W8AKL, are both DX hounds, so when the band is open . . . !

KØRWC, Pittsburg, Kansas sez that the auroral visual display of October 2 and 3 was tremendous 25 miles northwest of Pittsburg; on 50 apparently that's where Dave was during the aurora 'cause he doesn't mention hearing or working any of it on 50 Mc. The aurora of October 11 was caught by W8MBH in Detroit, Michigan, when ones, twos, and threes were getting into that area via aurora. Reg also reports that s.s.b. activity on 50 Mc. in the Detroit area has picked up considerably, and that a number of stations are on RTTY on 50 Mc. Ten stations on s.s.b.; six on RTTY. (Things are picking up all over.)

WA2BPE reports hearing aurora on October 1, 11, 19, 26, and 28; with the one of the 28th classed as "excellent". Tom said that the aurora peaked (for him in Corning, New York), at about 40 degrees west of North. He got into a six way at about 1530 with K3MKB, W8ZRL, W8PKL, K8KPD, K1PYI and himself — all on sideband. A 4 tried to break in to the QSO but was too weak to read. Tom also noted two short openings during October, on the 20th and the 25th. On the 20th a very weak opening to WØ land — no luck; on the 25th a good but short opening during which he worked KØPXL/Ø, KØLFI and KØFUT, all in Missouri. Heard one 5 but was unable to identify. W1DDV of Hanson, Massachusetts, reports contacts with VE3CUA and W2JKI during the auroral session of September 30. W5SFW, Phil (better known all over the country as Slew Foot Willie) confirms the rumor we heard of aurora being heard in Texas. 'Twas at 1930 GMT October 28 that the 8's were getting into Texas via aurora. Phil's post card was filled with news from edge to edge, mostly concerning 50 Mc. in Texas on October 27 and 28. Seems that "the band was open from Amarillo to 4, 5, 6, 7, 8, 9, Ø, VE4 and VE6 lands on the evening of October 27 from 2230 GMT until 0630 GMT the next A.M. Next at 1930 GMT the 8's were in via aurora, followed from 2130 to 2230 GMT an F_2 opening to South America with terrific commercial signals coming in from 49 to 50 Mc." Phil worked K5BTC, Anderson, Texas on backscatter and heard K5ZTH Chocktaw, Oklahoma and W5ZTE, Hurst, Texas — both on backscatter. At 0200 GMT *E* skip came through to 4 land.

W4BCL mentioned hearing an HK in the F_2 opening earlier in the afternoon. Phil also mentioned that he has received his QSL from KP4CL/KV4 who he worked on

2-METER STANDINGS

W1REZ	32	8	1300	W5YYO	7	4	1330
W1AZK	28	8	1205	W5UNH	6	3	1200
W1KCS	24	7	1150				
W1RFU	24	7	1120	W6W8Q	15	5	1390
W1AJB	23	7	1130	W6NLZ	12	5	2540
W1HDQ	22	6	1020	W6DNG	9	5	1040
W1MMN	21	7	1090	W6AJF	6	3	800
W1IZY	20	7	1180	W6ZL	5	3	1400
K1CRQ	19	6	800	K6HMS	4	3	850
W1AFO	18	6	920	K6GTG	4	2	800
K1AFR	17	5	450	W6MMU	3	2	950
W2NLY	37	8	1390	K7HKD	13	5	1130
W2CXY	37	8	1360	W7JRG	12	4	1040
W2ORI	37	8	1320	W7LHL	5	3	1050
W2GQI	33	8	1200	W7CJM	5	2	670
W3BLV	30	8	1020	W7JIP	4	2	900
W2AZL	29	8	1050	W7UJ	4	2	235
K2LMG	27	8	1160				
K2IEJ	27	8	1060	W8KAY	38	8	1245
W2AMJ	25	6	960	W8PT	38	9	1260
K2CEH	24	8	1200	W8SDJ	37	8	1220
W2ALH	24	8	1100	W8IFX	35	8	980
K2DWJ	23	6	860	W8SFG	34	8	1040
K2HOD	22	7	950	W8LOF	33	8	1060
W2PAU	21	6	753	W8RMH	32	6	910
W2RXG	23	8	1200	W8GGH	32	8	1180
W2SMX	23	7	1090	W8BAX	32	8	960
W2LWI	21	6	700	W8NOH	31	8	1090
K2KIB	21	5	900	W8SVI	30	8	1080
W2ESX	21	6	750	W8EHW	30	8	860
W2UTH	20	7	880	K8AXU	29	8	1050
W2WZR	19	7	1040	W8LPD	29	8	850
W2RGV	19	8	720	W8WRN	28	8	680
K2RLG	17	6	980	W8DX	26	8	720
WA2GCH	3	3	140	W8ILC	25	8	800
				W8JWV	25	8	940
W3RUE	33	8	1100	W8WNM	25	8	900
W3EPH	32	8	1000	W8GFN	23	8	540
W3GKP	31	8	1180	W8LCY	22	7	680
W3SGA	31	8	1070	W8BLN	21	7	610
W3TDF	30	8	1125	W8GTR	17	7	550
W3KCA	28	8	1110	W8NRM	17	7	550
W3BYF	28	8	1070				
W3LNA	21	7	720	W9KLR	41	9	1160
W3NKM	20	7	730	W9WOK	40	9	1170
W3LZD	20	7	650	W9GAB	34	9	1075
W3LST	20	6	800	W9AAG	33	8	1050
				K9AAJ	31	8	1070
W4HJQ	38	8	1150	W9REM	31	8	850
W4HHK	37	9	1280	W9ZIH	30	8	830
W4ZXI	34	8	950	W9PRP	28	8	820
W4LTU	34	8	1160	W9LVC	27	8	950
W4MKJ	33	8	1149	W9EQC	27	8	820
W4AO	30	8	1120	W9OJI	27	8	910
W4VLA	26	8	1000	W9ZHL	25	8	700
K4EUS	26	7	1130	W9BPV	25	7	1030
W4EQM	25	8	1040	K9AQF	24	7	900
W8AIB	25	8	900	W9LF	22	7	825
W4WNH	24	8	850	W9KPS	22	7	690
W4JCJ	23	6	725	K9SGD	21	7	1100
W4VVE	22	6	720	W9CUX	21	7	800
W4RMU	21	7	1080	W9ALU	18	7	800
W4TLV	20	7	1000				
W4IKV	20	6	720	WØBFB	37	9	1350
W4OLK	20	6	720	WØIHD	31	8	1030
W4RFR	18	9	820	WØSMJ	29	9	1075
K4YUK	18	8	830	WØLFE	28	7	1050
W4LNG	18	7	1080	WØQIH	27	9	1300
W4CPZ	18	6	650	WØRUF	23	7	900
K4VWH	18	6	590	WØMOX	22	6	1150
W4MDA	17	6	757	WØINI	21	6	830
				WØTGC	21	7	870
W5RCI	37	9	1215	WØRYG	20	8	925
W5AJG	32	9	1360	WØIC	19	7	1245
W5FYZ	29	9	1275	WØJAS	18	6	1130
W5JWL	29	7	1150	KØAQJ	16	6	1120
W5DFU	28	9	1300	WØIFS	16	6	1100
W5PZ	27	8	1300				
W5LPG	25	7	1000	VE3DIR	30	8	1330
W5KTD	23	8	1200	VE3AIB	29	8	1340
W5ML	16	5	700	VE3BQN	19	7	790
W5FSC	12	5	1390	VE3AQG	18	8	1300
W5HEZ	12	5	1250	VE3DER	17	8	1340
W5KFU	12	4	1300	VE3HW	17	7	1350
W5SVW	12	4	745	VE3BPR	14	6	715
W5CVW	11	5	1180	VE2ABF	10	4	580
W5NDE	11	5	620	VE7FJ	2	1	365
W5VY	10	3	1200				
W5EDZ	8	5		KH6UK	1	22	2540

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

July 25 on 50 Mc. *She* was using a G-50 and a 3-element beam. More news contributed by Phil sez that K3LFW/5 is now operating from Clovis, New Mexico, with a Seneca and beam for those who need that state. And a final bit from Phil sez that XE1GE mentioned openings to South America from Mexico during the early part of October. W6CDQ heard a short opening to Texas on October 8 but that was it.

WØHPS, Minnesota is looking for schedules (c.w., that is); he operates 50.1 and will be there nightly from 2200 to 2300. Pinky is erecting a 120-foot tower, 48 inches on a side, and galvanized, too; as Pinky sez "Geel". Atop the tower will be arrays for 50, 114, and 220 Mc. K3KPA and K3PXA both write to tell us a small amount of activity in the upper 2 Mc of the 50 Mc band. K3MPW is also working up there with John and Russ and the three of them are trying to stir up more interest in that portion of the band. These boys also agree that ground wave has been very good during October in the early and late evening. Too much QRM during the shank of the evening. Wyoming is becoming 50-Mc. conscious with the aid and assistance of W7UFB, W7VTB and a few others.

Bob, W7UFB noticed a trace of aurora on September 30 and worked KØTUD in Omaha at that time. He also heard K9QYA and WØCCD that same evening. On October 27, the sporadic *E* brought forth Missouri, Arkansas, Tennessee, and the 7's to the northwest of him. In Ames, Iowa, Jim McMechan, WØIFP, noted the opening of October 28 hearing Alabama, Texas, Louisiana, Oklahoma, Montana, Colorado, Wyoming and Utah during the period from 0030 until 0250 Z. Jim has been keeping skeds with W9HGE in Beloit, Wisconsin (about 250 miles) each morning with results being quite good.

K4KYL, Jim Rule, noted the auroral opening of October 1 when he heard six states coming in via that method. He also noted the sporadic-*E* openings of October 28 (Texas and Nebraska) and October 29 (Texas). Jim sez six-meter activity has slowed down considerably in his area with many nights hardly a station to be found on the air. (In New England the band is quite quiet during the daytime but at night there's so much activity you'd never know there was any decrease in activity.) WØENC from Rapid City, South Dakota, sent in a report noting that he noticed the aurora of October 19 and heard K7CMU working WØUDZ on 50 Mc. Also on October 20 a short *E* opening at 2000 when KØUDZ worked VE3CIK, K8MMM and K8KOB. October 25 KØUDZ once again worked the opening contacting K8NZW and W8CCB. K2JRP reported an opening to Nebraska (and a new state for Fred) on October 24; while K2PQY reports hearing K1FCT in Maine on October 27, but had no luck with a contact.

KØGIC, Dot, comes through once again with the following "No skip openings here until October 26 — 0305 to 0325 GMT, Vermont, New Hampshire, Pennsylvania and New York were in. October 28 — 0023 to 0118, Indiana, Illinois, Michigan, Wisconsin, Texas, New York and VE4 were in. The band closed down and opened up again to South Dakota, Montana, and VE6IP. W7EGN heard on cw long after phone signals were gone. After an hour and a quarter the band opened up again to Arizona for about twenty minutes. October 29 — 0320 to 0402, Florida and Alabama were in."

Clubs and Nets

The newly organized Casper VHF Society meets the first Monday night of each month unless members are otherwise notified. Officers elected at the first election were Armond Noble, K7MFA, President; Robert Lane, W7UFB, Vice President; James Masterson, W7PSO, Sec/Treas.; Robert Downs, W7VTB, Activities Manager. Armond was forced to resign soon after he moved to Billings, Montana and Bob Lane, Vice Pres., was voted in as President with the office of V.P. left open for the remainder of the term. The club was organized to promote v.h.f. activity and experimentation in the Casper, Wyoming, area. All active v.h.f. amateurs in the area are urged to apply for membership.

The Casper VHF Net meets Monday nights at 2100 MST on 50.105 Mc. This net recently organized will soon hold drills on 50.350; members of net are K7GLL, W7PSO, W7UFB, W7UDZ and W7UTB.

The Massachusetts VHF Society recently held its election meeting with the following results: W1QXX, President; W1KCO, V.P.; K1AAA, Secretary; K1ISL and K1EJW elected as members on the Board of Directors.

The Evergreen 50 & Up Society Inc. is the active group in the Seattle, Washington, area. Among many activities sponsored locally by this group is their Fall Round-Up, an on-the-air contest held in December; the Puget Sound Emergency Net, which meets every Monday at 2000 local time on 50.850 Mc., with K7LQI acting as Net Control; and, of course, their very fine and informative *VHF News* giving any and all information concerning the club, its activities and its members.

A new traffic net called the Seven-Eleven Traffic Net has recently been started on 144 Mc. Net meets each day of the

week at 0000 Z and 0400 Z on 145.350. Traffic passed on the net during October–1560. Five regular members check in plus six or seven other occasional check-ins, ranging from southwest Miami to Cocoa Beach to Auburndale, with three daily contacts from Stuart to Lake Worth.

220 Mc. and Up

Now that the winter season is with us we are happy to note that W8PT has gone back to work on his push-pull 4X250B final for 220 Mc. Jack has been having a little TVI problem on 144 Mc. because of image interference with Channel-2 receivers. So far no trouble on 220, hence the high-power final. (Or, how to get acquainted with your neighbors.) Schedules on 220 Mc. from W8PT to W8GOV, W8CVQ, W9REM and W9SKN continue. Jack also maintains 432-Mc. schedules with W8JLQ, W9GDP and W9OII. If you want to join in or listen in I would suggest a postcard to W8PT for times and dates. Incidentally, Jack just worked his 6 state on 432. A real good showing from Michigan. The 220-Mc. converter that W8PT is presently using a nuvistor preamplifier in front of the 417A. Jack claims a better noise figure and less burned out 417As.

WØIFC in Jennings, Missouri, has just completed a nuvistor converter for 220 Mc. also. Of interest to Missouri-ites is the Monday evening at 10:00 P.M. 220-Mc. get-together. KØABK, KØHZW, and WØIFC are in regular attendance. These boys, also joined occasionally by WØQHL, are increasing the weekly Monday meetings to three nights a week. Note that they also monitor the 50-Mc. band for any crossband contacts. 50 Mc. to 220. W7IST, who operates 220 Mc. only, is still looking for schedules in his area. Lack of contacts have prompted Allan to rebuild his converter in the hope of improving his reception. The best probable solution to Allan's problem would be another Auburn, Washington, 220-Mc. enthusiast, any takers?

W6IEY is launched on a program of building W6AJF converters for 220, 50, 144, and 1296 Mc. Louis hopes that the new converter series will improve activity in the La Mesa, California area. Speaking of California and 220 Mc., at least one active group in the eastern end of the country is looking for moonbounce activity on 220 Mc. Bill Clark, K2IWS, of the Niagara Radio Club in Niagara Falls, New York, is hoping to hear from any 220 Mc. activity in the moonbounce area.

This is a good time to call for a show of hands on the 220-Mc. band. W1BU is presently erecting a new paraboli-reflector which will be of sufficient size to allow communication by way of the moon on 220 Mc. We will be ready to accept schedules in the early spring. The antenna will consist of a forty-eight foot parabolic reflector on a polar mount. Transmitter has an RCA 6181 running 1000 watts input. Receiver will be using a parametric amplifier into a very narrow-band i.f. system. We are open to suggestion on the frequency to be used, polarization with respect to the hour angle arm, and low frequency bands for liaison use. While on the subject of moonbounce, we are pleased to note that the W6 end of the 1296 Mc. moonbounce contact is being reactivated. The Eimac Radio Club has appointed Ray Rinaudo as chief engineer of the project. A great move! Operating under the call of W6AY, the Eimac gang hopes to be on before the end of the year. Meanwhile, the sudden availability of the UPX-4 1296-Mc. transmitter receiver combinations has put a number of other groups within striking distance of being on the air. K2TKN has completed a modification of the ring amplifier which uses six 2C39s. Bill is preparing an article on this modification which should appear soon. Suffice it to say that the modification, which requires less than an hour's work, results in between two and three hundred watts output from the amplifier.

As of this writing there are no more UPX-4's available in the Boston area. Of the ten which we were able to acquire through the good offices of W1QXX, two were shipped to California, three to Canada, three to New Jersey, one to Ohio, and two to the Boston area. A letter from VK3ZGG requesting a reservation of one of the UPX-4's came too late. Jim reports that the two Michaels, VK3ZEO and VK3ZEZ, are progressing apace with their 20-foot parabolic reflector. They have chosen a location which provides a good horizon shot to the northeast. One of the biggest deterrents to their operation is going to be the transmitter. If anyone is in possession of an extra UPX-4, please communicate with W1FZJ for particulars.

WA6GHW of Manhattan Beach, California, reports a modest amount of activity on 1215 Mc. Among others WA6DII/6 in Gardena, California, is on. Glen is making mobile in motion experiments using a ¾ wave slotted pylon taped to the roof of his car. Best distance so far was about two miles to W6YFK. Any challengers for best mobile 1215-Mc. DX? Glen also points out a considerable amount of experimentation on his part on the 10,000-Mc. band. If anyone is interested in obtaining his present line of experiment, we would be happy to send a duplicate of his activities. Drop a card to Sam Harris, W1FZJ, 99 Elm Street, West Newton, Massachusetts, for this information. Please note that this is only a copy of his past experiments and his proposed future experiments. If information on his present activity is desired, please address your inquiries to Glen Johnson, WA6GHW, 1544 Deeds Avenue, Manhattan Beach, California.

W3ZAC notes that 432 Mc. activity in his area (Feasterville, Pennsylvania) encompasses six states. Represented are Virginia, Connecticut, Pennsylvania, Maryland, Delaware and New Jersey. (Please note no New York.) As this activity encompasses some twenty different stations, it would seem that the Philadelphia area at least is well represented on 432. Anyone interested in schedules with this area should address inquiries to W3ZAC. While we're in the 432 category I take leave to point out that K3OGA of Baltimore, Maryland, has completed the conversion of the BC645 for 432-Mc. use. Anyone interested in modulated oscillator type experiments on this band should get in touch with James Cullen, K3OGA. A new star in the Indiana area on 432 Mc. is K9UIF in Hobart. He is operating on 432.-005 Mc. So far he has been in contact with W8JLQ, Ohio; W8TYY, Ohio; W9AAG, Illinois; W8PT, Michigan — providing a new state for all. I understand that schedules are cheerfully accepted.

W1QWJ, Springfield, Massachusetts, reports 432-Mc. activity on the low side. However, one good opening allowed contacts with W3ZFW, W3CLK, W2BLV and K2DZM. (For the benefit of Westerners these distances are in the vicinity of 150 to 220 miles.) Dick has also been working on a 1296-Mc. crystal controlled amplifier/transmitter using a 2C39 flat-plate amplifier. So far he has obtained six watts output and is feeding it into a 32-element colinear. QST

Strange Happenings on 50 Mc.

Some 50-Mc. DX heard and worked in November fits no known propagation pattern. Between 2150 and 2200 EST Nov. 5, K1KTK, Brookline, and K1OHU, Reading, Mass., worked a station signing YV5EKM. Another station, believed to be YV5UVR, was heard. Now, it's a long time since any South American stations have been heard in the northern parts of this country on 50 Mc., and never before have there been any Venezuelan contacts. To make the picture even stranger, this is the latest in the evening that north-south DX of this extent has ever been reported in the Northeast.

At 1110 EST the same day, K1DIT, Chelmsford, Mass., heard an s.s.b. station, thought to be W7RT, calling W8LVE on 50.3 Mc. W7RT has already stated that it could not have been he, yet K1DIT reports that the signal had every evidence of being DX.

W1FZJ dwells on the vagaries of 50-Mc. propagation elsewhere in this department. The band has a great reputation for springing surprizes, but these two surpass anything reported of late. If any reader can shed further light on these events, we'd be glad to hear from him. — *W1HDQ*

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How—so?

It's not a bad idea to start off the new year with a cheery chuckle, so we poked about in the "How's" mailbag for something appropriate. Reliable K3CUI zero-beats the theme with a clipping from a recent edition of the Washington *Post:*

Postman Calls U. S. Stamps Chinese, Bounces Letter Back to Sender

Marie de Pingre, cashier at the Statler, is having so much trouble trying to mail a birthday card to Luxembourg that she's going to lug it over herself.

Her troubles began eight days ago when she left her home at 1431 Crittenden St., NW, and mailed an envelope containing the card to her brother, Francois, in Luxembourg.

She got it back last Monday because it had insufficient postage — 16 cents instead of 30 cents. So she put on 14 cents worth of stamps including a U.S. 4-center featuring the face of Sun Yat-Sen and commemorating the 50th anniversary of the Chinese Republic.

Well, she just got the envelope back again. The postman told her the Sun Yat-Sen thing was a Chinese stamp and no good. "Did you ever hear of such a thing?" exclaimed Mrs. De Pingre. "I couldn't convince *him*, so I gave up trying."

Anyway, it's too late now. Francois' birthday was last Tuesday, and his sister is going to keep the card and the envelope as a souvenir of confusion.

"I'll keep it and take it to Luxembourg myself next year," she said. "Francois is a big stamp collector, and he will like these stamps — and this story."

Moral? Take your pick. Of direct and vital concern to DXers, who sometimes plaster QSL shipments with commemoratives just in case rare recipients happen to be collectors, it would appear prudent to use U.S. postage recognizable as U.S. postage. Our P.O. has enough to do without its job being unnecessarily complicated by jokers who paste perplexing artpieces on mailings. The confusion is further compounded by the fact that it's often not easy to tell whether you've got the things stuck on upside down, sideways or inside out.

What:

The new year certainly promises to be an interesting one for the DX crowd. Operational emphasis is shifting toward lower frequencies as the sunspot count declines toward a minimum which should occur in 1964–'65. Longer and higher skywires, optimum receiver selectivity, more patience and longer operating periods will be required to keep those DX QSLs rolling in. Brushing up on c.w. capabilities also will help keep one's DX log well fed as propagational openings grow more marginal. But the phone gang can expect to hit DX pay dirt on

75 phone where W1s BU FOS FRR FZJ HKK, K1s HTV IDR, W5KNE and VE3PV are hobnobbing with **DJ5ID, HR3HH, HZ1AB*, KG4AP, PJ2AA*, TG-5HC, UC2AA*, VP7BP, ZL1AIX** and **ZS6AJH***, plus some KH6s and KL7s, the asterisks indicating single-sideband specialists . . . . . Downband on **80** the dit-dahs of K1-HTV, WA2KWB, K5JVF, WA6IVM, W7DJU and KØJPL flag down scads of DJ/DLs and Gs, EL4s A and YL, **HC1-AGI, HK3AH, JAs** 1ON 2BCT (14 hours GMT), 7LK 8AWG, **KH6EGL, KL7AUG, ON4s** HC HK, W4VAK/**KH6**, some VKs and ZLs.

40 phone interest increases inversely as 20's dependability wanes. K1HTV, K5YAA, WØPAM, EL4s A YL and KG1BX get through to ELs 6F 6N 8B 8E, **HHs** 2JK* 8BV*, **HK2WO, HZ1AB*** (7896 kc.), **HR3HH*, KG1s** AA* BX (204) 8-9, **KH6DG*, TU2s** AC AL, XE1-CV, **9G1s** DP and YL despite the raucous BC and jammer depredations.

40 c.w. satisfies K1s HTV JFF JKS, K2JUA, WA2s LDC KSD KWB SLB, K5YAA, W6RCV, K6CJF, WA6s IQM IVM, W7s DJU LZF POU, W9NN (162 confirmed on 40), K9s JPL TZH UCR, KN9FLJ, WØPAM, EL4s A YL and VE7BBB with quite an assortment of imports: **CEs** 2GS 3OE, **CN8s** BP MB, **CO2CT** (7017 kc., 0400 GMT), **DM3LK, DU7SV, EA8CP, EL4s** A YL, **ET3Q, FA8RJ, GC2FMV, HKs** 1AAF ØAI ØQQ, **HP1IE**, three dozen **JA1s**, seven **JA2s** seventeen **JA3s, JA1s** BCN YZ, **JA5s** ADR FQ NG, eight **JA6s**, seven **JA7s** six **JA8s**, JA9NA, **JA0s** ACX PF, K4JQV/**VP9** (80) 8, **KG1s** AA (20) 3, FD, **KR6NW** 13, **KW6DM, KX6AJ, KZ5MQ, LU1s** YC **ZL, LZ1s** KAA (40) 3, KED, many LAs, **OA4FM, OD5AB** a batch of OE-OH-OKs, **SP3KBQ, TU2AL, UAs** 9QZ ØKZA ØLJ ØLL 14, **UB5VU, VKs** 6WT 7ZZ, VO1BD, **VPs** 5BH 5BL 7BP 7NG (28), 7NQ 9EP, **VRs** 2DK 6TC, **VS1KQ** 14, **VU2RX, XEs** 1HO 2FJ 2OK 2UA, numerous YVs and YUs, YN1OC, **ZC4CT, ZE3JJ** (10) 3, **ZK1BS**, many Z8s, **4X4DF, 9K2AK** and **9M2FK**.

15 phone holds up well for W1BPM, K1HTV, W2-WMG, K2TDI, WA2s FQG KWB SLB, W4LJV, K4FRM, K5YAA, K6MQG, WA6s DNM IVM ORS, W7MH, K8s GJD RDE, K9s TZH UTM, EL4s A and YL, providing good shots at **CEs** 1AGI 3CQ 3HZ, **CN8IK*** (440), **CRs** 6JL 18, 7BN 7CK 9AN 0, **CTs** 1OR 2A1, **CX-9BA*, EAs** 6AZ* 8BA* 8CF 8CV, EL2Q 18, **FG7XL, GD3UB, HC1FM, HH2RD, HI8s** DGH* GA* (420) 13, **HK6LI, HP1AP, HZ1GB*, JAs** 1BDF 1CYG 1DBR 2BEK 3BOA 3WU 4AWH 4CI 6AFO 7RB 7UJ 7VI (200) 1, 7WI 8WQ 23, 9UU 23-0, **KAs** 2LL 5AS, **KB6BS, KGs** 1AA* (427) 17, 4AL (310) 16, **KR6s** JG 2, MF 0, OC 23, **OA4K, OE2HW, OX3KM, SL6BA, SP9KJ, TF2WGF*** (410) 17, **TGs** 5RM 9ED (250) 0, **TT8AD, UR2KAE, VE3BQL/SU** 16, **VPs** 2AR 2SY (17), 3FM 5BL* (410) 23, 8DW of the Falklands, **VQs** 2MS 2WZ 4RF 5IH, **VSs** 1FE (25) 0-1, 9AAC* (405) 1, 9MB, **XEs** 1RY 1ZC 2FV 3BL 17-18, **XW8AL** (250) 0-1, **YVs** 2DW 3EJ 4DU, YN5AV (250) 0, **ZBs** 1HC 17, 2AD, **ZD7SE, ZE7JV, ZK1AR, ZS7L, 4X4s** HC* LC* ME OC, **5A2TC, 5N2AMS** and **9U5VS**, the asterisks for s.s.b. users.

15 c.w. boosters K1s HTV JKS NST SGV, W2WMG, WA2s FQG (118/101 countries claimed worked/confirmed), KSD SLB (25/6), K3s CUI MNJ, K4s FRM KSY, K5s FPU YAA, W6RCV, K6s CJF MQG, WA6s DNM (47/38), FGX IVM ORS, W7s MH POU, W8KX, K8OKM, W9CLH, K9s BHR TZH UTM YOH (40/12), WØBEB, KJPL, DL9LI, EL4s A YL, VEs 3PV 7BBB and ZS2U recommend the logging of **CN8ED, CO2PY, CRs** 7IZ (35) 17, 9AH, **CT2AI** (95) 20, **CX2BT, DM3s** 8NO (60), JBM RD, **EA6s** AM (25) 17, AZ (87) 19, EL6E 13, **GD3FXN, HAs** 5FQ (35), 8WH 10, **HC1AGI, HKs** 7BE 7YB 7YC ØAI, **HZ1AB**, oodles of JAs led by 4DZ 4IO 5CB 5FQ 9NB ØHC ØKA, Ks 6EJD/**KM6** 7LRK/VO1, **KGs** AO AQ, **KM6BU, KR6s** IN KS LD, **KW6DF, LA9XG** (90), **LUs 1ZL 4ZM, LZ1KPZ, OA4s** FM JH, **OEs** 3AT (30), 6PN (50), **PJ2AE, PZ1AR**, a quantity of 8Ps, **TI2DL, TT8AE, UAs 2AK** 2KAA (64) 13, **9NN**, ØFG ØGF ØKJA, **UB5JX, UC2AR UO5BN** 13, **UP2s** AP NS 15, VE8s NR RX, **VK9GP** (35), **VPs** 5BH (30) 7BAN, VQs 2WR (70) 20, 4DW 5IB 5IG (75) 19, **VS9MB** 15, **VU2JA** (46) 16, **WL7DSI, WP4s** AYP BBW, **XEs** 1PJ (70), 2BM, YN3KM, **YO6XI** (40), lots of **YVs, ZB2AD** 17, **ZC4SS, ZE4JS, ZP5HK, 5As** 1TW 13, 3TQ 18, **5N2JKO** (8) 19-22, **5U7AC** 8, **6W8DF, 7G1A, 9M2FK** (30) 1, **9Q5PW** and **9U5DS**.

15 Novice news this month features a remarkable solo by WV6SBO (45/33) who defies the sunspot scarcity to work such stuff as **DM2BTO, HK7XI, HS1CR,** *thirty* JAs including 5NG 9TS ØKA ØMO, **KA2s** CM DL, **KR6s** AF IN LD NG, **KW6DM, OE3WB, UA3GF, VKs** 3XB 4DO, **VP8EE, WP4s** AYI AYP, **YU2OB, YVs** 1FI/4 4BH, **ZL1NG** and **ZP5OG**. A couple of years ago during the sun-

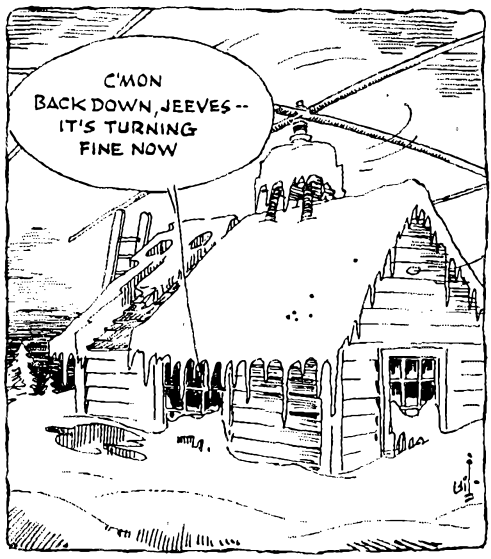
*7862-B West Lawrence Ave., Chicago 31, Ill.

spot peak we would have predicted a fast DXCC membership for this fellow!

20 phone continues to tease us with sudden spectacular openings — now you hear 'em, now you don't — that entertain K1HTV, W2WMG, K2TDI, W4IUO, K5YAA, K8s GJD RDE, K9TZH, EL4s A YL, KG1BX, VE3PV and ZS2U. Most of these are single-sidebanders: **CE**s 2AK (263) 4, 3UV (340), **CN8**s FU (302), IK 12, **CP5**EA (330), **CR6**CA (345) 0, **EA6**AZ (325) 20, **ET3**RS (283) 18, one FR7ZG 13, **HC1**AGI (315) 12, **HH2**s AD JT (280) 22, **HI8**GA, **HM1**AX 16, **HV1**CN (340) 20, K4PGL/**VP9**, **KA2**s JL (300) 7, VO (300) 7, **KG**s 1BO 22, 4AO (330), 5 **KX6**BU (287) 4, **LU1ZL** (273) 1-2, **MP4**MAH 18, **OA4**EY, **OE1**DH (265) 20, **OD5**-CT (290) 23, **PJ**s 2AF (329), 3AR (300) 3-4, **PZ1**AX (340), **SVØ**WN, **TF2**WGF (300), **TI2**EB, **TN8AZ** 6, **UA**s 1KAE (210), 3AT (303), 3CR (342) 20, VE8MC (325), **VP**s 1RT (190) 12, **5B**L 23 5CH (335), **7B**P **7N**P (276) 0, **VQ4**RF 22, **VR2BJ**, **XE**s 1ZE 22, 2FC, **YO3ZA** (326) 14, **YS1**MS (328), **ZD6**HK (276) 23, **ZS**s 3BC (305) 20, **3E 7P** (345) 22, **6W8**AD and **9G1**BF (346).

20 c.w.'s daylight hours fascinate W1AGS, K1s HTV JFF (95/86), JKS (100/74), NST (33/29), W2WMG (198/182), K2s JUA TDI UYG, WA2s KSD (101/79), KWB LDC, K3s CNN CUI JIQ MNJ, W4IUO, K4FXT, K5YAA (81/48), W6RCV, K6s CJF MQG (112/70), WA6s FGX IVM, W7s DJU LZF MH (147/128), POU (86/72), W8KX (217/204), K8s GJD OKM RDE, W9CLH, K9s TZH (120/102), UCR UHH UTM, WØBEB, KØJPL, DL9LI, EL4s A YL, VE7BBB, ZS2U and s.w.l. A. Rugg because of such items as **AP**s 2RP 5CP (78) 13, **BV1USB** 12, **CE9AS** (60), **CP**s 3CD (15) 0, 6FJ 2, **CR**s 6CA 7CI (28), **7IZ 9AH** (52), **CT**s 1LZ (86), 1TT (10), 2AI (30) 21, a dozen DMs, **DU1FM**, **EA6**s AAI (48) 20, AZ (56), **EL2AG** 1, FA3CT, **FK8**s AU (32), AZ, **FO8**s AC 6, AK (80), **FR7ZD** 13, GC2FZC (36) 17, **GD3GMH** (56), **HA**s 3KMF (90), ØHC (86) 21, Switzerland's **HB4FD**, **HC**s 1JU 1LE 2CS, **HH2OT**, **HKØQQ**, **HM1AS**, **HP1IE** 20, **HZ1AB** 0, many JAs led by **JAØPX**, **JZØs** ML PH (80), K3KRK/**VP9**, **KA2**s JM (15) 1, KS, **KC4USN**, **KG**s 1AA (50) 22, 1BB 1BO, 6AJS, **KH6-EDY** 3-7, **KR6**s GP (50) 15, KS 12, LJ 13, **KV4AA** (81) 20-22, far-south **LU**s 1ZL 1ZN 0-11, 3ZO (49) 22, **LZ**s 1AW (80), 1KPZ 2FN 2KSL (90), **MP4**s BDO (36), QAQ 0, **OX3UD**, **PI1STC** of Holland, **PJ2ME**, SM5ARQ/**9Q5**, **SVØs** WC (16) 18-22, WI, **TA2**s AR BK, **TF**s 2WFX (60) 21, 2WGB 3AB, plenty of TI2s, **TN8AT** 6, **TT8**s AE (40) 21, AG 17, **TU2AL** 14-23, **UA**s 1KED (30) 10 of Franz Josef Land, 2AK 2AW 2BD 2KAA (75), 9DN 9FJ 9FW (40), 9JH (49) 3, 9KPW (47), 9NN 9XG ØAH ØAL (58), ØDN ØFG ØIW (32) 1, ØKIB (61) 23, ØKZA ØRK ØVV, ample UB5s, **UG2**s AR (20) 15, BW CS (35) 14, KAO, **UD6BE** (81) 2-3, **UF6DD** (84) 11, **UH8BI** (81) 15, **UI8**s AQ 3, BU 3, **UJ8**s AH 15, KAA (80) 13, **UL7**s CH 20, HV 3, KAA (72) 14, KBK (106), KKD 4, **UM8**s CM (75), KAB 2-3, **UN1BE** (20) 16, **UO5**s AA KAA, **UP2**s KBA KNP, **UQ2**s AX (85) 19, KAE 18, KAT KBA, **UR2**s BV KAN, **UT5**s CC 14, CO GL (24) 13, **UW**s 3ME (70) 16, 9AG (30) 3, VE8s LG RX TU, **VK**s 9GP (25), ØFZ (90), ØTC 5, ØVK (73), **VP**s 5MJ 9EP, **VR**s 2DK 4CV 6TC, **VS**s 1KQ 9MB (35) 20, **VU2**s AD AJ (67) 2, AZ (41), **XZ2HT**, **YS1O**, **ZB1**s FA HC FQ 23, **ZC4**s CT 23, SS (96) 20, TX, **ZD**s 7SE 23, 8JP, **ZE**s IJU 4JS, **ZK1**s AK 5, AR (55), **ZS7**s M 13-15, R 14, **3A2CD**, **4X4**s JU LR MZ (95) 0, **5A**s 3CA (1) 20, 3CD 5TA 0, **5N2**s IND 0, JKO 15, LKZ (30) 20, RDG (53) 2, **SMW**, **5U7AC**, **6O1MT** 20, **6W8AD**, **9G1DE** (25) 21-23, **9M2FR**, **9Q5**s EI and US 17.

10 phone fools the critics with some impressive DX results although the U.S.A.-Europe path is conspicuous

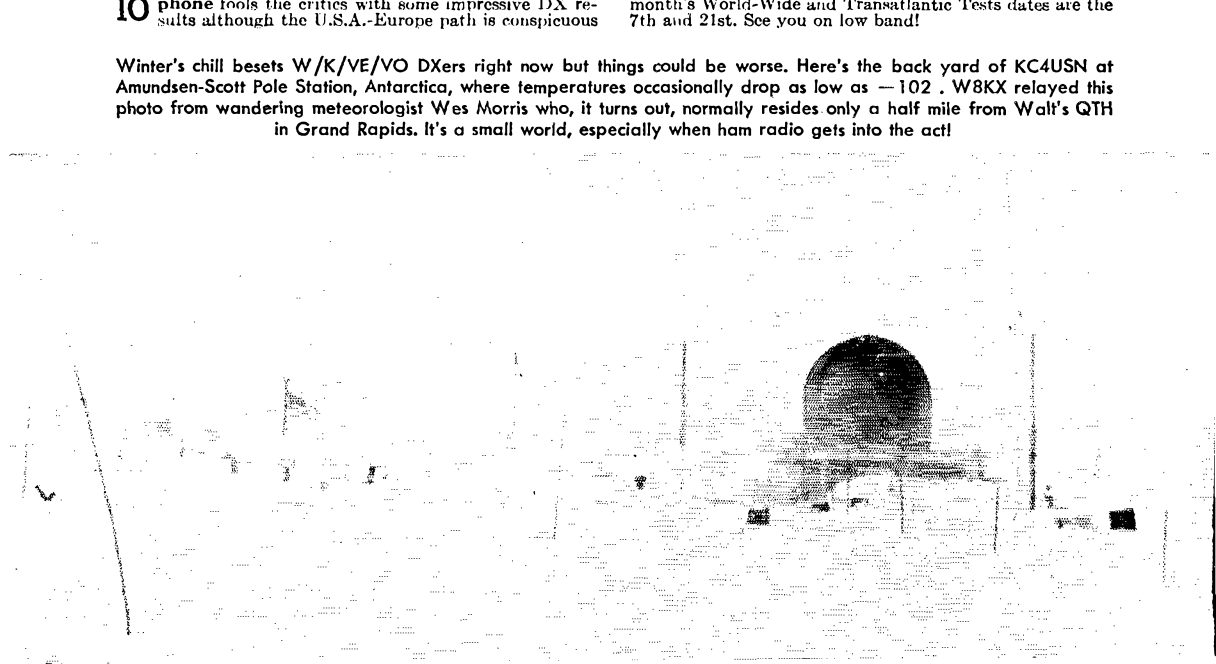


by its usual absence. K1s JSH HTV NJE (45/32), NST, K3JIQ, W4LJV, K6MQG, WA6s DNM IVM, W7MH, K8s GJD OKM RDE, K9TZH, EL4s A and YL do right well with **CE1AGI** (551), **CN8AC**, **CR**s 6CA 7CH 7CI 7CK, **CT1**s AP (400) 17-18, EY* (610), HF JH KF, **CX**s 2CO (680), 3AM, **EA**s 5GK 8CF 8CK, **F2FC**, **FS7RT*** (623), **HH2**s OP V, **HI8**s DGC DGH (480), **HKØAI**, **HR2**s HA (800), RH (500), **IS1ZDT**, **JA1FKY**, **KG4BC**, **KR6LY**, **KW6DG**, **OA**s 1W 4BP 4GP (58) 15, **PJ3AR**, **PZ1**s AX* (630), BW, **TG9BJ**, **TI2**s OE WA* (585) 17, **UAØLBQ** (450) 0, **VK**s 2ADE 2FU 2TG 3ANQ 4RH (480), 6RG (300), **VP**s 2GHU 2LA 5GT 17, 5LG 19, **ØRT** of Anguilla, **VQ**s 2MS 4AX, **VR2BC**, **XE1**s IQ RY, **YV1FV** (700), **ZE**s 3JU (548), 7JV 8JA, **ZL1**s AMO CA RI, **ZS**s 3HT 13, 7L, a stack of other South Africans, **4X4FR** and **5N2LKZ**. Not bad for a "dead" band, eh?

10 c.w. similarly holds its following against increasing ionospheric odds. K1s HTV JKS, WA2KSD, K3CUI, K6CJF, WA6DNM, W9CLH, EL4s A and YL clicked with **CX2B'T**, **DJs** 3XK (7) 16, 4DN (55) 15, 6OR (7) 16, **Gs** 3EUJ (7) 15, 5BZ 8TD (7) 16, **HC1**DD, **HI8**s DGC DGH, **HKØAI** (77) 21, **KP4AXN**, **KZ5MQ** (151) 16, **PJ3AD**, **VK2**s ADE (80), APK (40), **VP5GT** (100), XE1AX, **ZE8-JZ**, **ZS**s 2NG 6AUY and **7G1A** (53) 16. Stay with it!

160 c.w. is crackling with DX opportunity right now. W1BB'S 1961-'62 *160-Meter DX Bulletin* No. 1 informs us that festivities really began October 10th when K2DGT kicked off the transoceanic season by working G6BQ. W2FY grabbed G3PU around the same time. This month's World-Wide and Transatlantic Tests dates are the 7th and 21st. See you on low band!

Winter's chill besets W/K/VE/VO DXers right now but things could be worse. Here's the back yard of KC4USN at Amundsen-Scott Pole Station, Antarctica, where temperatures occasionally drop as low as —102 . W8KX relayed this photo from wandering meteorologist Wes Morris who, it turns out, normally resides only a half mile from Walt's QTH in Grand Rapids. It's a small world, especially when ham radio gets into the act!



Where:

Oceania — Ex-KC6UZ observes, "Due to my travels last February and March many QSLs sent to me have remained unanswered. All that mail is stored with personal effects which should reach my Stateside home in December or January. Also, cards mailed to me since the first of May may have gone astray, so I recommend that new QSLs be sent to my Washington address [which follows]. Vagaries of forwarding out in the Pacific are sometimes responsible for mail being 'opened by mistake' or laid aside for future handling. Word reaches me that the Trust Territory communications officer will not be operating a QSL bureau. Can't blame him because most ex-KC6s and ex-KX6s fail to file forwarding addresses and essential self-addressed stamped envelopes. Also, the heavy flow of U.S.S.R. and Japan s.w.l. cards creates quite a problem when it comes to financing the forwarding." . . . . . "QSLing by air would put VK9GP in bankruptcy, so Ray requests Stateside QSLs each be accompanied by two IRCs if airmail reply is desired." This from WA6DNM . . . . . W8KX reports W1AGS (ex-K2QXG) still hard pressed to keep current with log transcripts from Steve of KC4AAC-VKØVK. QSB and QRJ — PSE QSP . . . . . "All QSLs for VR1M accompanied by s.a.s.e. have been answered," confirms W1HGT via WGDXC. "Others will receive cards via the bureaus." . . . . . WA2EFN, concerning 1957–'58 VKØTC operation, recommends consultation with T. Cordwell, 277 Hardey Rd., Cloverdale, W.A., Australia . . . . . W3VKD advises, "VK3CX now has logs and QSLs from VK9AD, Norfolk, and will supply QSL upon receipt of s.a.s.e. or IRCs. There are approximately 6000 QSOs to confirm."

Asia — From G3GJQ regarding the October Kamaran triumph of RAFARS personnel: "Assure all who sent cards with IRCs, etc., that all is well. I will personally guarantee direct reply." . . . . . "I have XW8AL's world-wide logs for 1961 QSOs dating through October 19th. W/Ks will be QSLd on the usual self-addressed stamped envelope basis." This from K4KTR of the Hampton Roads Radio Club . . . . . RSGB *Bulletin* DX Editor G2BVN writes in behalf of ex-VS9AZ-ZD8SC. "Stan Crow has been inundated in the past with QSLs for contacts when he was not even on Ascension Island but actually in Aden. I do not mean the odd card or two but actually dozens of QSLs all relating to contacts that did not happen. A lot of these cards were forwarded with excessive numbers of International Reply Coupons and also dollars, all of which were returned to the senders. When he returned from Aden, where he operated as VS9AZ, Stan moved to a QTH not far away from myself, and I persuaded him to dig out his old logs and check for any cards that might come in following a note in the *Bulletin*. This he did, and one of the contacts that could not be found in his log was one with W3EAI." G2BVN testifies that Stan does QSL 100 per cent and will replace strayed confirmations of genuine contacts . . . . . W8KX commends International Short Wave League's fast attention to VS9MB QSLs and stresses the importance of including the name of the Maldives operator on duty at the time of QSO . . . . . In addition to the regular HL9KT QSL route, staffer K2LSX says cards can be sent via the KARL bureau . . . . . West Gulf DX Club items: EP2AG advises another try if your APO-addressed card to him was returned. Use no name on the envelope next time. . . . AP5CP's QSL policy is reputable, so reapply if Mohd's card is truly overdue . . . . . "Some twelve KR8 calls have been issued to Okinawa nationals," notes FEARL *News*. "QSLs may be sent through the KR6 bureau or via JARL. We hear that KR8AC is ex-JA1CWX." KA2CM, FEARL's QSL chief, laments, "I receive cards that look as though they came by way of Outer Mongolia with a stopover in Honeybucket Hollow. Some are bent double, and a recent batch of incoming QSLs had been twisted like a *wrung*-out dish cloth." Package your QSL shipments carefully and sturdily, OMs . . . . . W3KVQ informs, "4S7WP was named QSL manager for RSC (Ceylon) at a recent meeting. Cards for 4S7 stations now may be routed via Shanti, Wijaya Rd., Kolonnawa, Colombo, Ceylon. I will continue as 4S7WP's Statewide QSL manager." . . . . . HB9PL, according to VERON's *DXpress*, hopes to have concluded JY2NZK QSL disseminations by the time this *QST* gets around. Bottleneck at the printer . . . . . KR6LF's K8YUW promises dependable QSL response.

Africa — K5MDX apprises, "7G1A told me that two weeks after his Mali trip he sent all logs and QSLs to OK1ACO. Apparently all QSLs for Josef will be answered more quickly if sent to OK1ACO via the Czech bureau." . . . . . W2JXH is busy with W3ZA's ET3RS logs, and WGDXC's *DX Bulletin* lists K4TWF as QSL manager for XT2Z (9G1DP), s.a.s.e. or s.a.e.-plus-IRCs desired . . . . . The Gulfers also learn that ZE1JA shipped a thousand QSL blanks to ZD8JP who evidently will attend to his own QSL chores . . . . . Ex-XT2A vows 100-per-cent QSL response via REF, according to CE3AG . . . . . ZS2U is beginning to doubt that KX6s QSL. Al gets good response from the EP gang, though.

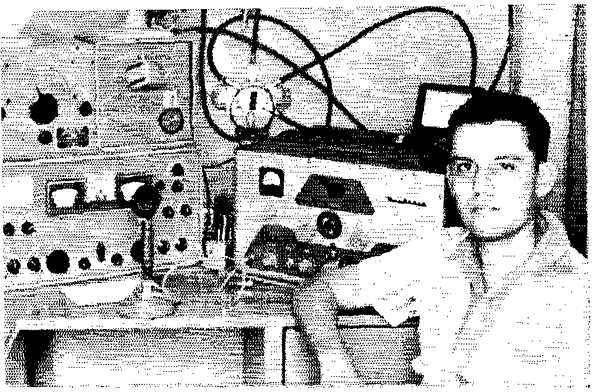
Europe — "As of August 24, 1961, I'm the legal holder of the call SVØWU," declares Dick Bales whose QTH follows. "Apparently the previous licensee rotated back to the States. I'll attempt to forward cards received for him." Those pesky lend-lease suffixes again . . . . . OK1FF tells W2GT he has no connection with ZA QSL matters . . . . . HB1EO/M1 (HB9EO) vows 100-per-cent QSL from his home location . . . . . WGDXC understands that Moscow's RAEM (that's a ham call, not a club) has taken care of UA1KED F.J.L. QSLs for QSOs through July 12, 1961 . . . . . For a fee, Polar Bears Radio Club, SL3ZO, c/o Solgardsgatan 15, Ornskoldsvik, Sweden, makes available a listing of all ninety local U.S.S.R. QSL bureau branches . . . . . The WGDXC organ suggests Hallicrafters, Inc., of Chicago as a source of QSLs for HV1CN's autumnal contest-type operation.

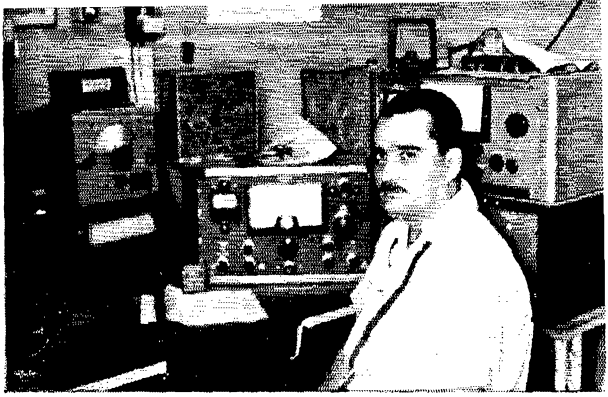
South America — "I'm now QSL manager for PY4AXN," confirms K3JJG, requesting W/K s.a.s.e., or non-W/K s.a.e.-plus-IRCs . . . . . Self-styled VP3EFG now signs PZ1CG, according to WA2FQG and others . . . . . YV3BS points out that only the calls YV0s AA and AB have so far represented Aves Island . . . . . "I still handle all mail for HKØAI," affirms W9WHM . . . . . VERON hints that Gs 2BVN 8KS and/or W4OPM may be of assistance concerning FM7WQ QSLs.

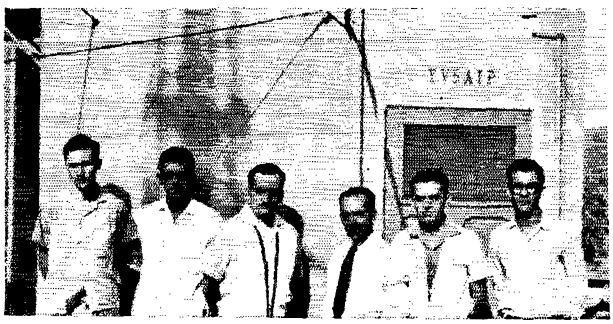
Hereabouts — Regarding his upcoming Middle East, etc., DX swing, W4BPD urges, "Send all QSLs to W4ECI except those for QSOs originating within the Rome area; these should go via W2BIB." . . . . . If you can keep track of the wandering HB9TL-9K3TL s.s.b. rig now being passed around in the Caribbean, amateurs in the western hemisphere should QSL through Virginia Century Club, Route 1, Box 152, Bayside, Va.; all others via G8KS. Include the appropriate necessary s.a.s.e. or s.a.e.-with-IRCs . . . . . K9BHR's statistics indicate that random use of International Reply Coupons does not necessarily guarantee a super QSL-returns percentage, for many overseas stations *disregard* them. Still, they *might* make the difference between reply and no reply. . . . . Florida *DX Report* has W3AYD aiming for complete January clearance of QSLs for that recent Caymans kick . . . . . "From March 1 to December 31, 1958, I operated as KG1CK at Thule," states S/Sgt Bud Lafferty, WØUBT/1, Box 117, 18th Comm. Sqdn., Westover AFB, Mass. "Friend Jose helped man the station and we contacted some 1500 amateurs, mostly on 21-Mc. c.w. During that period I QSLd 100 per cent to all stations informing me that they needed my cards. I've kept my Greenland logs and still have a quantity of KG1CK QSLs left in case there are strayed QSLs to be replaced." Full QSO data requisite, of course . . . . . "All QSLs not bearing GMT will be held until there is time to make the necessary time conversions," warns XE1CV of the XF4 Socorro team . . . . . M. Godwin, W4WFL/2, Apt. 12A, 210 Riverside Dr., New York 25, N.Y., is game to act as QSL manager for some worthy overseas DXer . . . . . Help! W1TQS pleads for a lead on VP2FD, presumably back in England; WV6SBO yearns for word on HS1CR; K8s *GJD* and *RDE* need news of *VQ4HY*; and *WØBEB* wants UA1DI's direct address . . . . . Our "QSLers of the Month" are CN8CJ, EAs 6AM 8EA, EI9J, FO8AC, FP8s AS BU, JA5FQ, MP4QAQ, OH6NS, SVØs WI WZ, UA1KED, VKØFZ, VPs 2SY 7BP, VQ5AU, VR2DK, VS9MB, ZP5BC, 4X4ME and 9U5DS — plus honorable mentions for QSL managers Ws 2CTN 2EQS 2JXH 4KWC 5WW and RAEM — on petitions signed by Ws 1BPM 2WMG 5KNE, Ks 1JKS 3MNJ 4KSY 9TZH 9UHH 9YOH and DL9LI. Nice going, OMs! . . . . . This column's substantial spread of *QTH* data comes courtesy W1s AGS *BPM* QON, K1s JFF JKS, W2WMG, K2s TDI UYG, WA2s EFN FQG, W3VKD, K2s CUI MNJ, W4IUO, K4KSY, W5KNE, K5s FPU MDX, K6s CYG MQG, WA6DNM, WV6SBO, W7s DJU LZF, W8KX, W9s BUD CLH VES, K9s TZII UCR *UHH UTM YOH*, *KØJPL*, CE3AG, DL9LI, EL4s A and YL, VEs 3BQL/SU 7BBB, ZS2U, listener A. Rugg, FDXC (W4CKB), FEARL (KA2LL), HARC (K9HLV), ISWL (address in the following), JDXRC (JA1DM), NCDXC

LZ1BZ operated DXtensively at LZ1KBD and other Sofia co-op stations before obtaining his own call last year. Mitko's hamming interests go back to 1952. (Photo via Bill Smith, Bay State DXer, and K3CUI)

QST for







Venezuela, as previously noted in these pages, has an impressive amateur radio boom under way. Two typical DX installations among our neighbors to the south are those of YV5AIP, upper left, and YV5AB (YV5ANQ shown operating). Assembled at the YV5AIP hamshack, right, are (l. to r.) YV5s AKP AQS ANQ AB AIP and AJK. (Photos via W1WPO and EL4A)

(K6CQM), NNRC (L. Waite, 39 Hannum St., Ballston Spa, N.Y.), OVARA (W8JIN), PBRC (SL3ZO), VERON (PA0FX), WGDXC (W5ABY), WVDXC (W7HKT) and WWDXA (W7JPC):

ACs 3NRM 5NRM (via W7PHO)
CE2OF (via CE2AA)
CE9AS, R. Lagos, Calle Franklin No. 660, Santiago, Chile
CE0AD (via CE3HL)
CN2AQ (ex-PK7AQ; to PA0AQ)
CN8JO, P.O. Box 1224, APO 113, New York, N.Y.
CR4AH, N. Pinheiro, Sal Airport, Cape Verde Islands
CR6JL, P.O. Box 71, Ganda, Angola
CR9AH (via W1DWH)
DL5BV, APO 123, New York, N.Y.
EA6AW, P.O. Box 313, Palma de Mallorca, Balearic Islands
EA9AP, A. Real, Box 213, Melilla, Sp. Morocco
EI4BBW (to MP4BBW)
EL2V, P.O. Box 37, Monrovia, Liberia
EP2AF (via ISWL, 12 Gladwell Rd., London N.8, England)
ex-ET2TO, 821 26th Avenue, NE, Minneapolis 18, Minn.
FK8AI (via W2CTN)
FK8AZ, L. Chaumont, P.O. Box 40, Noumea, New Caledonia
FM7WT, A Meunier, P.O. Box 7, Au Lamentin, Martinique
FO8AC (via W4KWC)
ex-FO8AI-KP6AL (to KC6BD)
FP8BS (to K2SQM)
FP8BT (to WA2HSM)
HA9OZ, P.O. Box 12, Miskolc, Hungary
HB1EO/M1 (to HB9EO)
HC5WE, Box 779, Cuenca, Ecuador
HE9LAC, R. Mader, Oschenstrafze 425, Schaan FL, Liechtenstein
HH2P (via K0RDP)
HH2RD, Box 963, Port-au-Prince, Haiti
HI8WPC, H. Pons, Box 157, Ciudad Trujillo, D.R.
HK3JF (via LCRA)
HP1BR, A. Rowley, Apartado 883, Panama, R.P.
JZ0DA (ex-PK1AD-PK4DM) H. Diemont, Sentani Airstrip, Hollandia, N.N.G.
JZ0ML, M. Leahy, c/o Decca Navigations, Merauke, N.N.G.
JZ0PN, W. Noomen, c/o PTT, Sorong, N.N.G.
KA5AS (via FEARL)
KC6BD, J. Wheeler (W7FNK), Weather Bureau, Truk, E. Carolines
ex-KC6UZ-KX6UZ, C. Kunz, 4730 East Av., Washington 28, D.C.
ex-KG1CK (see preceding text)
KH6EGO/KJ6, 517 Langley Loop, APO 915, San Francisco, Calif.
KL7FLC, Arctic Research Labs., ARLIS No. 2, Pt. Barrow, Alaska
KP4BEA, R. Roach (W1EXY), USCG, Box 2029, San Juan, P.R.
LZ1CW, Postbox 76, Plovdiv, Bulgaria
MP4BDN (via RSGB)
MP4BDO (via G3KDE)
MP4TAO (via DJ1BZ)
PJ2AF (via K4OGT)
PJ3AR, Box 328, Lago, Aruba
PY4AXN (via K3JJG)
RB5KDT, B. Shiyahn, Lenina 1/13, Brody nr. Lvov, Ukrainian S.S.R., U.S.S.R.
SM2COL/mm (via SSA)
ST2AR (to G4AR)
SV1SMX/mm, Box 495, Baton Rouge, La.
SV0WU, R. Bales, USASG, APO 223, New York, N.Y.
ex-TF2WCD (to W2LTT)
TF2WGF (via WA6SAA)
TG5HC (ex-YN4CB; via K5GOT)
TG8CW, C. Castillo, P.O. Box 1397, Guatemala City Guatemala
TI2WA (via K9TZH)
TU2AC, A. Grollimond, Box 5, Korhogo, I.C.R.
TY2AA, Dahomey (to 5N2AMS)
UA3FG, G. Zhomov, P.O. Box 570, Moscow, U.S.S.R.
UA9s DA DN, Tonya and Vladimir Semenov, Malysheva St. 107/1, Apt. 58, Sverdlovsk 62, U.S.S.R.
UL7JA, Z. Shmemling, 15-107 Lenin St., Leninogorsk, Kazakh S.S.R., U.S.S.R.
UR2AR, E. Lakh, Lai 1, Radio Club, Tallinn, Estonian S.S.R., U.S.S.R.
UR2BU, K. Kallemaa, Vaike-Tahe 14-1, Tartu, Estonian S.S.R., U.S.S.R.
UR2CK, E. Paaksi, Kehra, Estonian S.S.R., U.S.S.R.
UR2KAW, Tallina Pioneiride Maja, Tallinn, Estonian S.S.R., U.S.S.R.
VE8NR (via VE8AI)
ex-VK9AD (via VK3CX)
VP2MX (via KV4AA)
VP2SY, P.O. Box 80, St. Vincent, W.I.
VP9DB (via W1EOL)
VS9AAT (via GI3MUS)
VU2BK, R. Kabraji, 2 Middlesex Rd., Mhow (MP), Central India
W6QMN/KH6, Tern Island (via K6HAU)
XE1CV/XF4 and **XE1FB/XE4,** P.O. Box 31129, Mexico 19, D.F., Mexico
XE1YJ/XE4, P.O. Box 31541, Mexico 20, D.F., Mexico
XE2UA, Box 460, Obregon City, Sonora, Mexico
ex-XT2A, M. Doulier, 9 rue du Transvaal, St. Armand les Eaux (Nord), France
XT2Z (to 9G1DP or via K4TWF)
XW8AL (see preceding text)
XW8AS, MAAG, Box 179, APO 152, San Francisco, Calif.
XZ2SY (via W4ANE)
YV2DW, Box 32, Barinas, Venezuela
YV5AFR, Box 2299, Caracas, Venezuela
ZB1BL (via G3ITR)
ZC4FB (via G3ATL)
ZC4SS (via RSGB)
ZD1S, Box 548, Freetown, Sierra Leone
ZL4JF, Campbell Island (via ZL2GX)
ZSs 1AB 3AB (via WA2FQG)
3V8CA (via W4YWX)
4S7WP (via W3KVQ)
5N2JKO (via W4MCM)
5N2RDG (direct or via RSGB)

UA2BD of Kaliningrad has scored about 5000 QSOs with 130 countries with a 200-watt 813 rig, HRO-50T and Windom skywire. Stasik is perturbed by a measly 20-percent QSL return from W/Ks, and anticipates increased phone operation when he completes his English studies. (Photo via K2UYG)

5N2SMW (via RSGB)
6W8AN, P.O. Box 971, Dakar, Senegal
6W8DD, Box 19, Dakar, Senegal
6W8DF, Box 3033, Dakar, Senegal
7G1A (see preceding text)
9G1DE (via K8IQQ)
9K2AQ (via G3FJU)
9M2FR (via MARTS)

NOTE: Nothing necessarily "official" and accurate about the information preceding; employ the suggestions at your own postal risk. So good luck already. . . .

Whence:

Asia — From the Palace, Gangtok, AC3PT gives us the DX picture out his way: AC3NC (ex-AC4NC) is on the air only occasionally because of a heavy work schedule. Tiber's two stations are QRT due to governmental restrictions. AC5s PN and SQ (ex-AC3SQ-AC4SQ) operate fairly regularly in Bhutan. "AC3PT, that is myself, unfortunately has been QRT for the last four years but I hope to be on the air again this winter. In view of the political events in these parts it is unlikely that any new amateur stations will go on the air for the time being." Via the grapevine we hear that VU2NR now holds the calls AC3NRM and AC5NRM which may be used this month or next . . . . K4FXT writes from Istanbul: "I hear TA2BK on 14 Mc. almost every night calling W/Ks without result. TA2AR works 15 and 20 phone but I haven't heard TA5EE's 14-Mc. c.w. for several months." Pat and his dad, K4UDS, expect to stay in Turkey another year . . . . K1KTR & Co. are trying to scrounge up an SB-10 to supplement XW8AL's DX-100 . . . . HL9KT staffman K2LSX comments, "Hope to hit single-sideband hard here with S-line gear as soon as Korean authorities give us the green light for s.s.b. transmissions. We're also converting two BC-610s for increased power on a.m. and c.w., 7 through 28 Mc. Conditions have been quite poor lately. WØEYZ is new here and spends a lot of time on 20 meters. We expect new authorized spot frequencies but right now we stick mainly to 14,150 and 21,225 kc. HL9KS joins us in occasional DX activity." . . . . G3GJQ reports about 5600 QSOs with 135 countries for the autumn RAFARS DXpedition to Kamaran isle in the Red Sea. The party of seven had three separate stations perking simultaneously on c.w., *a.m. and s.s.b.*, 10 through 80 meters . . . . Notes from Japan via WA6IVM, W7DJU and JA2AEV: JA6AFO lost his grandfather in a typhoon-inspired landslide that buried an entire bus. . . . JA3AIS's kw. was demolished in the same storm, and other JAs suffered severe losses. . . . JA1BAR studies at our Lehigh U. now, and JA1DCY may soon visit these shores for educational purposes. . . . WA6IVM will ship 100 QSLs to JARL for JCC certification with fingers crossed. . . . ZS6Z dropped in on JA2AEV in late November. . . . VL JA9NB hops the Pacific to W7DJU neatly with only 16 watts of c.w. . . . Ks 2JOZ and 3PAG throw switches at KA2MA with a KWS-1 and 75A-4 on 14-Mc. sideband plus an occasional visit to the 21-Mc. Novice range . . . . K8YUW (KR6NN) is chief op at KR6LF where 14,265-14,335 kc. is the rule except for 15-meter action around 2200 and 0300 GMT . . . . WGDXC understands that ZC4CT may get a chance to warm up his MP4 BDK MAL QAU and TOP suffixes in February or March.

Africa — "XT2A worked over fifty countries and only one CE — me," chortles CE3AG, Maurice left Upper Volta for France around November 1st . . . . ZS2MI tells ZS2U there's a steep mountain between him and the U.S.A. "I hear him battling for W/K contacts now and then with scant success." (How does one rotate an island, Jeeves?) . . . . "9G1DS tells me he's now ZD1S and will soon be cruising the c.w. bands," cheers K6MQG . . . . That new Nigeria award is all set, according to K3MNJ. It calls for contacts with five 5N2s on any two bands (3 on one band, 2 on another, for example) dating since January 1, 1961. Check with 5N2JKO for complete specs . . . . VE3BQL/SU finds 40-meter phone fine business between 2000 and 0400 GMT. "W/Ks with beams put fine signals in here. I have to dodge around the BC sidebands and jammers between 7100 and 7300 kc. My neighbor HZ1AB also has been working into the States well on 7 Mc." Elvin is particularly peeved at heavy east-central European QRM caused by stations indiscriminately calling him. "Twenty meters has been opening earlier into W/K/VE, usually around 2000 GMT and folding at about 2300. Fifteen is occasionally good between 1400 and 1600 GMT, but 10 is just about out. I'll be hitting 160 meters when things start popping on that band." They're popping, OM! . . . . EL4A writes, "Hope to move into our new home soon. At present we must hike a half mile to the hamshack. The start of our dry season tempts us to leave the air for swimming, fishing and boating. EL4YL now has *over 100 countries on c.w. and is patiently* awaiting the cards. Our s.s.b. is almost ready to go — a.m. doesn't seem compatible with present erratic band conditions." . . . . African tidbits via K2UYG: 9G1DE should be good for a few more months in Ghana. . . . 5U7AC likes 14,012, 14,022 and 14,086 kc. between 1900–2200 GMT, while TL8AU prefers 14,012 kc. around 2300 GMT . . . . JDXRC, NCDXC, PBRC, VERON and WGDXC Africa observations: VQ9IB seeks a transistorized power supply for his TCS-12 outfit. Excessive dynamotor drain hampers Harvey's DX action. . . . FB8WW activity from the Crozets is DXpected momentarily. . . . TR8AA should be back from Paris by now. . . . 5N2AMS hopes for an early Dahomey encore as TY2AA, and also retains Gabon and Upper Volta DXpeditionary interest. . . . A leg amputation nullified ZE3JO's intentions to accompany the ZE3JJ/ZS9 safari. . . . TU2AL's splendid 7-Mc. signals cause some W/Ks to slander him as phony. . . . YL ZE7JY pops up around 21,060 kc., 1800-1900 GMT, with occasional c.w. emanations.

Oceania — Ex-KC6UZ, who will be touring our western states for the Department of Interior, says KC6BII has taken up the Eastern Carolines DX workload. KC6s AQ and KR are the Western Carolines mainstays. Carl will be on the air himself soon from his Washington headquarters with a large sideband signal. He hopes to visit with many of the gang he QSOd from the Trust Territory . . . . WA6DNM finds VK9GP having a ball with 40 watts, a quad and 75A-3, all powered by batteries and genemotors. Ray is an engineer at Norfolk's submarine cable relay station . . . . More Oceaniagrams courtesy FDXC, NCDXC, VERON and WGDXC: There are VK9s AM and DJ on Nauru; VK9s BB HC, Cocos-Keeling; VK9RO, Papua; VK9MV, Christmas; VKØs FZ RF, Macquarie; and two dozen VKØs in Antarctica. . . . ZK1BS's QRP c.w. may put Manihiki on the 7-Mc. DX menu. . . . Sarawak's VS1RM is said to try 14,070 kc. almost daily, 1230 GMT.

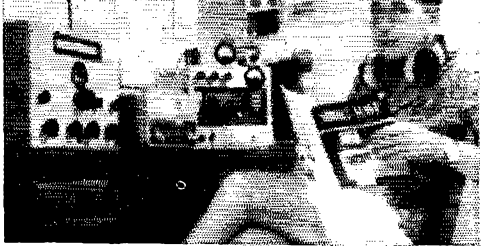
Europe — DARC (Germany) invites amateur radiotelegraphers throughout the world to participate in the Seventh WAE DX Contest scheduled for 0600 GMT, January 13th, to 2400 on the 14th. Non-European stations will

VP4NC, manned here by VP4LQ, performs valuable hurricane-watch communications service in addition to more casual DX and rag-chewing activities. The Antilles Emergency Weather Net, KP4AEB NCS, is monitored by W/Ks on 40 and 80 meters with more than academic interest when Caribbean storms swing our way.

swap RST001, RST002, etc., serials with Europeans once per band at *one* point per contact (*two* points per 3.5-Mc. QSO). Additional points are yours by sending "QSO reports" (QTC) to European stations at *one* point per QTC. Each QTC consists of (1) time in GMT, (2) station call, and (3) QSO number of any previous WAE Text contact. For example, W9XYZ raises DJ7JJ and earns a contact point thereby; W9XYZ previously worked G3BS at 1207 GMT for G3BS's 96th Test QSO. So, besides the QSO point for his serial trade with DJ7JJ, another point accrues to W9XYZ if he sends "1207/G3BS/096" to DJ7JJ. W9XYZ can work DJ7JJ again later on the same band, but only for QTC purposes. During the entire Test period each QTC can be transmitted to Europe by W9XYZ but once, and DJ7JJ can accept no more than 10 QTC per band from W9XYZ. (It figures that the more Test QSOs accumulated, the more QTC are available to parlay into additional points). SCORING: Multiply combined QSO and QTC points collected on all bands by the combined numbers of *multipliers* collected on all bands, the latter deriving from DARC's Worked-All-Europe Countries List — CT1 CT2 DJ/DL/DM EA EA6 EI F FC G GC GD GI GM GW GA HB HE HV I IS IT LA LX LZ M1 OE OH OH0 OK ON OY OZ PA PX SM SP SV TF UA1-6 UB UC UN UO UP UQ YO YU ZA ZB1 ZB2 3A2, GM Shetland, LA/p Jan Mayen, LA/p Spitzbergen, SV Athos Republic, SV Crete, SV Rhodes, TA Europe and UA Franz Josefland. (DARC stresses that UD UF and UG are Asia, not Europe.) Entries go to the DARC DX Bureau, Berlin-Rodow, Germany, postmarked no later than March 31, 1962. The highest scorer in each continent and country (or call area) will earn a certificate of merit; second- and third-place awards also will be considered. By the way, a large self-addressed envelope sent to DARC together with a pair of IRCs (for airmail reply, 5 IRCs) will bring back convenient score sheets for transcript and summary. See you on the North Atlantic path! . . . . . The 1961 Helvetia-22 Contest sponsored by USKA of Switzerland saw W1ADM, WA2DIG, W1FZ, W8UMR, W1WY, KØIKL, W5WZQ, W3MGP, W5ARJ and W5KC finish in that order for U.S.A. honors. VEs 3BWY 1AE and 3JZ ran 1-2-3 in Canada. Other continental highs were turned in by OD5LX, OA4FM and VQ4KRL. Best European scores were recorded by OH2LX, G3EYN, YU3-CDE, DL1CF and PAØVO in that order . . . . . HB9EO switched his DXpeditionary attention from Liechtenstein to San Marino last November for c.w. and phone fun. A Valiant and HQ-180 went along . . . . . WA2KXH and WV2UWQ report DJ1IM recovering from heart difficulties but it may be two or three months before Luwo is well enough to rejoin the gang on 14 and 21 Mc. . . . . GM3IAA strongly protests the operating discourtesy and irresponsibility displayed by certain W/Ks on DX bands. Uncle Sam has no corner on the DX hog market, to be sure, but some of those 20-meter pile-ups on XT2A, for example, disported a sad lapse in the state of the art. GM3IAA recommends reference to The Amateur's Code (see p. 8, ARRL *Handbook*) . . . . . PAØFLX, whose eyesight is minimal, credits K2PRN, PAØs CL and PO with getting him back on 14 Mc. through installation of a station of foolproof simplicity. "Please announce that PAØFLX is on the air again. I hope that I shall be able to work a great many of my old DX friends." . . . . . LA5FG tells W1BDI of the activity of Harstad club station LA1H north of the Arctic Circle. Members there will be glad to help your WALA pursuit and are regularly active on Mondays, 1800-2000 and 2200-0000 GMT, 14 or 21 Mc., c.w. or a.m. . . . . W8KX ran across Boy Scout Jamboree station GB3ICH with G3KGW at the 21-Mc. key . . . . . DL9PF tells W7DJU he needs only Okanogan, San Juan and Skagit counties for a sweep of Washington state . . . . . Continental commentary thanks to FDXC, NCDXC, PBRC, VERON and WGDXC: HE9LAA brandishes a new HT-37 on 14,296 kc. . . . LAs 1DF 2DE radiate from Spitzbergen, LAs 1LG 1LP 2NG 7IF and 8YB from Jan Mayen. . . . DL9PF evidences FC PX M1 and TA DXpeditionary inclinations.

South America — Direct from RCV: "Radio Club Veuezolano, with the assistance of the Venezuelan Navy, is planning a DXpedition to Aves Island. It is expected that YVØAA will be on the air January 7th, 40, 20 and 15 meters, c.w.-sideband-a.m., for seven days." . . . . . HC1JU reports newly married HC1KA and bride setting up housekeeping in Washington, D. C. . . . . Larry of VP4NC commends the ham spirit of our Caribbean brethren: "Most of these fellows, with top-notch business and trade qualifications, earn but a fraction of the U. S. and Canadian income for similar work. How some of them manage to stay in amateur radio with their limited resources and almost nonexistent supply of components is a wonder to behold. Most are not very interested in QSOs limited to 'How about a QSL card, old buddy? — 73.'" . . . . . W9WHM says HKØAI is now armed for the DX wars with a brand new TA-33 spinner and Heathkit lineup . . . . . From W4OPM: "PJ2AA is arranging to have HB9TL's s.s.b. transmitter on the air at existing stations in various Caribbean spots — possibly most VP2 areas, FM7 FG7 PJ2M VP1 VP9, etc. using 14,274, 14,281, 14,294, 14,304 and 14,314 kc." Check with PJ2AA or W4OPM if you'd like to pitch in and help this undertaking along . . . . . For those interested in the WBH diploma, K3JJG directs attention to PY4AXN's steady c.w. availability on the low edges of 7 and 14 Mc. He's the son of PY1AO . . . . . NCDXC, VERON and WGDXC mention HKØQQ's mention of February Baja Nuevo intimations, also that G8KS attributes South Sandwich silence to the islands' treacherous volcanic activity and sulphurous atmosphere.

Hereabouts — W6AEE, through W1DGL of ARRL Hq., favors us with a peek at preliminary returns from the 1st World-wide RTTY Sweepstakes held October 21st-23rd. Merrill's consultations with W6s CG and TPJ reveal heavy high-scoring rivalry among Ws 2JAV 2RUI 6TPJ 7ESN 9EWC, 1IRIF, KH6IJ, TG9AD and several Cis. Some radioteletypers active: DL6EQ, G3s BXI CQE, GM3s 3IQL 8FM, KH6s ANR DWZ, KL7s FA MZ, KM6BU, KR6MF, KZ5BR, LA6J, PAØFB, VEs 4BJ 7KX, VK3KF, XE1BI, YV1EM, ZK1BS, ZLs 1WB 3HJ and ZS1FD . . . . . "KG1BX operates on 7204, 14,275 and 21,430 kc., appearing regularly between 2200 and 0100 on the 20-meter spot," specifies staffman K3LYO. "Antennas for the lower frequencies present a problem. No trees at Thule. Then, too, we have those two- to five-day arctic radio blackouts to contend with." . . . . . W1s BDI QON and CO2ZQ tell of Cuban exiles forming a radio club in Miami. CO2ZQ estimates that some 100 CM-COs have left the homeland since the present regime moved in . . . . . Among the hundreds of habitations destroyed in those late-'61 California brush fires were those of W6s BMC FHR GVV GY LGU UOU, K6RDP, WV6s QGL and TVM. WA6FGX, who assembled this list, escaped such grief by only two city blocks . . . . . W7MH's DX enthusiasm goes back to 200-meter spark skeds between Seattle and Los Angeles, real DX back in 1921 . . . . . K5CDA/mm is back at sea again looking for world-wide friends on 14,038 kc. . . . . When the skip is right you'll hear *QST*'s W1QON scheduling her brother-in-law, KP4BEA (W1EXY), on 21,380 kc. Eleanor says Bob really guns for DX from the Coast Guard's KP4CGB layout as well as from his own station, concentrating on 14,040-kc. c.w. . . . . XE1s CV FB and YJ, signing /XF4, activated the Revillagigedos on a.m., c.w. and s.s.b. in November. An Invader and 100-B served ably on 40 through 10 meters . . . . . W4BPD, preparing his juicy year-long DXpeditionary endeavor to commence next month, emphasizes the necessity of off-frequency calling and brief contacts to give all DXers maximum opportunity for QSOs. Watch for Gus's c.w. 35 or 65 kc. up from the lower 14-, 21- and 28-Mc. band edges, and close to 7000 and 3500 kc. when the higher bands are poor. His single-sideband will be heard off the low edges of U. S. phone suballocations; 14,120-14,130 kc. on 20 meters, for instance. W4BPD/DX's public relations committee — Ws 2AGW 2BIB 2JT 4ECI 5AZB 5IGJ 5UX and 8PQQ — will be hanging around near 14,050 kc. with late word on the undertaking's progress . . . . . Ws 2QHH 6KG 8AJW 8JIN 8WT, SM5WI and UR2BU are star members of K6BX's Certificate Hunters' Club. OH2YV's Award Hunters' Club is resuming publication of regular bulletins. Any other certificate-certifying outfits out there? . . . . . Florida DX Club, W4CKB prime mover, stirs up DX interest with its Florida *DX Report* and a 7210-kc. Sunday-morning net. Bev's research reveals W4s LVV FVR AZK, K4PDV and W4VPD leading the peninsular DXCC parade in that order. W4ANE, K4HEF, W4s CWV EEO and BWP pace the phone flock. QST



9G1DE, who dredges for gold and DX near Dunkwa, is a 14-Mc. c.w. fan who started up in March of last year and expects to continue active till May. Bill wants to complete WAS with his 100-watter, still needing Ariz., Ark., Del., the Dakotas, Me., Nebr., N. Mex. and Utah. He's usually active daily except Wednesdays and Saturdays until about 2300 GMT. (Photo via W8KX)

Correspondence From Members-

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

HURRICANE TRAFFIC

¶ I want you to know that we in Tropical Radio very much appreciate the assistance VP1AB, W5KSI, K5USO rendered the Government and people of British Honduras and their correspondents world-wide in enabling us to restore our public-service radiotelegraph communication between our stations in Fort Lauderdale, Florida, in Guatemala City, Guatemala, and the Government Station in Belize, British Honduras.

This is but another of many instances on record where radio amateurs, or "hams," have performed outstanding service in times of emergency or distress, in the restoration of public-service communication. . . . *R. V. Howley, President, Tropical Radio Telegraph Company, Boston, Massachusetts.*

DX TEST TIPS

¶ I have just received the October issue and am pleased to note the results of the International DX Competition. Am looking forward to the next one and hope to better my previous score.

There are just one or two points I would like to mention in connection with the competition. These of course will not be new, but may bear repeating.

1. Keep your log straight and check for repeats before calling. We were the only "HI" operating yet we had numerous repeats on both week ends. This not only slowed up our participation but kept others waiting who were after us.

2. Please use GMT when filling out QSL cards. Also make sure your times, dates and bands are correct. This helps greatly when checking logs.

3. Do not forget to check with your QSL bureau. Unless IRC's were included we answered via the bureaus. We are still receiving second and third requests for cards that we acknowledged three or four months ago. — *Douglas G. Crowe, H18DGC, Dominican Republic.*

DISASTER COURTESY

¶ I'm sorry to say that I'm thoroughly disgusted with the operating techniques of a few amateurs. My technique may be lousy when it comes to calling a DX station but at least I know when to stay clear of a disaster frequency. The other night RACES could hardly get off of the ground, so to speak, because of some unthoughtful operators. Fellows, such frequencies are not toys to be played with — they are vital lifelines in disaster communications (whether you think so or not). The recent Topanga Canyon and Sierra Madre fires were no exception. Wake up before it's too late! — *R. H. Boal, K6SLM, San Marino, Calif.*

CD PREPAREDNESS

¶ One of the weaknesses of the civil defense organization in Dutchess County is the lack of sufficient radiation detection monitors and further, the lack of means for any such monitors to communicate to county defense headquarters or to local conelrad stations. It is believed that amateur radio operators with stations who are not already in the civil defense communication network might solve this major problem. . .

. . . I am pleased to report that the amateur radio volunteers are among the very few volunteer groups in Dutchess County which are in a state of relatively complete preparedness at this time. You and your organization have reason to be proud of the selfless efforts of your members. — *Melvin P. Williams, Dutchess County Civil Defense, Hyde Park, New York.*

. . . And QRM

¶ I always enjoy reading the interesting articles appearing in *QST* and I feel ARRL has done for the amateurs what "hams" have done for the electronic industry — either one would be hard to do without.

Every amateur has experienced difficult QRM conditions from time to time and of course many of these situations could be prevented if a greater percentage of operators would observe routine courtesy. This brings me up to the point of this letter.

The extract of regulations appearing in October issue of *QST* was welcomed indeed — it offers a quick reference to pertinent operating information. I would suggest that you issue a similar extract showing each amateur band with recommended use such as s.s.b. — a.m. — c.w., etc., at various segments within each band.

The great majority of operators want to observe all good practices; however, when working all bands occasionally it is very easy to forget a lot of the helpful suggestions — and a handy reference would go a long way toward correcting this situation — and eventually I think it would completely cure many of these QRM problems. — *Roy E. Alexander, W4GLP, Pikeville, Kentucky.*

BOY SCOUT THANKS

¶ Allow me to express my grateful thanks to those of your members who so very generously loaned their time and equipment to Boy Scout groups during the 4th Jamboree-on-the-Air over the week end of 21st–22nd October, 1961.

While the main object of the event is to enable Boy Scouts in various parts of the world to talk to each other and to learn something of each other's activities, a secondary purpose which is being achieved is that of interesting them in amateur radio, and I know of quite a few who have obtained licences as a direct result of the first three Jamborees-on-the-Air.

None of this would have been possible without the willing cooperation of amateurs throughout the world and we in Scouting fully realise how much we owe the "ham" fraternity for their so willing cooperation. — *Maj. Gen. D. C. Spry, Director, Boy Scouts International Bureau, Ottawa, Canada.*

TECHNICAL HELP

¶ Congratulations on your November editorial, "Roll Your Own." We have too many amateurs who are afraid to experiment a little — or do their own "bug shooting."

When I was new to ham radio I built an amplifier which was quite unstable. After a night of wrestling with it, I went to a friend, W8CJM, for help. He not only didn't fix it, but gave me quite a ribbing about it. I ended up taming the beast myself, and had a good rig. Probably he could have spotted it quickly, where it took me many hours. By tossing me out on my own he did me a real service, because from then on, I "rolled my own" unaided, and acquired a thorough background by myself. I think we need more of his kind, instead of "wet nursing" a lot of people who could go it alone if they only had the guts. — *Bill Wildenhein, W8YFB, Elyria, Ohio.*

THE STONE AGE . . ?

¶ I am renewing my membership in the League after a period during which it has not been convenient to free the dues money from the family budget.

I would like to use this occasion to tell you that I appreciate the work you people in West Hartford did at the last frequency allocation session.

However, I must admit that I was quite shaken — almost appalled — when in the latest issue of *QST* I came across a full article on "How to Build a Modulator" (Voss, 57). Good grief! Modulators came in in 1931 and departed in 1951. Must I remind you that we need s.s.b. for survival?

I also fear that if Ed Tilton continues to do such a good job of selling v.h.f. we will find more pressure to banish us to these frequencies above 50 Mc., on the pretext that we are so happy there. — *James M. Fisher, W3KNG, Williamsport, Pennsylvania.*

W2ZX CHART

¶ I wish to express my disagreement with the suggestion outlined on page 96, November, 1961 *QST*, under paragraphs "More on 20 Meters" and "Planned Use of 14 Mc. Charted."

The suggestions are greatly biased against those who prefer a.m. to s.s.b., operations. The chart submitted by W2ZX (and apparently with the blessing of *QST*, since it advocates its use on a trial basis) does nothing toward alleviation of QRM except to create an additional 25 kc., to the now used 75 kc., of the upper segment on 14 Mc., with resultant build-up of QRM to the 50 kc., W2ZX so graciously leaves to a.m.

QST advocated the splitting of the 14 Mc., phone segment half and half in your October, 1960 (correct) issue of *QST* under "It Seems to Us." I am afraid now that you advocate a trial of W2ZX's suggestion will place us right back where we were a year and a half ago with resultant ill-feeling and bickering being renewed. W1APA's suggestion regarding DX on the s.s.b. section doesn't help any, for it seems he would have DX stations listen in the a.m. section 14,250 up, and apparently he expects contacts in those 25 kc., which ordinarily is now used by a.m. . . . — *Frank L. Parsons, W4KQI, Assistant Director, Great Lakes Division, Louisville, Kentucky.*

¶ It is with concern I noted the 14-Mc., chart as listed in the Operating News of the November, *QST*, along with W1APA's comments in the same section. Both seem to lose sight of two important facts. The chart fails to show the active s.s.b., band at 14.100 to 14.150 kc. That is a fact that will not disappear because the DX gangs' spokesmen ignore it. (According to *QST*'s recent survey s.s.b. now accounts for 75% of the phone operation on 20, so how come it rates only slightly more than ⅓rd of the spectrum?) The DX s.s.b. band is here to stay. Secondly, the type of operation suggested by W1APA ignors the right of others to use the band for other than DX. A review of the happenings during the recent DX Contest, surely, gives one cause to pause before espousing his suggestion. When XT2Z said he was tuning below 14,335 for replies, all heck broke lose. . . . *Ted Wilds, KZ5SW, W4GVD, Balboa, Canal Zone.*

BCI GENERATORS

¶ I am somewhat disturbed by the attitude expressed by W4KVH in November *QST*. If he says to someone who has a case of BCI, "Go to . . . I've paid for my license . . ." he will not be doing amateur radio any good. He will be making enemies for us among the listeners, who will think that we are just a group of BCI generators. Paying $5, $20, or even $100 does not give us the right to cause interference to another radio service. — *Bram A. Darrow, WA2PWG, Bayside, New York.*

SINPO CODE

¶ Concerning W1HDQ's article in *QST* (November, 1961, page 44) about the variety of S-meter readings, may I add a comment or so?

In the international shortwave listening fraternity a signal report is almost universally made in the SINPO code. These letters, in case there are some unfamiliar with them, stand for Strength, Interference, Noise, Propagation, and Over-all average. Following each letter is a number, from one through five. It has been found that the use of this SINPO code is highly appreciated by most international broadcasters, and many of them request their permanent area monitors to use this form in submitting their monthly reports.

For instance, a signal of highest quality over-all would receive an SINPO rating of 55555. But a signal which was relatively weak, but not bothered by QRM or noise, that was having some difficulty with propagational disturbances, would receive a report of 35534. As you can see, the first four numbers are averaged together for the final figure.

Those of us who have become accustomed to using this SINPO code find that it is much more expressive of the true nature of reception than is the RS(T) reporting system. Granted it takes longer, but it does give a station a true report of all conditions affecting his signal. It also eliminates the utterly incredible reports we hams sometimes encounter; a good example of one was this one which I got recently from a fellow evidently just turned General; "Dave, you're really booming in here . . . 70 dbs. over S-9." Well, this sounded good, so I listened even more intently to this benevolent young chap. When he got around to telling me about his rig, though, I had to laugh in his face: "The rig here is Bandblaster, and we're receiving you on a Hallicrafters S-38."

Yes sir, some code, SINPO or another, would surely do away with these 70 over nine reports from an S-38. Maybe the code of honesty would help? — *Drayton Cooper, K4KSY, Southport, North Carolina.*

TEXAN'S COMMENDATION

¶ I recently enlisted in the Marine Corps. I think that one of the things I have missed most during Basic Training was not being able to read your wonderful magazine. But, you can't always have the comforts of home in boot camp. I am looking forward once again to perusing *QST*, and renewing my membership in ARRL.

I would like to commend the members of the base ham club here at Marine Corps Recruit Depot (W6YDK) for their contributions of time and effort in relaying messages from new recruits to relatives. Needless to say, on my first base liberty after graduation the first place I headed for was Building 143, located under the all-band beam.

Thanks for such an interesting and informative magazine from a Texas ham who's temporarily /6-QRT. — *Pvt. Ray L. Mote, jr., K5FKT, San Diego, Calif.*

EPT SCORES AGAIN!

¶ I have read with much interest and enthusiasm the articles by VHF Editor Ed Tilton, regarding construction of a complete v.h.f. station for the beginner. At the present time for reasons not necessary to mention, my activity will be limited to low-power operation, and to that end I believe that much space can be devoted to antenna design and proper matching systems. It will be in this field that I shall devote considerable time in the coming winter months. . . .

The League and the staff of ARRL are to be commended for making this template service available to members without charge. Many thanks, and continue the good work. — *Walter R. Hoyles, K8NPB, Wilmington, Ohio.*

¶ . . . Would you please send me the free drilling templates for the units in the four-part series in July–October 1961 *QST*, titled "A Complete Two-Band Station for the V.H.F. Beginner," by Edward P. Tilton, W1HDQ. I would like to see more of this type of article in *QST*, for the main reason that it is *complete*, even to the s.w.r. bridge. Because it is for the beginner, almost anyone can unerdstand it thoroughly. It gives you something specific to look forward to from month to month in your fine magazine. — *Gene M. Moore, WA6HCO, Stockton, Calif.*

¶ Contrary to the opinion of some others who write to you, I think the staff of *QST* does a commendable job presenting articles which concern the various phases of our hobby. Keep up the good work . . . — *Thomas H. Clark, K4SHY, Kingsport, Tenn.*

¶ . . . Your work in v.h.f. is greatly appreciated by us newcomers. I sincerely hope that ARRL *does* publish a v.h.f. handbook.

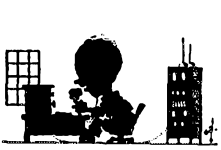
None of the currently available books show the accuracy and reliability of ARRL equipment . . . — *Clem Woest, K9SET, Brownsburg, Indiana.*

¶ . . . Mr. Tilton, I've been a subscriber to *QST* for almost a year now, but I've read many previous issues of *QST*, plus a host of other literature pertaining to amateur radio. Your six- and two-meter transmitters are by far the most sensible and practical low cost "clean" looking transmitters I've read about yet. Thank you for bringing them to the attention of the sensible ham . . . — *Frank Gensiak, K3NOE, Hyattsville, Maryland.*

Strays

VU2SL Dale Sikligar, Madanwad, Bulsar (Western Railway), India, a high school science teacher, would like to hear from high school radio clubs in the States.

Operating News



F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, W1DGL, Ass't. Comm. Mgr., C.W.

ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administ ative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

Operating Challenges for 1962. The first three months of the new year will offer a variety of juicy operating activities sponsored by ARRL and announced in *QST*. In January we have activities like the V.H.F. Sweepstakes and the CD Parties, the latter for SCM-appointees only. There's the NOVICE ROUNDUP, a challenge for newcomers, with points to be accumulated for fifteen days of on-the-air progress in early February. ARRL's DX Competition takes place February and March. Open to all, likewise, don't overlook the Frequency Measuring Test with W1AW runs on February 16th. All amateurs and prospective amateurs not yet certified or endorsed (10 through 35 w.p.m.) are invited to try monthly qualifying runs for Code Proficiency certificates. See W1AW and W6OWP schedules each month in *QST* in connection with this continuing program. Around 40,000 different amateurs will have been ARRL-certified in CP as of January 1, 1962. Why not you?

Of course, the top challenge to Novices and Technicians is to keep right on to the point of acquiring FCC's reward in terms of full class amateur priviliges, such as with the General Class Amateur License. The doors then swing open to the more attractive world-wide and coast-to-coast DX, and membership in section nets. Technicians have widely accepted the opportunities in the SCM-proffered v.h.f. OES appointment. With the help of v.h.f. operators, OES will doubtless attain new highs in 1962.

Our most sought-after awards appeal to everyone and call for versatile use of the whole amateur spectrum. It is a challenge to work all states (50) for WAS or to contact 100 countries for DXCC, if you have not yet earned such laurels. Post-war we now have 8,000 DXCC members. Some 13,000 amateurs hold WAS and we issue but one certificate to a customer! WAS is a mark of advanced accomplishment and the RSGB has referred to DXCC as "the most widely known of all operating awards." Will you have one of these awards coming to you in 1962?

The Greater Challenges. These incentive awards and all purely hobby activities can be taken as stepping stones that lead to improved station efficiency and high individual proficiency in operating. Casual hobbyists may be content working for little beyond some wallpaper. But to be identified with useful results from practical operating has caused many amateurs to subscribe to extended objectives that are instruments of service to the public. For example, some 35,000 amateurs are registered in the Amateur Radio Emergency Corps; 6,477 station and leadership posts were outstanding as of the latest Annual Report.

Amateur radio itself may be faced with the greatest challenge of all to further extend and perfect its practical communications capability for traffic and emergency work in 1962. The National Traffic System and the AREC are means to meet the challenge of having tangible, useful communication results. Both invite your support to meet the tests of the future. Some questions point this up. Which SCM-appointment is most along the lines of your natural interest? Are you in a section net? Basic posts are those for OES, OPS, or ORS, as detailed on page 79, September 1961 *QST* . . . or see a copy of *Operating an Amateur Radio Station*. Unless active on the air you can hardly qualify for one of these or a net certificate. But we think every member who is active should aspire to recognition through one of these appointments, and also aspire to participation in nets, AREC-RACES, or NTS. It is important to be a part of organized communications and to have procedure experience, if you have to take responsibility for accurate handling of traffic or emergency communications.

About AREC and Citizen's Band. Are you in the Amateur Radio Emergency Corps? Do you have an ARRL Emergency Coordinator, or have you recommended one to your SCM or SEC? Does your community have a RACES plan in which you're active? You no doubt have heard it said that amateur radio exists as a hobby because it qualifies as a service. As an amateur one can be proud in being part of that service. But are any of the things *you* do identifiable in terms of public service? Every active operator, we believe, should be AREC-registered; this doesn't even require ARRL membership. All League leadership posts under SCMs are challenging to the holders to produce practical organizational results, none more so than the Emergency Coordinator, whose duties are clearly set forth in the operating booklet. The SECs of East and West Florida, W4IYT and W4MLE, as an example, have made great strides in 1961 in blueprinting state-wide emergency plans, assigning functions on emergency responsibilities to all the different state nets, and running an outstanding state-wide simulated emergency test (SET) so amateurs are prepared and ready. These leaders and others point to recruiting and planned AREC

activities by their ECs, as needed to keep us ahead in 1962.

The sense of challenge in this field is accentuated in that *another service*, Citizen's Radio Service, while intended and regulated for personal and business communications of the licensee, has members who aspire to get into local defense and emergency planning. The answer by amateurs everywhere is to get on the ball by constantly implementing active organization in AREC and RACES, developing realistic stand-by radio facilities that are beyond challenge! It is not enough to rely on the fact that CB installations lack power capability, coverage, and are subject to the expectation of impossible interference levels; it is not enough to rely on the fact that CB installations are to be off the air under Conelrad, and do not have emergency power sources or a set-up like RACES to permit wartime continuance on the "reasonable dependability" for coverage that the Office of Civil Defense, Dept. of Defense (OCD-DOD) wants. We amateurs are looked upon to use the provisions in our regulations to work with local-government on this. OCD-DOD cautions civil defense directors to carefully evaluate any proposed CB supplements that would for their purpose have to be licensed *only* for defense, *not* personal business. It can be correctly stated that the work of other services is hardly any of our business. But it is our business to see that we implement our AREC and RACES plans as a first-AREC-responsibility right up to the hilt in 1962.

What is your part as an individual amateur? Just this; get lined up within the AREC and RACES plans. Build a fire under your section officials to get an EC appointed and an AREC group started, if now without active emergency-dedicated coordination. Likewise, help implement RACES fully. Complete your own emergency and mobile equipment. Make sure you are AREC enlisted. Get from your EC just as soon as you can rate some, both the Official Mobile Unit and Emergency Radio Unit placards and the decal for the rig and car. Continue to do practical communicating in the tradition of amateurs-for-their-community. You'll have fun in the process. Use matching decals to advertise ARRL and AREC.

Code Proficiency Skeds Requested. There is need for more on-the-air practice stations, judging from the requests for such information. ARRL's circular, "Suggested Methods for Code Practice by Radio," telling the best way to go about transmitting practice and mentioning the FCC regulations that cover such special work, is free on request. Volunteers are needed! It takes continuing schedules to be of use to those following such transmissions. A schedule good for only four or six weeks is not useful for our "Current on the Air Code Practice Stations" listing, since it takes almost that long to get this into print. But if you can plan beyond that, we would like to know your schedule. Let us send you a "Code Practice Schedule Card" on which to note your frequency, days, times, speeds, and how long you will observe the schedule. V.h.f. bands are excellent for scheduling practice runs to help those in your club working for the General Class License. We suggest using the earlier evening hours before peak band occupancy for evening practice sessions. Interested? Then write for a card to give us your code practice schedule.

R Means ALL OK. "Have been back on about three months after eight years inactivity. It's been a ball. I'm gratified to find QRP will work about anything and that some Novices show signs of becoming excellent c.w. operators. Things have not degenerated as much as some *QST* letters made me fear. . . . Some contrasts are evident to one who has been away. Suggest operators see point 5, page 567, in the current *Handbook*. What you said in the *October OO Bulletin* about "R" prompts me to quote from recent QSOs. Some may find them amusing, others we hope instructive" —*Jim, W8EXZ/4.*

"DE K8 — R Got most of that. . . ."
"DE K9 — R R BT I didn't get too much . . . QRM . . ."
"DE VE7 — R R . . . didn't get any of last part . . ."
"DE WA6 — BT OK on part, Joe . . ."
"DE WØ — R R R BT Sorry lost you for a while . . ."

Local Clubs Invited to Affiliate. Each passing year for ten years has shown increases in the number of active local clubs that are ARRL-affiliated. Only affiliated clubs can book training aids films on a loan basis. There's prestige of national recognition that comes through affiliation with the League. Affiliated clubs get weekly mailings of bulletin releases; there's mutual strength for amateur radio through this bond of affiliation. And it costs a club not one red cent. The present roster carries over 1200 clubs.

Our invitation is taken directly from the ARRL Board of Director's policy that ". . . local non-commercial amateur radio societies of kindred aims and purposes" may be affiliated. In affiliating, a society expresses its sympathy with and allegiance to the common aims of amateur radio and ARRL. A statement of a club's purposes is required, so the League may have assurance that a group is not chiefly devoted to short-wave listening, broadcasting or other services. Also the Board requires that 51% or more of the voting members of an affiliated group must be full members of ARRL and licensed radio amateurs. However, if a *high school* club meets the latter test, it may affiliate if the group has just *one* ARRL member, providing "high school" is part of the club name. A League director recently had to scotch a rumor that one club had heard that it cost $100 to affiliate. This is simply not true. We suppose a club could reason that it would be worth this. At any rate, the large number of clubs accepted for affiliation throughout the year (see "Happenings of the Month," Sept. and Nov. 1961 *QST*) speaks for itself. In conclusion, remember that (1) ARRL believes in furthering the work of local amateur radio clubs such as have frequent meetings for technical, operating, and fraternal objectives; (2) new clubs getting started are invited to write for a specimen club constitution and pointers on organizing; (3)

If you have operated in the CD Party, the chances are 11 out of 17, that you have QSOed W9YT, according to the calculations of W9SZR, left, and K9ELT, right, who regularly fire up the Badger Amateur Radio Society club station for CD Parties. Fred and Phil nearly collected all the marbles in the October Party, by placing second nationally in the c.w. and phone parties.

to consolidate the strength of all local organized groups for amateur radio, as well as to better serve and assist such groups, ARRL renews its invitation to all amateur clubs not presently affiliated to get from ARRL the forms for initiating application for affiliation.

Dishonest Tone Reports. Official Observer W3NNC suggests that every serious amateur padlock his transmitter and spend just one hour carefully tuning any band, listening for the poor notes and sick signals. This can hardly fail, he says, to bring to light instances of very poor signals, calling for critical and honest reports. We think all amateurs may be interested in W3NNC's remarks and suggestions.

"Right while I was making out a card for a KN1 with a T4 signal, he was answered by a WA2 in New York who proceeded to give him RST 599!" All amateurs who hear such things might well be encouraged to send a direct criticism to any operators giving such inaccurate and misleading reports! Give honest and accurate T-reports . . . any other type report is a disservice. W3NNC recalls that he once got an FCC notice himself for a poor note *after* getting T8 and T9 reports. He concludes: "Fully forty percent of the signals listened to could not, in all honesty, even be called T8." Let's remedy this by posting those RST definitions (ARRL Op. Aid No. 3) in each station operating position, and following the tone definitions accurately.

In V.H.F. Calling, Specify Where You Will Listen. Many sections have v.h.f. traffic nets coming into operation. Lots of stations are rockbound and each NCS must comb the band well to pick up stations. For the v.h.f. man looking for DX, it is even more valuable to specify where you will listen. You will never or infrequently find stations if you follow operating practices that encourage continued pileups at the low edge of bands! Tune to the Novice segment of two meters and you will often run into a signal coming through from the state you are looking for. Call specifying that you are tuning 146–145, 145 down to 144, etc. In this way you are more likely to accomplish your individual operating desire as well as cure the bad habit of overdoing the use of the low end. AØ continuous-carrier operation below 51 Mc. in the 6-meter band is *citable by FCC*. Technician Class operators should be duly advised never to engage in such duplex practice.

— *F. E. H.*

RESULTS, OCTOBER CD PARTIES

More and more the October CD Party is becoming a proving ground for Sweepstakes, with CDers loosening the kinks out of their fists and vocal chords for the November grind. As he did in the last October Party, ORS W1EOB paved the way with 703 contacts in 68 sections for 241,400 points. Somewhat discouraging to Vic was that he missed Ariz., Miss., and VE5 . . . all of which were QSOed in the July Party. Which all leads to speculation that someday somebody's bound to snag 'em all. K9ELT, magnificently keying W9YT, scampered close behind with a like number of contacts, but shy by one section at 67. Others over 200K were ORS/OPS K2EIU, OO/OBS K4PUZ/4, and multi-operator W1MX. W6ISQ, K7CHH, K7CTI, W6NKR, and WA6ECF all proved that you can score big from the West Coast.

On phone K2EIU lead the field by what is fast becoming the "hard way" — that is without s.s.b. Ken seems to becoming adept at leading the phone gang, but two others were right at his heels. The University of Wisconsin station W9YT had hardly cooled off from the blistering c.w. week end of K9ELT, before W9SZR took over the controls and put it through the microphone paces with high QSO total of 182 and second-high phone score of 41,580. OPS W1ECH/1, *tied* with K2EIU in section *high of 46*, scored 39,790 points. OBSs W6UGA and W6JVA both made the phone list with W6UGA racking up a tremendous 20,475 points, a record W6 phone score. A phone score like this from the West Coast was unheard of a few years ago.

The following are the high *claimed* scores. Figures show the score *claimed*, number of QSOs, and the number of different sections worked. Final and complete *official* standings will appear in the *January CD Bulletin*.

— *W1DGL*

C.W.

W1EOB	241,400-703-68
W9YT[1]	237,515-703-67
K2EIU	219,760-650-67
K4PUZ/4	207,570-625-66
W9RQM	192,150-603-63
W9KLD	187,525-573-65
W4DQS	176,000-543-64
W6ISQ	164,800-518-64
W3EIV	162,560-508-64
K1JDN	161,920-506-64
WØNYU	159,705-500-63
K4RIN	153,720-484-63
K5OCX	151,280-490-61
K7CHH	149,440-462-64
K7CTI	145,600-452-64
K2KTK	143,220-427-66
W9QQG	142,080-439-64
W1TS	141,750-443-63
W1PJJ	140,120-446-62
K5BSZ	135,630-406-66
W4KFC	134,505-420-63
KØAZJ	132,600-438-60
K4UBR	131,985-412-63
W1AW[2]	131,760-425-61
K1AII	129,150-408-63
K4BVD	128,985-378-67
KØIVQ	127,410-405-62
K4YEP	126,790-404-62
W6NKR	126,720-389-64
W1WCG	125,050-406-61
W2FEB	124,425-391-63
WØPHR	123,830-420-58
W4MLE	121,520-388-62
WA6ECF	119,600-362-65
W8VPC	119,255-384-61
K1MBM	117,490-375-62
W2GKZ	113,150-358-62
WØETT	112,455-353-63
K4GBS	112,220-358-62
K8RMK	107,700-354-60
W2MTA/4	107,260-341-62
KØQCQ	105,600-305-64
K3JCT	104,410-363-56
WA2EBR	102,370-348-58
K2SSX	102,300-360-56
W1JYH	101,410-310-64
W9MAK	101,410-306-64
K4UJS	100,800-332-60
W1MX[3]	204,350-604-67

PHONE

K2EIU	41,860-176-46
W9YT[4]	41,580-182-44
W1ECH/1	39,790-166-46
K2PHF	21,935-100-41
W6UGA	20,475-105-39
K4BAI	17,835- 80-41
K5MDX	16,150- 85-38
K2QDT	13,330- 86-31
W4KFC	11,160- 65-31
K8RMK	10,075- 60-31
W1GKJ	10,005- 64-29
K4PQV	8450- 62-26
K2KNV	8100- 54-28
W9PNE	8120- 49-29
K4LXG	8875- 58-25
K4YEP	7695- 52-27
W9KLD	7420- 49-28
W1YK[5]	7215- 69-21
W2EEN	6900- 56-23
K2PBU	6820- 62-22
K1LPL	6000- 55-20
K2SSX	5760- 43-24
W6JVA	5635- 43-23
KØYRQ	5100- 43-24

[1] K9ELT, opr.; [2] W1WPR, opr.; [3] K2KIR, W1WAJ oprs.; [4] W9SZR, opr.; [5] W1DXS, opr.

A.R.R.L. ACTIVITIES CALENDAR

(Dates shown are per GMT)

Jan. 5: CP Qualifying Run — W6OWP
Jan. 6–7: V.H.F. Sweepstakes
Jan. 13–15: CD Party (c.w.)
Jan. 20: CP Qualifying Run — W1AW
Jan. 20–22: CD Party (phone)
Feb. 2–4: DX Competition (phone)
Feb. 3–18: Novice Roundup
Feb. 8: CP Qualifying Run — W6OWP
Feb. 16 — Frequency Measuring Test
Feb. 16–18: DX Competition (c.w.)
Feb. 20: CP Qualifying Run — W1AW
Mar. 2–4: DX Competition (phone)
Mar. 16–18: DX Competition (c.w.)
June 9–10: V.H.F. QSO Party
June 23–24: Field Day

OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of *QST* issue in which more details appear.

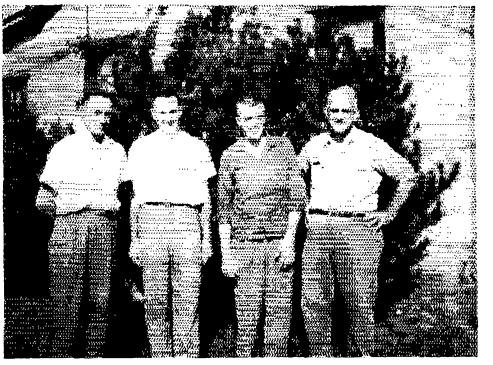
Jan. 13–14: WAE DX Contest (c.w.). DARC (p. 74, this issue).
Jan. 20–22: Third New Mexico QSO Party, CHC Chapter #1, of Albuquerque (p. 126, this issue).
Jan. 20–22: Fifth Pennsylvania QSO Party, Harrisburg Radio Amateur Club (p. 90, this issue).
Jan 20–21: Eighth Annual VE1 Contest (c.w.). New Brunswick Amateur Radio Assn. (p. 136, this issue).
Jan. 27–28: Eighth Annual VE1 Contest (phone).
Jan. 27–28: New Hampshire QSO Party, Concord Brasspounders (p. 112, this issue)
Feb. 9–11: QCWA QSO Party, Quarter Century Wireless Assn. (next issue).
Feb. 10–12: NYC-LI QSO Party, South Shore Amateur Wireless Assn. (next issue).
Feb. 24–26: First Rhode Island QSO Party (next issue).

Let's talk about the National Calling and Emergency frequencies. This subject has been kicked around so much that it must be groggy, but all the discussion has been most inconclusive. Certainly the present setup is not perfect, but something can also be found wrong with every suggestion made so far, and we can see no hope that anyone will come up with the perfect solution. Most likely there is none. As a result, we are sticking with the present NCEFs until or unless an alternative can be arrived at which will alleviate all the present disadvantages without presenting any of their own.

What are some of the present disadvantages? Well, for one thing, novices can't use any of the NCEFs, except on two meters. The solution to this is to put the NCEFs in the novice segments. This is a solution? For another, they are too far inside the bands and in the midst of QRM, therefore hard to find; they ought to be on the band edges. If we put them there, we'll have more out-of-band operation, because if an amateur can't find a frequency in the middle of the band, why should he hit it any closer at the band edges?

The NCEFs are not widely-enough known, is another complaint. We put them prominently in each issue of *QST*, and have conducted campaigns to popularize them.

They are in parts of the band that some amateurs can't get at. For example, 29,640 kc. is outside the range of many commercial converters. Also, 14,225 kc. is not the part of the band in which s.s.b. is generally used, so there ought to be separate calling frequencies for s.s.b. stations. All we can say to these arguments is that of the twelve NCE frequencies, every amateur ought to be able to put a signal on at least *one* of them. We cannot and do not expect that each amateur can or should operate on each NCEF.



The Big "K" Amateur Radio Assn. of Pa. gathered these AREC members together at their Open House and Anniversary Party held at the club house near Towanda, Pa., Sept. 24. Left to right are K2DNN (EC Chemung County, N. Y.), W2YLM (EC Broome County, N. Y.), WA2HFL and W3MUR.

Some critics say that there is too much QRM on the NCEFs, while others say they are too isolated and ought to be in those parts of the bands that are most crowded, so more listening will be done there. So, what do we want, lots of QRM and lots of listening, or a minimum of QRM and less casual listening?

It has been often pointed out to us that marine stations have specific designated frequencies which are used only for calling purposes, and that these frequencies are monitored at certain intervals each hour to minimize the possibility that any distress call will go unobserved, and that we amateurs should emulate this technique, which works very well. We could try this, but in order to make it effective we would have to have the cooperation of all amateurs to observe the silent periods on the frequency or frequencies designated. Such voluntary cooperation is mighty hard to come by. Even FCC would have a hard time enforcing such provisions, as was pointed out some years ago when they proposed rulemaking to put such into effect — proposals which they subsequently withdrew. As a matter of fact, the *present* recommendation (by ARRL) is that amateurs avoid the use of the NCEFs except for calling purposes.

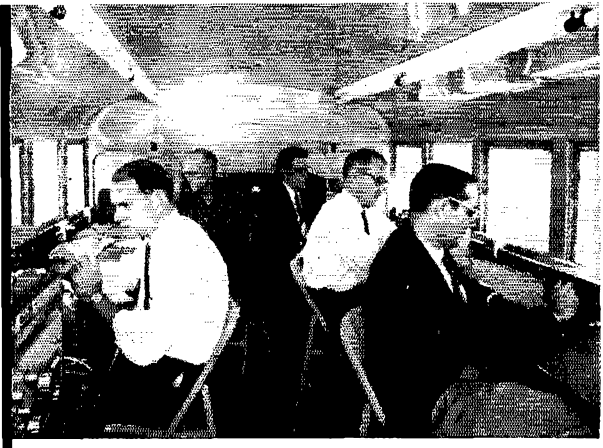
Then there are requests from various special interest groups that specific frequencies in the bands be set aside for their use. These groups would have us designate special frequencies for novices, for RTTY, for s.s.b., for f.m., for RACES and for technicians in addition to those frequencies already set aside for general use.

Arguments pro and con various proposals can go on endlessly, and show every evidence of doing just that. Our present list of NCEFs have at least one frequency on which *every* amateur can operate, if he deems it worth while to equip himself so to do. Far from being insufficient, the list is more likely so extensive as to cause a dilution of its effectiveness. Instead of extending the list to accommodate special interest groups, maybe what we should do is to eliminate some of the NCEFs that are seldom or never used.

Anyway, after all is said and nothing is done, it seems that there is little wrong with our present NCEFs that some avid support from the amateur fraternity wouldn't alleviate. — *W1NJM.*

— • • • —

Iowa SEC KØEXN tells us of some errors in the account of the Washta, Iowa, flood on p. 99, Nov. *QST*. KØEIC should have been KØSIC; KØDON should have been KØDOM. Other calls that should have appeared as participants are *KØs* LCI UUA JNK GXP POI EXN and WØFLM.



A view inside the Owensboro-Daviess County (Ky.) mobile unit, a converted school bus. The bus was contributed by the county school board, equipment purchased by Owensboro C.D. and conversion and installation performed by the Owensboro Amateur Radio Club under EC W4VJV. Shown at the various operating positions, left to right, are W4ITC, K4UDZ, K4UCS, W4EWL and W4VJV (EC).

On July 29, Alabama Emergency Net "P" conducted a surprise simulated emergency session on 3955 kc. to ascertain (1) how many stations monitor the net frequency, and (2) how many stations monitor the National Calling & Emergency Frequencies. In response to the call, ten of the 90 stations on the roster checked in, plus two stations not on the roster, somewhat better than the 10% that had been expected. Procedure and discipline were of the highest order. More such drills are planned to bring this unit of Alabama's statewide amateur emergency plan into the highest possible state of readiness. — *K4KDE.*

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On Oct. 7 the SOCAL Six Net provided communications for the unique tournament of the Pioneer Pass Golf Challenge. Not the usual type of golf tournament, this one covered 28 miles of winding, rugged terrain in the San Bernardino Mountains. Communications were a real problem and a real challenge to the SOCAL Six boys.

Because the area is some 125 miles from Los Angeles, the mobileade left on the evening of Oct. 6 and deployed to prearranged locations the next morning. WA6GAG set up at radio station KDHI. Three mobiles went to Tip Top Mountain to act as relays. K6UZI was at the finish at Moonridge and WA6JOX established himself at the Tee Off point at the Yucca Valley Country Club. The rest of the stations were mobile along the route. Progress and scores were relayed to WA6GAG at Twenty-nine Palms and put on the air over KDHI. The following day the same procedure was repeated, but it snowed on Tip Top Mountain and the mobiles couldn't get up, so they established themselves on Butler Peak instead.

It was a lot of hard work, but the tournament officials were greatly pleased and a lot of good publicity for the amateurs resulted. — *K6PZM, PAM Los Angeles.*

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We have three reports of ARRL Hallowe'en "Goblin Patrols."

The Clinton County, N. Y., AREC established a base station command post at the Sheriff's office in Plattsburgh. K2VXR in Dannemera was net control. Mobile units were instructed to patrol and report all acts of vandalism, but not to investigate or apprehend. Five fixed stations, one portable and fourteen mobiles participated. — *WA2GCH, EC Clinton County, N. Y.*

In Pickway County, Ohio, it was the RACES group that did the job. K8GOY, radio officer, reports that three mobiles patrolled the county and two the city of Circleville. A dispatching station was set up at c.d. headquarters. Operators reported all unusual events, which were then screened and passed along to patrolmen and deputies.

Cuyahoga County AREC did its usual excellent job of assisting police to minimize Hallowe'en vandalism and protect the young "trick or treat" set. The boys were on the job Oct. 28, using ten meters, on Oct. 30 using two meters and on Oct. 31 using six meters. Portable equipment was set up at the police station and six mobiles, each carrying an officer, off-duty patrolman or auxiliary policeman in addition to the AREC member, were sent out each night. Because "the word was out," little in the way of vandalism was attempted; thus, the AREC activity served as a preventive. Twenty amateurs took part. — *W8VFU, EC Cuyahoga County, Ohio.*

Better late than never, and we seldom omit an item on a real emergency, no matter how old it is. On Oct. 18, 1960, while W0CVG and WØMYX were on a hunting expedition in the Saguache, Colo., area, they participated in a search for a lost hunter. Communications were conducted from their own camp, using a portable station and the call W0CVG 0. W0CVG also spent seven hours on horse back with a search party using a hand-carried unit with which he kept in contact with WØMYX at the camp station. Skeds were kept with WØKVD and WØTV to keep the family of the lost man in touch with reports. However, the missing hunter walked into a ranchstead about 40 hours after being reported missing. — *W0KQD.*

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On October 22, members of the Bloomington Amateur Radio Club and the Indiana Memorial Union Radio Club provided communications for the Indiana Powder Puff Derby, an all-women air race. Stations were established at the starting and finishing points and at points along the route so that progress and other information could be relayed back to the starting point. Excellent cooperation was experienced and traffic was often delivered the same minute it was originated. Sixteen amateurs took part. — *W9NZK, EC Monroe County, Ind.*

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Approximately 1500 people were stranded when an unexpected snowstorm blocked the roads about 25 miles east of Rock Springs, Wyo. Among them was W6IW who, when it appeared that no immediate aid was forthcoming, fired up his mobile rig and called for help. He was answered by K7KLE and W7SFK, but conditions were so poor that good contact could not be maintained. Later, contact was made with W6MRO, who relayed to K7KLE and W7SFK and assisted in keeping the frequency clear. Assistance was obtained from the Red Cross, the National Guard and the Wyoming Highway Patrol. Hardly any of the stranded motorists knew that succor came as a result of the efforts of the amateurs. — *W6IWSW.*

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On the morning of June 24, when amateurs far and wide were getting ready for Field Day, the AREC of Tarrant County, Florida, under the leadership of EC K5MZW, took part in an exercise sponsored by the Civil Air Patrol and the District Area Rescue-Emergency Corps. Two flyers were spotted at remote areas to simulated airmen who had bailed out of their planes. At 0830, K5MZW mobile put out a bulletin on the frequency of the Tarrant County Disaster Net announcing the situation and asking for assistance from stations in the field. CAP was notified to commence the search by air, and DARE to dispatch their trucks. Some 15 amateurs also responded and their mobiles were put to use observing the location of CAP search planes.

At approximately 25 minutes after the search was started, a CAP plane spotted one of the "missing" airmen. The plane reported to temporary CAP headquarters, which relayed to W5YUO to W5RIR at DARE headquarters whereupon a rescue truck was dispatched and guided by CAP planes circling overhead and communicating through amateur liaison. The second man was located and zeroed in on in much the same manner. W5VEZ being the first rescuer on the scene. As ambulances and other vehicles arrived, K5MQA was stationed at the nearest intersection to direct them. Full coverage was made by TV cameraman, unbeknownst to the participants, and shown to the public that evening. It was, all in all, an excellent demonstration of amateur versatility in providing liaison communications which might not otherwise be available. — *K5MZW, EC Tarrant Co., Texas.*

Members of the Denver AREC assisted in two of the largest events held during the American Legion Convention on Sept. 10–11. The first was communications assistance to the Red Cross during the drum-and-bugle-corps competition held at the huge, mile-high Denver University stadium. Hand-carried units were used in the stand and on the parade grounds. A base station on each band was set up in the first aid room under the stands and a mobile capable of operating both bands simultaneously was stationed on the field with a group of ambulances. A ten-meter station in another part of the city stood by to handle any outside calls. Several persons were stricken during the event and some had to be evacuated to hospitals. All patients received quick assistance, thanks to AREC communications. Thirteen amateurs were involved in this phase.

In the *big* parade in downtown Denver the following day, a mobile AREC station was assigned to each ambulance, with a base station set up at temporary police and Red Cross headquarters. The club station in the main Red Cross building acted as net control. Amateurs with hand-carried units patrolled the areas between ambulances. This provided smooth coverage. The AREC summoned ambulances, arranged police escorts for ambulances with patients, moved in other ambulances to replace those in use, and kept a running watch on the ambulance oxygen supply so that more could be called for when the supply ran low. The AREC was very much in evidence during this grandaddy of all parades. Seventeen amateurs took part. — *KØOVQ, EC Denver Area, Colo.*

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The Hillsborough Amateur Radio Society, Inc., of Tampa, Fla., participated in six public service events from February through October, 1961, as follows: Feb., '61, Mothers March of Dimes; Feb., '61, assisted Tampa Police during annual Gasparilla Day; Apr., '61, OPAL '61, national c.d. drill; June, '61, c.d. drill and field operations on emergency power; Sept., 61, standby alert for Hurricane Carla; Oct., '61, annual ARRL *Simulated Emergency Test*. Their performance in most of these activities was the subject of special citations.

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September reports were received from 26 SECs, representing 12,543 AREC members. This is two reports more than Sept. of 1960 and over 3,000 more AREC members. Illinois submits its first report for 1961, bringing to 45 the number of different sections reported in 1961. Sections reporting: Tenn., Utah, E. Pa., Mich., Maine, Ala., Wash., Ind., S. Texas, Nevada, S. Dak., Ore., Colo., E. Fla., Ill., Iowa, Alberta, NYC-LI, E. Mass., Okla., Ohio, Md.-Del.-D.C., SCV, Sac. V. Va., N. Texas.

RACES News

The Office of Civil and Defense Mobilization (OCDM) is no more, and so these initials will disappear from the pages of *QST* and the annals of amateur radio, as did FCDA and WERS before them. What was formerly OCDM has been split in two, part of it going to Washington as the Office of Emergency Planning (OEP), the rest staying in Battle Creek as a part of the Department of Defense. The Warning and Communications Service, which has RACES under its wing, remains with the latter. We don't know for sure just what initials will be adopted or the new DOD function (neither do they, apparently), but the letterhead says "Department of Defense, Office of Civil Defense," so until we know better we'll refer to it as OCD-DOD, or just as OCD.

Leo Haijsman, W8KA, remains in charge of all RACES matters at OCD national level.

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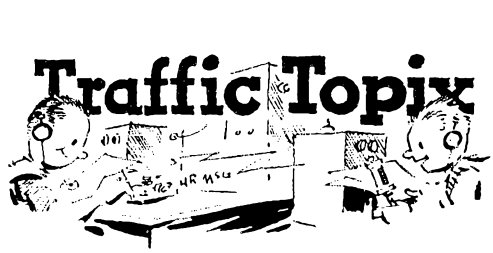
St. Petersburg, Fla., RACES had a test alert on Aug. 26, under the leadership of W4WPF. Headquarters was at St. Petersburg City Hall, using the call W4GAC 4. The six and ten meter bands were used. The ten meter RACES group was notified ahead of time of the alert, but to the six meter group it was a real surprise. Some of the latter were thus miffed, but all went well. About 25 amateurs took part.



October net reports. Reports are invited for this tabulation from nets not a part of the ARRL National Traffic System encompassing a coverage area greater than a single state or ARRL section. Just the information in the tabulation below will suffice for a listing.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for October Traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	226	1391	1121	256	2994
W0LGG	173	1043	949	90	2255
W3IVS	12	786	1316	27	2171
K6BPI	87	884	798	86	1855
K4AKP	44	858	825	30	1807
K2UAT	410	509	448	6	1373
W0SCA	45	646	607	29	1327
K4SJH	140	662	497	7	1306
KØONK	148	562	547	34	1291
K2GAO	243	503	463	43	1252
W3EML	15	554	466	83	1118
W7BA	10	501	457	44	1012
W7DZX	6	509	475	21	1011
W6GYH	193	398	388	10	989
W8UPH	11	486	409	77	983
W9JOZ	7	450	443	3	903
W8DAE	33	429	326	74	862
W9SVL	55	400	400	0	855
WN4BMC	182	260	231	73	746
W3WRE	54	333	328	9	724
K5KTW	53	436	121	61	671
K4KGB	91	319	229	17	656
K3IMP	12	326	300	17	655
W6WPF	5	317	303	14	639
W9DYG	47	316	222	52	637
W9MM	3	341	277	7	628
K3GSU	0	581	21	0	602
W3VR	31	289	263	12	595
W0OHJ	4	289	278	11	582
K2UBG	10	305	244	15	574
K9OZM	55	261	149	103	568
K6EPT	10	272	167	105	554
K6KCB	16	279	233	23	551
W2GKZ	6	272	33	238	549
K4UBR	11	293	231	14	549
W4TUB	25	264	243	15	547
W0BES	33	248	207	41	529
W5GY	44	244	180	57	525
W0ANT	27	247	139	108	521
WA2GPT	22	253	222	19	516
W4PL	7	252	226	19	504
W0DUA	48	249	205	1	503
K9UGY	53	218	209	22	502
W1SMU	19	257	220	5	501
W0ZWL	2	329	1	169	501
Late Reports:					
VE2AZI/W1					
Aug.)*	24	1656	1667	39	3386
WA6DJB (Sept.)	6	374	362	12	754

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W6IAB	119	1509	1502	7	3137
W6YDK	2033	104	53	40	2220
W4LEV	1532	100	75	25	1732
W4PFC	4	407	391	10	812

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

W8ENI/8	370	K8QLL	134	W3UHN	107
W9RTH	268	K8KSN	128	W4BWR	106
K9IVG/9	233	W3KUN	126	W9BUQ	106
KØLTJ	199	W4CGE	124	VE6HM	106
W2EW	174	W8BZX	121	WA2EFN	105
K6GZ	169	W3NEM	120	W5ZHN	100
K4FS8	161	W1BDI	117	Late Report:	
K3JYZ	149	K4IWT	113	KØHGI (Sept.)	116
W1TXL	143	K4RDX	109		
W4PIM	135	KP4WT	108		

More-Than-One-Operator Stations

W1AW 184

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: WA2GLU, W4PED, K7IEY, W9QQG, K9UOV, W0BES.

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.

* Correction to November listing.

Net	*Sessions*	*Check-ins*	*Traffic*
Early Bird Transcon	—	—	335
Fourth Region Day	31	226	447
Eastern Area Slow	31	77	22
Northeast Area Barnyard	26	709	4
Mike Farad E & T	51	524	1207
Interstate Side Band	31	1320	371
20 Meter Interstate S.S.B.	22	713	1206
7290 Traffic	44	1475	655

National Traffic System. The only thing about NTS personnel that requires headquarters attention now is the turnover of leadership officials. This has been quite rapid of late. When an NTS net manager at region, area or TCC level resigns, it is necessary to solicit recommendations for replacement, obtain the approval of the resident SCM, then write the new appointee a long letter of indoctrination. NTS manager appointments are for no specific term, but are good until the appointee resigns. (On one or two instances, we had to request a resignation, but this is rare.) This they do a little too often to suit us, but we realize that leadership jobs in the top echelons are pretty demanding, as a general rule, and can wear one down. You might think that a pretty good overall picture of how demanding managership can be gleaned by observing the turnover of net managers. Using this as a yardstick, it looks as though 2RN and RN6 are the roughest region nets to handle; each has had eleven different managers. By the same standard, 1RN has been the easiest, because ole W1BVR has been at the helm ever since NTS started, twelve years ago. This is probably exceptional (i.e., some of us are iron men in handling traffic and some are iron men in managing nets), because the next-lowest turnover is five (3RN and ECN). The average is seven, which means that the average region net manager stays on the job for nearly two years. Of course stalwarts like W1BVR, W8DSX and W3UE who stay on the job year after year are responsible for this seemingly-long average.

We don't know just that we're trying to prove with all this. So many factors can affect the average tenure of any net manager that it really isn't conclusive, except that we have a hatful of qualified leaders among traffic men (look how many of them become SCMs and ARRL Directors) and we're pretty proud of them.

October reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
1RN	58	752	.421	13.0	65.5
2RN	57	459	.361	8.1	92.4
3RN	62	687	.310	11.1	100.0
4RN	61	663	.336	10.9	88.9
RN5	59	685	.369	11.6	76.3
RN6	56	980	.459	17.2	78.2
RN7	59	406	.242	6.9	56.6
8RN	62	463	.211	7.5	93.5
9RN	60	664	.435	11.1	62.1
TEN	89	767	.359	8.6	60.1
ECN	22	67	.150	3.0	65.2
TWN	31	288	.303	9.3	84.5
EAN	31	1441	.878	46.5	96.2
CAN	31	1168	.800	37.6	100.0
PAN	31	1211	.675	38.4	98.9
Sections[2]	1059	7638		7.2	
TCC Eastern	124[3]	603			
TCC Central	93[3]	1063			
TCC Pacific	119[3]	754			
Summary	1778	20759	EAN	10.3	3RN/CAN
Record	1777	24452	.928	12.3	100.0

[1] Region net representation based on one session per night. Others are based on two or more sessions per night.

[2] Section nets reporting: NEB (Nebr.); SCN & NCN (Calif.); BUN (Utah); WSSB & WIN (Wis.); MDDS (Md.-Del.-D.C.); Ohio Fone; RISPN (R.I.); CPN & CN (Conn.); GBN (Ont.); QKS (Kans.); OSN (Ore.); WSSN & WSN (Wash.); VFN & VN (Va.); SCN (S.C.); MSN, MSPN Eve, MSPN Noon, MJN (Minn.); Tenn. CW; AENB, AENM, AENO, AENP Morn, AENP Eve, AENT (Ala.); NJQ, S. Dak. CW, S. Dak. 75 Phone; SOCAL 6 (Calif.); NJN (N.J.); GSN (Ga.).

[3] TCC functions reported, not counted as net sessions.

Only one record broken this month — the total number of sessions exceeded last year's record for October by *one session*. In total traffic we were well below the record set in 1959. The record rate was set in 1957, the record average 1959.

We are having to eliminate quite a number of section net reports because they do not contain the required data: number of sessions, traffic handlings and NTS connection. If these could be validated by proper execution, it would help our traffic total each month.

W2EZB is trying to fill in the blank spots in the NCS-liaison roster on 2RN. W4SHJ has issued 4RN certificates to *K4s* BWS FJD KIT and WJR. W5GY invites all and sundry to route XE traffic via him, on RN5; Miss. and W. Fla. need bolstering in representation. Attendance is now holding up fine on 8RN, sez W8DAE. WØFEO is back from vacation and ready to carry on with TWN; he promises to be more active. EAN Manager W8SCW is QRL but willing to keep on as manager unless someone else wants a crack at it. CAN misses W9DO, WØKJZ, and WØBDR; certificates have been issued to W1WEF, WA2APY, W5TFB, W8ELW, W9JOZ and W9VAY. PAN is suffering from poor conditions (aren't we all?). WA6ROF says conditions are either very good or very poor.

Transcontinental Corps. Erratic conditions are causing those TCC percentages to go down, down, and giving the TCC managers fits in trying to keep personnel in good morale. The best solution is to have at least one alternative to the regular schedule, and possibly two. Of course, you can't do much if all bands are dead, but most of the time during this part of the cycle it is simply a case of a fast-changing m.u.f. If you set your schedule for lower frequency bands as an alternative to the regular frequency, oft-times you can get through. If 20 is dead, 40 may be open for the path you want. If 40 also is *kaput*, try 80. In years to come, we may even have to use 160 for TCC!

By the way, we want everybody to notice that WØBDR has justified our faith in him; he's back in the saddle again!

October reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	124	70.2	1919	603
Central	93	82.8	2138	1063
Pacific	119	86.3	1484	754
Summary	336	79.5	5541	2420

The TCC roster: Eastern Area (W1SMU, Dir.): *W1s* AW EMG* NJM OBR SMU WEF, *K2s* SSX UFT*, WA2APY, K3IMP*, *W3s* EML* FAF* WG WRE*, W4DVT*, *W8s* ELW* CHT UPH*, VE2AZI. Central Area (WØBDR, Dir.): K4AKP, *W9s* JOZ DYG CXY ZYK, *WØs* DUA SCA. Pacific Area (W7DZX, Dir.): W5ZHN, *K6s* DYX LKD GID WAE, *W6s* EOT HC, *WA6s* ROF JDB, *K7s* IEY NWP, *W7s* GMC DZX, *KØs* EDH DTK EDK, *WØs* BES WME KQD WHE.

* Awarded TCC certificates.

RESULTS, SEPTEMBER FREQUENCY MEASURING TEST

The September 13, 1961 FMT, open to all amateurs, brought entries from 223 participants who made a total of 786 measurements. Of these, 120 ARRL Official Observers submitted 427, and 103 Non-OOs made 359 readings. All taking part have received individual reports of their readings. The standings accredited to the more precise in each group appear below; all listed show ability of the highest order in Frequency Measurement. February *QST* will announce details on the next ARRL FMT.

Observers	*Parts/Million*	*Non-Observers*	*Parts/Million*
W1BGW	.0	W6KT	.1
W5NKH	.0	W8DSX	.1
W8CUJ	.03	W8GQ	.2
W4JUI	.1	KH6EGQ	.6
W4CVO	.1	M. Hogen	1.0
W1VW	.2	W3DTH	2.4
W8YCP	.4	W8TBZ	2.6
W8GBF	.5	K6HI	3.0
VE6HM	.5	W7NPV	4.1
K6MZN	.7	W4SHL	4.7
K5VXN	1.5	W2BHJ	5.4
W6GQA	1.5	K1DIT	5.9
K1IZM	1.8	W4EGY	5.9
W6YCF	1.9	KH6EGL	7.0
W3BFF	2.3	W8LAG	7.4

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.w.* — 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 W1AW will be made Jan. 20 at 0230 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 Jan. 5 at 0500 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, 0230 GMT Jan. 20 becomes 2130 EST Jan. 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 your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

W1AW conducts code practice daily at 0230 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. 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 fist, try to send in step with W1AW.

Date — Subject of Practice Text from Nov. *QST*

Jan. 3: *Sweepstakes Comes First*, p. 17
Jan. 9: *Four Bands on Split Level*, p. 11
Jan. 12: *Single-Switch RTTY Control*, p. 18
Jan. 17: *A Rack-Mounted Operating Table*, p. 62
Jan. 23: *The S Meter — False Idol*, p. 44
Jan. 26: *Space Communications and the Amateur*, p. 26
Jan. 31: *A Novel Idea for Radio Clubs*, p. 74

W1AW SCHEDULES

(January 1962)

Operating-Visiting Hours

Monday through Friday: 3 P.M.-3 A.M. EST.
Saturday: 7 P.M.-2.30 A.M. EST.
Sunday: 3 P.M.-10.30 P.M. EST.

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 Jan. 1, New Year's 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 W1AW signal, not for exact calibrating purposes.

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, 0100; Tuesday through Sunday, 0500.

Voice: Monday through Saturday, 0200; Tuesday through Sunday, 0430.

Caution: Note that in the U. S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

W1AW CONTACT SCHEDULE

Would you like to work W1AW? W1AW welcomes calls from *any* amateur station in accordance with the following schedule:

GMT	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0030-0100	.....	.....	7255	.....	7080	.....	7255
0120-0200[1]	.....	.....	7080	3555	7080[2]	3555[2]	7080
0210-0230[1]	.....	.....	3945	50.7 Mc.	145.8 Mc.	3945	3945
0330-0430	.....	.....	3555	3945	7080	1820	3555
0440-0500[1]	.....	.....	3945	14,280	3945	14,280	3945
0520-0600[1]	.....	.....	3555[2]	7255	3555	7080[2]	3945
0600-0700	.....	.....	14,280	14,100	3555	14,100	.....
0700-0800	.....	.....	7255	3945	7080	3945	7255
2000-2100	.....	.....	14,280	21 28 Mc.[3]	14,100	.....	.....
2100-2200	.....	14,280	21 28 Mc.[3]	14,100	21 28 Mc.[3]	21,330	.....
2200-2300	.....	14,100	14,280	21,075[2]	14,280	14,100	.....

[1] General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0200 and 0430 on phone and at 0100 and 0500 on c.w. Starting time is approximate.
[2] W1AW will first listen for Novices before checking the rest of the band for other contacts.
[3] Operation will be conducted on either 21,075, 21,330, 28,080 or 29,000 kc.

DX CENTURY CLUB AWARDS

HONOR ROLL

W3JNN....315	W1ME....312	W9LNM....308
W2AGW....315	W7GUV....311	W2BXA....307
PY2CK....315	W3GHD....311	W6ENV....307
W8JIN....315	W9YFV....311	W0QVZ....307
KV4AA....315	W8BF....311	W8KMI....307
W9RBI....314	W8DMD....311	W1CLX....307
W1GKK....314	W6EBG....311	W1JYH....307
W4DQH....314	W5ADZ....311	W4TM....306
W6CUQ....314	LU6DJX....310	W7PHO....306
W8BRA....313	W7GBW....309	W3BES....306
W2HUQ....313	W5USG....309	ZL1HY....306
W6AM....312	W8UAS....309	W8KIA....306
W9NDA....312	W8BKP....308	W0ELA....306
W3KT....312	CE3AG....308	W1BIH....306
	4X4DK....308	

Radiotelephone

PY2CK....314	VQ4ERR....307	W8PQQ....304
W8GZ....311	W8KML....305	W4DQH....304
W8BF....310	4X4DK....305	CX2CO....302
W9RBI....309	W7PHO....304	W6YY....300
W3JNN....308		W6AM....300

From October 1, to November 1, 1961 DXCC Certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

W6PUY....288	OH2EW....105	K4YSK....101
DL1FK....209	K4SCT....104	W8APN....101
K1TML....195	DJ5AI....104	DJ4YQ....101
FL7AQ....120	G3FTQ....104	Z82KX....101
CT1JY....118	W3MVR....103	W2LHH/1....100
LA4LE....114	W8QNW....103	W2CUE....100
KR6GR....110	K3EIB....102	WA2FQG....100
W7IYW....110	K4ICA....102	K2SRO....100
W2RQE....109	DJ2GL....102	K4AMC....100
PA0VER....106	YU1SF....102	W4AQL....100
W1LJO....105	W2ELW....101	VE3AIF....100
JA1GV....105	W4EUV....101	VE4SC....100

Radiotelephone

DL1FK....194	W3LPF....119	I1HL....106
YV5AJK....172	IICAO....109	KR6GR....106
W2YTH....146	K8ONV....108	SM6RS....104
Z84MG....143	G3NFV....108	VE6IN....102
W3BS....142	W2RQE....107	K4ICA....101
K4ASU....142	F3DB....107	W2ELW....100
GM3NPR....124		K4PSR....100

ENDORSEMENTS

W3JTC....300	W9MQK....252	DL7EN....228
W9GIL....285	W3VKD....251	W4NT....227
W2ESO....280	W7GHB....250	W8KBT....227
W8IRN....280	W6BTD....250	G6VQ....227
W9HI....280	F3YR....250	W2NOY....225
W6LRU....271	W7AQB....249	W4AUL....225
W9KNK....271	W8AJW....245	W8SCU....225
W2HO....268	W1ZL....243	K4ASU....224
W3ADZ....267	SM5WJ....241	W6CG....221
W6YK....262	ZS1RM....241	W3LPF....220
G3FNN....261	ZS1OU....234	K2JYH....219
W2EQS....260	W9UZ8....232	W0CDP....213
W1JB....256	K1JDN....231	KS1KB....212
W9QYW....255	ZL3GU....231	W4JJL....211
DL7AB....254	EA3CY....230	W9AEH....211
W2UDB....210	W9FLK....173	K2UVV....140
K2QHL....210	K2INP....171	W4AVY....140
W9HLY....210	W5PWW....171	W8CFX....140
W8UHN....210	W9DSO....171	DL7HU....140
G6LX....209	EA5BD....171	KP4AQQ....139
ZS4MG....208	W1ALK....170	JA3BB....135
W9TKD....201	K2TQC....170	SM3FY....135
W1AW....200	K2YXY....170	KIDIR....132
W2CDP....200	W0YZD....170	K4HMX....132
K4TWK....200	W4NPT....168	SM3BHT....132
OZ7GC....199	W4HCE....163	HZ1YM....131
W1MIJ....195	Z88U....162	W7AIB....130
OK1JX....194	W6NUQ....161	W7CNL....130
XE2TH....194	G8KU....161	W9EKH....130
W2IDEO....191	ON4LX....161	VR2DK....130
W2JVZ....191	TG9AL....161	W1ZJJ....128
W4NO....191	DL3TG....158	DL1TA....125
WA6AMZ....190	VS1FZ....153	W1IP....122
W9QFC....190	W1DBM....152	DJ2XP....122
W0AUR....190	K8AITI....152	W1YPH....121
OH3TH....190	G3FPK....152	W2HWX....121
W3MSR....188	K5AIW....150	K1MOD....120
K5KET....187	W7YOA....150	K5GOE....120
W2ZQ....186	W9IWX....150	K5UXP....119
LA2B....185	ZL1NG....150	OH2FS....116
KH6DLF....183	SM6RS....148	W0TW....114
CC2AR....183	OA4HK....144	W7BSP....113
K7GCM....181	K4TKM....143	PJ3CJ....113
W1KXP....180	EA1GZ....142	Z87M....113
DJ4DN....179	K8QJH....142	WA2HXC....112
ZE8JJ....179	K8VDV....141	W5EJV....112
VE6TP....176	SM5BEU....141	VE3PE....112
F3MS....176	Z85KU....141	K8JWC....110
K4JEY....174		K9OYD....110

Radiotelephone

PY4CB....270	G2BXP....174	W8CUO....143
DL3IR....260	W0TJ....171	SM5VS....143
G3FNN....257	W2HXG....170	W0GAA....142
W8AJW....224	K9LUI....170	DL3NE....141
W8NGO....220	LA4HF....170	DL3VZ....140
I1RIF....211	W9ILW....167	DL7HU....134
W9MUY....210	TG9AL....161	W3SFK....131
SM5WJ....210	EA3CY....157	W3YZI....131
W4CWV....203	W1DBM....151	OA4HK....131
W1HX....202	W1DGJ....150	KH6DLF....127
W2TP....200	W7SFK....150	K1IDW....126
G6LX....200	DL9OV....150	K4HMX....126
DL7AB....188	G3MVV....150	G3NRZ....120
W3VSU....181	Z81DC....150	TI2RFT....120
W8JXM....181	W5LBI....148	VP2DA....119
W2HQL....180	CT1HF....148	W4DFE....115
W4FPS....180	I1ZLW....146	TG9UB....111
W1YDO....176		K5GOE....110

U.S.-Canada Call Area and Continental Leaders

KH6CD....261	VE2WW....200	VE7ZM....305
KL7PI....261	VE3DIF....284	VE8AW....195
VE1PQ....264	VE4XO....200	ZS6BW....294
VO1DX....255	VE5RU....220	G2PL....305
	VE6NX....256	

Radiotelephone

W1FH....289	WØAIW....291	VE5RU....203
W2ZX....293	VE1PQ....172	VE6TF....190
W5BGP....270	VE2WW....240	VE7ZM....287
KH6OR....261	VE3QA....260	VA2CQ....282
KL7AFR....190	VE4RP....102	ZL1HIY....296

SUPPLEMENT TO NET DIRECTORY

The following listing will supplement and correct the listing on pages 101–104, Nov. *QST*. This brings the record up to date as far as Nov. 21, 1961. Registrations received after that date will appear in the March *QST* list. Nets listed in Nov. *QST* are not relisted unless a change has been made, in which case they are indicated by footnote.

Important note: All net listings are made under the conditions specified on page 101, Nov. *QST*.

Name of Net	*Freq.*	*GMT*	*Days*
Addison Co. Emerg. Service Net (Vt.) (ACES)	144,900	2330	M-S
Ala. Emerg. Net "P" (Evening) (AENP) [1,2]	3955	2400	Dy
Ala. Emerg. Net "P" (Morning) (AENP) [1,2]	3955	1230	M-S
Ala. Emerg. Net T (AENT) [1,2]	3970	2230	Dy
Ala. Post Office Net	3875	0030	W
Ala. Sideband Net (AENM) [1,2]	3965	0030	Dy
Alberta Phone Net	3770	0230	TThS
AREC Civil Defense Net (Calif.)	28,720	0315	M
AREC-Red Cross Disaster Services Network (Ohio)	29,460	0300	T
AREC Slow Speed Net (Iowa)	51,450	2400	W
Argonne Net (Ill.)	3708	0100	W
	145,800	0415	W
Arizona Post Office Net	3855	0045	T-S
Arkansas Emerg. Phone Net [1]	3885	1200	M-S
Arrowhead Radio Amateurs CD Net	29,600	0330	WF
Baltimore Co. Emerg. Net (BCEN) [1]	28,680	0100	T
BAR 50 Net (Mich.)	50,550	0200	T
Beehive Utah Net (BUN) [2]	7272	1930	Dy
Beeville Amateur Radio Klub Net (BARK) (Tex.)	3840	2200	2 3 4Sn
Berks Co. C.D. Radio Net (Pa.)	145,400	0100	T
Betsie Bay Fish Net (BBFN) (Mich.) [1]	3880	1730	Sn
Bingham Co. C.D. Net (Idaho)	3990	1230	MWF
Blackstone Valley Radio Net	29,000	2100	M
	50,675	0030	Th
Blair Co. AREC-CD 6 Meter Net (Pa.)	50,500	0030	W
Blair Co. AREC-CD 10 Meter Net (Pa.)	29,510	1900	Sn
Boonton AREC Net (N.J.)	50,700	0000	Th
Boston Region Post Office Net	3893	2315	M-F
"Breakfast Club" Net	3873	1000	Dy
Bridgeton Area Radio Klub Net	50,735	2300	M
B.C. Amateur Radio Emerg. Net	3755	0200	M-S
Broome Co. (N.Y.) AREC Regional Net	50,400	0200	F

Broward Six Meter Net (Fla.)	50,445	0100	M
Brown Co. Emerg. Net (Wis.) (BCEN)	3950	1930	Sn
Buzzards Bay Cape Cod & Islands Emergency Net (Mass.)	145,260	2400	M
Calif C.D. Net (CCDN)	3501	0300	M
Calif. Post Office Emerg. Net	3695	0400	T-S
	3835	0300	W
Calvert Co. AREC Net (Md.) (CCAREC)	29,500	0200	S
Cambria Co. C.D. & Emerg. Net (Pa.)	29,470	0100	T
The Capital City Net (Ont.)	3540	0200	M
Caravan Club of La. Net	3825	1900	Sn
	50,460	2000	Sn
Casper VHF Net (Wyo.)	50,105	0400	T
Cedar Valley Six Meter C.D. Net (CVCD6M) (Iowa)	50,400	0200	Th
Central Area Penna. C.D. Net	3987.5	1300	Sn
Central Fla. Operational Area Net C.D. (CFOACD)	145,200	2200	M-Th
Central Ill. Net (CIN)	1815	1430	Sn
Central Ky. Emerg. Six Meter Phone Net	50,300	0330	MTh
Central New England Net (CNEN)	3842	1045	M-S
Champlain Valley 6 Meter Net	50,250	2330	M
Chicago Area RACES Net	145,200	0200	F
Chicago 6 Meter RACES Net	50,540	0400	F
The Chicago Windy City Emerg. Net	50,540	0400	F
Civil Defense of N.J. Net (CDNJ)	3534.5	1515	Sn
C.D. of Washtenaw Co., Mich., Net	145,680	0100	W
Clark Co. CD Net (Ohio)	3860	1300	TWSn
Clermont Co. Emerg. Net (CCEN) (O.)	29,600	0100	Sn
	50,700	0200	Sn
Colorado CW Net (CCW) [1,2]	3652	0200	T-S
Colo. High Noon Net [2]	7240	1900	M-S
Colo. Weather Net (CWXN)	3947	1335	M-S
Columbia Basin Net (CBN)	3960	0330	Dy
Comanche Co. AREC Net	3885	1900	Sn
Communications Club of New Rochelle Net (N.Y.)	145,380	0030	W
Confederate Signal Corps Two Meter Net (CSC2M)	145,350	0100	T
Conn. Mobileers Net	145,350	0100	Dy
Conn. 6 Meter Phone Net (C6MPN)	50,580	0045	T
Coosa Valley Emerg. Net (CVEN)	3950	1830	Sn
Copper State Net [2]	3880	0230	T-S
CQ Radio Club Net of Torrington (Conn.)	146,700	2300	T
Crawford Co. Emerg. Net (Ind.)	50,400	1800	Sn
Cumberland Co. AREC Net (Md.)	50,460	0130	T
Cumberland Co. Emerg. Comms. Net (Maine)	3960	1730	Sn
	29,000	1730	W
Cuyahoga Falls Radio Club Net (O.)	53,520	1845	M
CVN (Conn VHF Tfc & Emer.) Net	145,980	0130	TThS
Dallas Ten Meter Net	28,950	0200	T
	29,465	0400	T
Danvers Emerg. Net (DEN) Mass.	29,455	2400	M
Delaware 6 Meter Net	50,400	0200	T
Denver Area RACES Net	29,624	1600	Sn
Denver Area Training Net (DATN)	29,640	0400	MWS
"Dixie Early Bird" Net	7235	1230	M-S
Dover AREC Net (N.J.)	50,450	0100	W
Dover Delaware Six Meter Net	50.300	0100	Th
Dover Delaware 2 Meter Net	145,200	0100	W
Dutchess County AREC Net (N.Y.)	145,800	0200	S
	145,800	0200	S
Early Bird Transcontinental Net (EBTN)	3845	1000	Dy
East Coast VHF Society Net	146,700	0200	F
East Penna. CW Net (EPA) [2]	3610	2330	Dy
Eastern Area Penna. C.D. Net	3987.5	1330	Sn
Eastern Mass. Net [2]	3660	2400	M-F
Eastern Mass. Phone Net [1]	3842	2230	Dy
Erie Co. Emerg. Net (Ohio)	3918	1300	Sn
Evergreen State Net (ESN)	3920	0100	M-S
Five City AREC Net	146,500	1900	T
Fla. Midday Traffic Net (FMTN)	7230	1700	M-S
Fla. Post Office Net	3765	0030	T-F
	3820	1230	Sn
Fla. RTTY Emerg. Net (FREN)	7135	1900	Sn
FMN-2 Net (Ill.)	146,940	0330	F
Fort Wayne and Area AREC Net (Ind.)	50,580	0001	Dy
Fulton Co. Emerg. Net (Ill.)	3810	0730	Sn
Fulton Co. (Ohio) Net	1821	0100	Th
Gem State Traffic Net (GEM) (Odaho) [2]	3580	0300	Dy
Georgia S.S.B. Net	3975	0100	Dy
Grandpappy Net (Calif.)	3825	1500	Dy
Granite State Phone Net (GSPN) [2]	3842	2400	Sn-F
Graveyard Net Work (GYN)	3885	0900	Dy
Greater Atlanta VHF (6 Meter) Society Net	50,170	0130	S
Greater Pittsburgh VHF Society, Inc. Net	50,400	0001	T
Grey Bruce Net (GBN) (Ont.) [2]	3645	2330	M-S
Gulf Coast Sideband Net [1]	3925	2330	Dy
Gulfoa Net (Fla.)	50,300	1800	S
Hamilton Co. Emerg. 160 Meter Network (Iowa)	1815	0030	Dy
Hancock Co. AREC Net (Ill.)	3990	1530	S
Hastings Slow Speed Net	21,150	0200	Sn
Hawkeye Emerg. Net. (Des Moines, Iowa)	29,600	0130	TF
Hawkeye 75 Meter Phone Net	3930	1400	Sn
Hi-Plains Net	1815	1400	Sn
Hit and Bounce Net (HBN) [1]	7125	2230	M-S
	7140	1330	Dy
Holland Area FM Net	146,940	0200	Dy
Hoot Owl 6 Meter Net	50,300	0200	MF
The Huntington Weather Net (HWN) (W.Va.)	50,550	2400	M
Illinois Post Office Net	3880	1430	Sn
	7106	2100	Sn
Illinois Weather Net, Inc.	3873	1335	Sn
	145,350	0200	W
Interstate S.S.B. Net	3985	0100	Dy
Intra-County Net (Miami, Fla.)	29,600	0100	S M
Iowa Post Office Net	3806	2000	Sn
Iowa 75 Meter Phone Net	3970	1830	M-S
Iowa Single Sideband Net [2]	3970	0100	T-Sn
Iowa Tall Corn Net (TLCN) [2]	3560	0030	T-Sn
Jasper County Emerg. Net (AREC & RACES) (JCEN) (Iowa)	1810	0130	T
Jayhawk Amateur Radio Society Net	29,600	0200	Th
	51,150		
Kansas City Area Post Office Net	28,826	0245	Th
Kansas Post Office Net	3910	2330	M
Kentucky CW Net (KYN) [2]	3600	2300	Dy
Keystone Slow Speed Net (KSSN) (Pa.)	3585	2330	M-F
Kings County AREC-RACES-CD Net (N. Y.)	50,400	0030	T
Kings County AREC/RACES Net (N.Y.) [1]	29,640	0200	T
Kings Co. Traffic & Emerg. Net [1] (N.Y.)	50,400	0030	Th
Knox Co. Emerg. Net (KEN) (Penn.)	50,400	0000	M-F
The Knucklehead Net (KN) (Ohio)	28,845	0200	TThS
KW 6 Meter Emerg. Net (KWN) (Ill.)	50,550	0300	T
Lakeland AREC Net (N.J.)	29,000	0000	W
Lancaster Co 6 Meter AREC Net [1] (Pa.)	50,700	0215	T
Lansing Sunday Net (LSN) (Mich.)	3885	1600	Sn
Lawrence Co. Emerg. Net. (Ohio)	3860	0030	W
	50,100		
Lee Co. RACES Net (Fla.)	50,580	2400	Th
Linn Co. Emerg. Net (LCEN) (Iowa)	3915	1900	Sn
Lorain County Net (Ohio)	1820	1800	Sn

Los Angeles Amateur Radio Emerg. Council Net (LAAREC)	29,500	2015	M
Louisiana Post Office Net	3870	1300	Sn
Lynchburg 2 Mtr FM Net (Va.)	145,260	2345	Dy
Madison Mobile Net (MMN) (Wis.)	29,620	0100	W
Manitoba ARRL Phone Net	3760	0100	Dy
Maryland Emerg. Phone Net (MEPN)	3820	2200	MWF
		1700	SSn
Mason Co. Red Cross Disaster Net (Mich.)	29,610	0200	M
Mass. Post Office Net	3700	1445	Sn
	3893	1400	Sn
McPherson-City-County C.D. Net (Kans.)	145,080	0330	T
Md., D.C., Del. AREC Net	3521	0100	W
	7042		
	50,700		
	145,660		
Medina County Net (Ohio)	1805	1800	Sn
Memphis Emerg. Six Meter Net (Tenn.)	50,500	0200	MF
Memphis Ten Meter Mobile Emerg. Net (Tenn.)	29,627	0100	TS
Merrimack Co. AREC Net (N.H.)	50,820	0200	T
Mich. Emerg. (Sun.) Buzzards Roost (Week) Net (MEN/BR)	3930	2230	M-F
		1400	Sn
Michigan Post Office Net	3645	0030	F
	3855	2330	T
Michigan Six Meter Net	50,250	2200	Sn
Michigan Thumb Net (MTN)	3850	1300	Sn
Middle Tenn. 6 Meter Emerg. Net	50,600	0130	M
Mike Farad Emerg. & Traffic Net	7238	1700	M-F
	3610	0500	Dy
Military Civilian Affiliated Net 7 Mc. (MCAN7)	7252	2130	M-F
Minn. Evening Phone Net	3820	0001	M-S
		1500	SnH
Minn. Junior Net (MJN) [2]	3595	0030	Dy
Minn. Section Phone Net (Noon Session) [2]	3820	1805	Dy
Missoula Area Emerg. Net (Mont.)	3890	1600	Sn
Mohawk Hudson Training Net (N.Y.)	3716	1800	S
Montana Phone Net	3910	0100	TThS
Morning Ky. Phone Net (MKPN) [1]	3960	1330	M-S
		1400	Sn
Muskingum Emerg. Net [1]	29,616	0300	S
Muskogee Co. Emerg. Net (MCEN) (Okla.)	50,140	0500	F
Muskogee Co. Net (C.W.) (MCN) (Okla.)	3742	1400	S
Muskogee Mobile Net (MMN) (Okla.)	3850	1340	M-F
National Post Office Net (PON)	7040	0300	T-S
	14,080	0001	T-S
Nebraska Post Office Net [1]	3890	0015	T-Sn
New England Weather Net (N.E. Wx)	3900	1045	M-S
New Mexico Post Office Net	3850	0430	Dy
New Orleans Emerg. Net (La.)	3825	1400	Sn
N.Y. C.-L.I. CW Net (NLI) [1,2]	3630	0015	Dy
		0245	
New York Post Office Net	3600	2330	Th
	7090	1800	Sn
N.Y. State C.D. Command Net (Phone) (YCD)	3993	1400	Sn
N.Y. State C.D. CW Net (YCD)	3510.5	1400	Sn
N.Y. State CW Net (NYS) [1,2]	3615	2400	M-S
Nishna Valley 2 Meter Net (Iowa)	145,250	1900	Sn
Nite Owl Net (Ill.)	29,640	0400	Th
North Bay Amateur VHF Net (Calif.)	50,400	0400	S
N. C. RACES Phone Net	3987.5	2400	Th
North Central Phone Net (NCPN)	3915	1245	M-S
North Country Radio Club Net	3926	1800	Sn
No. Dak. CW Net	3670	0030	TThS
No. Dak. Post Office Net (NDPON)	3845	0030	M
North Lake VHF Net	51,000	0200	M
N. Texas Emerg. Net (NTEN)	3930	1330	Sn
Northeast Area Barnyard Net (NABN)	3960	1200	M-S
Northern Net B.C.	3780	0330	Dy
Northern Slow Speed Net	3700	0300	M-S
Northwest Texas Emerg. Net [1]	3950	1400	Sn
Novice Hurricane Net	3725	1200	Sn
Nutley CD Net (N. J.)	3725	1200	Sn
Nutley CD Net (N. J.)	146,100	0000	M
Oak Ridge AREC Net (N. J.)	50,500	0100	W
Oakland Co. AREC Emerg. Net (No. 2) (Mich.)	50,250	0200	T
Oakland Co. AREC Emerg. Net (No. 3) (Mich.)	29,000	0200	T
Oakland Co. AREC Emerg. Net (No. 4) (Mich.)	1807	1930	Sn
Oakland Co. AREC Novice Net (Mich.)	3730	1700	W
Oakland Co. AREC 2 Meter Net (Mich.)	145,350	0330	Sn
O'Brien Co. Six Meter Emerg. Net (Iowa)	50,400	0030	F
Ohio Emergency Net (OEN) [2]	3580	0001	Sn
The Ohio Phone Net (OPN) [1,2]	3860	2200	M-F
Ohio Post Office Net	3675	2330	Th
	3870	1300	Sn
		2300	T
Okaloosa Co. 10m Emerg. Net (HAIR) (Fla.)	29,564	0100	T
Okaloosa Co. 2m Emerg. Net (Fla.)	145,200	0100	T
Oklahoma Post Office Net	3695	0200	T
Oklahoma Slow Speed Net (SSZ) [2]	3682.5	0330	M-S
Oklahoma Traffic Net (OLZ) [2]	3682.5	0100	M-S
Orange Co. 6 Meter Emerg. Net (Texas)	50,800	0030	Dy
Oregon AREC Net	3875	0300	M-F
Oregon Post Office Net [1]	3820	0300	Th
Oxnard Emerg. Net (Calif.)	3930	1630	Sn
		0030	TTh
Pacific Area Net (PAN) [2]	3675	0430	Dy
Paterson CD-DC RACES & Emerg. Group Net (N.J.)	145,188	0115	T
Peninsula Emerg. Net (PEN) (Wash.)	3940	2100	1/3S
Penna. C.D. (CW) Net (PACD)	3538.5	1400	Sn
Pennsylvania Post Office Net	3610	0130	T
	3955	0030	T
Penna. State C.D. Net	3987.5	1230	Sn
Pensacola 10 Meter Emerg. Phone Net (Fla.)	29,560	0100	T
PICONET (Minn.)	3840	2000	Alt/Sn
Pierce Co. RACES-AREC Forum Net (Wash.)	29,510	0400	Sn
	50,600		
	145,650		
Pine Ridge Amateur Radio Club Emerg. Net (Nebr.)	3850	1700	Sn
POI Net (Hawaii) [2]	7140	0500	TTh
Post Office Net (Missouri) (PON)	3810	2100	M-F
Post Road Emergency Net (Mass.)	28,890	0000	M
Potomac-Rappahannock Valley Net (PRVN)	3935	1400	1/3Sn
Poweshiek Co. AREC Net	3775	1500	1/3Sn
	28,950		
Putnam County-AREC-Putnam County C.D. Net (N.Y.)	145,590	0100	TW
The Queen City Emerg. Net (QCEN) (Ohio)	29,600	0100	T
	50,700	0100	Th
Queens 6 Meter AREC Net (N. Y.)	50,250	2359	Th
Red Cross Disaster Services Net (Ohio)	29,460	0300	M
Red River Amateur Assn. Net (La.)	3902	2030	Sn
Red Rocks Amateur Radio Club Net (TRRARCN)	3980	2100	S
Regional Net Five (RN5) [2]	3645	0145	Dy
		0330	
Regional Net Seven (RN7) [2]	3560	0345	Dy
		0530	
Rhode Island Net (RIN) [2]	3540	0000	T-S
R. I. State Phone Net (RISPN) [2]	50,600	2330	Dy
River Forecast Net (RFN)	3656	1300	Sn

Roane Co. Emerg. Net (Tenn.)	50,300	2330	M-F
Rock Island Co. RACES Net (Ill.)	50,580	0300	M
Rockford Emerg. Net (REN) (Ill.)	28,700	0300	T
San Diego AREC Net (Calif.)	3825	1700	Sn
San Joaquin Valley-ARRL Sectional Net (Calif.)	3915	0230	T-Sn
San Jose C.D. Net (Calif.) [1]	146,920	1930	T-Th
Scioto Co. Emerg. Net (SCEN) (Ohio)	3845	1330	Sn
Scott County C.D. Net (Iowa)	50.460	1600	Sn
S. Dak. Wx Net	3870	1400	M-S
Sector 2D 6 Meter Sector 2D 2 Meter Net (Mass.)	50,440 145,325	0030	M
Seven Eleven Traffic Net (SETN) (Fla.)	145,350	2400 0400	Dy
75 Meter Mobile Net AREC	3988	1945	Th
7290 Traffic Net	7290	1500 1900	M-F
Short Skip Radio Club Net	28,800	0400	Sn
Sioux Falls Emerg. Net (SFEN) [1] (S. Dak.)	144,900	0300	WS
6 Meter Cross-Band Traffic Net [1]	50,875	1930	M-F
Six Meter West Gulf Emerg. Net (Texas)	50,400	1500	Sn
Sixth Regional Net (RN6) [2]	3615	0345 0530	Dy
Sketo Net (Calif.)	3910	0400	TThS
Skokie Six Meter Indians Net	50,298	0300	T
Socal 6 Net [1,2]	50,400	0230	Dy
Sooner-Nooner Net	7235	1820	M-S
Sooner Traffic Net	3850	2345	M-S
South Bend 6 Meter Net	50,300	2330	M-F
South Carolina CW Net (SCN) [1,2]	3795	2400 0300	Dy
South Carolina Post Office Net	3845	2300	T
South Dakota CW Net (SDNET) [1,2]	3645	0100	TThS
So. San Diego Co. Amateur Radio Emerg. Net (Calif.)	3825	0300	M
South Texas Emerg. Net	3780	0130	M
S. Texas Emerg. Net (STEN Zone 2)	3855	0015	Th
Southern Los Angeles AREC Net (Calif.)	21,396 50,400 145,800	2100 0400 0300	Sn T W
Southern Maryland Net (SMN) [2]	28,747	0300	W
Southern Michigan Net	50,700	0100	Th
Southern Wis. Relay Net	50,400	0300	M-S
Southtown AREC & RACES Net (Chicago)	29,640	0130	T
Southwestern Mich. Two Meter Net	145,260	0100	T
St. Clair Co. Emerg. Net (SCEN) (Mich.)	29,610 29,590	0100	T
St. Louis Monday 6 Meter RACES Net (Mo.)	50,550	0200	M
St. Louis Tuesday 10 Meter RACES Net (Mo.)	29,640	0200	T
Suburban Amateur Radio Assn. 6 Meter Net (Minn.)	51,000	0300	WSn
Sunnyvale RACES Net (SRN) (Calif.)	50,440	0300	T
Susquehanna Emerg. Net (SEN)	3910	1300	Sn
Tar Heel Emergency Net (THEN) [2] (N. C.)	3865	0030	T-S
Tarrant Co. Disaster Control Net (TCDCN) (Texas)	3970	1900	Sn
Tennessee Post Office Net	7045	2000	Sn
Tenth Regional Net (TEN) [2]	3545	0145	Dy
Texas CW Traffic Net (TEX) [1,2]	3770	0100 0400	Dy
Texas Post Office Net	3935	1130	M
Third Region Net (3RN) [2]	3590	0045 0230	Dy
Tioga Civil Defense Net (N. Y.)	50,640	2330	M
Towaco-Montville-Pinebrook AREC Net (N. J.)	146,820	0000	M
Traffic Hounds' Morning Watch (MW)	3540 7080	1200 1230	M-S SH
Transcontinental Relay Net (TCRH2) (TCRN3) (TCRN4)	7042 3521	0615 0215 1600 2200	Dy
Tri State Net	50,500	1400	S
Tri-State 6 Meter Net	50.520	2035	Sn
Tri-State Traffic Net	3855	2400	TThS
Tropical Phone Traffic Net (TPTN) [2] (Fla.)	3945	2230	Dy
Tucson Emerg. Net (AAREC) (T.E.N.) (Ariz.)	3880	0200	Th
Tucson Two-Meter Net (T.T.M.N.) (Ariz.)	145,350	0300	Th
The Tulare Co. Net (T.C.N.) (Calif.)	3895	1800	Sn
Twelfth Region Net (TWN) [2]	3570	0300	Dy
Two Meter Broward Emerg. Net (2BEN) (Fla.)	145,230	0100	W
Union Co. 6M AREC Net [1] (N. J.)	50,550	1530	S
United Trunk Lines (Central) (UTL)	3590	0330	Dy
United Trunk Lines East West 7 Mc	3550 7123	0315	Dy
United Trunk Lines (Eastern) (UTL)	3568	0200	Dy
Upper Level Hillbilly Net (N. C.)	29,560	1400	Sn
U.P.Y.L. Net	3920	1400	M
Utah Co. Emerg. Net (UCEN) (Utah)	7290	0330	Th
Valley 6 Meter Emerg. Net (Ill.)	50.220	1500	Sn
Valley 2 Meter Emerg. Net (Ill.)	145.290	0330	Th
Vanderburgh County AREC & RACES Net (Ind.)	29,600	0130	MTh
Vigilante Net (Mont.)	3525	0400	M
Virginia Phone Net (VFN) [2,1]	3835	2400	Dy
Virginia Post Office Net	3855	1830	Sn
Va. SW Region CD Emerg. Net	3835	1300	Sn
Waltham CD Net (Mass.)	146,800	0030	M
Wash. Amateur Radio Traffic System (WARTS) [2]	3970	0200	M-S
Wash. County AREC Net (Ore.)	50,550	0400	T
Wash. County Emerg. Net (Ohio)	3825	1700	Sn
Washington Post Office Net	3960	0230	T-S
"Weatherbird" Net, 6 Mtr Section	50,540	0400	Th
"Weatherbird" Net, 10 Mtr. Section	29,640	0300	1/3Th
"Weatherbird" Net, 2 Mtr Section	145.500	0200	S
W. Fla. Phone Net (Evening) (WFPN) [2]	3836	2300	Dy
W. Fla. Phone Net (Morning) [2]	3830	1200	Dy
West Gulf Emerg. Net (Texas)	3995	1400	Sn
W. Phila. Radio Assn. Net	29,360	1500	Sn
West Va. Post Office Net	3905	2230	MWF
Western Area Penna. C.D. Net	3987.5	1400	Sn
Western Mass. Phone Net [2]	3870	2300	MWF
Western Nebr. Net	3850	1400	M-S
Westmoreland Co. CD Net (Pa.)	29,500	0200	W
Westmoreland Co. Sector 1 C.D. Net (Pa.)	29,360	0100	W
Weymouth C.D. Net (Mass.)	147,186	1600	Sn
Whiteside Co. C.D. Net (WCCD) (Ill.)	50,520	0100	W
Whittier Emerg. Net (Calif.)	3885	0415	T
Wichita Radio Emerg. Net (WREN) (Kans.)	29,600	2400	Sn
Winston-Salem CD 2-Meter Net (N. C.)	146,700	0100	WF
Winter Park Amateur Radio Club Net (Fla.)	147,150	0100	Th
Wisconsin Post Office Net	3630 3860	0100 1830	Th Sn
Wisconsin Side Band Net [2]	3985	2400	Dy
Wyoming Co. CD & Emerg. Net (N. Y.)	28,610	0100	W
Wyo. Pony Express Net [2]	3920	1530	Sn
YL Welcome Net	3900	1330	W

[1] Correction to Nov. *QST* listing.
[2] Part of ARRL National Traffic System.

BRIEF

Now is the time to push for passage of Senate Bill 2361.

Station Activities

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

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: DUI. PAM: IVS. RM: EML. The EPA C.W. Net meets nightly at 2330 on 3610 kc. The Pennsylvania Phone Net meets Mon. through Fri. at 2300 on 3850 kc. The new frequency of the Pa. C.W. C.D. Net is 3585.5 kc. at 1400 Sun. WRE is NCS. Six marks a new high for BPL in this section with CUL, IVS, EML, K3IMP, GSU and VR the honored stations. JKX is added to the ORS list. Aside from the usual traffic routine UIU and K3HTZ found time to do a bit of small-game hunting. K3JJG added WBH to his list of 40 awards. DHJ is retiring as Lt. Col. in the U.S. Army. K3GAU is now running 120 watts on 6 meters. K3CNN added the AZ5 award to his stack of wallpaper. GJA has filled a spot in the PFN as NCS. October activities brought forth the SET. A number of stations were in operation but 1D's was the only report received. FEY is adding RTTY on 146.8 Mc. The CD Party brought a few new states in for ELI. Emergency-wise, JYL is ready with the newly-installed 7½-kw. generator. 2UZN/3 has completed his converter in preparation for "Project OSCAR." K3PXA installed a nuvistor preamplifier on his G-50. K3ADS reports good results with 6-meter RTTY. The section of Eastern Pennsylvania consists of 34 counties. Our SEC, DUI, reports there is no Emergency Coordinator in the following counties: Berks, Bradford, Chester, Columbia, Dauphin, Montour, Perry, Pike, Snyder, Sullivan, Tioga, Union, Wayne, Wyoming and York. Anyone interested in an EC appointment in these counties should write your desires and inquiries to Emmet Kuehner, W3DUI, 242 East Broad St., Hazleton. K3PIY, IUZ, NBS, JHU, OVI and OVJ are now General Class operators. The Susquehanna Valley ARC held its first annual banquet which was highly successful. AIW is a Silent Key. He was secretary of the Carbon ARC since its formation after World War II. Within a few short days we will greet 1962. One resolution we all hope and pray for is "peace." Peace and prosperity to all. Happy New Year, gang. Traffic: W3CUL 2994, IVS 2171, EML 1118, K3IMP 655, GSU 602, W3VR 595, W4DVT 201, W3FAF 107, CIU 105, K3BHU 56, MVO 56, W3NNL 49, JSX 38, K3HTZ 37, W3ZRQ 33, HNK 29, K3JSX 26, CAH 21, JJG 17, W3PDJ 16, K3KTC 14, NLW 14, W3OY 14, BFF 13, BUR 8, DUI 5, GJA 5, MJM 5, K3ADS 4, W3ID 3, ADE 1, EEN 1, ELI 1, IWO 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—Asst. SCM Del: M. F. Nelson K3GKF. SEC: CVE. MDD Traffic Net meets on 3650 kc. at 0015Z daily; MDDS (slow) net on 3650 kc. at 0130Z daily; MEPN on 3820 kc. at 2300Z work days, 1800Z Sat.-Sun. DEL Emer. Net on 3905 kc. at 2330Z Sat. Check in one of these active nets and help keep MDDC on top. Oct. appointments: EJU and IYE as OOs; K3AMC, K3AZH and CFA as OPSs; K3AZH as OES; EIV as ORS. K3AMC is NCS for the new DEL Emer. Net and welcomes all Delaware stations, especially from the southern counties. John also is the new caretaker for the WDEL Award and all inquiries should be addressed to him. New officers of the Friendship ARC are K3IYJ, pres.; K3LFD, vice-pres.; K3CBW, secy.; QA, treas. K3AXW is now a member of the Certificate Hunter's Club. K3AZH worked 6 call areas on 50 Mc. Oct. 28. BUD reports the St. Marys County boys had 4 emergency-powered stations in the SET. John is working hard for expansion of the AREC group. K3BYJ is busy with AREC activities in New Castle County. The Rock Creek ARA had Lt. Shinn, of the Office of Chief Naval Operations, as speaker at its Oct. 13 meeting CFA divides time between 7.2 and 3.9 Mc. K3CRF is attending military school in Georgia. Vice-Director ECP operated portable from Maine during his recent vacation trip. CVE is awarding emblems for outstanding AREC work in Prince George County. EEB is busy working DX and handling traffic in MDD. EOV is getting set for RTTY on 3.5 Mc. EQK keeps up his OO activity. Glad to hear from K3EWK a new General Class licensee in Delaware. 4EXM/3 still is on Okinawa. The Foundation has set Sept. 30 for the big Annual Gaithersburg Hamfest. K3GZK likes his new extended double zepp on 20 meters. HKS is providing a good Delaware outlet on MDD. K3HPG now has 97 confirmed. IVC is helping as NCS for MDD. K3IZM liked the 6-meter aurora opening in late October. K3JIQ reports he has a new "Sixer" and needs 4 more for DXCC. K3JYZ makes BPL again to lead the section. KIIA checks in from Baltimore. K3KHN is building a new 220-Mc. converter. K3KPZ has all his equipment in working order for the first time! K3LFD has a new emergency a.c. generator. K3LJB acted as NCS during the recent AREC drill. K3LLR is working hard for his General Class ticket. LQY is a new YL in Baltimore from Louisiana. K3LWD likes his new 50-Mc. turnstile antenna. MCG had a big time in the VK/ZL Contest. GRF now has the new 80-meter quad working. The Washington TVI Committee meets every 2nd Tue. at Broadcast House and invites visitors. K3MDL says the SET was a big success in Baltimore County AREC. K3MQP is a new reporter. K3MZY is rebuilding his rig for contests. K3OGA has his BC-645 working on 432 Mc. OHI moved his shack to a new location. KN3OZA was thrilled to work an EA as his first DX. KN3PEJ is studying for General Class. K3QOL is another new Baltimore refugee from Louisiana. TMZ is waiting for the DX Contest. TN maintains his steady pace in the traffic nets. UCR reports that AAI and K3HDQ received 20-year awards from Naval Research Lab. UE reports in by radio. K3WBJ picks up plenty of traffic at Walter Reed Hospital. WV received PG AREC Award No. 1. YZI is now the section antenna expert after his big QST article. ZAQ continues to lead the MDDC OOs. ZNW reports he has a job making Generals out of 3 Novices. Traffic: K3JYZ 371, LFD 208, W3UE 118, TN 104, IVC 93, MCG 87, ZNW 85, LQY 74, K3WBJ 73, MZY 70, KPZ 62, MDL 56, W3EOV 51, K3GZK 36, W3BUD 24, ECP 19, K3EWK 18, MQP 18, W3EEB 17, K3AZH 10,

FIFTH PENNSYLVANIA QSO PARTY

January 20-22, 1962

The Harrisburg Radio Amateur Club announces the Fifth Pennsylvania QSO Party, in which all radio amateurs of the world are invited to participate.

Rules: (1) *Time*: The contest begins at 2300 GMT Saturday, Jan. 20, and ends at 0500 GMT Monday, Jan. 22. (2) Suggested congregating frequencies will be 60 kc. above the low end for *each* band and sub-band, i.e., 3560 for c.w., 3860 for phone. This party is being conducted for the purpose of aiding stations obtain their *Keystone Award* and endorsements, and to work counties for WAPC; therefore, each Pennsylvania station will be worked once during the party. (4) *General call*: "CQ PA." Pennsylvania stations sign "DE PA." (5) *Exchange*: Penna. stations send QSO number, RS(T), and county; outside stations send QSO number, RS(T), and state, VE province, or country. (6) *Awards*: Every station working 100 different Penna. stations during this party will receive a KEYSTONE AWARD or an endorsement if they already have the award. (7) *Entry*: A copy of the log, showing station, date, time, band, mode, and station worked QSO number, should be submitted to the contest manager, Charles T. Vogelsong, W3-BQA, R-3, Dillsburg, Penna., postmarked not later than Feb. 15, 1962. All logs become the property of the Harrisburg Radio Amateur Club. No charge for Keystone Awards issued on this basis. Complete information and revised rules for Keystone Awards can be obtained by sending a self-addressed stamped envelope to the above address.

AMC 8, JIQ 8, W3OHI 8, BKE 6, K3AXW 3, OGA 3, HPG 2, LJB 2, KN3PEJ 2.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. RMs: W2BZJ, W2ZI and W2HDW. New appointment: WA2NDK, Levittown, as OES. K2ECY, Riverton, arrived safely in KX6-Land, N.J. Phone & Tfc. Net totals for Oct.: 31 sessions, QNI 599, traffic 260. A very fine net roster has been prepared by W2ZI, net mgr. Fifty-nine members are listed. WA2NPD is doing an FB job teaching Gloucester Co. ARC classes. The club will hold its Annual Birthday Party in January. K2UUY and W2CKX have new tribanders. W2BZJ, Pennington, took a three-week vacation. W2ZI, Trenton, is back from a vacation trip to Niagara and visited many friends en route. WA2VAT, Audubon, top traffic-handler this *month*, is active on EAN, 2RN, NJN and NHN. WA2KWB, Yardville, is working lots of DX with his 600-watt rig. WA2MEQ, Moorestown, has 23 award credits toward his CHC certificate. With regret we report the passing of K2PTG, Minotola. K2SUN, K3HNP and K2UDA are heard regularly working mobile. The Cumberland Radio Club, W2BX, holds a *club* drill each Mon. night. W2BLV, writer of "News and Libel" in SJRA's *Harmonics*, reports many FB DX signals during the recent Aurora. Look for SJRA's 10-meter net Sun. at 1500 GMT. The Leevittown (N.J.) ARC lost its regular meeting place in a recent fire. Meetings now are being held in members' homes. RTTY is on the increase in the section. Two-meter RTTY nets are active on Mon. nights. Contact W2JAV for a sked. The Southern Counties Radio Club has selected a new EC. Clubs electing new officers are asked to please supply information for *Station Activities*. No reports were received from a number of areas this month. Club secretaries, please note. Traffic: WA2VAT 389, W2RG 159, K2RXB 59, W2ZI 44, K2SON 16, WA2KWB 14, WA2LBL 4, WA2ARJ 3, WA2MEQ 2.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF, W2EZB and W2FEB. PAM: W2PVI. NYS C.W. meets on 3615 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN *on* 3925 kc. at 1800, NYS C.D. on 3510.5 and 3993 kc. (s.s.b.) at 0900 Sun., TCPN 2nd Call Area on 3970 kc. at 1900, 1PN on 3980 kc. at 1600, 2RN at 2345 and 0230 GMT on 3690 kc. Happy New Year, everyone. I hope the New Year brings better operating, cleaner rigs and courtesy on the bands to all. Congratulations to K2GAO on making the BPL. K2BPU was appointed OES and K2QDT and W2RQF were renewed as OPS. K2KWK contemplates going on 3500 Mc. and is looking for parabolic dishes. K2EQB *now* is using an SX-111. WA2GCH reports the AREC initiated a Goblin Patrol in conjunction with the sheriff's office, which was a great success. K2PBU has a new Ranger II. WA2LHG has a new harmonic. WA2SNA, in Gloversville, is now General Class. He is 13 years old. WA2DAC has a stacked "Big Wheel" for 2 meters. K2DNN reports the Chemung AREC supplied communications for a sports car rally. W2RQF has acquired a BC-221. WA2LSJ has built a transistor 6-meter walkie-talkie in a 3X3X6 box with ½-watt output. Batteries are outboard. W2TCU reports that the Auburn ARC has its club station. WA2QBL, just about ready to go. WA2QKM and WA2RNA are new Generals in the Syracuse Area. KBT has been reactivated in the Buffalo Area. Your SCM would like to compile a list of active clubs and then reproduce it so it would be available to anyone interested. Your *cooperation is requested*. Monthly reports are invited from all groups and individuals for inclusion in this column. Materials must reach me by the 4th of each month. Traffic: K2GAO 1252, W2EZB 386, W2OE 381, W2FEB 275, K2RTQ 136, K2QDT 101, K2OFV 65, W2RUF 59, WA2KQG 54, W2FCG 51, K2EQB 33, K2PBU 29, WA2KZQ 25, K2KWK 19, W2QQK 17, K2RYH 17, W2PVI 16, W2ZRC 16, WA2HEC 11, W2RQF 9, WA2DAC 6, K2TDG 6, K2HOH 5, W2PGA 5.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: KUN and NUG. The WPA Traffic Net meets Tue. through Sat. at 0000 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets at 2330 GMT on 3585 kc. Mon. through Fri. The Penna. C.D. (Pa. C.D.) State Level RACES Net meets on a new frequency of 3538.5 kc. every Sun. at 1400 GMT. KUN and WRE share NCS chores and are eager for representation from as many counties as possible. *The Radio Log* of the Greater Pittsburgh V.H.F. Society reports: New officers for the coming year are K3DMT, pres.; EWV, net mgr.; K3QBI, secy.; K3AZY, treas.; K3BAK and RTV, trustees. K3HID built himself a keyer. The Western Penna. Mobileers, at their Annual Roundup, elected the following officers: SHT, pres.; K3COU, vice-pres.; UHP, secy.; PDR, treas.; LHN, act. mgr.; PUX, RSB, DAW and VVG, directors. KPJ is sporting new antennas. The Quarter Century Wireless Assn. (QCWA), Pittsburgh Chapter, is functioning under AVY, pres.; and UGV, secy. The Nittany ARC reports via *QST de K3IIKK*: MGP has a new HQ-110; SLX has a four-element beam on 6 meters; NEM is sprouting an antenna farm; SAY, for Centre County, reported a *fine turnout* for the SET. K3AKR will be on 220 Mc. shortly. RUE and 8TYY made two-way contact on 432 Mc. a distance of 160 miles airline. The Cumberland Valley ARC reports via *Valley QRM*: K3MUF *now is* General Class; RJH is working some DX. The Steel City ARC reports via *Kilowatt Harmonics*: New officers of the club are SVJ, pres.; OKU, vice-pres.; ZDW, *treas.*; SDV, rec. secy.; MPK, corr. secy.; SVJ has been recalled to active duty. K3IQU is coordinating efforts on 15, 10 and 6 meters locally for satellite scatter. Coke Center RC reports: K3NOU has her General Class license. KN3s PLZ and PMA are attending Waynesburg College; NCE has *a new* Drake 2B. The Juniata Valley ARC reports via *Static Blast*: The Annual Mifflin-Juniata County Club Joint Picnic was held with great success; K3GZQ has a Heath "Sixer" for *mobile work*; a new Novice is KN3RCB; PVZ is getting his share of DX. K3NQX has his General Class license through the efforts of ARJ. At the Radio Assn. of Erie Annual Hamfest, VNC *was selected* the local Ham of the Year. Traffic: (Oct.) W3WRE 724, NEM 356, KUN 263, UHN 184, K3KMO 143, W3MEB 124, K3DKE 63, W3SMY 63, NFH 16, K3GQA 13, W3OEO 10, K3HID 9, W3GJY 8, K3AKR 3, W3IDO 3, KWO 2. (Sept.) K3HSE 23, GAO 10, AKR 1.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: PSP. RM: USR. PAM: RYU. EC of Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. With this column, I am completing four years as your SCM. I wish to thank all the section appointees and my many other friends for their contributions to make monthly news column successful. OAR is recuperating from a *recent surgery siege* and hopes to be back on the bands soon. The Rockford Amateur Radio Association now has completed club rooms in Winnebago. K9KGV and K9TKT are recent converts to s.s.b. JHZ was included among 52 Illinois surgeons to be inducted as fellows of the American College of Surgeons. After 20 years KPC is replacing his Homebrew beam with a new tribander. WN9AIT is DXing with a new DX-60. WN9AFC, WN9ADR, WN9AGC, WN9ADF, WN9ADO, WN9AFJ and WN9AEN are new calls in the Canton Area. GFF, UA/FGN, ZIV, K9KRW, K9KZW, PBI, DRY, REC, KCR, K9QMJ/W9CSC, IMN and K9JTD were participants in the September ARRL Frequency Measuring Test. CLH received certificate No. 343 in the Certificate Hunters Club. K9CUB has a new DX-60 working FB QSOs and bringing in the hard ones with his new antenna setup. K9SRW is experimenting with *6-meter s.s.b.* rigs, with all semi-conductor design. K9YLX's new QTH will be the United States Navy. K9WTS made DXCC. K9VJE has a new TA-33 jr. KZ is now using the 2000 amplifier with his Invader. KN9HIQ has a new Drake 2B. K9QYW, newly-elected net manager of the North Central Phone Net, reports the net total for September was 233 messages. The Traffic count for the same period of the Chicago Area Emergency Net was 89. In the November issue of *QST*, the Chicago Area Radio Club *Council* Trade Show station call was erroneously listed as K9TEM instead of W9TEM. Many of the clubs have reported that their code and theory classes have been very well attended and many more new calls will be heard very soon. Recipients of the BPL award this month: K9OZM and K9UGY. Traffic: (Oct.) K9OZM 568, UGY 502, W9JXV 343, IDA 205, K9UOV 205, W9FAW 178, IMN 143, K9BTE 89, SCP 82, OAD 67, QYW 42, OCU 38, QAE 30, TVA 30, W9QQG 28, HPG 23, K9ZQT 21, CRT 20, W9KQL 19, K9LXG 15, W9PRN 14, K9ZTV 13, RHU 1, SRW 1. (Sept.) K9QAE 28, W9KQL 27.

INDIANA—SCM, Donald L. Holt, W9FWH—Asst. SCM: Clifford M. Singer, 9SWD. SEC: SNQ. PAMs: K9GLL, MM and RVM. RMs: DGA, TT and VAV. Net skeds: IFN, 0800 *daily and* 1800 M-F on 3910 kc. ISN (s.s.b.), 1930 daily on 3920 kc. QIN (training), 1800 M-W-F on 3745 kc. QIN, daily at 1900 and RFN, 0700 Sun. on 3656 kc. Contact K9GLL for member net of the Hoosier V.H.F. Net in your locality. New appointments: JSV as OBS on 3910 kc., SVL as EC Henry County and K9RLM as EC Dearborn County. The Indiana Radio Club *Council* met at Butler U. in Indianapolis with twenty member clubs represented. New officers elected for a two-year term: DKR, chairman; IMU, vice-chairman; K9IXD, secy.; LYU, treas. TQC and IHO, four-year directors; SWD and BDG, two-year directors. Steps have been taken to amend the Council's Field Day Rules for the highest scoring transmitter. Copies of the revised rules will be available at the April Council meeting. The Indiana "500" Award is a new council activity. The Hoosier *Amateur Women's*

Klub is custodian of this certificate. Complete details and rules in the *BISON*, or make request to K9MZV, 3311 South Tacoma St., Indianapolis, Ind. Include self-addressed stamped envelope. Host to the council for the April '62 meeting is the Indianapolis Radio Club. New officers of the Goshen Amateur Radio Club are K9PNV, pres.; K9FSA, vice-pres.; WDO, secy.-treas.; CJJ, act. mgr. *Amateur radio exists as a hobby because of the service it renders.* Those making BPL were JOZ, MM, SVL, BUQ, RTH, K9OET and K9IVG/9. Oct. net reports: TT reports 117 for RFN, QIN not reported. K9WET reports 21 for QIN (training). K9GLL reports 209 for the Hoosier V.H.F. Net. MM reports 611 for ISN. RVM reports 515 (Oct. 312) for IFN. Traffic: (Oct.) W9JOZ 903, SVL 855, MM 628, RTH 318, K9IVG/9 288, W9BUQ 263, K9OET 250, W9TT 210, NZZ 124, QYQ 99, K9SGZ 80, WET 80, W9SNQ 72, SWD 72, K9GLL 61, W9JFF 49, GJS 48, K9HMC 44, W9FWH 43, K9ILK 40, W9IMU 36, TQC 36, DOK 35, OG 34, EJW 31, K9JYW 28, W9CC 24, YYX 22, K9CRS 21, W9CLF 18, DZC 18, K9LJB 13, W9HUF 12, DKR 11, K9FEB 10, RCZ 10, W9WDQ 10, BF 8, BDP 8, K9IXD 8, JCD 8, SPH 8, KOW 7, W9DCA 6, CKW 4, YEW 4, YVS 4, BSV 3, YDP 3, K9FVL 2, IZL 2, MAN 2, KN9FOZ 1, W9GUY 1, KN9IGK 1, K9JCE 1, TFJ 1, ZQJ 1. (Sept.) K9CRS 11.

WISCONSIN—SCM, George Woida, W9KQB—SEC: BCC. PAMs: NGT, NRP and SAA. RMs: VHP and VIK. New appointees: SAA as PAM, YQH as OBS. Milwaukee AREC members BCK, BTM, KQD, UPM, VCC, PYM, K9s CAG and MZJ furnished communications for the Boy Scouts 20-mile hike called Operation Big Foot. SEC BCC reports reception of 23 messages during the recent Simulated Emergency Tests. Over 100 AREC members took part. There is a new Invader 2000 and antenna at K9BSC, who does the OBS duties for the Wisconsin Side Band Net. VZP and CCO are working schedules with HP3CR for a Whitewater student to his family in Panama. YQH, our ex-SEC, has been appointed as assistant to N. H. Blume, co-director of Wisconsin c.d. warning and communications, and will handle the formation of the RACES RTTY system. A new homemade three-element full-size 20-meter beam 60 feet high at SCZ is reported by YSZ. The Wausau Club station, NUW, moved to a new location in the county jail. New at Waupaca are WN9AUY and WN9AUZ. With the writing of this report my 4½ years as your SCM come to a conclusion. My sincere thanks to all of you for your efforts and cooperation with the progress of all activity in the section, and for making my duties a pleasure. Future reports and correspondence should now be sent to K9GSC, the new SCM, who will appreciate your continued full cooperation. Our best wishes to Mr. Ken Ebneter. Happy Holidays and 73. Traffic: (Oct.) W9DYG 637, CXY 341, SAA 123, VHP 109, K9VSO 101, W9VIK 35, K9WIE 31, GSC 29, W9KQB 29, APB 28, OTL 22, K9BSC 20, DTK 18, ORR 16, DOL 10, WIG 10, W9MWQ 9, K9HXJ 5, W9RQM 4. (Sept.) K9VSO 78, W9VHP 23, VIK 4.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: CAQ. PAM: KØTYY. There is very little news this month and no reports on the 75-meter phone net. The North Dakota Post Office Net reports 5 sessions for Oct. total check-ins 57, maximum check-ins 14, minimum 8; 1 formal message, 7 informal messages sent with 2 relays. A new Novice in Jamestown is WNØAPJ. He will be on the air soon with a borrowed transmitter and a Hallicrafters SX-99 receiver. Traffic: WØCAQ 12.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN. SEC: SCT. ZWL made BPL this month, and received the Traffickers certificate for 10,000 messages. Bill Martinek, ex-GWS of Mitchell, now is K7EFB, 55 Sunny Slope Homes, Kennewick, Wash. New calls in Sturgis: KØALN, Vernon Merritt, and KØYBX, Robert Merritt, father and son. YQR participated in the Sept. FMT with an error of only 19 parts per million. KØYNR and KØYVC have gone to work as dispatchers in the Sioux Falls Police Department. A new call at Howard is KNØAND. He's on the air with a Globe Chief and an S-85. KØDIH has reentered the Air Force. KØSZJ is working as an engineer for KMNS, Sioux City. Traffic: (Oct.) WØZWL 501, SCT 309, KØBMQ 175, WØDVB 130, KØAIE 72, YNR 34, WØOFP 32, KØVYY 25, WØDIY 20, KØYVC 20, WØGWW 16, KØZBJ 15, TNM 8, TAM 7, WJT 7, BSW 6, WØPMA 6, KØRQY 5, WØYVF 5, KØJGM 3, WØNNX 3, KØTVJ 3, WØZMA 3, KØDIH 2, WØDJZ 2, DYR 2, EQV 2, KØEWJ 2, WØEXA 2, KNØHPS 2, HQD 2, KØMIHF 2, WØPDW 2, QMM 2, TVJ 2, TWT 2, TXW 2, ZEW 2, ACG 1, KØACJ 1, WNØAGD 1, WØAPL 1, BJV 1, BLZ 1, FKL 1, KNØGKX 1, WØGWL 1, KNØIBX 1, JHJ 1, JMW 1, KØLKH 1, KNØKVS 1, WØNIW 1, OOZ 1, KØORH 1, WØRWE 1, TLK 1, KØTVK 1, WØURD 1, KØZKJ 1. (Sept.) KØYVC 39.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles M. Marsh, ØALW. SEC: KØJYJ. RMs: KLG and KØAKM. PAMS: OPX and KØEPT. OES HPS is putting up a galvanized 120-ft. tower with 6- and 2-meter arrays on top. He is on 50.1 Mc. nightly from 0200-0300 GMT. KØWYV is building a v.f.o. and a plate modulator for his Viking transmitter. KØUKU is serving as Alternate RO for MSA No. 1. New ORS KØOTH has a 32 S-1 transmitter and a three-element beam for 20 meters. Jim has received his CP-35 and the Armed Forces Day Award. WNØADX, a new Novice in Atwater, has an HT-40 transmitter and an S-38E receiver. The New Ulm Radio Club held an AREC test Oct. 15. WNØBHV is newly-licensed in New Ulm. KØIYK has a Morrow mobile transmitter on the air. Laura, KØOSR, was hospitalized for a month with a slipped disc. OO WMA won a Collins dummy load at the MRC meeting. New ECs are KØRDP for Itasca County; and KØDZE for Wabasha County. K7KBO resides in New Ulm, KØEUB's XYL passed the General Class test. Their two sons are KØRTX and KNØKNK. Visually-handicapped KØGIR and XYL KNØGDA can be heard on 40-meter c.w. KØVTG received a "Confederate States Award." A newly-licensed Novice in Glencoe is WNØALJ. OES appointees KØs VLD and PSE operated a Gonset Communicator on the Electronics Club float during their high school "home-coming" parade. KØIKL now qualifies for her 104th award. MDL reports that RTTY editor KØWMR plans to return to W2-Land and will be associated with 1T&T. The "RATS," the Twin Cities RTTY Club, meets the 2nd Mon. of each month at the Kenwood telephone exchange, 22nd and Emerson, Minneapolis. WET soon will be heard from Eritrea with the call ET2TO. KØSBB and his charming XYL visited KJZ. Traffic: (Oct.) KØOTH 195, AKM 172, WØKJZ 148, YC 144, HEN 90, RIQ 83, OPX 80, KLG 67, LST 66, KØQBI 62, WØUMX 61, THY 43, OEZ 42, BUO 39, KØJYJ 37, EPT 35, ZKK 34, PML 31, WØDQL 30, ALW 22, KØAYU 22, WØKYG 21, KØLWK 20, WØGCR 18, YHR 18, MXC 15, KØICG 14, VPJ 13, SNG 12, WØATO 11, RQJ 11, WMA 11, WNØABU 10, KØMIZ 10, MGT 6, ZRD 5, HLT 3. (Sept.) WØKYG 46, KØSBB 12. (Aug.) KØSBB 6. (July) KØSBB 11.

DELTA DIVISION

ARKANSAS—SCM, Odia L. Musgrove, K5CIR—SEC: K5IPS. PAM: DYL. RM: K5TYW. Activity on the nets slowed up a bit during September but lots of traffic was passed. Several of the early risers have been working some DX on 75 meters from four to six in the morning. The single sideband stations of Arkansas hope to have a net going in the near future. We will try to give the time and frequency next month. Anyone interested should see RIT. K5IPS is our new SEC. RACES had an emergency weather drill with 48 stations checking in. K5YTR was net control. Jefferson County has a 250-watt base station operating on 50.50 Mc. The SEARK Club has organized a TVI committee and has made plans to install the mobile equipment in the school bus. It will operate as K5DAK. KRO has a home-brewed kw. linear. ARRL has training films and slides available for affiliated clubs. Traffic: W5RIT 93, SZJ 35, K5IPS 28, UEK 9, ABE 8, CIR 8, YMU 6, CIX 4, W5DYL 4, HPL 4, K5YCM 4.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Director De Hart held a meeting the week end of Oct. 21 in New Orleans with our new director-elect MUG, Arkansas SCM K5CIR, Louisiana SCM FMO, SEC MXQ and Tennessee SEC K4OUK. Participating in the meeting also was 1UED, ARRL Asst. Secy., who addressed the Metropolitan New Orleans clubs the following Mon. JMB is the new call of ex-BGL, who left the 8th Naval District Radio Control Station a few years ago and has returned for another tour of duty. The Lafayette Amateur Radio Club placed first in the one-transmitter group on Field Day. The club scored 6777 on 738 contacts. Those participating were CKZ, K5VJT, UYL, YTK, VJZ, TFG and SGX. K5ARH got a model 15 teletype going. His OPS certificate recently was renewed. K5CZV also was endorsed as OPS and Harry should be out of the hospital by the time this report is out. K5ESW, who has been doing some fine Official Observer work, headed for Georgia Tech. for some serious studying. While visiting in Shreveport recently your SCM met AFS, who was on the citizen band as well as on the ham bands. The recent hurricane that hit Belize caused a few hams in the New Orleans Area to burn the midnight oil, handling traffic pertaining to relief for the area. Water purification materials, food, medicines, bedding, etc., were dispatched from the area by HHT, K5USO, LJY, MXQ and FMO. Cards have been mailed out to holders of official appointments throughout the area and returns have been very poor. Your SCM suggests that if you are

(Continued on page 100)

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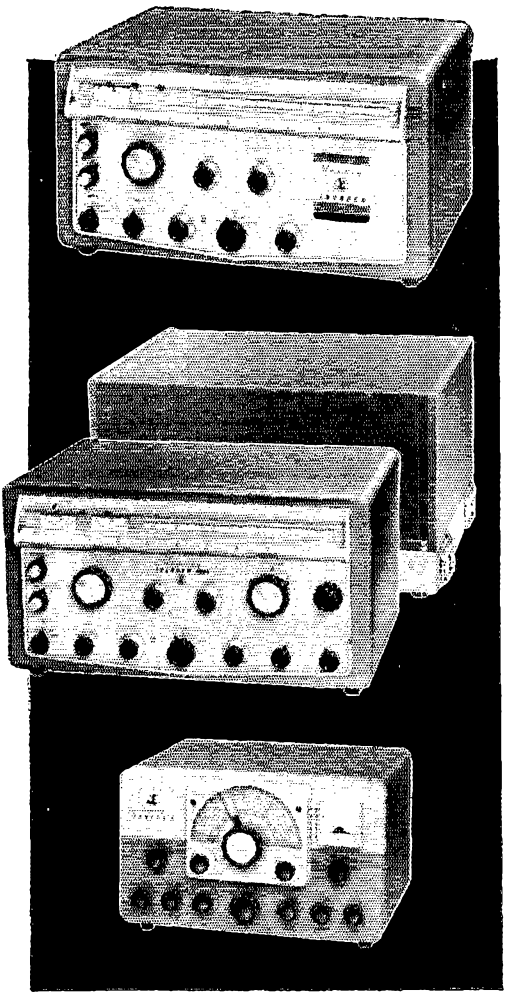

INVADER—More exclusive features than any other Transmitter/Exciter on the market today! Specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db sideband suppression—more than 55 db carrier suppression! Instant bandswitching 80 through 10 meters—no extra crystals to buy—no realigning necessary. Delivers solid 200 watts CW and P.E.P. SSB input; 90 watts input AM. Built-in VFO—exclusive RF controlled audio A6C and ALC (limiter type) provide greater average speech power. Wide range pi-network output circuit—extremely smooth VOX and anti-trip circuits. Fully TVI suppressed. Self-contained heavy-duty power supply. Wired and tested with tubes and crystals.

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Cat. No. 240-304-2—Amateur Net $1229.00

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 through 6 meters! Operates by built-in VFO or crystal control. High gain audio-timed sequence keying, TVI suppressed. Pi-network antenna load matching from 50 to 500 ohms. With tubes, less crystals.

Cat. No. 240-162-1
Viking "Ranger II" Kit—Amateur Net . . . $249.50

Cat. No. 240-162-2—Viking "Ranger II"
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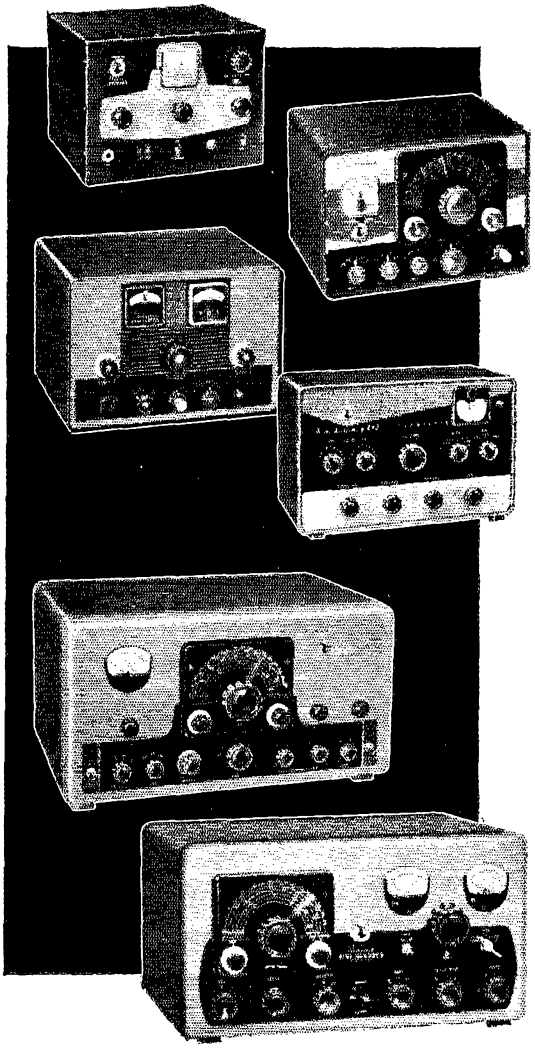

ADVENTURER—Self-contained . . . 50 watts CW input . . . rugged 807 transmitting tube . . . instant band-switching 80 through 10 meters. Crystal or external VFO control—wide range pi-network output—timed sequence keying. With tubes, less crystals.

Cat. No. 240-181-1 Kit—Amateur Net . . . $54.95

NAVIGATOR—40 watts CW input . . . also serves as a flexible VFO exciter. 6146 final amplifier tube—band-switching 160 through 10 meters. Built-in VFO or crystal control. With tubes, less crystals.

Cat. No. 240-126-1 Kit—Amateur Net . . $149.50

Cat. No. 240-126-2
Wired and tested—Amateur Net $199.50

CHALLENGER—70 watts phone input 80 through 6; 120 watts CW input 80 through 10 . . . 85 watts CW on 6 meters. Two 6DQ6A final amplifier tubes. Crystal or external VFO control—TVI suppressed—wide range pi-network output. With tubes, less crystals.

Cat. No. 240-182-1 Kit—Amateur Net . . $114.75

Cat. No. 240-182-2
Wired and tested—Amateur Net $154.75

6N2—Rated 150 watts CW and 100 watts phone—offers instant bandswitching coverage of both 6 and 2 meters. Fully TVI suppressed—may be used with "Viking I, II", "Ranger I, II", "Valiant" or similar power supply/modulator combinations. Operates by crystal control or external VFO with 8-9 mc. output. With tubes, less crystals.

Cat. No. 240-201-1 Kit—Amateur Net . . $129.50

Cat. No. 240-201-2
Wired and tested—Amateur Net $169.50

VALIANT—275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) 200 watts phone. Instant band-switching 160 through 10 meters—built-in VFO or crystal control. Pi-network output matches antenna loads from 50 to 600 ohms. TVI suppressed—timed sequence keying—built-in low pass audio filter—self-contained power supplies. With tubes, less crystals.

Cat. No. 240-104-1 Kit—Amateur Net . . $349.50

Cat. No. 240-104-2
Wired and tested—Amateur Net $439.50

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 through 10 meters—TVI suppressed—high gain push-to-talk audio system. Wide range pi-network output. With tubes, less crystals.

Cat. No. 240-500-1 Kit—Amateur Net . . $749.50

Cat. No. 240-500-2
Wired and tested—Amateur Net $949.50

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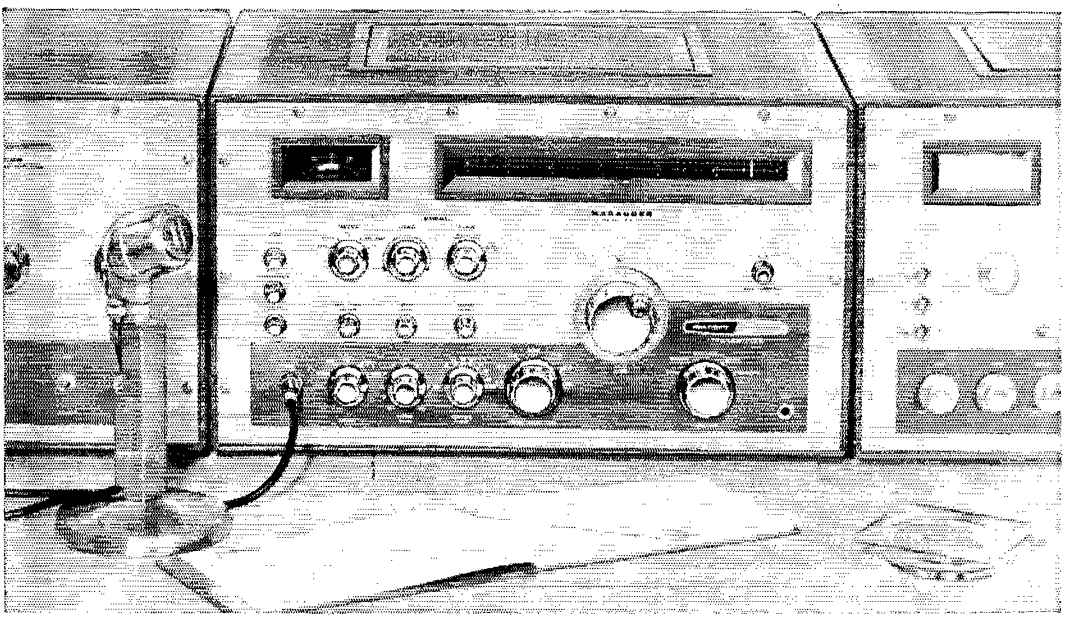

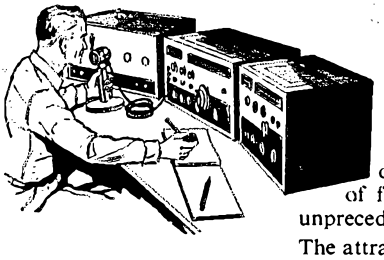

Presenting the "Marauder" . . . performance and features that cannot be duplicated for less than twice the price!

Over two years were spent in the development of this new Heathkit Single Sideband transmitter to bring you performance, quality and dependability unheard of in this price range! The outstanding array of features listed, plus its beautifully styled exterior all add up to an unprecedented amateur radio value!

The attractive front panel layout with edge-lighted meter and slide-rule tuning dial is accented by chrome-plated die-cast zinc knobs. All controls are located in front, where you want them, for maximum ease of operation . . . no doors or hatches to open or equipment to move! Here is a transmitter that was designed with "you" in mind, a transmitter to fill the requirements of the most demanding amateur radio operator, a transmitter you will be proud to own and operate for years to come! Order your Heathkit HX-10 SSB transmitter today! Send for free schematic. 92 lbs.

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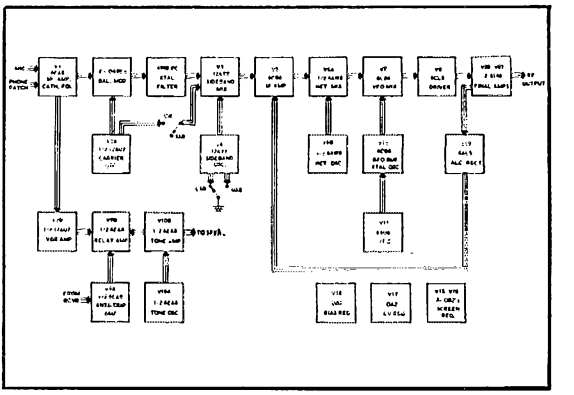
Heathkit HX-10...no money dn., as low as $22 mo.....**$334.95**

SPECIFICATIONS—Emission: SSB (upper or lower sideband), CW, AM and FSK. **Power input:** 180 watts PEP—SSB and CW, 75 watts AM. **Output impedance:** 50 to 75 ohms with not more than approximately 2:1 SWR. **Frequency range (MC):** 3.5 to 4.1; 6.9 to 7.5; 13.9 to 14.5; 20.9 to 21.5; 27.9 to 28.5; 28.5 to 29.1; 29.1 to 29.7. **Frequency stability:** within 100 cps, overall. **Carrier suppression:** 50 db below peak output. **Unwanted sideband suppression:** 55 db below peak output. **Keying characteristics:** Break-in CW provided by operating VOX from a keyed tone using grid-block keying. **Audio input:** High impedance microphone **Audio frequency response:** 400 to 3000 cps at ± 3 db. **Power requirements:** OFF 14 watts; STANDBY—200 watts; KEY DOWN—400 watts at 117 volts, 50/60 cycles AC. **Cabinet size:** 19" W x 11⅝" H x 16" D.

MICROPHONE ACCESSORY—Ideal for use with the HX-10, this Electro Voice dynamic microphone has been modified to our specifications especially for SSB operation. Frequency response is limited from 300 to 3,000 cps with sharp cutoff above 3,000 cps. Chrome-plated mike stand has grip-to-talk switch with lock. Hi-Z output. Complete with 6' single and 6' multiple conductor shielded cable and instructions to accommodate any installation. 2 lbs.

HDP-21 . . . No money dn., $5 mo.....**$29.40**



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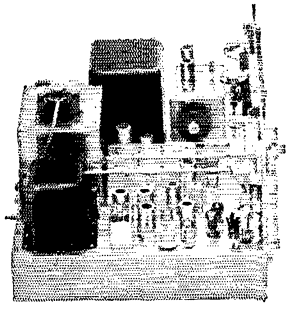
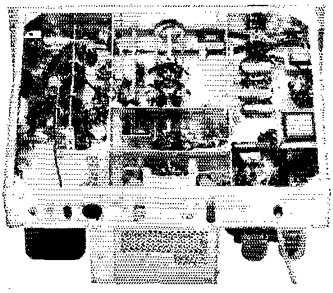
33. ALL CONTROL FUNCTIONS ARE LOCATED ON THE FRONT PANEL—NO DOORS OR HATCHES TO OPEN—CONVENIENT TO OPERATE



TOP VIEW—Quality components used throughout assure years of dependable, trouble-free performance. Shielded final amplifier is forced-air cooled by a noise-free fan. Chassis screening clearly identifies all tubes, adjustments, etc. for future reference.



BOTTOM VIEW—Compartmental construction provides necessary isolation and shielding of transmitter sections for top performance . . . adds rigidity to the chassis for rugged, dependable service and long life. Neat circuit layout through careful design and a precut, cabled wiring harness permit easy assembly.

GOTHAM VERTICALS DELIVER THE CONTACTS

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

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 tal king 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:

2539 Christie Place
Owensboro, Kentucky

GOTHAM
Miami Beach, Florida

Gentlemen:

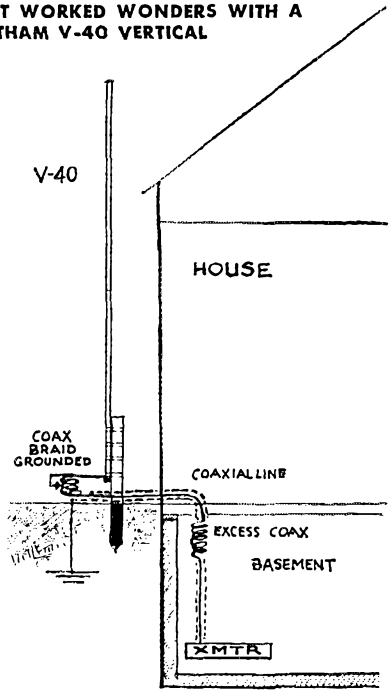
During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (Hallicrafters 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

THAT WORKED WONDERS WITH A GOTHAM V-40 VERTICAL



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Send a card for our valuable catalog of 50 different antennas with specifications and characteristics. Gives bands and frequencies covered, element information, size of tubing used, boom length, shipping weight, feed line used, polarization, and other data.

WHY

THE GOTHAM V-80 IS THE BEST ALL-BAND ANTENNA

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- 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.
GOTHAM

DO YOU KNOW

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2. LOADING COIL NOT REQUIRED ON 6, 10, 15 AND 20 METERS. FOR 40, 80, AND 160 METERS, LOADING COIL TAPS ARE CHANGED MANUALLY EXCEPT IF A WIDE-RANGE PI-NETWORK OUTPUT OR AN ANTENNA TUNER IS USED; IN THIS CASE BAND CHANGING CAN BE DONE FROM THE SHACK.
3. EVERY GOTHAM ANTENNA IS SOLD ON A TEN DAY TRIAL BASIS. IF YOU ARE NOT FULLY SATISFIED, YOU MAY RETURN THE ANTENNA PREPAID FOR FULL REFUND OF THE PURCHASE PRICE. THIS IS YOUR GUARANTEE OF FULL SATISFACTION.

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Airmail Order Today — We Ship Tomorrow

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1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE NOVICE WHO OPERATES 40 AND 15..... $14.95

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....

Address.....

City.....Zone.....State.....

(*Continued from page 94*)

not active, please notify him. Check the expiration date of your appointment. Traffic: W5CEZ 431, MXQ 118, K5QXV 90, CZV 38.

MISSISSIPPI—SCM, Floyd C. Tedtson, W5MUG—K5YPV reports he is getting a new beam on the air. He also says that KN5KIR is on with an R-100 and a scout 65B and that K5DGL is on with an S-85 and a DX-40. The Jackson Club was visited recently by 1UED, from ARRL Headquarters. Perry gave a fine talk on "how we get our frequencies." The local gang, plus the boys from Vicksburg, enjoyed the get-together very much. I recently attended a meeting in New Orleans with Director 4RRV and the SCMs of the division. It was a fine meeting and I'm sure will be of benefit to all. K5MDX reports a fine showing in the DX Phone Contest. Just received a fine news letter published by the Jones County Club. It seems that a good many of the gang from Laurel are getting on 6 meters. The Jackson Club has a fine project going to promote club interest. At present they have about ten 6-meter transceivers going. Keep it up, gang. Traffic: K5MDX 2.

TENNESSEE—SCM, R. W. Ingraham; W4UIO—SEC: K4OUK. RM: K4AKP. PAMs: W4UVP and W4PQP. The Mid-South Club received a certificate from the Heart Fund. K4KTC is on 2 meters and is planning on trying 6-meter s.s.b. K4TTA reports that K4TED is Asst. EC in Henderson County and new hams in Lexington are WN4ATB, WN4BUN and WN4CNL. W4ZJY says he is on 6 meters with a transceiver. W4OQG is working toward 432 Mc. W4WBK reports from Memphis that new officers of the V.H.F. Club are K4ETG, K4RKU, K4UCA, K4PKX and K4VIJ. The Nashville Club reports high interest in its operating contest. New appointments: K4BYJ as OES. Renewed: W4ZJY as ORS. W4UVP is resigning as PAM because of a change in work. Thanks, Bill, for your fine service. Reports received: Clubs—Oak Ridge, Nashville, Chattanooga and Delta and Mid-South in Memphis. Nets—W4UVP, W4PQP and K4AKP. OO—K4RIN, W4TDW, W4ZBQ and W4TDZ. OES—K4KYL and W4TDZ. OBS—K4AKP, W4VJ and W4TDW. Traffic: K4AKP 1807, W4PL 504, W4FX 373, W4OGG 217, W4VJ 150, K4OUK 109, W4PQP 90, W4JVM 88, W4OQG 75, W4ZJY 68, W4UVP 58, W4TZG 29, K4AMC 28, K4TTA 27, W4UIO 12, K4VOP 12, K4CNU 11, K4RIN 3, W4TDZ 2.

GREAT LAKES DIVISION

KENTUCKY—SCM, Elmer G. Leachman, W4BEW—SEC: W4BAZ. PAM: W4SZB. RM: K4KWQ. V.H.F. PAM: K4LOA. Ky. Novice Net, WN4AGH. The ARRL State Convention, sponsored by the Blue Grass Radio Club of Lexington, was a great success. *Kentucky Ether Clippings* editor, W4CDA, has resigned after nearly twelve years of untiring service. The Central Ky. Emergency Six-Meter Phone Net is functioning under K4KJQ. The use of 6 meters is growing rapidly in Kentucky. The Novice Net had 143 QNIs with 22 stations and 33 messages. The MKPN held 29 sessions, with 487 QNIs and 77 messages. KYN held 42 sessions and handled 201 messages. K4ZRA, K4TZP, K4DMD and K4DLK are all operating/4 from St. Thomas Seminary, Louisville. All radio clubs in Kentucky are asked to please contact the SCM. We need a complete roster. OO reports were received from K4ZRA, K4ZRQ and K4GSU. K4GSU is a new OO in Lexington. Also new net certificates went to WA4AAS, K4NPZ, WN4AGF, WN4AGH, W4TRO and K4TQZ. OES certificates are going to W4RHZ and group, who are doing a fine job on 420 Mc. The Kentucky Novice Net held 26 sessions, traffic 21. Traffic: W4BAZ 182, W4RHZ 103, K4KWQ 83, K4CSH 54, W4ZDB 32, K4KSC/4 30, W4MWX 27, W4KKG 25, W4SZB 23, WN4AGH 21, W4YYI 19, W4BEW 17, K4VHJ 17, K4OEK 16, W4RBI 16, W4RNF 16, K4LOA 13, K4TQZ 11, W4CDA 9, K4ZQR 9, W4KJP 8, W4TRO 7, K4ADH 3, K4HSB 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: ELR. RMs: SCW, EGI, QQO, FWQ, K8KMQ. PAMs: CQU, JTQ, V.H.F. PAM: PT. Appointments: AUD, ELW, NOH, RAE, RTN as ORSs; ATB as OPS; DSW as OBS. K8NEY and K8PBA as OESs: K8BDR, SLV, UCG as ECs. New officers: Grand Rapids ARA—K8ZVG, pres.; K8DCS, vice-pres.; K8TDV, secy.; ONH, treas. Motor City RC—K8BMC, pres.; STV, vice-pres.; ARH, secy.; NBF, treas. A new club, the Central Mich. V.H.F. Club, elected ZGW, pres.; K8PKW, vice-pres.; "Susan," secy.; K8OIC, treas. MBH reports 6-meter s.s.b. activity is picking up and six RTTY stations are on 6 meters in Detroit. The Michigan Six Meter Club calls its new paper the *Mich Open Mike*. YAN, our former SEC, nearly lost an eye in a buffing accident at Kellogg's, but his sight will be saved. K8PBA is working with transistorized v.f.o. The WYLs have a new son, and MGQ/MMB have a new daughter. ATB reports the 12th Midwest YL Convention will be held in Flint May 18 and 19, 1962. K8PBA has 17 states on 144 Mc. and PT has 6 states on 432 Mc. NOH was called to San Diego by the USN for radar training. WQH is working with a remotely keyed and controlled transmitter. IXJ had a throat operation but is now recovered. Michigan (QMN) nets now have their own bulletin. DSW got 20-w.p.m. CP. K8GOU changed QTH. K8IRC and K8QBM get on QMN. EMD is setting up a new antenna farm. FDO has come back to life. K8LZF has gone to 2 meters. RHD is going s.s.b., but still likes c.w. ISO and K8EWD are both in the hospital. Michigan 6-Meter Club officers are K8QXC, pres.; MBH, vice-pres.; K8JGF, secy.; K8LUY treas. The Wolverine Award was issued to APN, K8JED, K8LJS, K8MKG, K8OMH and K8RDE. K8QLL made BPL on originations plus deliveries. K8SHQ and K8QEI also click into QMN. The Oakland County AREC had a nice dinner party with 170 in attendance. All Michigan clubs are urged to get club nets on 50 Mc. Traffic: (Oct.) W8RTN 307, K8QLL 291, W8ELW 263, K8IUZ 178, KMQ 153, W8WQH 88, PBO 83, IXJ 72, OCC 65, JTQ 52, FWQ 49, K8GJD 45, HLR 42, W8FX 41, IBB 40, MPD 34, OQH 34, K8EXE 32, W8HKT 30, DSW 27, K8MEG 22, W8AUD 21, K8NHC 21, W8NOH 21, EGI 18, EU 18, K8PYW 15, GOU 13, W8EOI 12, DSE 11, K8IRC 9, QBM 9, W8TBP 8, K8LZF 6, SHQ 6, VE3CYG/W8 6, W8EMD 5. (Sept.) W8IXJ 113, TBP 26, RHD 17, IBB 12, SS 4, K8KVM 2.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: HNP. RMs: BZX, DAE, VTP and K8ONQ. PAM: K8KSN. WRP and K8s GAS and LSI have new HT-37s and are active on s.s.b. Officers for 1962 of the 20/9 ARC of Youngstown are K8CNZ, pres.; K8PPC, vice-pres. and act. mgr.; K8YOU, secy.; and K8CFD, treas. WA8ABF is a new OES. Canton ARC's *Feedline* has pictures of K8MZS and K8MZT (a man-and-wife team) on the cover page and states that GNO became a Silent Key. K8DHJ was home on leave from the Navy before leaving for the Philippines; the club held a wiener roast; K8LBZ is conducting a class in advanced theory and the club started a code class on the air; G3NR visited FSM; the stork brought a baby boy to OHP; RNL is back in the hospital and K8LVU is recovering from an illness at home; GAB has a new beam and K8EML is now mobile on 10 meters. K8EIO sends news of the Cuyahoga Falls RC and reports that K8WLK received his General Class license and WN8AJO, K8ZPF, K8ZUD and KN8ZWJ are new hams. The Seneca RC held a transmitter hunt. Tusco RC's *The Beam* held an antique exhibit where each member brought the oldest piece of gear they had; the Knucklehead Net has started a new season on 28.845 kc. at 9 P.M.; EUK had HR2SM and KZ5WZ visit him; new Knuckleheads are BVE, K8MZT and K2RHN/8; BVE, GAC, LVN, NSR, K8s IST, KSN and RUU are now mobile; SBM has a new Thunderbird tribander. Massillon ARC's *MARC News* states that K8s HTM and LYR left for Naval training and K8TWH left for college. Received the first edition of *Loud & Clear* published by the Cleveland Chapter of Red Cross and the Cuyahoga County ARES, whose officers are K8EXL, chairman; IOT 1st vice-chairman; JBS 2nd vice-chairman; and K8ZFE editor; DIG, FFA, RBI, UBE, K8s HZI, MMM, TID, UBA, UMA, VEL, VYT, WWR and YBH, of Geauga County, have joined their network. Inter-City RC's *IRC News Bulletin* informs us that Mr. V. L. Walker, formerly with Triplett, spoke on meters and their function and uses; JYY and LRR have started teaching the second half of the beginners' class and already KN8s AQW, CMJ, COQ, COY, CPN, CZL, CZM, ZMK and UWW and K8s RHC, TCH and UNG have their licenses; K8RLE received his General Class license. Dayton ARA's *R-F Carrier* tells us WYL spoke on Amateur Teletype, a color movie on the sun, how it effects the earth and its atmosphere; the club's v.h.f. section held a foxhunt; the club held a hidden transmitter hunt. Findlay's RC's *The W8FT NEWS* was received. Parma RC's *P.R.C. Bulletin* informs us they heard a talk on the construction and use of tantalum capacitors; K8JHZ spoke on TVI; CZM, K8GBH and K8DHX are instructors in the club's code and theory classes. Greater Cincinnati ARA's *The Mike and Key* tells us its recent hamfest broke all records as to attendance, prizes, food and refreshments; the 1962 stag hamfest was held Sun. Sept. 23. The OH-KY-IN V.H.F. Society's *Q-Fiver* states that K8YVD was in the hospital and K8MAIN told of his building a 500-watt rig he refers to as The Monster. Toledo's *Ham Shack Gossip* names RZQ as its Ham of the Month and Ed was awarded a plaque; the club held a family night dinner; K8OAU and K8VDN are the proud parents of a baby boy; K8RGK was in the hospital; K8LCW has a new beam; KN8s WDL and WEH are new YL hams. Your

(*Continued on page 102*)

AT LAST there's a

Difference in Doublets

HY-GAIN TRAP DOUBLETS TAKE UP TO 500 WATTS AM; 1 KW PEP

New high level of radiation efficiency is made possible for the first time by using a matched set of Slim Line traps for each band. This exclusive feature produces true halfwave resonance at every design frequency. Antennas can be adjusted for phone or CW. Will equal or surpass the performance of any other multiband system, SWR 2:1 or less at resonance on every band. Fed with 52 ohm coax (not supplied). Guaranteed to survive winds up to 100 mph. An ideal system for any ham with multi-band capability.

Trap Doublet for 10-15-20-40-80M, Model 5BDT **$34.95**
Trap Doublet for 10-15-20M, Model 3BDT **$17.50**
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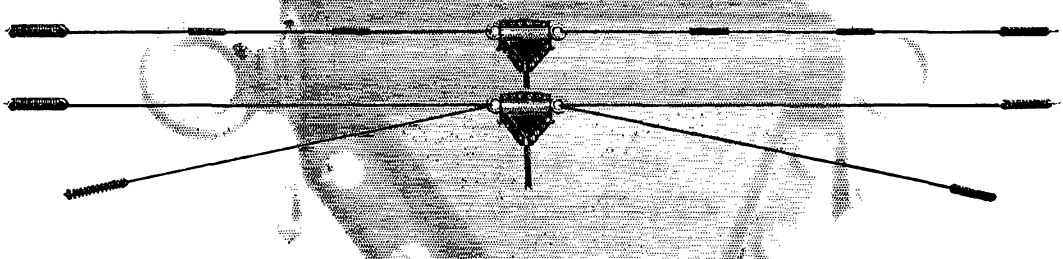
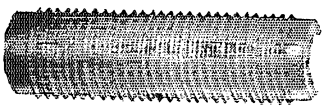


HY-FAN TRAPLESS DOUBLET TAKES UNLIMITED POWER ON 40 & 80M

Complete antenna system, single 52 ohm coax fed, and constructed of copper clad steel stranded wire, cycolac insulators and coax center insulator assembly. Fan configuration eliminates traps, increase bandwidth and is virtually impervious to all weather conditions. Takes unlimited power. SWR less than 1.5:1.

Fan Doublet for 10-40-80M, Model 2BDF **$19.95**

Reliability of the Hy-Gain Slim Line traps has been proven by the more than 100,000 in daily use throughout the world operating under every conceivable condition and climate. This enviable record is made possible by the unique triple molding process which completely embeds the trap circuit in tough, ageless polypropylene. In addition to this high degree of weatherability, the Slim Traps are practically indestructable mechanically and will survive even greater strain than will the copper clad steel doublet wire. Fully guaranteed for one year.



Center Doublet Insulator Coax Feed, Model CI **$3.95**
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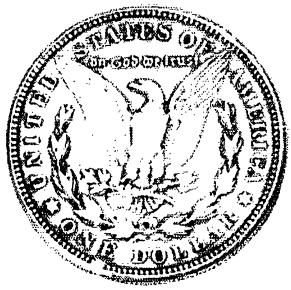
Great Lakes Division Director, UPB, and your SCM attended the Great Lakes Convention in Cleveland along with Kentucky's SCM, W4BEW, and Michigan's SCM, FX, where more than 1800 registered. There were 78 at the S.S.B. Banquet with the main speaker GAS, whose subject was What Makes a S.S.B. Man Tick. The Ohio Council of Amateur Radio Clubs held its fall meeting. Speakers at various forums were DLD, WFH, 4OH, 1WPO, UPB, K2FF, 9DYV, BF, LY and NGN. There were 364 at the banquet at which Sidney Stadig, Chief Engineer of KYW, spoke on Commercial Broadcasting and the Radio Amateur. Cups were awarded to K8MTI, UPB, K8UNP, WRH and AL. The *CQ* representative presented AJW with a CHC 400 certificate, the fourth to be issued to date. Prizes were won by kNOGPY/8, W8CHE, GEE, K8WON, K8SOW and K3IOL. Traffic: (Oct.) W8UPH 983, DAE 862, BZX 376, FNI 8 373, K8ONQ 290, BDZ 192, SQK 177, RYU 161, W8CHT 160, K8KSN 152, RUC 85, W8AL 52, LZE 35, YGR 29, K8DDG 21, OZG 16, VKK 11, BNL 8, W8HZJ 8, GAC 4, K8NQO 4, W8GQD 2. (Sept.) K8QHH 150, W8ZYU 13, WE 6, K8PBE 3, W8DG 2.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAM: W2IJG. Section nets: NYS on 3615 kc. at 0000 GMT; NYSPTEN on 3925 kc. at 2300 GMT; ESS on 3590 kc. at 2300 GMT; MHT (Novice) on 3716 kc. Sat. at 1800 GMT. Endorsements: W2PHX as RM and ORS. W2AWF as EC and WA2BAH as OES. October was auction month for the Albany and Schenectady Clubs. Your SEC, W2KGC, and SCM, W2EFU, were guests of the Communications Club of New Rochelle Oct. 2. Our thanks for a fine evening. K2QIX is a student at Princeton. W2DVC is now living in Texas and signs W5IPH. W2LCB reports a new 1st-class commercial phone ticket. K2YDO visited son K2YDD at school in Grand Rapids. Chairman of the Christmas Party for the Albany Club was W2AWF. The SET was very successful according to SEC W2KGC, who was loaded down with traffic from this section. Our apologies from the Nov. Activities Report: WA2QEQ is EC for Pelhams while WA2QEG is the XYL of K2SSN. WA2HFT was speaker on troubleshooting receivers at the Albany Club meeting. W2AAO reports a new approach to obtain call-letter license plates, with success, we hope. It's nice to hear that K2ACB and K2CT have improved after being on the sick list. W2SZ, the R.P.I. Club, has power in the new shack so up goes the antenna farm. The club has classes for Novice, Technician, General and Extra Class. Congratulations to our young engineers in Troy. WA2IRK has a new beam on 6 and a vertical on 20, 15 and 10 meters. WV2VFW is a new Novice in Earlton. A new station on 6 meters is K2QQB in Clintondale. On 220 Mc., K2BGU is building gear for 432 Mc. Traffic: WA2KUS 216, WA2HGB 143, W2EFU 120, W2PKY 48, K2HNW 39, WA2DRP 25, K2SJN 25, K2EIU 22, W2URP 21, W2PHX 20, WA2IRK 2, K2LKI 2.

NEW YORK CITY AND LONG ISLAND—SCM, George V. Cooke, jr., W2OBU—SEC: W2ADO. RM: K2UFT. PAM: W2UGF. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0015 GMT nightly; NLI (late), 3630 kc. at 0345 GMT nightly; NYC-LIPN, 3908 kc. at 2230 GMT nightly; V.H.F. Traffic Net, 145.8 Mc. at 0100 GMT Tue.-Wed.-Thurs. I wish to thank W2TUK for his cooperation and assistance during my hospitalization and recuperation in writing up this column and visiting with the section's various groups. It's good to be back on the job. BPL cards have gone out to K2UAT, K2UBG, W2GKZ for making it the hard way and to W2EW and WA2EFN by originations plus deliveries. Newly elected officers of the Mohawk RC are W2HTH, pres.: K2TAQ, vice-pres.: K2HQR, secy.: and W2MGV, treas. K7LDN is now WA2TVE in Commack using a new Hornet beam and a Valiant squirter. The brand-new call issued the South Shore RC is WA2WEA. 1962 officers of the Massapequa HS RC are WA2HCP, pres.: WA2CZG, vice-pres.: WV2OUO, secy. W2EEN added a new HQ-180 to his set-up. WA2GAF put up a 12AVS vertical 50 feet high. The Amateur Radio Society of City College is offering a nice certificate for working 5 operators in their station. W2HJ, WA2JUG, WA2IKN and WV2OIF are brothers in one family in Island Park. GKZ is enjoying a new tri-band quad on a new crank-up tower. WA2OBN added a new TH-3 Tribander to the Ranger and worked 32 countries in 6 continents in 3 weeks. WA2QJU is looking for additional stations to report in to the Q5 Net meeting daily on 3935 kc. at 2100 GMT to handle N.Y.C. traffic. WA2KER requests all Nassau County 6-meter stations to check into the county 6-meter AREC Net, 2000 local time, on 50.25 Mc. Mon. PF now is residing in Manhattan and installed antennas on the roof 14 stories high.

(Continued on page 104)



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GONSET GSB-201 LINEAR AMPLIFIER!

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COMPARISON OF GONSET GSB-201 WITH 4 OTHER LEADING LINEAR AMPLIFIERS

PEP		Watts per $ of investment
1500 W.	GONSET GSB-201	3¾*
2000 W.	A	3¼
1000 W.	B	3
1000 W.	C	2½
2000 W.	D	1¼

*Even more watts per dollar in terms of output due to high efficiency. The Gonset Linear delivers a FULL GALLON of PEP output.

†P.E.P. Input is approximately twice average d.c. input.

This little powerhouse is compact, finished in attractive blending colors. It's powerful in all transmission modes, versatile, with full band-switching with pi network output for five bands.

Compare Gonset GSB-201 with other leading makes for watts per dollar of investment... proof positive it's your best buy!

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After a two-year layoff K2KYS is back on the NLI Net and covering the east end of the island traffic-wise. WA2BJK announces the Town of North Hempstead C.D./*AREC Net frequency has been changed to* 146.82 Mc. while the RACES group remains at 147.21 Mc. WV2VVI is a new call in Westbury. WA2GJT built a new 4X250B final in a hi-fi cabinet (what else). *Advance news*: Watch out for rules and procedure of a new NYC-LI QSO Contest in the February issue of *QST*. Please start spreading the word around in order that it become a worthwhile endeavor. W2FGD now is located in Long Beach and became faculty advisor to the Lawrence HS RC, using the call K2ZXV. Ex-K2AFX now is known as K1MIA. WA2UGH is looking for MCW 6-meter contacts in the Massapequa Area. K2QVH vacationed in W6-Land and visited ex-K2JNE, now WA6MXR. Clubs in this section seeking information on the Hudson Amateur Radio Council should contact WA2JZH or W2TUK. It's important to join up now with a pending convention in '62 and a World's Fair Convention contemplated in '64. Your help will be needed. To assist in recruiting for the AREC/C.D./-RACES groups in our section the following are the ECs in areas of our section: Bronx, W2DUP; Manhattan; K2JVB; Brooklyn; K2OVN; Richmond; W2VKF; Queens; W2LGK; Nassau; W2FT; Suffolk; W2KNA. K2JWT got quite a surprise; a general CQ on 144 Mc. resulted in a contact with VE1QY in Nova Scotia. After five years lay-off, W2HKF, is back on 2 meters and having the time of his life. May all amateurs in our section have the time of their lives by having a very happy hamming New Year in 1962. Traffic: (Oct.) K2UAT 1373, K2UBG 574, W2GKZ 549, WA2GPT 516, W2EW 331, K2UFT 230, WA2EFN 181, WA2BWO 164, WA2NCE 151, K2CMJ 77, WA2QAT 70, WA2NWG 50, K2THY 30, W2EC 21, K2FO 17, WA2OBN 17, K2KYS 12, WA2QJU 10, WA2KER 4, W2OME 4, W2PF 3, WA2RAQ 2. (Sept.) W2OME 6, W2DBQ 5, W2PF 3.

NORTHERN NEW JERSEY—Acting SCM, Daniel Earley, WA2APY—SEC: WA2APY. RM: K2VNL. PAM: K2SLG. V.H.F. PAM: K2KVR. Section nets: NJN daily at 0000 GMT on 3695 kc., NJPN Mon. through Sat. at 2300 GMT and Sun. at 1400 GMT on 3900 kc., N.J. 6 & 2 at 0400 GMT Thurs. and Sun. on 51.15 Mc. and at 0300 GMT Wed. and Sun. on 147.75 Mc. We must dispense with the presentation of routine activities this one month in view of the necessary and unexpected change in our leadership. Routine activity reports will be welcomed by the Acting SCM (address page 6) until the outcome of an election now in progress can be made.

John "Sparks" Remeczky, K2MFF

Our entire ARRL Section as well as his society, the Bayonne Amateur Radio Club, mourns the loss of an enthusiastic leader and fine operator. He died as the result of a motorcycle accident. As our SCM he held Extra Class and commercial tickets. An honor student, he was a senior at Newark College of Engineering specializing in electronics. He set a fine example in our traffic nets, took full part in our NNJ QSO Party and major national activities and at 21 held certificate awards too numerous to recount.

—W2GKE.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WØNTB. Asst. SCM: Russell B. Marquis, BDR. SEC: KØEXN. PAM: PZO. RM: DUA, Mrs. Russell Marquis (Tina), wife of our former SCM died Oct. 16. She was an inspiration to all who knew her and was my most unforgettable person. New officers of the SUIARC are WXG, pres.; KØUJJ, vice-pres.; KØDUA, secy.-treas. Project OSCAR is making progress at Luther College at I.S.U. and tracking is operational at the home of KØKPG. Newton hams have tracked down and eliminated a bad case of QRM. The SET was a qualified success in this section but I would like to see greater participation. Iowa 160-meter men are cooperating with all other sections in trying to have the entire segment between 1800 and 2000 kc. restored to amateur service. Why not try for 1750 to 1800 kc. as well. Congratulations to KØs TGT and CKX, and WØs AAE and NCS on the fine records in the Sept. FMT. KØCKK was top man. BDR was appointed Asst. SCM Nov. 1. Oct. net reports: 75-Meter Phone, QNI 1428, QTC 156, sessions 26; 160-Meter Phone, QNI 640, QTC 35, sessions 31. Late for Sept.: QNI 271, QTC 10, sessions 15. Traffic: (Oct.) WØLGG 2255, SCA 1327, DUA 503, CZ 285, KØMMS 175, WØPZO 158, NTB 150, KØEXN 105, WØYOZ 43, KØUAB 32,

(*Continued on page 106*)

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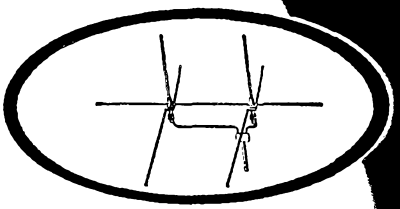

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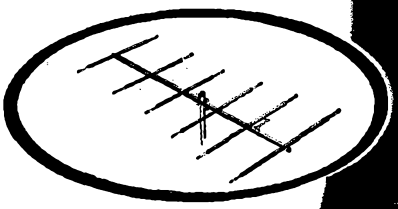
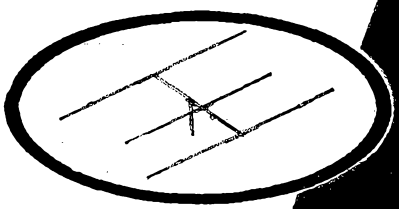
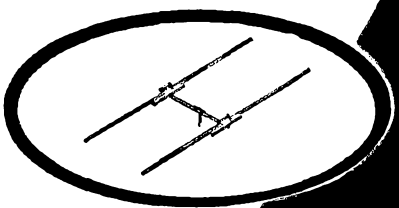


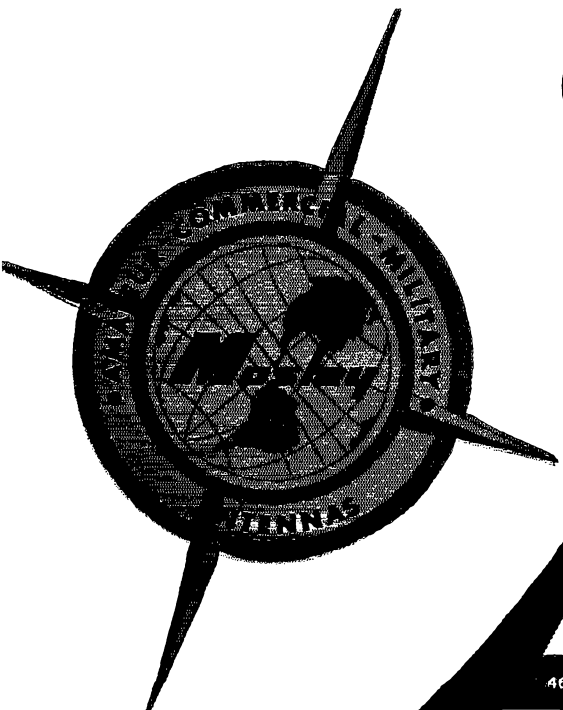
Yagi Six Element



Model TA-20-40



Model S-402



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KANSAS—SCM, Raymond E. Baker, WØFNS—Asst. SEC: KØEMB. RM: QGG. PAM: KØEFL. V.H.F./PAM: HAJ. KPN meets on 3920 kc. Mon., Wed., Fri. at 1245Z, Sun. at 1400Z. NCSs KØQKS, FHU, ORB, IFR; QNS 552, high 53, low 18, average 30.6; QTC 111, high 14, low 0, average 6.2 QKS meets daily on 3610 kc. at 0030Z and had 31 sessions, QNS 238, high 11, low 4, average 7.68; QTC 156, high 17, low 0, average 5.0; NCSs KØBNF, BYV, FNS, IFR, QGG, RJF and TOL. The Kansas Jayhawker YL Net meets on 3940 kc. Tue. at 1530Z, Sun. at 2200Z. KØHEU mgr. The KSN Weather Net meets on 3925 kc. at 0001Z Mon. through Sat.; KØEMB Mgr. EMB has been appointed Asst. SEC in charge of the Kansas Weather Net. The Henry Leavenworth ARC elected REU, pres.; 6RXN, vice-pres.; KØMAC, secy.; KØBLH, treas.; KØYSL, program. The call is KØYGV and the club is located at Fort Leavenworth and has a BC-610-E and Wilcox transmitters. KØHIM advises that the Kansas U. ARC now is active with a pair of 813s 80 through 10 meters, phone and c.w. An ORS appointment has been made to HS and OPS and OBS to ALA. MXG got married. Good luck, Chuck. ICV, former Kansas SCM, stopped by Topeka on his way to warmer climes. QGG has submitted his resignation as Route Manager after five long hard years of mighty excellent work. Jim, we wish to thank you very much for your help. TOL took over as Route Manager effective Dec. 1. We will appreciate all helping him to make QKS and keep it the best of c.w. nets. Traffic: (Oct.) WØOHJ 582, BXF 172, YRQ 103, FNS 95, ABJ 90, KØLHF 68, WØQGG 68, BFE 50, TOL 38, KØUHF 34, WØIFR 28, KØHVG 18, GQO 13, JWW 13, WØBBO 12, KØEFL 12, TCS 11, WØALA 10, KØJID 10, PSD 9, JMF 6, EMB 5, GIG 5, QKS 5, WØBSS 4, WFD 4, KØYBC 4, LPE 3, ZHO 1. (Sept.) KØHGI 277.

MISSOURI—SCM, C. O. Gosch, WØBUL—Net reports (Oct.) SMN (3580 kc., 2200 GMT Su) 5 sessions; QNI 30; ATC 34; NCSs OUD 4, KIK 1, MON (3580 kc., 0100 GMT T-Su) 26 sessions; QNI 141; QTC 176; NCSs OUD 9, KØVPH 7, KIK 6, RTW 3, WFF 1, MoSSB: (3885 kc., 2400 GMT, Tu-Th) 9 sessions; QNI 120; QTC 24; NCSs GMM 7, TPK 1, MKJ 1, MSN (3715 kc., 2200 GMT M-F) 21 sessions; QNI 81; QTC 78; NCSs KNØGFA 7, KNØGOB, KØONK 5, KØVPH 4, MEN (3885 kc., 2400 GMT, MWF) 14 sessions; QNI 422; QTC 325; NCSs KØMMR, KØONK 5, KØVNB, OVV 1, OVV/BUL 2. Note that these reports include special sessions of all nets as activated for SET. The SEC and SCM wish to thank all participants for their excellent cooperation. Endorsements: OVV as PAM/-MEN Mgr.; ORF as OPS. Cancellations: KØRPH as OO (Cl. III & IV). KØRPH as OPS, KLQ as OES, LFE V.H.F. PAM reports about equal activity on the 50-Mc. and 144-Mc. bands with a slight increase on 50 Mc. This activity seems centered as follows: 50 Mc. in Kansas City and the St. Louis Area; 144 Mc. around Springfield, Cape Girardeau, LaPlata and the Bowling-Green/Hannibal Area. Future plans include section wide formation of nets on these v.h.f. frequencies. KØBWQ has reinstalled his repaired v.h.f. beam. KCG and GCL report activity in the CD Party. IFS reports activity on 220 Mc. along with KØABK and KØHZW and occasionally QHL. KIK has received his 10000 Traffickers Club certificate. KØQCQ and KØOJC are attending Missouri U. Fellows, this is your column we can report only those items which you send us! Traffic: KØONK 1291, WØANT 521, KØLTJ 459, VPH 153, WØMKJ 144, OMM 119, KIK 114, OUD 107, ZLN 106, KØRPH 69, IHA 67, AYB 49, RTW 48, BUL 45, KNØGFA 45, BVL 38, OVV 36, KØMMR 32, EPC 24, WØWAP 17, GBJ 9, PXE 9, DCR 7, EPI 4, VFP 4, WØKCG 3, W5ZEY/Ø 3.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—SEC: KØTSU. Please send your AREC applications to our SEC, John Spahr, KØTSU, 705 West 28th St., Kearney, Nebr. The Nebraska Section C.W. Net, OKO as NC, reports 31 sessions, QNI 146, QTC 84. EGQ reports the Nebraska 75-Meter Emergency Phone Net had QNI 833, QTC 40 formal and 101 informal, 100 per cent reporting VZJ. The Nebraska Morning Phone Net, KØDGW as NC, reports QNI 662, QTC 96. The Western Nebraska Net, NIK as NC, reports QNI 662, QTC 490, 100 per cent reporting AHB. KØAIE, KØBMQ, DVB, FJZ, OCU, OFP, RIH and KØTUH. Five mobile units helped the Alliance Police Patrol on Halloween. We of the Nebraska section wish to thank the Ak-Sar-Ben Radio Club at Omaha for the best Midwest Division Convention that has ever been held in this state.

(Continued on page 108)

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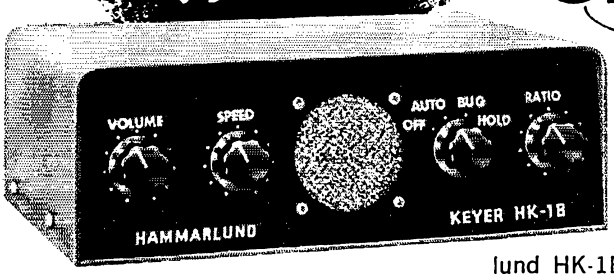

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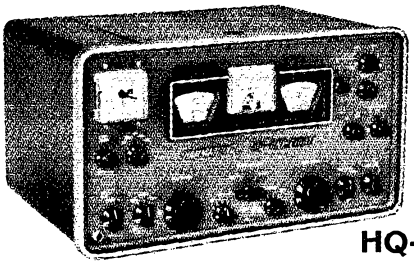

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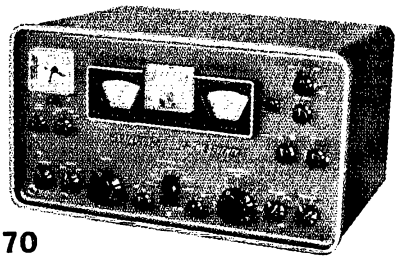

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Traffic: (Oct.) WØGGP 370, OKO 158, AHB 120, NYL 78, KØKJP 77, OCU 57, KØDGW 54, WØNIK 51, SJF 44, RIH 41, KØFBD 36, WØWUV 29, YFR 25, KØUWK 19, WØVZJ 16, KØIWS 14, WØBOQ 12, LOD 11, KØMSS 10, SBP 10, WØVEA 10, EGQ 8, KLB 8, UOV 8, SWG 7, CIW 6, GAT 6, LFJ 5, KØZEO 5, ELU 3, WØKFY 2, QKW 2, HOP 1, WKP 1. (Sept.) KØSBP 3.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, jr., W1CHR—SEC: EOR. RM: KYQ. H. F. PAM: YBH. V.H.F. PAM: FHP. See Dec. *QST* for traffic nets and skeds. BDI worked IIRIF and GM3IQL on RTTY. K1GUD will put his ham talents to work as Navy technician or radioman if he fails to make OCS. QV gave a talk to the Springfield, Mass. RC. K1JXG built a 6-meter rig for the Spiritan ARC. The Conn. Training Net (CTN) needs support. Here is an opportunity for newcomers to traffic to learn the ropes without pressure. Contact RFJ, net manager, if interested. Sessions are held Sun. at 1400Z on 3640 kc. KYQ reports CN held 55 sessions handling 514 messages, with 31 early sessions handling 435 for a 14.1 average and a 12.8 attendance average; 24 late sessions handled 79 messages for a 3.3 average with a 3.5 attendance average. High QNI were ROX, RFJ and K1IFJ. ZGO and his XYL, K1SUZ, moved to Weston and both are active on 6 and 2 meters. IOW is on sea duty. IOH works s.s.b. with a GSB-100. K1TSM is very active in Waterford c.d. work and will be on 40 meters soon. K1HNT needs a receiver. Waterford's c.d. drill produced seven mobile units, including visitors TSL, NAC and K1QDS. HHK is using the Command twins for 80 meter mobile. NTH had trouble with his Matchbox. OBR will pack a 500-watt wallop soon. VW had an error of *two tenths* of a part per million in the Sept. FMT. How close can you get? Others participating were OJR, PHT and K1HTV. KUO is back in the traffic swing again. BNB is trying CHR's DX-35 modification. AGS has moved to Weston and is happy to get his old call back. FVV is trying out a 6-meter G-50 for home use. EFW has been busy visiting clubs. PRT reports that the Bloomfield ARC has been assigned the call CWA in memory of the late Donald Clark. The club is dedicated to AREC and RACES. YBH advises that CPN had 31 sessions handling 246 messages for an average of 8. Daily attendance averaged 25 with 80 per cent or higher attendance by K1s DGK, MBA, AQE, PPF, BSB and W1s DAV, YBH, VQH and ETF. FHP vacationed in the South with 10-, 6- and 2-meter mobile with 6 meters most active. The CQRC is working on 220-Mc. gear planned and designed by JJL. Reports received: OES from K1PKQ and FVV; OO from EQV, VW and K1IFJ. New appointments: ZGO and K1s TKJ, PTK as OESs; HAX, GEA and K1PPF as ECs; KUO, K1QCR as ORSs; K1s DGK and MVQ as OPSs; ZGO as OO. WPR renewed as ORS. Traffic: W1KYQ 470, AW 365, K1MZM 263, W1BDI 245, RZG 172, K1IFJ 152, W1YBY 138, K1JAD 108, GGG 98, W1OBR 72, NTH 67, K1AQE 62, W1ROX 55, K1PQS 53, PPF 43, W1CHR 38, FHP 36, RFJ 31, K1DGK 25, W1KUO 20, K1PRW 20, W1QV 19, K1MBA 17, W1BNB 16, K1PUG 14, MVQ 13, W1CUH 10, K1EIC 8, W1LV 6, K1BSB 5.

MAINE—SCM, Albert C. Hodson, W1BCB—Fall activity increased on all bands with more traffic on the nets. Your SEC, GRG, reported good response on the SET and has visited with clubs and other groups to stimulate interest in the AREC. Many more AREC members are needed to fill out some areas of the state so any who are interested should send forms to the EC or SEC. K1SCY and K1OPN have mobiles going. K1GAX has gone s.s.b. with a Pacemaker. ISO soon will plate-modulate the DX-60. GRG has a TH3 tribander. K1MBM made 117,490 points in the C.W. CD Contest and is 1RN representative for the Eastern Area. K1ADY has gone from Cadillac to Renault and is trying to find space for his mobile rig. Not many news items were sent in this time so if you have any information about new amateurs or activities just drop your SCM a card so he can keep all up to date. The PAWA has been meeting in the Portland Boys Club so come on in you old-timers and look the place over. BRU, IZS, PTL, K1AOQ and K1GPP are working into Maine daily from Florida and hope 10 and 15 meters stay open this winter. Season's Greetings from your SCM. Traffic: K1MBM 300, W1GRG 150, K1IMI 62, W1ISO 26, K1BZD 15, MDM 14, W1UYY 9, YA 7, K1RQE 6, OJH 5.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—AOG is our EC. New appointments: FXW Peabody as EC, FZJ and FRR as OOs. Heard on 75 meters: K1PPP. Our Eastern Mass. 75 Phone Net is now on 3842 kc. at 1730 (2230). K1TXF, ex-WØETN, is in North Quincy. K1SKP is ex-1IVT on 2 meters in Billerica. Heard on 2 meters: IET, HOM,

(Continued on page 110)

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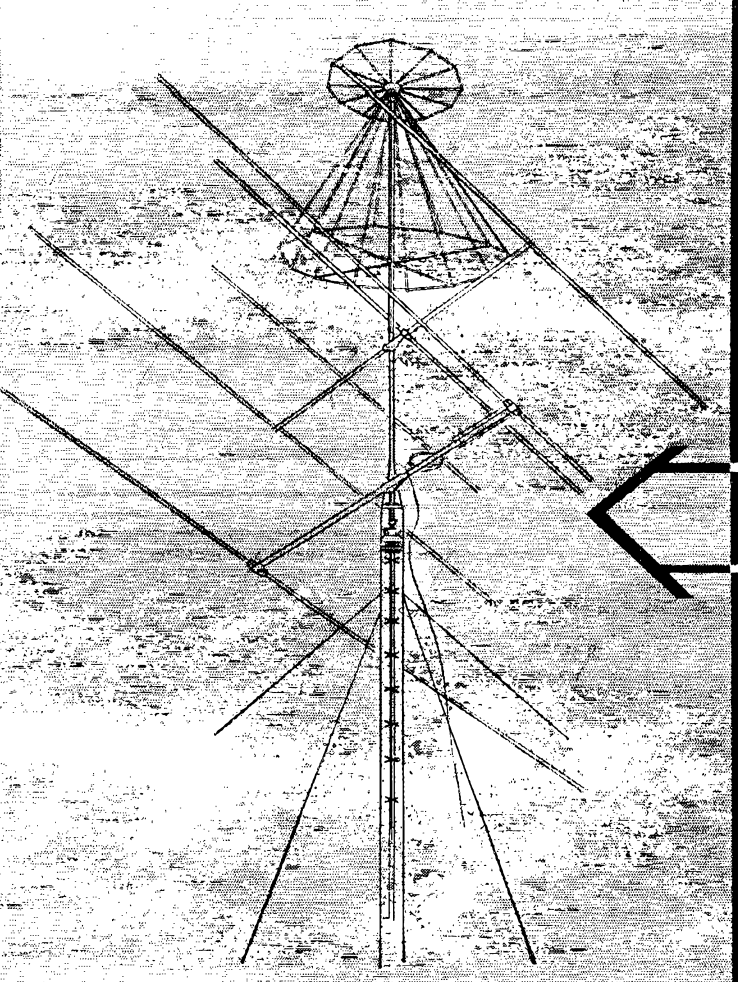
City_____ State_____

YHM, AWO, K1s JCC PLU, GCN, KEC, KSP, QWF, KN1s RZL and QLA. UIR is feeling better and is back on our nets on 75 and 2 meters. DDV worked VE3CUA on 6 meters and 2JKI on c.w. EM75PN had 495 check-ins, 252 traffic, 31 sessions. BGW took part in the RTTY World Wide SS Contest. Sorry to report the death of HM. K1JGX has a new operating desk which he designed. WEJ was in the hospital. The 2200 Net, on 50.65 Mc., is going strong with code on 6 meters. K1PSJ is manager while K1LCQ is in Connecticut. NF is busy with OO work. EHT took a trip to San Diego. HJP and MEG are on 3620-kc. RTTY. I met W1GA-K1GA in person after 30 years or so; he is on 20-meter s.s.b. BVL has a new vertical antenna. HX spoke at the QRA *meeting on* DX. K1TQJ, Lexington, has a Ranger 2 and a Gonset 6-63 receiver. K1NTS has a new QTH and will be on 6 meters. The King Philip ARS, K1OOR, was up on Mt. Greylock for the V.H.F. Contest. K1MVN is busy at school. The Framingham Club held a transmitter hunt-cookout and SSN spoke on s.s.b. The Braintree, Weymouth, Dedham and Wayland c.d. groups were *out on* Halloween duty. Officers of the Wayland Radio Club are EHT, pres.; QQT, vice-pres.; K1AKU, secy.-treas. The club meets the 1st and 3rd Thurs. in the C.D. Room, Town Hall, Wayland. HWE recently had his 71st birthday. Lexington High School RC, K1JMQ, has new officers: K1QBU pres.; Ed Frost, vice-pres.; K1MJS, secy.-treas. NSZ, Groton, is c.d. comm. director *and is on all* bands. The EM2M Net held 22 sessions, with 315 check-ins and 174 traffic. Ex-K1GVR is now WA6TLY. K1JKR is in the A.F. in Germany. MOG is working with OFK. K1SLZ is on 2 and 6 meters. QXX went to the V.H.F. Roundup at Syracuse. The Mass. V.H.F. Society held a meeting in Waltham. DEI gave a talk. K1NGJ is on several bands in Nantucket. K1IZM is doing some building. SS is central control for the Satellite Net, which meets Tue. at 1800 on 3820 kc. It covers the New England states, New York and Canada. K1TJV has a Valiant, an NC-303 and a Hornet beam. BGW, K1IZM, WAJ, K1DIT, AYG, EHT, PXH, K1LJK, JSS and PLJ took part in the Sept. FMT. K1TON is new in Melrose. K3GAD/1 is at Otis AFB. K1KBO is in the Mike Farad Net on 7238 kc. at 1700Z. DBY says the Chelmsford Club will have a new meeting place. EFW presented the affiliation charter to the Nortronics ARC K1TJD, at a banquet. EAE and ALP also were there. The Easetrn Mass. Phone (75) Net held a meeting at KBN's, thanks to K1KED, to talk things over and certificates were given out. Guests were 2OE, 1EFW, HQ and TA. Appointments endorsed: SS as ORS/OPS; SS Lincoln, YYZ Randolph, BB Winthrop, VYS Weston, as ECs; BB and GOU as OOs; EUJ and K1MVN as OESs. K1MYN has a new son. The Yankee Radio Club held a meeting and had a telephone co. film. The club now meets at the Moose Hall in Salem. HLP is home again after being away for two years in the Central Pacific and using a KX6 *call*. VQX is a Silent Key. Traffic: (Oct.) W1EMG 309, DFS 146, EAE 136, UIR 103, PEX 86, K1DIO 66, W1OFK 65, DOM 42, ZSS 36, K1QNQ 33, W1AOG 29, K1KBO 29, W1SIV 25, K1GTX 18, QNZ 17, GKA 13, W1VYS 13, K1QOG 9. (Sept.) K1MEM 19, W1DDV 9, K1KBO 5.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: BYH/K1APR. RM: K1IJV. PAM: DXS. Apparently the Massachusetts Phone Net problems have finally been solved to the satisfaction of most everyone concerned. We now have our separate nets operating, East, Mass. and West, Mass. FAB has been busy moving his equipment from one room to another. K1MKD and K1OGG are operating mobile 6-meter equipment (mobile by bicycle that is!) K1GCV is an operator at the Clarkson College station, 2TAB, using a DX-100 into a TA-33 beam. The West, Mass. C.W. Net (WMN on 3560 kc) cleared 81 messages during October in 26 sessions. West, Mass. still is maintaining 100 per cent attendance on the First Region Net. LIW has a new Drake receiver. K1MAL has a new tribander. Ditto QXV. W1AGL is planning a tunnel from his garage to the hamshack so the XYL *won't see* the new equipment being brought in! Mt. Greylock played host to a number of hill-toppers during the Summer and fall. WF, COI, GKK and AZW attended the North East DX Assn. Dinner at Albany. ARX became the proud papa of a new jr. operator Oct. 19. Congrats. AZW worked plenty of DX on 7 Mc. during October still using his 30 watts. K1JGW and CPN are *active in organizing* the Hinsdale C.D. setup. Berkshire County boasts over 35 hams on 6 meters. Could be more, eh? GKK, manager of the W1-K1 QSL Bureau, told of his experiences at the October meeting of the Berkshire County Amateur Radio Assn. Among points of interest was the fact that one prominent DXer has over 2000 QSLs at the bureau but refuses to claim them. Guess it takes *all* kinds to make the world. Thanks to Zero Beat and Random Scatter for most of the above news. Traffic: W1LDE

(Continued on page 112)



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NEW HAMPSHIRE—SCM, Ellis F. Miller, W1HQ—SEC: K1GQK. PAM: KVG. RM: K1ITS. GSPN meets Mon. through Fri. at 2400 and Sun. at 1430 on 3842 kc. CNEN meets Mon. through Sat. at 1145 on 3842 kc. NHN meets Mon. through Sat. at 2330 on 3685 kc. Appointments: KN1TGZ as OES and IJB as OO. Endorsements: RMH as OO and OES, K1BCS as OPS and ORS, K1MID as OPS. The SET alert on Oct. 7, ably conducted by our SEC, K1GQK, involved Merrimack, Hillsboro and Rockingham Counties. Howard reports excellent success and a proposed continuation of SET on a periodic basis. The AREC Net meets on 50.820 Mc. Those on 6 meters, please take note. This is a very interesting and instructive activity. Mark Jan. 27, 1962 on your calendar. The Thirteenth N.H. QSO Party will be held on that date. Because of a work schedule KVG has had to resign as PAM. Thanks for a fine job, Tom. Watch for announcement of a new PAM appointee. K1CIG has incorporated his shack into a fallout shelter. It may be the first in New England. Traffic: W1TA 97, KIBCS 66, W1QGU 62, PFU 47, K1GQH 18, IIQ 17, KVG 16, YMJ 11, K1JDN 10, EEN 5, W1JNC 5, PBE 2, KN1TMD 1.

THIRTEENTH NEW HAMPSHIRE QSO PARTY

January 27-28, 1962

The Concord (N. H.) Brasspounders, W1OC, announce their sponsorship of the Thirteenth New Hampshire QSO Party, and cordially invite all interested radio amateurs to participate. Here are the details:

(1) Contest period: Saturday, January 27, 2300 GMT to Sunday, January 28, 2300 GMT.

(2) No time limit and no power restrictions.

(3) Scoring: N. H. stations count 1 point for each N. H. contact, plus 2 points per outside contact; stations outside the state count 2 points per N. H. contact; both multiply by the number of countries worked (10 maximum).

(4) Engraved certificates will be issued to all participants reporting, with special endorsements for the highest-scoring stations, both in N. H. and outside, in the phone and c.w. categories. Single operator stations only are eligible for the special endorsements.

(5) The same station may be worked for additional credit on more than one band, phone or c. w. suggested frequencies are 3550 3842 7050 7220 14,100 14,250 21,075 21,350 28,100 and 28,800 kc., 50.4 and 145 Mc.

(6) General call: "CQ NH" on c.w.; "CQ NH QSO Party" on phone. N. H. stations are requested to sign *de W1———NH K.*

(7) Contact information required: Report and QTH (including county of N. H. stations) and number of QSO. Those operators participating in both the c.w. and phone categories must submit separate logs for each mode of operation. Each log shall be scored separately based on the number of contacts and counties worked in each mode. Logs and scores must be postmarked not later than Feb. 15, 1962, and should be mailed to the Concord Brasspounders. P.O. Box 339, Concord, N. H.

(8) The WNH (Worked New Hampshire) certificates will be awarded to stations working all ten counties during this QSO Party, participating logs confirming. Detailed requirements for the WNH certificate, a standing award, may be obtained by writing the club.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PAZ. RM: SMU. PAM: TXL. RISPN report: 30 sessions, 382 QNI, 55 traffic. The AQ Club of Rumford has a change in the rules for the WRI certificate. Contacts now may be mixed-mode instead of only all A-1 or A-3. The remainder of the rules remain the same. Club member K1QIE received his General Class ticket. The NCRC of Newport reports member AJR making 400-mile contacts on 220 and 435 Mc. K4OLC was elected a new member. K5FUI/1 is a new member of the Newport County Emergency Net. The Hope H. S. Radio Club of Providence, K1TJO, held its first election with the following results: K1PYO, pres.; KN1QQX, vice-pres.; Theodore Grossman, treas.; and David Caswell, secy. Mr. Robert Gurnham is the club's advisor. The club operates presently on 80 and 40 meters but plans for

(*Continued on page 114*)

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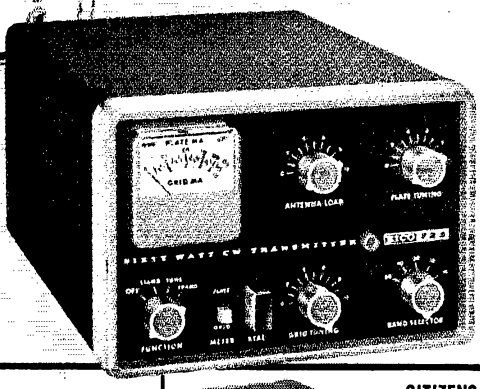

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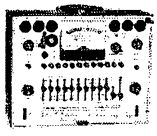

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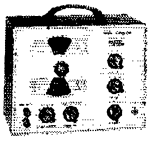

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the future call for a 150-watt transmitter for all bands. TXL has built a new 6-meter converter. K1LPL has completed a 150-watt transmitter for 80-6 meters. K1KDI has worked the Midwest with his "Sixer." K1OGZ passed the Tech. Class exam. K1JYO now has his 6N2 in operation. K1EGH and his roommate, CMH, are operating from the U. of R.I. Traffic: W1SMU 501, TXL 291, K1NEF 110, DZX 33, PZY 28, GRA 21, JOD 10, GRC 7, AAV 5, DUH 5, PNI 5.

VERMONT—SCM, Miss Harriet Proctor, W1EIB—SEC: K1DQB. PAM: HRG. RM: KRV. Officers of Middlebury Mike & Key Club for 1962 are K1DQB, pres.; K1KBL, vice-pres.; K1BDA, secy.; George Harvey, treas.; TFB, act. mgr. The SCM met with a group in the St. Albans Area to discuss public service activities and amateur club activities. K1GCX, formerly of Burlington, has been in West Haven, Conn., since leaving our section. Vt. SCM certificate No. 1 goes to K1LJL and No. 2 to K1LEC. EIB is now mobile on 2 meters. Each amateur might well keep his station in top condition in case it should be needed for extraordinary use within the hour. Those whose stations cannot be effective might arrange to be a relay operator at another station.

NORTHWESTERN DIVISION

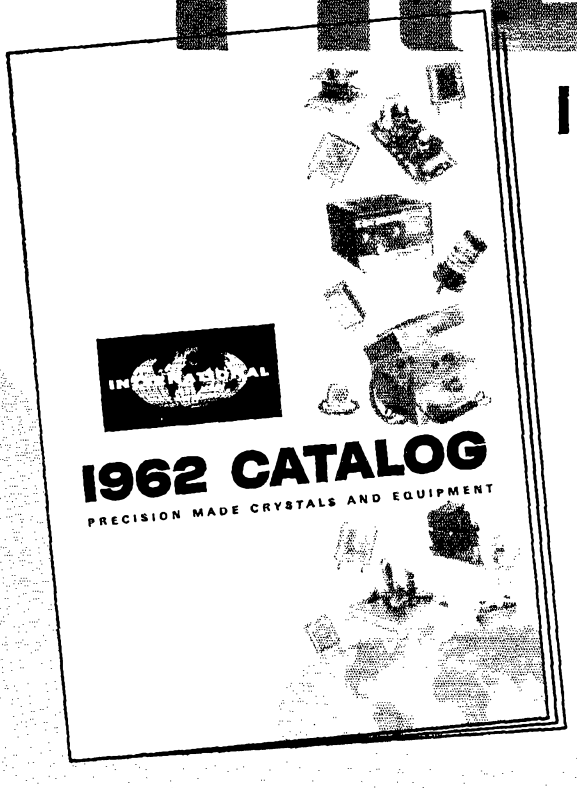
ALASKA—John P. Trent, KL7DG—Interest in the bunny hunts in the Anchorage Area has risen to new heights. There have been 6 hunts with PJ and AUV two hunts, AQU and DQT one hunt, leaving BZO and CDG three to their credit. There is a very nice trophy awaiting the winner. With all the work those bunnies go to stringing antennas out for miles NLC editor BLL thinks they are the sneakiest bunnies she ever did see. AQU is the talk of the town after looking in every nook and corner of BZO's house, trying to find the bunny. Much to his dismay the bunny was one mile away. Thanks to BPE for the use of his house. The following participated in the six bunny hunts: CQS, DQL, DRJ, CLY, W3YH, DBW, BJW, AQU, PJ, BLL, DQT and AUV. CQS, CLY, CDQ, CLA and BZO are attending the FAA Radiological Monitoring School now in session for the purpose of measuring radiation and understanding the problems of fallout in order to pass this information on to other persons. BGH is one of the instructors of this class. BZO sent in the above for the SCM.

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—A new net has started in our state. Employees of Uncle Sam's Post Office meet on 3900 kc. at 1830 MST Mon. through Fri. The Gem State Net, 3580 kc., 2000 MST, needs check-ins from Western Idaho. K7HLR solicits news from clubs and groups for the publication *HAMBONE*, which could appear bi-monthly with *your* help. Ray also prints QSLs. It was good to hear activity by ECs and the AREC during the SET. A state-sponsored c.d. drill Oct. 10 found DHL, RKI, DWE, DPD, GGV, OA and K7OAL cooperating with communications. K7OAL teaches code to Explorer Scouts. KXJ took the Extra Class exam. HAU, K7MNZ and K7OAL are putting up new beams. OAH has a new transmitter of his own design on the air. Helen, EEQ, had a Foreign Exchange student from Ireland as a house guest. UKH was written up in the company's publication with pictures of ham gear and DX activities. The FARM Net reports 470 check-ins, 22 sessions and 57 pieces of traffic handled. Traffic: K7HLR 94, KBY 49, W7VQC 18, EEQ 11, GGV 8, UKH 2, IY 1.

MONTANA—SCM, Ray Woods, W7SFK—SEC: BOZ. PAM: YHS. RM: K7AEZ. The MPN meets M-W-F on 3910 kc. at 1800 hours. The MSN meets T-T-S at 1830 hours on 3530 kc. TSN is meeting again at 2400 hours on 7230 kc. UPR is on a trip to California. K7MEG is heard from Havre. Director CPY is in Arizona for the winter. K7KJH has a new receiver, we hear. KJX and EEO are working on teletype rigs. We regret to report the passing of EEH, of Missoula. New Harlo Radio Club officers are RZY, pres.; SZB, vice-pres.; K7CHA, act. mgr.; TGM, secy.-treas. New appointments: IOA as EC, K7NHV as ORS, K7MFA as OES. EKB is on with a big signal. LBK is working on an RTTY setup. The Laurel Radio Club's officers are K7LSX, pres.; K7JAT, vice-pres.; K7MOW, secy.; LBK, program chairman. The club has 14 members. The Missoula amateurs helped the law with their Goblin Patrol again this year. K7KOK is a new ham in Bozeman, from Arizona. Bob's other calls sound like something out of a DXer's dream. K7NHV and LGV are both getting new Drake receivers. K7JKZ is the new secretary of the Electric City Radio Club. K7DGV has a new Valiant. Look for the hams at Laurel. There are more of them than I can list and they are real active. Traffic: K7EWZ 90, LDZ 59, NHV 47, W7TVX 37, K7JKZ 6, W7COH 3, FIS 2.

(Continued on page 116)

FREE



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OREGON—SCM, Everett H. France, W7AJN—New appointments: ADR as OES, K7CJB as OBS for the AREC Net on 3875 kc. Certificate endorsements: ZB as ORS. A nice report was sent in by K7CNQ regarding the 6-meter AREC Net in Portland and vicinity. K7BZP now has a Mohawk receiver to match his Apache transmitter; he also raises bob white quail as an extra hobby. GUH, OO for Oregon, reports hearing phone stations in the c.w. portion of the 6-meter band and suggests they better look to what crystal is in the socket. ESJ reports stations on the 3800 and 1990 kc. low-power chain are K7CVX, K7EPH, K7NTS, K7IWD, AAI, DIE, MUS and UZU. MTW, manager of the Oregon State Net, reports sessions 22, attendance 170, traffic 64. BRAT awards went to MTW, ZFH and K7IWD. New Novices in the La Grande Area are KN7RBC, KN7QNS, KN7QVS and KN7RBE, who is the XYL of K7KZP. KN7NXX has dropped the "N," having passed the Conditional Class exam. K7JVN is now active on 6 meters. K7KTP sends in a nice report of his activities as OO for Oregon. The Affiliated Council of Radio Clubs met with CPY, ARRL Northwestern Division Director, regarding the National Convention to be held in Portland in Sept. 1962, and plans are well under way with various committees being formed. K7IMH is active on the 6-, 2- and 1¼-meter bands and has a 3CX100A5 on 432 Mc. GUH sends in a good report on the ARRL Frequency Measuring Test. Traffic: (Oct.) K7JVN 143, AXF 94, W7BDU 75, K7IWD 62, W7ZFH 61, K7KBK 57, W7MTW 38, EUG 22, DEM 16, AJN 11, K7EPH 10, CNZ 9, CNQ 3, W7ESJ 3, K7KTP 3. (Sept.) K7KCZ 21, W7GUH 10, ESJ 3.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—SEC: HMQ. RM: AIB. PAM: LFA. Nets in the Washington Section are WSN, 3535 kc. at 0200Z; WARTS, 3970 kc. at 0130Z; CBN, 3960 kc. at 0230Z; and NSN, 3700 kc. at 0400Z. New officers of the Spokane Amateur Radio Club are K7AOZ pres.; LWX, vice-pres.; K7JXG, secy.; UOJ, treas.; HCJ, ZNN, K7s AFE, BEO and EVA, trustees. Meetings are held the 1st and 3rd Tue. of each month. K7PXV, formerly VE3BAR, received his U.S. Citizenship and K7 call in July. Bruce works for Boeing Aircraft and is active on WSN. Winners of the Tacoma Club hidden transmitter hunts for the season were K7NPG first and CZK and K7CZF in a dead heat tied for second place. UYL took home the trophy for the month of October in the pinochle games. The club also participated in the ARRL Sweepstakes as a club project. Officers of the Moses Lake High School Radio Club are K7MVR, pres.; K7MQA, act. mgr.; K7LXC, reporter; and K7OKE, treas. and business manager. KN7QMK passed the General Class exam. EHH is active in AREC and RACES. RGL now transmits Official Bulletins on 50.11 Mc. Mon. at 1930 PST and Wed., Fri., and Sat. at 2030 PST using m.c.w. CWN is QRL overhauling the kitchen. EBU also is QRL with siding on the QTH. FCB is back at Boeing's after a session in school of Tektronics. AWN is on 20-meter phone with a GSB-100. K7HST has a homebrew rig on 40 meters. K7APJ is attending Dartmouth College. IST is the new manager for the Evergreen State Net. ACA is on 160 meters and looking for QSOs. GIP ended the month by being called by LU1ZL near the South Pole and working him. AIB reports net attendance was normal on WSN but traffic was way down. He advises he worked 8 new countries. JEY is active on week ends from Bellingham. AMC is QRL building 6-meter gear. He has the "Sixer" completed. K7CWO is waiting for a new Drake 2B. VPW now is on 80-40-20-meter RTTY with 1 kw. FWX joined the ranks of Silent Keys Oct. 2. K7NLD holds daily skeds with DZX for traffic and also the Treasure State Net with Montana Mon. and Fri. on 7230 kc. K7BKX now is a member of the Blue Smoke Net. K7HJN is waiting for a new tower and fancy new beam. IDI is moving to a new QTH. WTG received his General Class license recently. We understand that FAS is building a new 25-tube receiver. UZB has a new homebrew mobile receiver and is working on a transistorized transmitter. OEB is running code practice on 3520 kc. Mon. and Wed. at 1800 PST. Sixty members and friends of the Skagit Club toured Jim Creek Sta. Congratulations again are in order for the Valley Amateur Radio Club, HZ, in taking first place in the nation in 1961 Field Day activities. Traffic: W7BA 1012, DZX 1011, QLH 304, APS 125, GYF 117, AMC 65, IST 54, ACA 37, K7NLD 37, W7GIP 28, KZ 23, AIB 11, JC 11, JEY 6, K7PXV 6, W7AXT 5, VPW 3, K7CWO 2, W7RGL 1.

PACIFIC DIVISION

HAWAII—SCM, John E. Montague, KH6DVG—SEC: CQV. RM: DVD. The POI Net has changed frequency and added a new session as shown below. We offer a welcome to our first Section Emergency Coordinator, CQV. All inquiries about AREC should be sent to your SEC. DVD is doing a magnificant job with the POI

(*Continued on page 118*)

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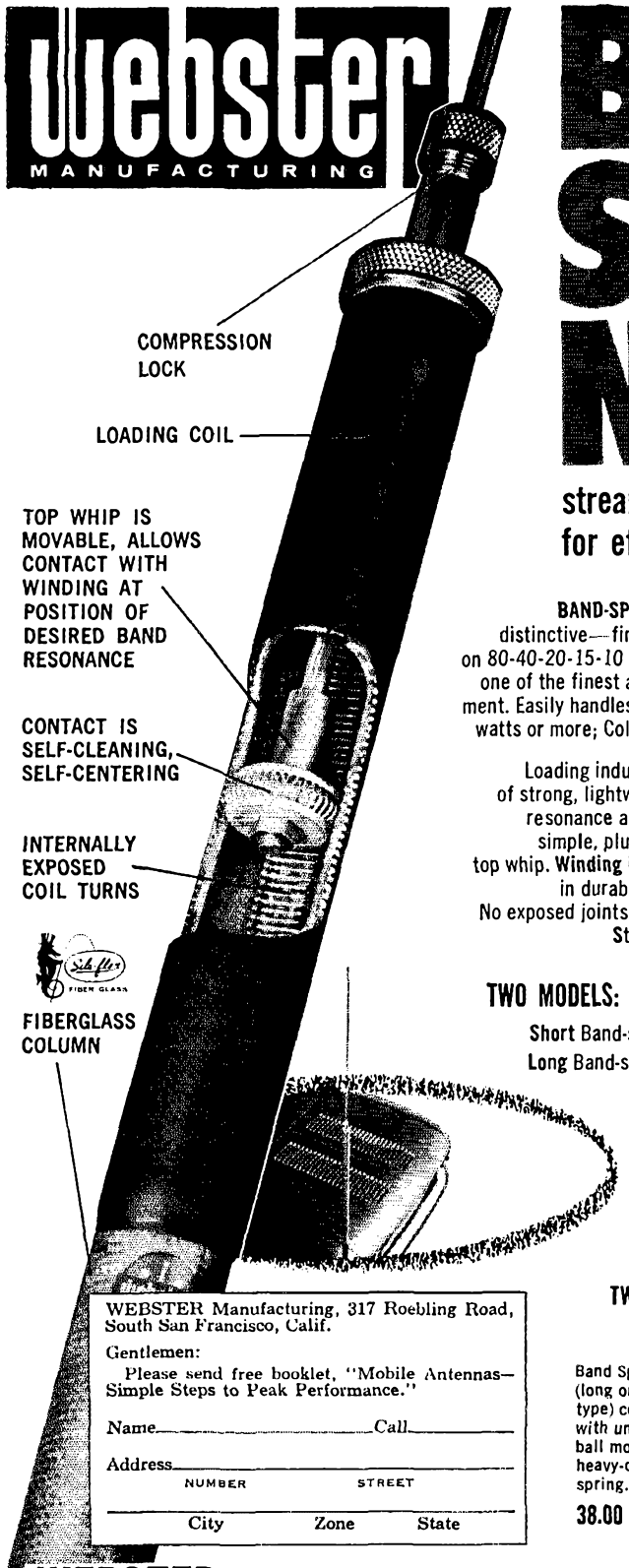

BAND-SPANNER, an exclusive Webster design—distinctive—fine looking on any car—a top performer on 80-40-20-15-10 meter bands (and MARS frequencies)—one of the finest antennas for use with multi-band equipment. Easily handles transceivers with power inputs of 100 watts or more; Collins KWM-2, Gonset G-76 among others.

Loading inductor is wound directly on upper portion of strong, lightweight fiberglass support column. Exact resonance anywhere within any band is obtained by simple, plunger-type adjustment of stainless steel top whip. **Winding is contacted internally,** is encapsulated in durable epoxy for lasting exterior protection. No exposed joints to corrode, no flimsy plastics involved. **Strong! Durable! Unaffected by moisture.**

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Either model: (less mount) **24.75**

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Band Spanner (long or short type) complete with universal ball mount and heavy-duty spring.

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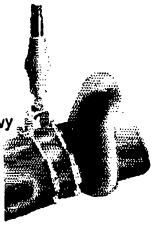

WEBSTER MANUFACTURING *317 ROEBLING ROAD, SOUTH SAN FRANCISCO, CALIFORNIA*

Net. ARL has the exclusive record of 100 per cent QNI on the POI Net. EGL/EGQ qualified for 1st-class OO from both of his stations, topping it off with a 0.6 parts per million error from EGQ. DVG has a new 50-ft.-high TA-33. DLX was host to WA6CYG. DLW worked 15 European countries on 20-meter s.s.b. in one hour. NU has a Novice class of 50 at Waimea High School. IJ follows suit with 20 beginners at Kauai High. The POI Net meets Tue. on 7150 kc., Thur. on 3750 kc., Sat. on 7150 kc. at 1900 HST. The alternate for Tue. and Sat. is 3750 kc. Traffic: KH6DVD 184, EGL 72, DVG 50, ARL 46, EJ 20.

NEVADA—SCM, Charles A. Rhines, W7VIU—SEC: 7JU. ECs: PC, HJ, YKC. OOs: KHU, K7ETN. OPS: K7ETN. ORSs: VIU, K7CJZ, K7ETN. YKC is the new EC for Las Vegas. HQS is finishing up a Heathkit Shawnee. KHU and VR attended the S.S.B. Hamfest at Santa Maria. VR won a Triex tower. KHU turns in another fine FMT score. PBV is constructing a fallout shelter which will house his ham shack. SKP has his 701-A rig debugged. JUN is back in Reno. VJR sold his home. BYR and son are big game hunting in Africa. The Boulder City AREC, under EC HJ, turned in a fine SET report for October with 17 members participating. KN7NMG broke his leg. OHY is attending the University of Nevada. K7DEF has a new KWM-1. AGZ and XYL CUF have opened a department store in Sparks. KØZJR/7 is now in Reno. Traffic: (Oct.) W7PBV 12. VIU 10. (Sept.) W7KHU 220.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—The South County ARS and the Palo Alto ARA held their annual Christmas Dinner Dance Dec. 12 at the Gold Platter in San Carlos. Newly-elected officers of the SCARS are WA6AUC, pres.; K6JJU, vice-pres.; WA6GIM, treas.; and K6UDU, secy. The SCCARA and the Monterey Bay RC held a joint picnic at Mount Madonna Park on Nov. 5. Especially organized for the 2-meter gang, there were upwards of 100 around the barbecue pits at one time or another. WA6EIC, Santa Clara County EC, reports Sunnyvale city officials endorse and support a RACES program. K6YOL will be manager of the net which will meet Mon. at 1900 hours on 50.44 Mc. Eight reports were submitted by S.C.V. amateurs in the Sept. Frequency Measuring Test; four of them by OOs W6CBX, K6MZN, WA6HRS and W6ZRJ. W6ZLO, PAM, will be using a longer long wire since his neighbor is cutting down the big elm. WA6HRS reports his antenna was torn down three times recently by the builders of a nearby apartment house. Incidentally, Hil is the 325th member of the Certificate Hunters Club. K6SMH has his Code Proficiency Award for 20 w.p.m. K6ZCR keeps her girlish figure by working out at the gym thrice weekly. W6CQK, Asst. EC for Redwood City, will be moving to Caracas, Venezuela. WA6HRY will take over his job as manager of W6WWJ. Traffic: (Oct.) K6KCB 551, K6GZ 212, WA6OLQ 142, W6AIT 103, K6ZCR 100, W6DEF 98, K6DYX 96, WA6EIC 86, W6FON 54, W6AUC 38, WA6LSS 24, K6BBF 20, WA6HRS 17, W6OII 14, K6VQK 9, K6SMH 2. (Sept.) W6ASH 41.

EAST BAY—SCM, R. W. Southwell, W6QJW—SEC: WA6HYU. ECs: K6VXK, W6FAR, W6WAH, K6HTJ and WA6MHJ. K6GK has been visiting in W3-, W9- and WØ-Land. Diablo Valley College is setting up a school station. K6ZYZ got his antenna back up at his new QTH. W6ZF's new antenna farm is sprouting. WA6LVX reports that 16 hams at Pacific Union College are starting a club. W6NDR has been recalled to active duty on anti-submarine warfare patrol. WA6ECF has been collecting award wallpaper with eight new ones. The ARRL Merits Awards Dinner was a huge success. WA6HYU is now the XYL of K6HYY. Congrats. The QCWA held its dinner party on Nov. 4 at the Claremont Hotel in Berkeley with 156 in attendance. NCN has switched to GMT. K6ZYZ is asst. mgr. of RN6. K6DX gave a talk on his trip to 9M2-, VK- and ZL-Land at the October meeting of the ORC. W6CXP is looking for small parts donations for boys of the Byron Rehabilitation Center. K6VLH is building a new ham shack. W6PIR is the new postmaster of the Alamo Post Office. K6TIP, EBARC pres., moved and K6BJJ, vice-pres., has taken over his duties. The EBARC is reorganizing its AREC network. W6IIF gave a talk on calculations made easy for the amateur at the HARC's October meeting. WA6MXK is moving to the Hayward Area. WA6ONO has a new Mosley trap master vertical. W3WAU/6 and his XYL have a new jr. operator. Congrats. That's it for this month, gang, let's get more reports in. Thanks. Traffic: (Oct.) WA6LVX 155, WA6ECF 22. (Sept.) K6GK 135, WA6ECF 60, KØOSO 36, W6ZF 7. (Aug.) WA6ECF 235.

SAN FRANCISCO—SCM, Wilbur E. Bachman, W6BIP—SEC: W6KZF. The San Francisco Radio Club held an election of officers. W6CDL will handle the gavel for the next year. K6IPM, will be vice-pres.; WA6LYA, secy.; and W6FAX will take care of the financial end

(Continued on page 130)

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of club duties. New board members are. WA6DEV, W6VYC, W6CTH, K6PBQ, W6FDU and K6BCH, with alternates W6JXK and WA6JVE. W6NCK will be editor of the S.F. paper. Army MARS held its 6-meter luncheon at the Presidio Nov. 5 and the MARS director spoke on the net's assignments and told of how the hams were prepared to handle emergency traffic in times of need. W6MLK, Red Cross station, is a member in this net and has received much help from all the MARS men over at the station! The Century Club held its dinner at the Claremont Hotel on Nov. 4 with many of this section's amateurs attending. The speaker of the evening told about the radio station on the SS *Hope* and mentioned what good relationships were made with the other countries through this radio station. BYS did a major part of the installation on the ship and kept a daily schedule with the ship when other stations were unable to take copy! W6BIP, as SCM, and W6GGC, as Asst. Dir., attended the ARRL Awards Dinner at San Mateo! W6KZF, our new SEC, gives this bit of advice: "Keep your local net active with regular on-the-air meetings and drills. Keep in mind that you should maintain *two* channels for use in a disaster or emergency, one for official traffic (Red Cross, c.d. sheriff, police, etc.) and one for welfare traffic. Join the discussions on the AREC Net, 3900 kc. 10:30 A.M. Sun." K6QJB reports no traffic because of a broken finger. The only action is a weekly schedule with KH6IR and a daily schedule with K6UZR, Ft. Bragg. Ralph is mobile on 50.250 Mc. W6OPL now has a station set up at his place of business which he keeps ready for any emergency. K4DGU is custodian of K6NCG at Treasure Island. He says the fellows are looking forward to a world-wide sked with military installations over the Christmas holidays. NCG operates 6-2, 80, 40 and 20 meters. The club meets each Tue. and hopes to get started on experimental work soon. W6OKR is v.h.f. and is NCS on MARS on 49.980 Mc. on Sun. at 9 A.M. WV6OFE is now a General with "A" instead of "V". WA6LVX manager of NCN, reports that WA6BXV is handling vital traffic to the northern part of the section. K6JFY is giving NCN lots of help. WA6MDL is liaisoning phone between the NCTN Phone Net. W6DEF is c.d. advisor for the NCN Net. W6QMO is busy with plans for a net dinner. W6RAS is the proud owner of a new KWM-2. WA6ABR (W6EQA's son) has joined the Navy and is stationed at San Francisco. WA6GQA reports this news. W6OHJ reports that many S.F. 40-meter s.s.b. operators meet for breakfast on the 1st Sat. of each month at Mels, Van Ness Ave., in S.F. The Mobileers meets the 3rd Sun. of each month for breakfast and field trails on 3995 kc. at various spots around the Bay Area. Traffic: K6JFY 305, W6QMO 201, K6SAA 58. K6FCT 50, W6JWF 25, K6LGF 24, W6OPL 19, W6GGC 16, W6GHI 6, W6BIP 1.

SACRAMENTO VALLEY—SCM, George R. Hudson, W6BTY—SEC: K6IKV. ECs: K6BNB, K6GOT and K6BYS. OBSs: W6AF, W6WGO and K6HHD. PAM: W6GQS. OOs: W6WLI, W6WGO, K6ER, W6ZJW and K6EIL, ORSs: W6WGO and W6CEI. OES: W6PIV. OPSs: W6WGO, K6EIL, W6PIV, W6GQS, WA6PVT and WA6OXK. Your SCM spoke recently to the live-wire El Dorado ARC in Placerville on ARRL metters and your SEC spoke on emergency operational details. W6ZJW is very active in OO work and is enjoying nice 20-meter contacts with a new vertical. W6AF is busy chasing DX and the elusive four-legged buck with little luck with either. K6EIL was active in the recent CD Party. WA6OXK, our newest OPS had 813 final trouble, but it is now OK and he is working plenty of DX. He is active in reviving the Redding ARC. WA6PVT entered the latest CD Party and did well but wished for more 75-meter activity. At present Bob has 40 states worked and 30 confirmed. Sierra College ARC (WA6OTI), up Placerville way, now is assembling three complete stations; 80 through 2 meters a.m.-s.s.b.-c.w. Heath-equipped. W6LAC is operating portable in Coloma on 75-40 and 6 meters with 300 watts on 6 for c.w. forward scatter on 50.040 Mc. at 0700Z week ends. Your SCM attended the Annual NCN Dinner Party at the New Tivoli in San Francisco. New members of the NCN from Sacramento Valley are W6UUN, K6YZU and K6EE. W6CMA is NCN liaison on Saturdays. K6EIL, W6CMA, W6UUN, W6VIJ and WA6ERC handled much traffic in the SET. WA6RBY is active on the 6th Army MARS Net at Sacramento Signal Depot each Thurs. at 0400Z on 49.900 Mc Interested joiners are welcome! WA6RBY also is truck-mobile on 75 meters on his Sacramento to Los Angeles run. W6LQT has been appointed trustee of the Aerojet Radio Club. Downtown SARC held a nice party with W6WGO as chairman.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Bakersfield gang is hot on the high frequencies. WA6OZX has converted an APX-6 and is QSO with K6MWW. WA6OZX is experimenting with parabolic antennas and a 4X-500 on 1296 Mc. On the lower bands

(*Continued on page 122*)

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he is using an SX-111 and a modified ART-13. W6PXP has a 40-meter Swan transceiver. W6NKZ and W6FXV are building 75-meter s.s.b. transceivers. The Six-Meter C.D. Net, which checks in on 50.25 Mc. on Mon. nights, averages 20 members. WV6SIL is operating on 40-meter c.w. W6OUX blew up a pair of 807 modulator tubes in his mobile rig. WA6DAU is heard on 75-meter mobile. K6BGK has a new mechanical filter and is building an s.s.b. exciter. WA6JZP and K6YDU are heard on 75-meter mobile. A MARSFEST was held in Fresno Oct. 28, and over 400 attended. W6DZZ has a new Tri-band beam up 50 feet. K6EJT is heard on 75-meter s.s.b. on week ends. WA6RLW is on 75 meters with the S/Line. WA6EDQ is on all bands with an HT-32. On Oct. 17, an earthquake was felt in the Ridgecrest-China Lake Area. 3845 kc. was used for reporting and those taking part were K6HLO, K6OZL, W6DUF, WA6MRU, W6LL, K7RAO, W7HQS, W6AVZ, K7OVB, WA6IIU and W6EFB. K6OZL got his big rig on c.w. The SJVN Net had 623 check-ins, 17 traffic and 26 sessions. Traffic: W6EFB 37, K6OZL 14.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: W4DRC. V.H.F.-PAM: W4ACY. RM: K4CPX. I am delighted to be around again, fellows. I appreciate the letters and cards saying that you missed the activity report each month. As Ed Handy stated in Nov. *QST*, I had the misfortune to break my left foot on July 31 while building a new home. In the meantime the wife moved the belongings and not being able to do anything most of the certificates, etc., were misplaced. However, we have found them now and at the moment I can get around with a cane. Whatever you do, fellows, don't break a foot—too many small bones to get all squared away and when you get beyond 50 it takes time. I have had a good many reports of activity in RACES. There is much interest in many counties and cities in getting some communications equipment. Fellows, please bear in mind that you are communicating within the county or city and the v.h.f. frequencies will do the job. Your county or city need only to communicate with area stations and the area stations with state headquarters. Please keep this in mind. Will the amateur who had enough traffic to qualify for BPL please send me his two reports again. In all the confusion of moving the two reports were lost and I would like to give him credit and issue the BPL card. W4RX was named net manager of the Tar Heel Net at the last meeting of the directors. Martin will do a good job. Traffic: W4LEV 1732.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—The Spartanburg ARC now holds its meetings at the Naval Reserve Armory. The club is to be congratulated on the best FD operation in the state and has been awarded the plaque given by the SCM and SEC. Second honors on FD go to W4TWW, who had an extremely good, outstanding operation. K4HDX has been commended by Club President K4GVE and by the SCM for his outstanding work in amateur radio. Excellent Frequency Measuring Tests have been received on K4AVU, W4TWW, K4JQY and K4VIW. W4TLC is keeping regular schedules on 220 Mc. The Mike & Key Club of Greenville has been having interesting tapes on v.h.f. loaned by ARRL. At Rock Hill on Oct. 7 the first and formative meeting of the SCAR Council was held. Temporary officers were appointed and copies of the articles and by-laws have been sent to the 26 eligible clubs for ratification prior to the next meeting to be called in January. The hamfest at Joslin Park Oct. 8 had a turnout of over 500 amateurs and their families from North and South Carolina. W4MWH was guest speaker. K4AVU and K4GAT hope to maintain contact on 20 meters from EA-Land. Traffic: K4ZHV 183, W4HDR 124, W4AKC 88, K4OCU 58, K4HJK 37, K4UOH 37, K4HDX 35, W4PED 34, K4WJR 18, W4TWW 16, K4KCO 15, W4CHD 14, W4VIW 12, K4WOI 12, W4DAW 2, K4YFK 2, W4YPD 2.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM: H. J. Hopkins, W4SHJ. SEC: W4VMA. PAMs: W4BGP, K4JQO and K4PQV. RMs: W4LK, W4QDY, K4KNB and K4MXF. Every active amateur in the section is invited to participate in one or more of the existing traffic nets. They are VSN, 3680 kc. at 2330 GMT; VN, 3680 kc. at 0000 GMT; VFN, 3835 kc. at 0000 GMT; and VSBN, 3935 kc. at 0200 GMT. Enjoy fellowship, perform public service and earn recognition through your net affiliations. K4QIY, down at Ga. Tech., asserts that college is really rough. W4SHJ concurs. W4CVO did it again. Out of three frequencies in the last FMT he was zero error on two of them and less than one-half cycle off on the other. The SCM has on file a number of 00 applications and urges that all those now holding 00 appointments and not able to observe and report regularly surrender the appointment so that new

(Continued on page 124)

great response

Naturally. This smart ham is using a University Model 70. It's dynamic! Now his QSO's are more frequent with better quality. You'd be surprised at the compliments he gets. He's also improved his SSB transmissions . . . found the perfect budget-minded way to increase peak power and intelligibility. And he doesn't have to swallow this microphone to be heard. All he does is sit back, relax and speak normally. The Model 70 does the rest. Why not let it do the same for you. Comes complete with integral 15-foot 3-conductor shielded cable, Model SA10 slide-on stand adapter and cloth carrying bag. Check the 'specs'. No other dynamic of its type can match the great Model 70! Only $29.95*

SPECIFICATIONS

Frequency Response: 50-14,000 cps (which extends to a usable limit in the 18,000 cycle region). *Impedance:* 30/50; 20,000 ohms. *Output Level:* 30/50 ohms: —50 db/1 mw/10 dynes/cm^2; —143 db EIA sensitivity rating; 20,000 ohms into high impedance input; 28 mv/10 dynes/cm^2. *Hum Reference:* —120 db/.001 gauss. *Dimensions:* 1-5/32″ maximum diameter, 6″ maximum length. *Shipping Weight:* 2¼ lbs. *Finish:* Acrylic silver-gray and non-reflecting black.

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appointments may be made. The Big Orange Amateur Radio Club held a mobile outing in the Blue Ridge. Those participating were W4HLF, W4VPO, K4CVL, K4DCL, K4DCN, K4DCO and K4JYL. W4BGB and K4DCN find new power helpful on VFN with a kw. and half-kw., respectively. W4BZE ran up over 100 points simply by monitoring the NCEF during the recent SET; he also snagged UA0KYA (Zone 23) while operating in the CD Party. The Virginia Century Club seeks DXCC holders in the Tidewater Area. Contact W4SHJ. There was no Va. QSO Party this past year because of a shortage of help in the SCM office. Clubs or groups interested in sponsoring such an event, please contact the SCM. W4OOL deserves special mention for his liaison between VFN and VN. This is a job no one seems to want. Any volunteers? K4BAV and K4ITV are New ORSs. Traffic: (Oct.) W4PFC 812, W4DLA 377, W4CGE 281, W4LK 256, K4FSS 220, W4NVX 166, K4PQL 150, K4MXF 142, W4BZE 117, K4AL 103, W4OOL 100, W4TE 100, K4PQV 78, K4FMJ 74, W4SHJ 73, W4BGP 29, K4YZT 27, W4IA 23, W4WRG 14, K4DCN 12, W4KFC 10, W4LRN 10, K4IIP 9, W4AAD 7, W4OWV 6, W4WBC 6, K4BAV 2, K4DAL 2, W4KX 2, K4ORQ 2. (Sept.) K4PQV 38, K4QIX 12, K4JQO 11, K4PRQ 11, K4IIP 8.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—K8LOU and K8MYU report 177 stations checked in WVN during 26 sessions and handled 93 messages. New officers of the Mountain State Transmitters at Elkins are K8PTF, pres.; K8CHW and K8MSP, vice-pres.; K8VKF, secy.-treas. Others active are JFP, K8LUR, GHU and KN8ZWM. K8BLR reports 46 states worked and confirmed on 6 meters. SNP has renewed his ORS appointment. K8RPB has a new QTH which is excellent for v.h.f. work. Officers for the coming year of the MARA are QR, pres.; GBF, vice-pres.; JM, secy.-treas.; IXG, act. mgr. KN8ZWN is a new station at Grafton. K8UQZ has a new DX-100 and a Gotham beam. V.h.f. activity is on the increase, but because of the terrain no state net seems possible. A V.H.F. PAM is needed and your suggestions will be appreciated. WHQ has a 500-watt mobile a.m. rig and plans to add s.s.b. to his mobile. The West Va. Phone Net meets at 1830 or 2330 GMT and the C.W. Net at 1900 or 0000 GMT on 3570 and 3890 kc. State s.s.b. stations may be found around 3905 kc. at 2000 or 0100 GMT. In traffic-handling West Va. placed 41st this year compared to 38th in 1960. Traffic: K8MYU 312, W8NYH 74, K8HID 31, CNB 26, LOU 21, CSG 10, BLR 2, RPB 1.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: SIN, PAMs: CXW and IJR, RM: FEO, OBSs: KØDCC and KØEPD. FEO, back from a three-week vacation, plans a *CCW News Bulletin*. MOX reported Aurora activity on Oct. 1. He writes, "Conditions were much better than the number of stations heard would indicate—it is a shame that more stations in the Midwest were not on." Ex-K7MFF/Ø is now licensed as WØETT. Ken holds ORS appointment. DQN, of Steamboat Springs, set up a gas-driven generator and handled emergency traffic for the community when a 14-inch snow severed power and telephone lines. The Mountain States Telephone Co. and Rural Electric Assn. routed their emergency communications through Rod. The emergency lasted for 72 hours beginning on Sept. 22. SIN reports that AREC members in Pueblo and Grand Junction held an SET. A BPL award went to BES. Traffic: WØBES 529, ETT 86, KØDCW 79, WØCWD 54, KØZSQ 42, RTI 37, WØFEO 36, ENA 29, MYB 12, KØLCZ 10, WGC 8.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, 7OCX. SEC: K7BLR. RM: OCX. V.H.F. PAM: SP. OES: SP. ORS: OCX. OO: BAJ. Except for ECs all section appointments are listed above. It is interesting to note that with the exception of K7BLR all present appointments are held by ex-SCMs. We could use some more active appointees. OCX earned BRAT Awards on BUN and TWN, qualifying him for the Great Grand Masters Traffic-Handling Certificate (GGMTHC)—the top BRAT award. The award was only the tenth one issued. Congratulations, John! QWH put up the 40-meter beam with the help of DQW and K7BLR. K7AUM has been called to serve a mission for the LDS Church. QWH and K7BGU also earned BRAT Awards on BUN. K7HFV, EC for Salt Lake City, has initiated a membership drive for new, active members. Traffic: W7OCX 170, QWH 16, K7AUM 1.

NEW MEXICO—SCM, Newell F. Greene, K5IQL—Asst. SCM: Carl Franz, 5ZHN. SEC: BQC. PAM: ZU. V.H.F. PAM: FPB. The Breakfast Club meets Mon. through Sat. at 0700 MST on 3838 kc. NMEPN meets Sun. at 0730 and Tue. and Thurs. at 1800 on the same frequency. TWN meets daily at 2000 on 3570 kc. The Caravan Club elected K5KWU as caravan master, K5CXN, emergency caravan master; K5SFU, secy.; and

(Continued on page 126)

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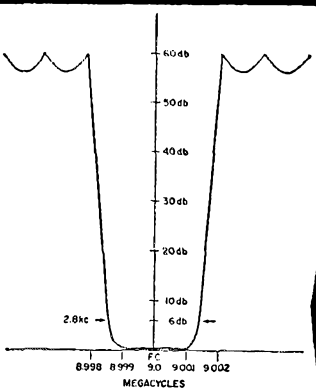
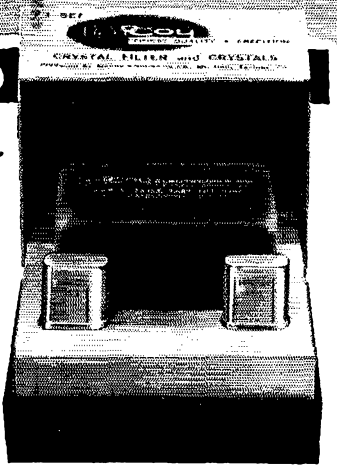
McCoy SINGLE SIDE BAND FILTERS

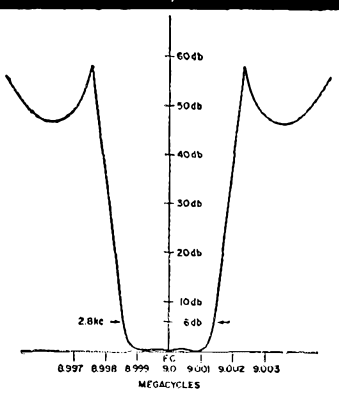
The GOLDEN GUARDIAN (48B1)

TECHNICAL DATA
Impedance: 640 Ohms in and out (unbalanced to ground)
Unwanted Side Band Rejection: Greater than 55db
Passband Ripple: ± .5db
Shape factor: 6 to 20db 1.15 to 1
Shape factor: 6 to 50db 1.44 to 1
Package Size: 2 7/16" x 1 19/32" x 1"
Price: $42.95 Each





The SILVER SENTINEL (32B1)



TECHNICAL DATA
Impedance: 560 Ohms in and out
Unwanted Side Band Rejection: Greater than 40db
Passband Ripple: ± .5db
Shape factor: 6 to 20db 1.21 to 1
Shape factor: 6 to 50db 1.56 to 1
Package Size: 1¾" x 1¼" x 1"
Price: $32.95 Each

Both the Golden Guardian and the Silver Sentinel contain a precision McCoy filter and two of the famous M-1 McCoy Oscillator crystals. By switching crystals either upper or lower side band operation may be selected. Balanced modulator circuit will be supplied upon request.

Both sets are available through leading distributors. To obtain the name of the distributor nearest you or for additional specific information, write:

McCoy ELECTRONICS CO.
Dept. Q-1
MT. HOLLY SPRINGS, PA.
Phone: HUnter 6-3411

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VLE, program director. The Caravan Club also announces the Duke City Mobile Awards with certificates of various grades given for contacts with five to twenty-five Albuquerque mobiles on any band. K5UYF, of the Certificate Hunters, reports he now has 108 awards. ZHN, trying to conduct an emergency test on the Calling Frequencies, learns no one monitors those channels! Traffic: W5ZHN 349, K5ZWI 8.

NEW MEXICO QSO PARTY

January 20-22, 1962

All amateurs are invited to participate in the Third New Mexico QSO Party, sponsored by the CHC Chapter #1, of Albuquerque. New Mexico hams are urged to work as many out-of-state stations as possible so that those interested can earn credit toward WAS, the Worked New Mexico Counties Award, and the Sandia Base Friendship Award.

Rules: (1) *Time*: 36-hour period from 1500 GMT Saturday, January 20 to 0300 GMT Monday, Jan. 22. (2) No time limit and power restrictions. All bands can be used and contact credit with the same station on different bands will be given. (3) *Scoring*: *New Mexico stations*: 1 point per contact and multiply total by the number of states, U.S. possessions, Canadian provinces, and foreign countries worked. *Outside stations*: 3 points per New Mexico station worked and multiply total by the number of New Mexico counties worked. (4) A certificate will be awarded to the highest scoring station in each state, country, Canadian province, and U.S. possession, plus a certificate to the highest scoring station in the U.S.A. outside of New Mexico. There will be awarded to the 1st, 2nd, 3rd, and 4th highest scoring station in New Mexico a gold trimmed certificate. Special certificate for multioperator groups. (5) *Frequencies*: 3600, 3835, 7050, 7250, 14,080, 14,250, 21,050, 21,300, 28,100, 28,600, 29,000 kc., and 50.28 Mc. (6) *Exchange*: New Mexico stations send number of QSO, RS(T), and county. Others send QSO number, RS(T), and state, possession, province, or country. (7) Logs postmarked no later than Feb. 20, should be sent to CHC Chapter #1, of Albuquerque, John C. Kanode, K5UYF, 4089½ Cornell Dr., SE, Albuquerque, New Mexico.

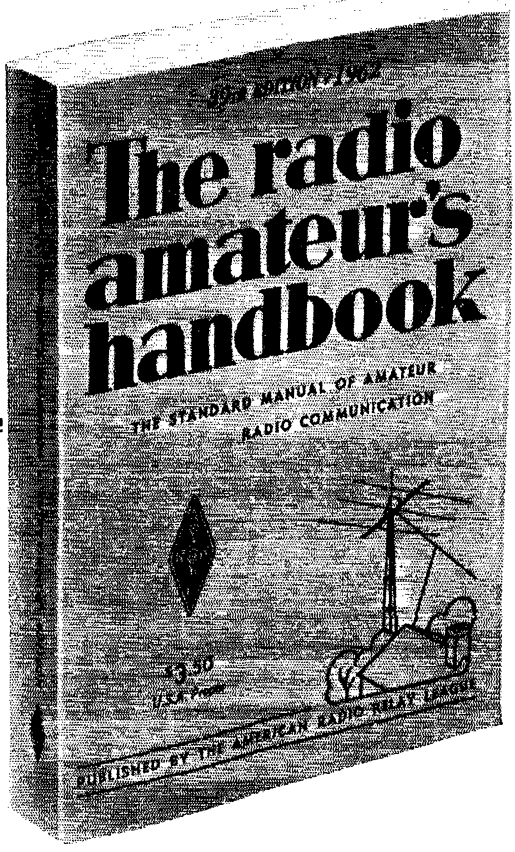
WYOMING—SCM, L. D. Branson, W7AMU—The Pony Express Net meets Sun. at 0830 MST on 3920 kc. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1800 MST on 3610 kc. The hams in Torrington, Wyo., are forming a ham club and will hold meetings at the home of ORO. K7CQX is performing OBS duties in fine shape—12 transmissions in October. GZG is the new Route Manager for the YO Net. K7HAW overhauled the rig and is back on the air again. AEC has a new sideband rig with a fine signal. BHH resigned the RACES State Radio Mau position effective Nov. 30. Casper Radio Club activities were disrupted because gas, water and lights were temporarily out for new YMCA building. The Casper Radio Club is running code classes every Tue. night with 26 registered for the course at present. The Casper V.H.F. Club is functioning nicely under its new president, UFB. The Wyoming RACES C.D. Net's time has been changed to 1900 MST every night except Wed. on 3920 kc. and the RACES C.W. Net meets at 1900 MST 3537.5 kc. Wed. Traffic: (Oct.) W7AMU 40, GZG 27, HH 15. K7PPU 11, W7AEC 10, CQX 5, K7HAW 2. (Sept.) W7GZG 30.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4AOZ - SEC: K4JDA. RM: K4YCD. PAMs: K4BTO, K4PFM and K4KJD. New appointments: K4KJD as PAM for s.s.b. operations; K4FTC and K4GXS as OPSs; W4FFZ-4 as OO. Class IV, K4CFG has moved to Ft. Myers, Fla. W4SWV moved to Orlando, Fla. W4FPP moved to Ft. Payne. K4AVM now is in a new home in Springville. The Birmingham ARC held "Old Timers' Night" Nov. 16. K4ETE has moved to a new home in Newton. K4SRF has a new HQ-180. AENM certificates have been issued to W4NUG, K4TSN, W4VNM, K4WSU, W5WZ and W5SPX. All s.s.b. stations are invited to check into the Alabama Sideband Net (AENM) each night at 1830 CST on 3965 kc. K4UDK has been appointed liaison captain for the AENP. We

(*Continued on page 128*)

1962 EDITION



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WEST HARTFORD 7, CONN.

regret that K4QMM, of Alexander City, has joined Silent Keys. K4ZYO is working 20-meter phone with good results. WA4BDW is a new member of AENP and runs a Globe Scout Deluxe and an HQ-180. W4DS received a Certificate of Performance for his high score in the Feb.-Mar. ARRL DX Contest. The Muscle Shoals ARC is conducting classes for Conditional or Novice Class licensees who want to obtain their General. K4KDE has a new TA-33 beam. K4KJD reports that W4SQV has moved to El Paso, Tex.; new ham W4ZIY has a DX-100 and an HRO-50; 46 people attended the S.S.B. Supper in Huntsville on Oct. 14. The Alabama Teenage Net (AENT) has moved to 3970 kc., same time, 1630 CST daily. All teenagers are welcome. K4GXS has a new SB-10. K4TRJ built an electronic keyer. K4SFA is building a 20-meter receiver of his own design. K4AWN is now serving in the U. S. Navy. K4PHH reports that K4ASF is teaching a code class at Millport. K4UMD has received his General Class license and is now active on all bands except 2 meters. K4TRJ scored 10,350 points in the August C.W. CD Party. We regret that K4MEQ has joined Silent Keys. K4WSS, EC for Marshall County, reports the AREC of Marshall is going to 6 meters for its local emergency net with W4RTQ in charge; he also reports the 6-meter AREC station is complete at Old City Hall and that the c.w. class for teenagers is going strong Mon. through Fri. *Notice*: Please mail all reports and correspondence to your new SCM, Harvell Tilley, K4PHH, Route 1, Ethelsville, Alabama. Congratulations to Harvell on his election and let's all cooperate with him 100 per cent during the next two years! Traffic: (Oct.) K4PFM 363, K4YUD 107, K4WSH 102, K4AOZ 81, W4MAM 81, W4RLG 60, W4OKQ 57, K4HJM 56, K4WHW 34, W4MI 30, K4TRJ 30, K4CFD/4 28, K4YTT 27, W4TOI 26, W4CIU 24, K4PBY 22, W4PVG 22, K4PHH 20, K4LNA 16, K4RIL 13, K4UDK 10, K4ZYO 8, K4TDJ 7, WA4BDW 5, W4DS 5, K4UMD 5, W4DGH 4, K4FTC 4, K4GXS 4, K4ZBX 4, K4ZNI 4, K4DJR 3, K4KDE 3, K4MIR 3, K4GRA 2, W4YRO 1. (Sept.) K4LNA 37, W4MAM 32, K4GRA 4, K4AAU 2. (Aug.) K4TRJ 15.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH.—SEC: W4IYT. RM: K4KDN. RM RTTY: W4EHU. PAMs: 40 W4SDR, 75 K4LCF, V.H.F, W4RMU, S.S.B. W4CNZ. The Newly-activated 7-11 2-meter net is doing a bang-up job handling traffic. K4KGB is manager. The Petersburg ARC says that any operator QSO 5 members sending a copy of his log to W4KCG will get a special 8x10 certificate for free. W4AZK, W4CKB and W4QVJ made over 4000 QSOs in 5 days from Grand Cayman. They were part of a six-man crew. So QVJ ends up with a new 20-meter beam and tower. There's something about a DXpedition. WN4BMC is on the BPL list, regularly mostly on 2-meter. K4IWT produced its same very effective performance during this SET. W4PTT is back in St. Cloud from Snowland. W4BKC and K4UIZ have started another 10-week code class. K4KRG is building a twenty-element spiral 2-meter array. K4YBL and K4RHL can now operate on emergency power continuously for 10 days with the present fuel supply. W4SMK and K4ZIF have been elected president and secretary, respectively, of the Ft. Myers RC. W4RMU is now running a kw. S.S.B. on 144.1 Mc. The RTTY Emergency Net is going great guns under the leadership of W4EHU. W4WHK, Clay County EC, could use some help round that county. Welcome to K4EZL, an old trafficker from way back. K4LLI says the DBRC now has a swell meeting place. W4IYT and I wish to express our most sincere thanks for the marvelous response of all during the SET. Traffic: (Oct.) K4SJH 1306, WN4BMC 746, K4KGB 656, W4TUB 547, K4IWT 439, K4KDN 418, WN4AKU 412, K4RDX 361, K4RNG 279, K4COO 258, W4IYT 258, K4BZ 234, W4WHK 230, W4HTH 218, W4FPC 200, W4SDR 200, W4EHW 194, K4LCF 164, K4ILB 158, W4AKB 156, K4NKO 141, W4CNZ 135, K4ENW 135, K4RCV 133, K4GBS 130, K4GUE 128, W4BWR 119, K4LVE 101, K6SXX/4 98, W4TRS 81, K4AX 71, WN4AZZ 66, W4ARV 63, K4JZU 63, K4DAX 60, W4WPD 52, K4DBT 45, W4VCX 44, W4FE 42, K4VSA 42, K4JWM 40, W4LMT 39, W4QVJ 39, K4RHL 39, W4TRU 38, W4ZAK 36, W4BKC 33, K4JJZ 33, W4DKJ 32, K4YBL 31, W4DDW 30, K4JZX 29, K4MTP 29, W4LSA 27, K4AKQ 25, W4SGY 23, K4BOO 22, K4NVD 22, K4AHU 18, K4LLI 18, K4ANR 16, W4UHB 16, WN4COR 11, W4HFR 11, K4VNA 11, W4AYD 10, WN4BSH 10, W4BBZ 9, K4YPN 9, W4AZK 8, K4DAD/4 8, K4ZIF 8, W4DQS 6, W4SVB 6, K4LML 5, W4SMK 4, K4TBG 4, WN4CJC 3, W4RMU 3, K4WEJ 2. (Sept.) W4SDR 159, K4FMA 155, W4FPC 106, W4WHK 84, W4EHW 69, W4ZAK 53, W4EHU 35, K4BZ 30, W4HRC 22, K4ZRP 17, K4BMG 16, K4PXY 16, WN4BSH 15, K4PPX 14, K4QQE 12, W4AAH 11, K4ODS 11, WN4COR 9, K4LLI 8, W4UHB 8, W4NLX 7, W4OVE 5, W4QVJ 5, W4SMK 5, KN4NTA 2. (Aug.) K4QQE 13, K4PPX 12.

(Continued on page 130)

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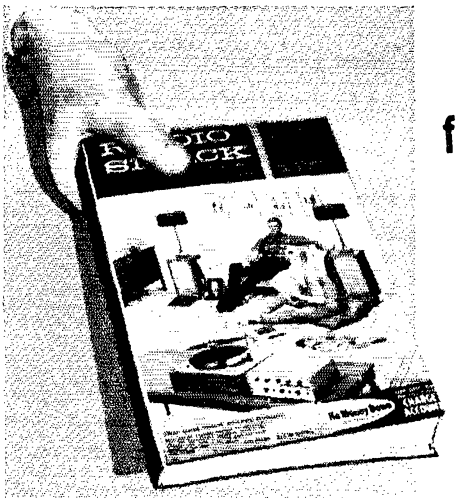
WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SEC: W4MLE. PAM: W4WEB. RM: K4UBR. The A.m. c.w. and s.s.b. nets all functioned very well in the ARRL SET. I urge all stations to check into section nets regularly, not just during drills and emergencies. Partly as a result of the SET, K4YPI has been appointed EC for Leon County and K4SWQ EC for Escambia County. Emergency Coordinators are badly needed for Holmes, Jackson, Franklin, Liberty, Hamilton, Lafayette and Dixie Counties. If you are an active ham in one of these counties, contact your SCM or SEC immediately. Tallahassee: K4YPI has a "Tenner" built and is awaiting a crystal. W4CMG has a coax 10-meter antenna 65 feet up which makes his "Tenner" sound like 100 watts. The club code and theory class had a good attendance. W4CMG is now OBS and OPS. Quincy: K4QDN has a new inverted "V" Antenna. Madison: W4WMA has joined the W. Fla. Phone Net. Ft. Walton: W4ZGS and W4PLK established a two-way QSO on 432 Mc. K4LOL is installing mobile in the new car. W7ULJ/a.m., flying between Pensacola and Mobile, was worked by several local stations on 145.2 Mc. Pensacola: K4HYL won the W. Fla. V.H.F. QSO Contest. New V.H.F. Club officers are W4EQR, pres.; K4QAC, vice-pres.; K4LAN, secy.; W4IMY, treas. W4SRK, K4VND and K4SWQ spoke on ham radio at recent meeting of the Chamber of Commerce. Traffic: (Oct.) K4UBR 549, W4BVE 272, W4CMG 170, K4CNY 116, W4GAA 91, K4LOL 45, K4VND 42, WA4AGL 13, K4BDF 6. (Sept.) K4CNY 150, W4MLE 140, K4UBR 133, K4BDF 20. (Aug.) K4CNY 128.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: W4PMJ. PAMs: W4LXE and W4ACH. RM: W4DDY. GCEN meets on 3995 kc. at 1830 EST on Tue. and Thurs., 0800 on Sun. GSN meets Mon. through Sun. on 3595 kc. at 1900 EST and 2200 EST with W4DDY as NC. The 75-Meter Mobile Net meets each Sun. on 3995 kc. at 1700 EST with W4LG as NC. The GPYL Net meets each Thurs. on 7260 kc. at 0900 EST with K4KIH as NC. The Atlanta Ten-Meter Phone Net meets each Sun. on 29.6 Mc. at 2200 EST with W4BGE as net mgr. The Ga. S.S.B. Net meets Mon. through Fri. on 3972 kc. at 2000 EST with K4RHB as net mgr. K4MYR and K4LIU are the proud parents of a new girl. Georgia hams were sorry to hear of the passing of W4BQT, of Valdosta. He was well loved by all and long a member of the Old Timers Club. K4UJS made 101,100 points in the Oct. CD Party. Tom also is building an electronic keyer. Congratulations to W4ZD on being reelected as Southeastern Division Director; also to W4HYW on being reelected as Vice-Director. W4HYW was guest speaker at the Birmingham Amateur Radio Club meeting on Oct. 5. K4QPL/4 is operating from Mercer Univ. K4TKM received his CHC No. 294. We are very happy to have K4QIY/4, from Virginia, now at Ga. Tech., checking in to our GSN. Don't forget to renew your ARRL appointments. Traffic: W4DDY 359, W4PIM 338, K4UJS 94, K4BVD 57, W4HYW 57, K4QPL/4 43, K4TKM 19, K4BAI 5, K4QIY/4 1.

WEST INDIES—SCM, William Werner, KP4DJ. CD Radio Officer. MC, KP4 QSL Mgr.: YT. CK has applied for OPS appointment. AWH sold the Heathkit mobile twins and plans to QRP transistor transmitters/receivers for 75 and 40 meters. AWH is DXCC now at 98/62. APY, four-time DXCC from various parts of the world, is up to 140/97 again from KP4-Land. AWW, who got a license at age 11, is on 6 meters from the Condado. K2LZG/KP4 is on 15 and 10 meters from Sabana Seca until he puts up an 80-meter antenna. W4OCZ/KP4 is on 40 and 80 meters from Isabela. KH6CJY/KP4 is on 40 meters from Caguas. W1EXY/KP4 is on 20- and 40-meter c.w. from San Patricio. CH now uses a 140-ft. long-wire antenna on all bands. FCC has authorized the following fequencies for Civil Defense Nets in P.R.: 3501.3 kc. 3990 s.s.b., 28.55, 28.75, 29.45, 29.65 Mc. KV4AA keeps a sked with K1IZV at C.D. Regional Office, Harvard, Mass., on 14.082 kc. on Wed. at 1230 GMT. W2RG skeds K1IZV on 3501.3 kc. at 8:30 P.M. AST Thurs. with c.d. traffic. KV4BV, St. Thomas, joined the Banana Net on 40 meters. BCA has a new 20-meter full-sized beam with a gamma match and is now alternate NCS of MARS on 4025 kc. phone Mon. at 1700 AST and hopes for large attendance. CL received her WPR-25 Award certificate for 50-Mc. operation. 6-meter operators again are enjoying band openings to So. America and Cuba. The KP4 Contest Committee announced that winners of the Sept.-Oct. Contest are AOV, 1st prize c.w.; AXN, 2nd prize c.w.; AXC, 1st prize phone; AKD, 2nd prize phone. WP4s BBI, BBJ, BBN and BAF were fighting it out on 3725 kc. with BAF the winner with 15 contacts. DJ incorporated remote-controlled mechanical switches in the 40-meter dipole to change length for phone or c.w. portions and spends most of his time on 7010 kc. ACF uses a BW-5100 all bands but resurrected the Viking I for permanent use on 40-meter phone. VP3YG plans a vacation in KP4-Land the first

(Continued on page 132)



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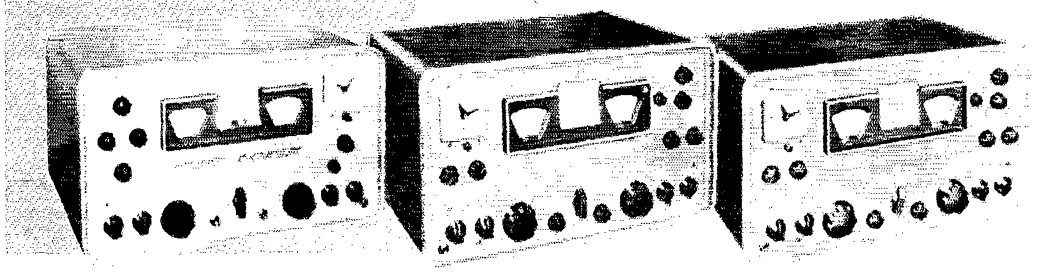

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part of December. AOD sends greetings from Dayton, Ohio. AAB has a new Solar 6-meter transceiver. The Mango Net meets on 3810 kc. at 2130 GMT Mon., Wed., Fri., the C.D. Net on 3810 kc. at 2130 GMT Tue.; the Antilles Weather Net on 3815/7245 kc. at 1045 GMT daily Traffic: KP4WT 161, BCA 2.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD—At a meeting of the CZARA, the movie "Project Hope" was shown. This was provided to the club by W8OLJ. WZ showed the members a QSL from that voyage. TG and MM are in the U.S. New hams are LV and SS. KZ5KR had his home in a bedlam during the recent RTTY Contest. DS provided his HT-37. TU unit and SP-600. GA brought over a TU unit. KR was running his HT-37 with a BC-794A. When the BC-794A would not copy well on 15 meters I dragged over my HQ-170 to continue operating on that band. One station was located on the patio and was feeding our dipole arrangement for a back up, which did not do too well. It took quite a bit of paper to make some 50 contest QSOs. JT worked feverishly to get some equipment working for operation during the two-week deep sea fishing contest. TD finished his 20-meter quad. RJ soon will be working with his new Invader transmitter. Traffic: KZ5JW 133, TD 48, OB 42, CD 14, FG 5, OA 3, HF 3.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—Asst. SCM: Lyle G. Farrell, W6KGC. SEC: K6YCX. PAMS: W6ORS and K6PZM. RMs: W6BHG, WA6ROF and K6LVR. The following stations made the BPL in October: W6GYH, W6WPF and K6EPT. Congrats, fellows! New officers of the Desert R.A.T.S. are K6EJS, pres.; W6HCI, vice-pres.; Don Kramer, secy.; K6MQU, treas.; K6ILE, act. mgr. W6EBK sends Official Bulletins on 145.5-Mc. RTTY. WA6GRG is doing some TCC work, school permitting. W6AM's serene conditions are about to be shattered by a new highway! WA6OUK is busy with the AREC in Monrovia. K6MISL reports some r.a.c. notes showing up on c.w. lately! W6VOZ schedules G3BWY on 15 meters daily. WA6ROF is doing a big job on PAN and TCC. K6COP is taking an electronics course through the courtesy of the USNR at Cal. Poly. WA6CKR really is mobile now with switchable G-76 between the camper and station-wagon! K6SUJ reports the Ramona Radio Club assisted in the San Gabriel Community Chest Bank Night. W6WAW reports a good SET in Central L.A. and hit a nice CD score. W6GYH reports conditions were bad on 80 meters in October. K6IWV is doing nicely on the SoCal Six Net handling traffic. WA6TYV is looking for some 6-meter c.w. skeds and plans to start with WA6SUF. Support your section nets: On c.w., the Southern California Net (SCN) meeting daily on 3600 kc. at 0300 GMT; on phone the SoCal Six Net meeting daily on 50.4 Mc. at 0300 GMT. Traffic: (Oct.) W6GYH 989, W6WPF 639, K6EPT 554, K6OZJ 431, WA6ROF 384, K6YVN 157, W6USY 132, K6IWV 128, WA6GRG 125, WA6JOC 121, W6BHG 118, K6SIX 108, WA6OUK 105, WA6CKR 97, WA6BCZ 90, WA6JDB 68, WA6KAW 64, K6ATB 61, K6SUJ 60, K6HOV 45, WA6MFH 28, W6WAW 19, K7AGG/6 16, W6CG 12, W6CIS 10, WA6ODF 10, W6FB 4, WA6DWP 2, WA6KVS 2, K6UYK 2. (Sept.) WA6DJB 754, WA6JOX 296, W6MLZ 122, WA6KVS 44.

ARIZONA—SCM, Kenneth P. Cole, W7QZH—Asst. SCM/SEC: George Mezey, K7NIY. PAM: OIF. RM: LND. The Copper State Net meets at 1930 MST Mon. through Fri., the Grand Canyon Net Sun. at 0800 on 7210 kc., the Tucson AREC Net Wed. at 1900 on 3880 kc. Beginning Jan. 1, 1962, Arizona will celebrate its 50th year of statehood. To commemorate this event, the Arizona Amateur Radio Club of Phoenix and all the amateurs of this state, with the authority and cooperation of the Arizona Development Board, an executive branch of the State of Arizona, will issue a special Arizona Semi-Centennial certificate. This certificate will carry the imprint of the Great Seal of Arizona and will be signed by the Governor of the State, the Honorable Paul Fannin. It will be certified by the SCM of the State of Arizona. This Arizona Semi-Centennial certificate will be issued to any amateur radio station operator who, during the year 1962, completes a two-way contact with a minimum of 35 Arizona radio amateur stations. Please do not send QSL cards. To qualify for this certificate, send a letter giving a list of the Arizona stations worked. This list will include the calls of the Arizona stations, the date, time, location and the mode of operation. This list must be certified by two (2) licensed amateurs other than the applicant, or by an officer of a radio club. There will be no charge for this certificate. All correspondence should be addressed to Arizona Amateur Radio Club, P. O. Box 7155 Phoenix 11, Ariz. The annual softball game between Tucson and Phoenix radio amateurs has been postponed.

(Continued on page 134)

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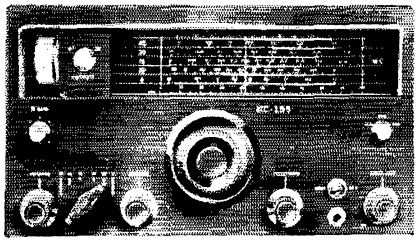

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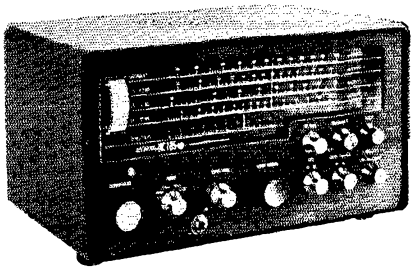

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SAN DIEGO—SCM, Don Stansifer, W6LRU—With regret we report the passing of three amateurs in this section. W6JH died of a sudden heart attack in late October. He was a member of the San Diego DX Club and for the past two years was the intake for the QSL Bureau operations of the club. He had been an amateur for 50 years. W6BZF, of Bonsall, who had been active since the 1920s in Pasadena and Santa Barbara, became a Silent Key after a short illness. He leaves his XYL, W6KAB. WA6AQZ, of the South Bay Amateur Radio Society, died of Hopkins' Disease. W6LIR and W6NSW won Net Certificates in October. WV6SBO is up to 45 countries on 21 Mc. The City of Chula Vista celebrated its 50th anniversary in October with 14 amateurs handling communications for the event. K6VNC was net control. WA6PAH retired after 20 years of Navy service and now lives in San Diego. K6BPI, who has made BPL for over three straight years, is now both ORS and OPS. W6EOT, RM for the section, is no longer TCC Director, but still is busy handling traffic. WA6BDW reports a TX-86 and a PMR-8 as new mobile equipment. K6IBY was guest speaker at the Nov. 10 Newport Club meeting, speaking on Satellite Tracking and Communications. W6YDK is looking for a W8 or W9 c.w. sked on 14 Mc. for traffic-handling. Your SCM visited both the Orange County Club and the Newport Club recently. W6IEY continues to be the most active OES in the section. The November meeting of the San Diego DX Club was held at the home of W6NXP in El Cajon. K6TXR, local phone DXer, moved to Sunnyvale near San Jose. WA6BUX is up to 109 countries. W6BKZ has been working into Europe on 80-meter c.w. W6CAE has a new 40- and 20-meter antenna. Seasons Greetings and all the best in 1962. Traffic: W6LAB 3137, W6YDK 2220, K6BPI 1955, W6EOT 468, K6TFT 81, WA6BDW 14.

SANTA BARBARA—SCM, Robert A. Hemke, K6CVR—W6JLY, our SEC, has moved to a new QTH in W7-Land. We certainly will miss him. The Ventura County ARC has elected K6ARK, pres.; K6VMN, 1st vice-pres.; WA6JBA, 2nd vice-pres.; WA6JMD, secy.; and K7NDC/6, treas. The Annual Dinner of the Ventura Co. ARC had a staggering crowd of seventy hungry people, thrusting forth empty plates and demanding to be fed by confronting W6KCD and his galley crew at the Oct. meeting. Fortunately Bob, with the able assistance of WA6EGY and WV6SNA, was well prepared to cope with the hungry crowd and the situation soon was well in hand. The Santa Barbara ARC had K6RWP as its guest speaker at the Oct. meeting. Curley showed movies of his recent trip to Tahiti. It was an exciting and interesting program. If other clubs are interested in seeing his movie, contact him over the air daily on 3885 kc. at 7 P.M.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNC—Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX, PAM: AYX, RM: LR. As usual at this time of the year the West Gulf Division Convention is the topic of conversation. This time it was held at Kerrville, Tex., and I must say if you missed it you really missed a very fine convention. There were 350 registered which, considering the time of the year, was a very good attendance. Will Wilson, Attorney-General of Texas, and the guest speaker at the banquet, paid high tribute to the hams for their participation in the recent emergency caused by Hurricane Carla, Tyler, Tex., was selected as the site for the 1962 convention. As usual THI and YUO won prizes in the transmitter hunts at Kerrville. K5ULC is the new EC for Cooke County. The Dallas ARC had a busy month with Ham Day at the State Fair and the Caravan Club Hamorama Swap-fest Oct. 28. More than 200 attended the Swap-fest at White Rock Lake. K5PXV won a Super 12 converter. YUO won the transmitter hunt. GY made BPL for the third time and also reports he has an outlet for Old Mexico traffic. Doc speaks Spanish, so you traffic-handlers take note. MSG has two new 50-ft. poles for his antenna. A tip to all AREC members: Place operating instructions for your rig in your log book so another operator may operate your rig in case of an emergency. A lapse of membership will disqualify you for appointive and elective offices in the League, so watch that expiration date. Traffic: W5GY 525, BKH 274, K5HTM 63, AVX 61, W5GNF 57, K5VWJ 55, PXV 41, RNM 8, SXK 3.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—The new PAM for 40 meters is FKL. Thanks, fellows, for the wonderful showing made during the SET. Oklahoma operators of the month are K5KTW for his fine work as SEC during the SET; also to K5AUX for his good work on the nets as liaison station between the c.w. and phone nets. New officers of the Enid Club are K5CAY, pres.; K5JTW, vice-pres.; MFX, secy.-treas. K5FPU, asst. secy.; QMJ, custodian of property. We also report that PCQ, an active member of this club, is now a

(Continued on page 136)

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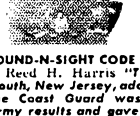

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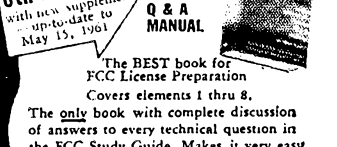

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Silent Key. R. S. is a past-president and his many friends will miss him. K5PGC is running a code class in Bartlesville. A new Novice is WN5AVD, a new General Class licensee K5IFZ. It was a pleasure to have John Huntoon, Secretary and General Manager of ARRL, in Oklahoma during October. This visit was sponsored by the ACARC. The OCARC and the V.H.F. Central Club also officially participated in the meeting at Oklahoma City. The SCM had a very nice meeting with the Clinton-Sherman AFB Club. K5YTH is pres. Two wonderful hosts of Oklahoma are Clara and Oscar McGuire. K5HFW and K5KVR. LTB, EC for Canadian County, is doing a bang-up job there. Traffic: K5KTW 661, MBK/5 196, W5DRZ 194, K5OCX 132, AUX 114, JGZ 67, W5JXM/5 47, K5IBZ 38, ZEP 38, W5ICQ 36, FWW 30, WAF 27, CCK 25, MFX 22, K5DMS 18, ZCJ 18, W5PNG 17, K5OOV 16, W5FKL 14, K5JOA 13, LZF 13, KØTNW/5 10, W5UYQ 10, K5BAT 9, GPU 9, JIJ/5 7, W5VLW 7, K5VNJ 7, CBG 6, W5CCV 4, EHC 4, WDD 4, K5VVD 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: AIR. RM: K5BSZ. The new officers of the Houston Amateur Radio Club are PM, pres.; K5RPD, vice-pres.; K5FJQ, treas.; K5BEQ, secy.; K5OLJ, membership; FEK, program. AQK has returned from Puerto Rico and Guantanamo Bay. The officers of the Lamar Amateur Radio Club are EKO, pres.; K5ETF, vice-pres. The West Gulf Division Convention was a real good convention, and the fellows at Kerrville are due lots of thanks for it. 1LVQ, Secretary and General Manager of ARRL, was the speaker at the ARRL meeting. Mr. Will Wilson, Attorney General of Texas, was the principal speaker at the Sunday Banquet. The Executive Committee of the American Radio Relay League, in a letter to Director Best, complimented the amateurs of the West Gulf Division very highly on their operation during Hurricane Carla. Also, K5TRY, Communication Officer for Disaster and Relief for the State C.D., gave praise to the amateurs for their fine work. New officers of the San Antonio Radio Club are IWE, pres.; K5CVR, vice-pres.; EDZ, secy.; and K5UKN, treas. Say, FKE, how about getting to work on the convention for next year, as we are all looking forward to coming to Tyler? Traffic: W5AC 117, K5WQM 14, ZSC 3.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. E. W. Street, VE1EK and H. C. Hillyard,
(Continued on page 138)

EIGHTH ANNUAL VE1 CONTEST

Jan. 20-21 and 27-28, 1962

All VE1 amateurs are invited to participate in a contest sponsored by the New Brunswick Amateur Radio Association. The contest is divided into two sections, phone and c.w. The highest scoring contestant in each section will be awarded permanent possession of an engraved cup, the NBARA Trophy.

RULES: 1) The c.w. contest will begin at 2400 GMT Saturday, Jan. 20 and end at 2400 GMT Sunday, Jan. 21. 2) The phone contest will begin at 2400 GMT Saturday, Jan. 27 and end at 2400 GMT Sunday, Jan. 28. 3) Any and all amateur bands may be used but only c.w. to c.w., or phone to phone contacts will count. Any contestant may participate and be eligible for awards in both sections. 4) The same station may be counted but once for credit (in each section) regardless of band used. Mobile, portable, and home stations covered by the same station license constitute the same station. 5) The general call is "CQ VE1." 6) Exchange signal reports, county, province, and operator's name. Local QTH is not required. 7) Logs should show band, type emission, signal reports, county, province, time, and date. Logs not showing this information IN FULL will be disqualified. 8) Score one point for information received and one for information sent and confirmed. Multiply total points by the number of individual counties worked in the three provinces to determine final score. 9) Decisions of the contest committee will be final. Logs must be postmarked not later than Feb. 8 and should be in committee hands not later than Feb. 15. Forward all entries to: Contest Committee, P. O. Box 366, St. Stephen, N.B.

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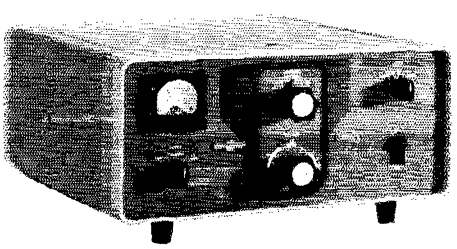
- Only 10% down (or your trade-in as down payment)
- No finance charges if paid within 90 days
- Reduced charges if paid off ahead of time
- You get more flexibility of financing in the future (such as re-financing) because we handle our own financing

Collins



75S-3 Receiver	$ 620.00
30L-1 Linear Amplifier	520.00
KWM-2 Transceiver	1150.00
32S-1 Transmitter	666.00
516F-2 AC Power Supply	115.00
MP1 12V DC Power Supply	198.00
75S-1 Receiver	520.00
30S-1 Linear Amplifier	1556.00

Write, phone or visit either store today!

Inquiries and orders from military men and others outside USA wanted

A-1 Reconditioned Apparatus

Nearly all makes and models. Big savings! Ten day trial—90 day warranty. 90 day full trade back on new apparatus. Write for bulletin.

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Henry Radio Stores

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Los Angeles 64 Ph. GRanite 7-6701

BIG TRADE-INS

"World's Largest Distributors of Short Wave Receivers"

VO1CZ. We regret to announce the resignation of BL as SEC. Our sincere thanks, Cy, for your excellent work in a difficult post. A v.h.f. society, comprising the Annapolis Valley and Southern N. B., has been formed. Contact 1W for details. QS has been transferred to Montreal. AFP has just received the WRONE certificate. Walter has been informed that he is the first in Canada to receive this award. ABL has been transferred to Saint John. The NSARA is attempting to establish 3750 kc. as a Calling Frequency in the section and requests your cooperation. BC is putting out an outstanding signal on 6 meters with his beam on top of a new 75-ft. tower. New calls include AIH and AIJ. 3BQL/SU is handling Maritime traffic through TN and IE (daily schedules with Harley). IF has been heard on PEI (VE1ADR) on 6 meters. Season's Greetings and top operating in 1962. Traffic: K1NPS/VO1 98, K8EFK/VO1 84, VE1OM 21, WB 4.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The fall weather brought out the mobiles in droves. There was many hidden transmitter hunts as well as the SET. Conventions and hamfests also added to the overall activity. HK was a visitor to Toronto. The s.s.b. boys of Ontario held their Annual Dinner in Toronto. They had visitors from VE2-, W2- and W8-Lands. Many of the Ottawa mobileers were surprised to find a Hunter and Fisherman Club holding forth in the same hall. All were good sports and amalgamated for a fine evening. Congrats to the Scarboro ARC on winning the Canadian Trophy for Field Day activity. The runner-up was Toronto's Nortown. CGD was in Toronto for the S.S.B. Dinner. PN is on 2 and CWJ is on 6 meters. DOO is s.s.b., as is DAR. CPB has a new tower and put up the beam himself. Roy is one of our remarkable blind hams. DVG is getting married. ENN has an antenna farm. CNB has WBE and WAC certificates. The London ARC provided communications for the local Yacht Club. London has come up with eleven new hams. We regret to announce VE3AYV as a Silent Key. A word of thanks to EAW for the effort on the S.S.B. Dinner. The Ontario Phone Net, on 75 meters, completed fifteen years of operation on Dec. 9. CP was one of the originals. Heard on the Hunters Net were BIV, ARF, NG, RG, ELC, VF, BZU, DZA, BD and DTO. DRF is on 75-meter mobile. The Grey Bruce Net now has its own call, VE3GBN. NZ is on from Stroud. PB operates week ends from Caledon Hills. DSM and CFR, both ECs, held tests in Toronto and London. Our SEC, AML, is cleaning out the deadwood in our Ontario files. If your certificate requires endorsement, send it to the SEC or the SCM as required. Traffic: VE3CYR 146, GI 133, NG 118, BAQ 111, DPO 102, CFR 68, EHL 48, BUR 32, LN 27, RN 23, DWN 18, AMT 12, DZA 10, OT 8, CE 4, DH 4.

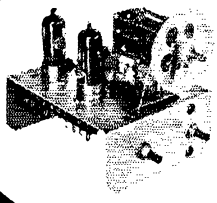
QUEBEC—SCM, C. W. Skarstedt, VE2DR—The 4th Scout Jamboree-on-the-Air was very successful with excellent cooperation from the VE2/Gang. BK did a fine organizing job. The CJO elected PY/FP8BG, pres.; AWR, 1st vice-pres.; AJV, 2nd vice-pres.; BJY, secy.; AOI, treas. BJV, Tech. cons. Graduates from '60-'61 classes are BHL, BAZ, BHY, BIH, BIK, BIW, BKE, BJV, BJU, BJY, BIY, BKI and BKY. The club also sponsors a new certificate, "Of the Island of Montreal." Foreign stations require 6 contacts, W and VE 12 contacts. Those interested should contact CJO at 7199 Ave. De Gaspe, Montreal 10. The Simulated Emergency Test, with EC AEW in charge, brought a good turnout with ER, AGM, AQN, GD, PD, AAP, KN, HX, JD, EP, BGO, BFE, SC, HY, AJI, ATT and BI taking part. On another front the EC for St. Maurice Valley, EC, reports an attempt was made to organize hams at Grand Mere, Shawinigan, La Tuque and Cap Madeleine. Interest in the AREC is rising. VE3BQL/SU at Rafah, Egypt, wishes to contact VE2s. An Oyster Party held by the Quebec Radio Club was a real success. VP6YB and his XYL soon will take up permanent residence in Canada. VE6AAG, ex-VE2, keeps his ears open for VE2 QSOs. So does KX6BU (from Rimouski). AFC hopes to leave TVI behind when the new house is ready. ASU moved to Quebec. BEZ/VO1 was awarded a decoration from the RCAF for efficient work during the Newfoundland forest fires. BAW, Sir George Williams University, turns out an interesting bulletin called *The Oscillator*. ARC/2 grabbed the FD honors. Thanks, fellows, for the news and a Very Happy New Year. Traffic: VE2DR 150, AUU 96, AGM 46, BG 28, EC 22, AGQ 14, AEW 5.

ALBERTA—SCM, H. R. Harnold, VE6TG—PAM: PV. All are asked to take note of the time change in the Alberta Phone Net to 1930 hours MST Mon., Wed. and Fri. for the winter months. If you are interested in the Emergency Corps please get in touch with IU, Lethbridge, for the south and SS, Craigmyle, for the central part of the province. Congratulations to CA as the first OPS. There will be more as time goes on so

(Continued on page 140)

BULLSEYE BUYS at ARROW!

AMERICAN GELOSO V.F.O.'s



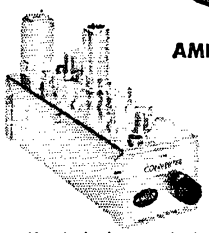
Wired, tested, calibrated, ready for use. Mod. 4/104 for driving one 807 or 6146 final in AM or CW under Class "C" conditions.

Mod. 4/102 for driving two 807's or 6146's final. Has 5 bands. Supplied with Mod. 1640 dial ass'y.

Mod. 4/103 for 144-148 mc bands. Combines VFO primary freq. of 18 mc with xtal fundamental freq. of 12 mc. Supplied with Mod. 1647 dial ass'y.

Mod. 4/104, 4/102 or 4/103 less tubes and xtal, each $29.95

AMECO NUVISTOR CONVERTERS



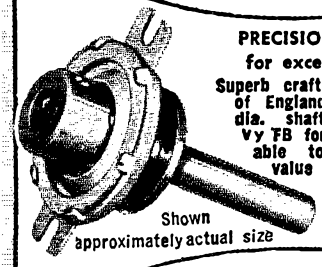
Choice of separate models for 50, 144 or 220 mc bands. Output frequency easily changed for present and future requirements. Three RCA 6CW4 Nuvistors used, two as RF amps, one as mixer with 6J6 oscillator. Noise figure: 2.5 db for 50 mc model, 3.0 db for 144 mc, and 4.0 db for 220 mc model. Image, spurious and IF rejection better than 70 db. Power required: 100-150 V @ 30 ma, 6.3 V @ 1 amp.

Specify desired IF output for converter model selected.

Kit: CN-50K, CN-144K, or CN-220K, each **$31.95**

Wired & Tested: CN-50W, CN-144W or CN-220W, each **$44.95**

PRECISION PLANETARY-VERNIER
for exceptionally fine tuning

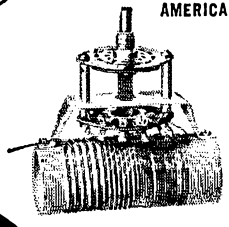


Shown approximately actual size

Superb craftsmanship by Jackson Bros. of England. Ball bearing drive, ¼" dia. shaft, 1⅛" long, 6:1 ratio, Vy FB for fine tuning. Easily adaptable to any shaft. Comparable value — $5.95.

Amateur Net $1.50 ea.
10 for $13.50

AMERICAN GELOSO PI TUNING COILS



Units have 6 posit. tap switch mounted on ceramic coil form. Mod. 4/111 designed for use with two 807's or 6146's (in parallel). Freq. Range 3.5 to 29.7 mc.

Mod. 4/112 is designed for use with single 807 or 6146. Handles up to 60 w. Range: 3.5 to 29.7 mc.

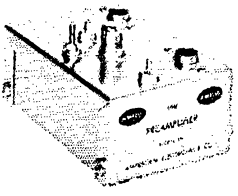
Mod. 4/111 or 4/112, each $4.95

PRECISION BALL DRIVE DIAL

Another superb product of Jackson Bros. of England. 4" dia. dial with 6:1 ball drive ratio. Fits standard ¼" shaft. For that velvet touch...

Amateur Net $3.95

AMECO NUVISTOR PREAMPLIFIER



FOR 50, 144 or 220 mc. Over 20 db gain plus a lower noise figure, 2 tuned ckts, 6CW4 Nuvistor completely neutralized. Noise figure is 2.5 db @ 50 mc, 3.0 db @ 144 mc and 4.0 db @ 220 mc. Power requirements: 100-150 v. @ 8 ma, and 6.3 v. at .13 amps. Specify frequency desired.

Mod. PV, wired and tested **$13.95**

Versatile Miniature Transformer

Same as used in W2EWL SSB Rig — March 1956 QST. Three sets of CT windings for a combination of impedances: 600 ohms, 5200 ohms, 22000 ohms. (By using center-taps the impedances are quartered.) The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, high impedance choke, line to grid or plate, etc. Size only 2" h. x ¾" w. x ¾" d. New and fully shielded.

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HAPPY NEW YEAR

keep up the good work and you may be next. DB and IP have been testing and listening on 6 meters with very few openings. They heard 8BY and KL7FLC for a few minutes one night but could not raise them. DB is trying out 6 meters on mobile. He also heard HØ on 2 meters but not long enough for a contact. I finally heard from a radio club, the NARC of Edmonton, whose officers are FB, pres.; UV, 1st vice-pres.; XØ, 2nd vice-pres.; ZX, secy.; RP, treas. Now lets have some reports once in a while. AFJ, AX and AEN are doing very nicely on c.w. Traffic: VE6HM 170, FS 20, BC 11, AEN 7, TG 7, UH 4, ABB 2, SS 2, ABE 1.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7-FB—Elections are the highlights of this time of the year. Chilliwack ARC's officers are XV, pres.; BFW, vice-pres.; Jim Erskine, secy. Vancouver ARC's officers are AMW, pres.; AA vice-pres.; JD, secy. They say, "Old dogs don't learn new tricks." Well OM did. He stuck his fingers into the revolving fan belt of his car and then shortly after he tried to chop off his fingers with a sharp instrument. MG, our PAM and AREC Net Control Manager, has been routed by the RCAF to a place 80 miles northeast of Winnipeg. Thanks from all of us for your services and we hope to see you home again soon. George AOI is our new AREC Net Manager. AGC now has Class H QCWA and Port of Stockton certificates. The following are members of the Quarter Century Wireless Assn.: ALY, JF, OM, TF, UP, US and VP. There are 22 in all of Canada. AIK has been appointed communication chief (c.d.) for Nanaimo. TF is on both teletype and is feeling lots better. BBQ still is searching for DX on the higher frequencies. The Boy Scout Jamboree was a great success, according to all who took part. DH, OO and OBS, is busy teaching code to the Air Cadets with the idea of making more VE7s. 8JJ is 110 west and 65 north of the North Pole and is looking for VE7s in the Vancouver Area. Traffic: VE7BDP 42, BGE 37, BBB 26, BFR 16, AQD 14, AMW 12.

MANITOBA—SCM, M. S. Watson, VE4JY—The Brandon ARC elected the following officers for the 1961/62 season: DQ, pres.; Les Haddon, vice-pres.; Adele Hall, secy.; KN, editor of *Sparks*. The Dauphin ARC elected the following officers effective Sept. 1. PA, pres.; XP, vice-pres.; SB, secy.; JQ, correspondence. MN is on the air again with an FB signal from his new transmitter. IW, HS and MN are recent additions to the 6-meter gang. The WARA has a new constitution. Highlight of the ARLM October meeting was a successful auction of ham gear, each entrant being his own auctioneer. 5LD and his XYL were welcome visitors to the ARLM meeting. Steve made many conatcts with his mobile rig while in Winnipeg. TJ reports contact with VE3BQL/SU, Rafah, Egypt, who is looking for VE4s. Traffic: VE4EF 11, JY 6, QD 6, HE 4, AN 2, TE 2, XY 1.

SASKATCHEWAN—SCM, H. R. Horn, VE5HR—New officers of the Saskatoon Radio Club are FC, pres.; CU, vice-pres.; HQ, secy.-treas. Plans already are under way for the 1962 Saskatchewan Hamfest to be held in Saskatoon. The Moose Jaw Club has as its new officers EI, pres.; DF, vice-pres.; SY, secy.-treas. It is with regret we record the passing of ex-5GA, who at his death was known all over the world as 7QE. Our sympathy to his family. FC is making good use of the hands on s.s.b. now. DB lost his beam and tower in the recent high winds. XX and YY, now in Schefferville, Quebec, hope to be on soon with a VE2 call. They like their new surroundings although they are quite different from the prairies. This is my last report and I wish to thank all those who have worked with me. I have enjoyed being your SCM and hope you will give my successor all your support. All news should now be sent to BL, Jack Robinson at Regina. Congratulations and good luck, Jack.

Choosing an Antenna

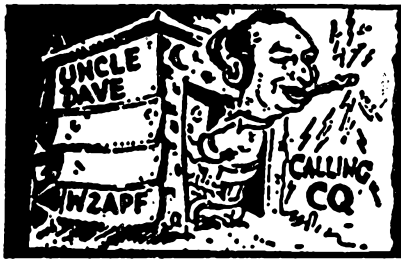
(Continued from page 29)

A Coax-Fed Multiband Ground Plane

Another system that has become quite popular is one described in *QST* by W1TS.[3] This antenna uses a single coax feed line to feed three vertical antennas for 20, 15, and 10 meters, mounted on the sides of a 17-foot long 2 × 2 wood mast. The three wires are connected together at the bottom

[3] Mix, "The Impromptu Ground Plane," *QST*, January, 1959.

(Continued on page 142)



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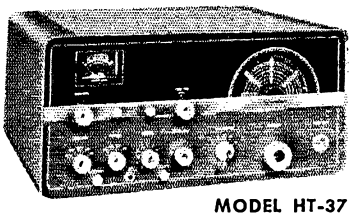
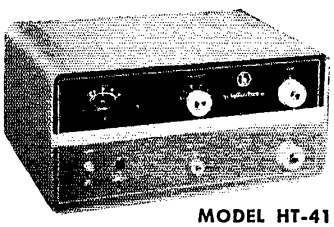


MODEL HT-37

The HT-37 has been carefully engineered to give you the best phasing unit at a moderate price. Complete tabletop high efficiency amateur band transmitter, giving SSB, AM or CW output on 80, 40, 15 and 10 meters. 70–100 watts P.E.P. output c.w. or SSB, 17–25 watts carrier on AM phone. Unwanted sideband down 40 db at 1000 cps; modern styling, instant c.w. CAL signal from any mode; precision V.F.O.; rugged heavy-duty deluxe chassis; 52 ohm pi network output for harmonic suppression; dual range meter for accurate tuning & carrier level adjustment; ideal c.w. keying; full voice control system built-in.

$450.00



MODEL HT-41

Truly a ham's dream! The HT-41 linear amplifier is an ideal companion for the HT-37 in price, style, and performance. Complete coverage 80 thru 10 meters; adjustable pi-network output; all circuits metered; built-in R.F. output meter to aid tune-up; standby bias supply. High efficiency, grounded-grid circuit; new 7094 beam-power.....**$395.00**

USED EQUIPMENT

COLLINS

KWM-1 W/N.B.	$ 795.00
KWM-1 W/N.B. & DX Adap.	849.50
270G3 Speaker	19.95
75A1 Receiver (as is)	150.00
KWS-1AM/KW	1195.00

BARKER-WILLIAMSON

650	$49.50
5100 B	375.00
5100	295.00

CENTRAL ELECTRONICS

Model A Slicer	$39.95
20A Exciter	195.00
"Q" Multiplier	19.50

TMC

GSB-1	$125.00
GPR90	375.00

HAMMARLUND

HQ160—Receiver	$295.00

JOHNSON

Pacemaker	$325.00
Thunderbolt	450.00
122 VFO	39.50
Ranger	150.00
Viking Mobile	75.00
6N2 Converter	69.50
"500" Xmtr	749.50
VIK II CDC Xmtr	275.00
VIK II	195.00
KW Matchbox	95.00
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HALLICRAFTERS

S38 E	$44.50
S38 B	44.50
S72	49.50
SX99	125.00
S102	34.95
S76	99.50
HT33	495.00
SX111	239.50
HT31	325.00
HT32	450.00

EICO

720—Xmtr	$79.95
730—Modulator	59.95

RME

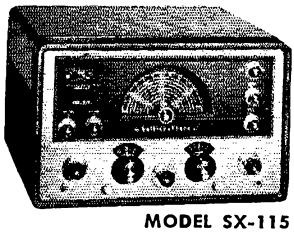
4350 Receiver	$195.00
45 Receiver	95.00
VHF152 Conv.	25.00

GONSET

G28	$225.00
GSB100	375.00

NATIONAL

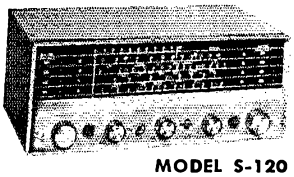
NC300	$325.00
SOJ3	15.00
NC125	119.50
NC173	175.00
HRO60/W-Coils	349.50
HRO 50T	295.00
NC188	119.50
NC98	95.00
Speakers	$10.00 to $15.00



MODEL SX-115

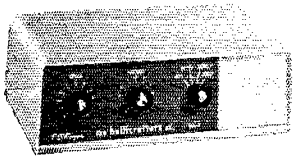
This is a new triple-conversion heterodyne type communication receiver. Combines highest accuracy, stability, sensitivity; linear tuning, constant tuning rate, built-in 100 Kc crystal calibrator, sensitivity less than 1 microvolt, selectable side bands, image rejection better than 60 db; band gain equalization, audio inverse feedback, and many other features. Covers nine 500 Kc segments.

$595.00



MODEL S-120

Covers broadcast band 550–1600 kc. plus three short-wave bands 1600 kc–30 Mc. Slide rule bandspread dial, separate bandspread tuning condenser; band selector, main tuning, bandspread tuning; standby-receive, B.F.O./selectivity, AC on/off. vol.; 50/60 cycle AC/DC.....**$69.95**



HA-4 "T. O. Keyer"

A transistorized keyer, using digital techniques. Constant ratio of dot-to-space-to-dash over entire speed range. Two speed ranges: 8–18 and 18–50 wpm. Employs 8 transistor and 10 semiconductor diodes. Transformer operated. A high voltage transistor is used to key the transmitter..**$59.95**

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and fed with coax. A hook such as used for clotheslines is screwed into the top of the 2 × 2. The 2 × 2 can then be hung up in a tree or from any overhead support.

In order to make a ground plane for this system you would, of course, need at least four radials for each antenna, or a total of twelve. A simple method of doing the job is to use four-conductor TV rotator cable. Cut four lengths of the cable to a ¼ wavelength on 20 meters (about 16½ feet). Then on each of the cables, strip off enough of each of the conductors to make radials for 15 (11 feet) and 10 (about 8 feet). When completed, you should have a length of cable with a ¼ wavelength radial for 15 and 10 and two wires for 20. The two wires for 20 will provide extra support when you string the radials out. Connect all the wires of all the radials together at the base of the vertical support. This is also where you connect the outer conductor of the coax.

The antennas discussed in this article are just a few of the more common simple types. Multi-element beams and some of the other popular antennas require considerably more discussion than is possible in an article of this type. *The A.R.R.L. Antenna Book* and *The Radio Amateur's Handbook* will give you plenty of additional information. QST

Novice Roundup

(Continued from page 84)

Rules

1) *Eligibility:* The contest is open to all radio amateurs in the ARRL sections listed on page 6 of this *QST*.

2) *Time:* All contacts must be made during the contest time indicated elsewhere in this announcement. Time may be divided as desired but must not exceed 40 hours total.

3) *QSOs:* Contacts must include certain information sent in the form as shown in the example. QSOs must take place on the 80- 40- 15- or 2-meter bands. Crossband contacts are not permitted. C.w. to phone, c.w. to c.w., phone to phone, phone to c.w. contacts are permitted. Novices work any amateur stations eligible; non-Novices work only Novices Valid points can be scored by contacting stations not working in the contest, upon acceptance of your number and section and receipt of a number and section.

4) *Scoring:* Each exchange counts one point. Only one point may be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see page 6 of this *QST*) worked during the contest is the "section multiplier." Yukon-N.W.T. (VE8) also counts as multiplier. A fixed scoring credit may be earned by entrants who hold ARRL Code Proficiency certificates. If an entrant does not hold a CP award he can apply for credit by attaching to his Roundup report a copy of qualifying run from W6OWP, January 5 or February 8, or from W1AW, January 20 or February 20. CP credit equals the w.p.m. speed indicated on the latest certificate or sticker held by the entrant. The final score equals the "total points" plus "Code Proficiency credit" multiplied by the "section multiplier."

5) *Reporting:* Contest work must be reported as shown in the sample form. Reporting forms and a map of the United States will be sent gratis upon request. Indicate starting and ending times for each period on the air. All Roundup reports become the property of ARRL and must be postmarked not later than March 3.

6) *Awards:* A certificate award will be given to the highest-scoring Novice in each ARRL section.

7) *Disqualifications:* Failure to comply with the contest rules or FCC regulations shall constitute grounds for disqualification. ARRL Contest Committee decisions are final.

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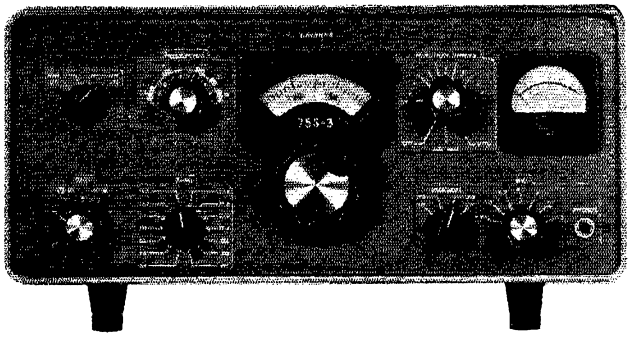

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Collins newly-introduced 75S-3 gives you the best reception in any mode — CW, SSB, or RTTY. And the versatile unit has all of the famous Collins quality features: frequency stability, rejection notch tuning, choice of variable or crystal BFO, 200 cycle crystal filter, 2.1 kc Mechanical Filter and control of AVC,

plus a new spinner knob which provides finger-tip tuning and AF-RF gain controls conveniently located on concentric knobs.

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Happenings of the Month

(*Continued from page 62*)

LICENSE SUSPENSION

The General Class license of Paul A. Eden, KØMWD of Boulder, Colorado, was suspended for two months by the Federal Communications Commission, effective October 28, 1961. The FCC found that Mr. Eden had operated his station away from its fixed location for more than 48 hours without notifying the District FCC Engineer in Charge; had failed to keep an accurate log; and had permitted an unlicensed person to operate his transmitter (without control over the emissions by a licensed operator). [*Sections* 12.28, 12.93 *and* 12.136, *Rules Governing the Amateur Service.*]

TEXT OF 160-METER FILING

(See page 61)

Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington 25, D. C.

In the Matter of

Amendment of Section 12.111(a) of the Commission's Rules Concerning Amateur Radio Operation on Frequencies Between 1800 and 2000 kc.

PETITION FOR INQUIRY AND RULE MAKING

The American Radio Relay League, Inc., by its General Counsel, respectfully requests the Commission to initiate an inquiry to determine if present restrictions upon amateur radio operation on frequencies between 1800 and 2000 kilocycles may be removed or relaxed, and to institute appropriate rulemaking following such inquiry.

In support whereof, the following is respectfully submitted:

1. Prior to World War II, the band from 1750 to 2000 kilocycles was allocated exclusively to amateur radio operation. During World War II, certain Loran navigational services were established in that band. However, at the 1947 Atlantic City Radio Conference, provisions were made for amateur sharing of portions of the 1800 to 2000 kilocycle band subject to no interference to the Loran service. Accordingly, in April, 1949, such a sharing arrangement was first instituted domestically, providing two 25-kilocycle segments in the western portion of the United States and two other 25-kilocycle segments in the eastern portion, for amateur use with power restrictions for day and night operation. In December, 1952, minor modifications were made in this arrangement, principally a modest increase in privileges available to amateur stations in the southeastern section of the country. In July, 1956, due to the expanding requirements of the Loran service, the use of portions of 1800 to 2000 kilocycle band by amateurs in states along the Gulf Coast was cancelled, and geographical boundaries in other areas rearranged, supposedly on a temporary basis while an evaluation and integration of the Loran frequency system was in process. Developments apparently indicated a continuing increase in the frequency requirements, however, for in May, 1958, a further reduction of amateur privileges occurred in the withdrawal of two of the 25-kilocycle segments, one from each geographical area. That arrangement has continued to the present time. Therefore, at present the amateur service has but one half of the frequency space available prior to 1956, and in the southeastern portion of the country no operation at all is permitted.

2. The League is aware that the frequency requirements for the Loran service are undergoing changes. The Loran-C system being developed on 100 kilocycles is one factor, although admittedly of long-term effect on the use of 1800 to 2000 kilocycles. More relevant to our present petition, the 1900 kilocycle channel earlier employed by Loran has now been discontinued. Because it is the League's under-

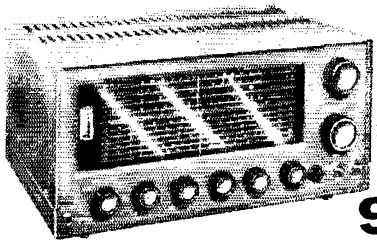
(*Continued on page 146*)

LAFAYETTE RADIO

WORLD WIDE STATION FOR AMATEUR EQUIPMENT

THE LAFAYETTE HE-30

Professional Quality Communications Receiver



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99.50

- TUNES 550 KCS TO 30 MCS IN FOUR BANDS
- BUILT-IN Q-MULTIPLIER FOR CROWDED PHONE OPERATION
- CALIBRATED ELECTRICAL BANDSPREAD ON AMATEUR BANDS 80 THRU 10 METERS • STABLE OSCILLATOR AND BFO FOR CLEAR CW AND SSB RECEPTION • BUILT-IN EDGEWISE S-METER

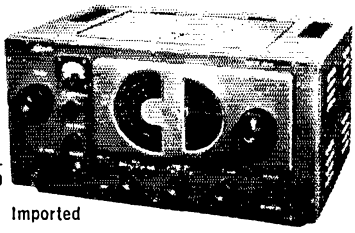
Sensitivity is 1.0 microvolt for 10 db, Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER. TUBES: 6BA6—RF Amp, 6BE6 Mixer, 6BE6 OSC., 6AV6 Q-Multiplier—BFO, 2-6BA6 IF Amp., 6AV6 Det-AF Amp. ANL, 6AQ5-Audio output, 5Y3 Rectifier.

TOP VALUE COMMUNICATIONS RECEIVER

NO MONEY DOWN

KT-200WX
in Kit Form
64.50

HE-10 WIRED AND TESTED
79.95



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- SUPERHET CIRCUIT UTILIZING 8 TUBES AND RECTIFIER TUBE • BUILT-IN "S" METER WITH ADJUSTMENT CONTROL • FULL COVERAGE 80-10 METERS • COVERS 455KC TO 31 MC • VARIABLE BFO AND RF GAIN CONTROLS • SWITCHABLE AVC AND AUTOMATIC NOISE LIMITER

The Communications Receiver that meets every amateur need—available in easy-to-assemble kit form. Signal to noise ratio is 10 db at 3.5 MC with 1.25 microvolt signal. Selectivity is —60 db at 10 kc, image reflection is —40 db at 3 MC. Tubes: 3—6BD6, 2—6BE6, 2—6AV6, 1—6AR5, 1—5Y3.

New! LAFAYETTE HE-45 DELUXE 6-METER TRANSCEIVER

- Highly Sensitive Superheterodyne Receiver Section for 50-54 Mc
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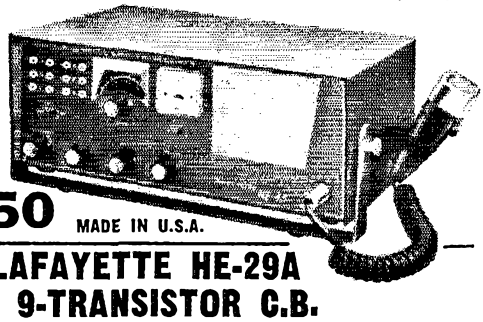

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- Switch Selects SWR or Forward Power—No Reversing Necessary
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The ideal aid in adjusting beams, trap antennas, matching networks, etc., or for tuning transmitters for maximum output.

LAFAYETTE HE-29A 9-TRANSISTOR C.B. "WALKIE-TALKIE"™

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- 9 Transistors plus Diode and Thermistor
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- Crystal Control on Transmit and Receive
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- Push-To-Talk Operation
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☐ Send FREE 1962 Catalog 620 featuring the full line of Lafayette Amateur Equipment
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standing that this 1900 kilocycle operation was the cause for withdrawal of the 1875 to 1900 and 1900 to 1925 kilocycle segments from the amateur service in 1956, it is the League's hope that a study of present requirements will permit a return of these segments to the amateur service.

3. Additional low-frequency space to relieve congestion in the amateur bands is particularly important at the present time because of propagation conditions and resultant restricted ranges on the high-frequency bands. Since 1956, when the segments were withdrawn, the number of licensees in the amateur service has increased 50 per cent.

5. However small the frequency segments presently available to amateurs, heavy use is made of them, particularly in winter months. There are 16 state and regional communications networks which have been registered on League records, and a number more which have not come to the League's official attention, organized by amateur groups for message-traffic and emergency-communications purposes, all operating within these restricted segments. During the evening hours of winter, it is the most suitable portion of amateur frequency allocations for providing reliable statewide coverage. Additionally, there is considerable use of mobile operation, particularly in the central portion of the country, again because of its local-area reliability.

5. For whatever assistance it may be in consideration of this matter, the general principle is that, from the amateur standpoint, frequencies are more important than power. To illustrate, if an increase in amateur frequency privileges in a certain geographical area is shown by study to be feasible except for the current power levels (e.g., 500 watts day, 200 watts night), the League is prepared to accept a modest reduction in power on such new frequencies. It is the League's understanding, however, that Loran transmitting stations have substantially increased power over the last few years, which supports the possibility of increased amateur use without a serious problem in respect of potential interference to the Loran service.

6. The League requests that consideration be given to an arrangement whereby the continental U. S. could be divided into three geographical areas — east, north central, and west — whereunder east and west could be allocated two each of the 25-kilocycle segments as existed prior to 1956, and the north central portion of the country could be granted privileges on all four 25-kilocycle segments, with power restrictions as necessary to protect the Loran service.

7. The League further requests that consideration be given to a sharing arrangement in Alaska, Hawaii, and the Pacific Island possessions and territories, looking toward the possibility of amateur use there of the 1800 to 2000 band with appropriate power input restrictions.

Wherefore, the premises considered, The American Radio Relay League, Inc. respectfully requests the Commission to initiate an inquiry to determine if present restrictions upon amateur radio operation on frequencies between 1800 and 2000 kilocycles may be removed or relaxed, and to institute appropriate rule making following such inquiry.

Respectfully submitted,

THE AMERICAN RADIO RELAY LEAGUE, INC.

1735 DeSales Street, N.W. ROBERT M. BOOTH, JR.
Washington 6, D. C. *Its General Counsel*
December 1, 1961

YL News and Views

(*Continued from page 59*)

of cards by 1st-class mail. Endorsement given for each additional 50 YLs. Application for stickers to be in same form as application for original certificate. This award is for working *different* YLs — same YL worked under different calls counts only once. Send application and QSLs to Katherine Johnson, W4SGD, Box 666, Fuquay Springs, North Carolina.

DX YL — available to YLs only! Work 25 duly licensed YLs outside your own country as defined in the ARRL DXCC countries list. All contacts must date after April 1, 1958. Send log extracts showing date, time, station, band, mode, RST report and own QTH, name, and call. QSLs not required. No charge but return postage will be appreciated. (Note: work 25 different DX YLs, not necessarily 25 different countries.) Custodian: Maxine Willis, W6HUA, 6502 Wynkoop St., Los Angeles 45, Calif.

(*Continued on page 148*)

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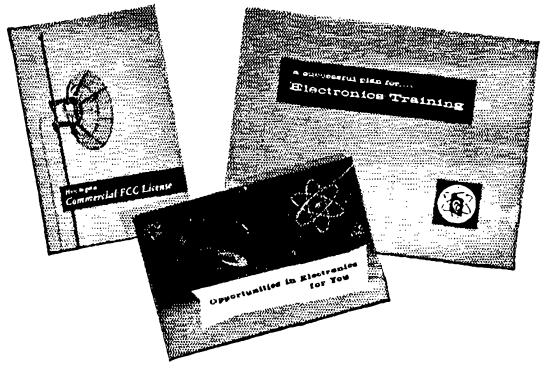

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Continuous Membership Certificate — available to YLRL members only. This certificate is issued for 5, 10, 15, 20, 25 etc., years of continuous membership in YLRL. It is issued automatically, but should you fail at any time to receive yours, contact Custodian Bettie Mayer, K7BED, 2015 S.E. Grand Ave., Portland 14, Oregon.

—•••—

For complete listing of 40 YL nets and roundtables conducted during the winter months see November 1961 column.

HOWDY DAYS RESULTS

Results of the new YLRL activity "Howdy Days" conducted Sept. 26–28 were received from YLRL Vice President Onie Woodward, W1ZEN, as below. Barbara Houston, K5YIB, has the highest score as a YLRL member. Frances Desillier, K1RPI, submitted the winning score as a non-YLRLer. W1ZEN concluded that many more YLs participated in Howdy Days, but they neglected to turn in logs.

YLRL Member Logs:

Call	*YLRL Members Worked*	*Non-YLRL Members Worked*	*Total Points*
K5YIB	45	19	109
W1ZEN	33	7	73
K5OPS/Ø	26	6	58
K1KYB	12	24	48
K1ONT	11	21	43
K1EKO	18	4	40
WA6AOE	18	2	38
K1IZT	15	2	32
W1HOY	10	11	31
K1SLS	13	3	29
K5TXQ	13	2	28
WA6BJB	10	1	21
WA6OKG	10	1	21
K1ADY	4	–	8
W3TSC	3	2	8
Non-YLRL Member Logs:			
K1RPI	9	13	31
K9TVN	9	–	18

KEEPING UP WITH THE GIRLS

YLRL — The new YLRL Directory, revised to Sept. 1961, has been sent to all members. Additional copies are available from Directory Editor Jean Kincheloe, K6OQD, 6625 N. Brightview Drive, Glendora, California for 50¢ per copy. In addition to a list of all YLRL members (almost 1000) with resumé of ham and other activities about each, the Directory contains the full club Constitution, By-Laws, Procedures Policy, YLRL Certificates, and a complete history of YLRL prepared by club Historian Vada Letcher, W6CEE.

Georgia Peaches — New officers are Pres. K4LIU; V.P. K4IFF; Secy. K4FLW; Treas. K4BDZ; NCS K4KIH; Pub. K4DNL; Membership K4ZNK; Historian K4WNH. Clarifying a misunderstood point, K4DNL states that as of March 31, 1961, non-Georgia YLs could be full members and would count as a full point toward the Georgia Peach certificate. QSLs from non-Georgia members worked prior to that date still count as ½ point only.

Rhode Island YL Club — New officers are Pres. K1DWH; V.P. K1SQS; Secy. W1ZOK; Treas. W1CEW.

MISCELLANY:

The headquarters office of the AWTAR, Inc. has been moved from the West to the East coast. Teterboro Airport, Teterboro, N.J. is the new address. An office will also continue to be maintained at Long Beach, Calif. Oakland, Calif. has been selected for the start of the 1962 AWTAR, with Wilmington, Delaware, the terminus. Dates will be July 7–11. Carolyn Currens, W3GTC, will again serve as chairman for the amateur radio race net. . . . Helen, W1HOY, has worked 200 YLs on six meters only. . . . Receipt of the Seldom Heard OM Certificate #2 brings the total of K4RNS' certificates to 51. . . . OM G3LWS writes "Where do the YLs get to out of contest time?" Ted adds he's always QRV for a chat, phone or c.w. on any of the DX bands. . . . Work W1SVN for a cute aeronautical mobile QSL. Really smitten by the flying bug, Millie is about ready for her private pilot's license exam. . . . W1ICV's KB6BT contact brought Jane's DX total to 200 countries worked, 194 confirmed. Other DXing YLs busy upping totals are W2OWL 116 94; W1RLQ 176 confirmed; K1JNE 135 confirmed. QST

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"THE GOLDEN AGE OF ELECTRONICS"

March 26-29, 1962
The New York Coliseum
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Members $1.00. Non-members $3.00. Age limit: over 18

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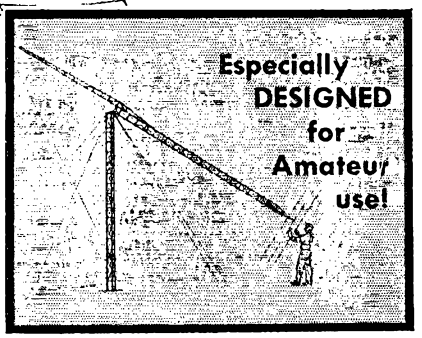

first IN DESIGN *foremost* IN SALES

ROHN "fold-over" towers are ESPECIALLY made for amateur use. They are the most practical tower in design because they allow you to work ON THE GROUND for antenna maintenance and servicing. You'll quickly agree that this is a most wonderful feature for an amateur tower. In addition, these towers are made and designed for true, heavy duty use. They are structurally sturdy for use up to 70 feet and in enough sizes for *all* types and sizes of amateur antennae. This means that they can easily handle your requirements. They have unexcelled workmanship. They are hot-dipped galvanized after fabrication which means you have no problem of maintenance. They come as a complete package with all materials and accessories included. Add all these wonderful features together and you see why they're the most demanded tower today! Priced from $186.

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"World's largest exclusive manufacturer of TV-Communication towers"

GUARANTEED CRYSTALS!

ALL MARINE FREQ.-FT-243, DC-34 Holders. Tol. .005..$2.00
POLICE, C.A.P., CD, MARS. Tol. .01%.....$1.89
CITIZENS BAND—11 METERS—.005% Tol.
26.965 to 27.225 MC, 3rd Over. Herm. Seal or FT-243 $2.50
13.4825 to 13.6125 MC, 2nd Harm.Herm. Seal or FT-243 $2.50
6741.25 to 6806.25 Kc, 4th Harm. FT-243 only.....$2.00

SPECIAL! STOCK CRYSTALS

FT-243 Holders 5700 KC to 8700 KC in steps of 25 KC's

$1.19 ea.

SEND FOR FREE CATALOG

DC-34 Holders 1690 KC to 4400 KC steps of 10 KC ea..$.79

NOVICE BAND FT-243 Fund. 1.49 ea.
80 Meter 3701-3748—Steps of 1 KC. FT-243
40 Meter 7150-7198—Steps of 1 KC. FT-243
Dbl. to 40 Meter 3576-3599. Steps of 1 KC. FT-243
15 Meter 5276-5312—7034-7083 Steps of 1 KC. FT-243

FT-243—2 Meters (Steps of 1 KC) $1.19
FT-243—6 Meters (Steps of 1 KC) $1.19
FT-243—From 3000-4000 .....$1.19
FT-243—From 1005-2999 (Steps of 5 KC) $2.39
FT-241 SSB Low Freq. Xtals 370 to 540 KC (Steps of 1.852 and 1.388) .....$ .69
FT-241 SSB Matched Pairs $2.39

Open Friday Evenings until 9 P.M.

Include 5c per crystal for postage (U. S. Only) Calif. add 4% Tax. No C.O.D.'s. Prices subject to change. Ind. 2nd choice; substitution may be necessary. MIN. ORDER $2.50

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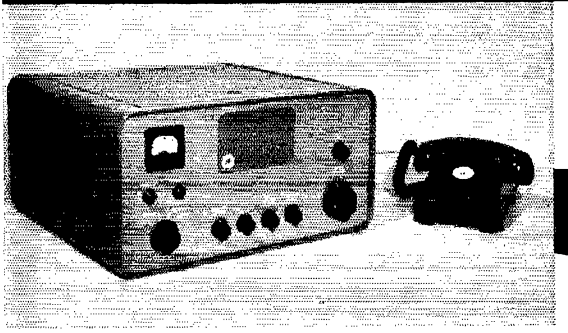

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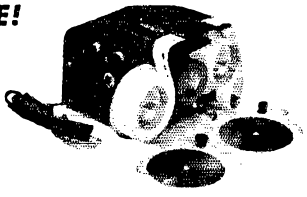

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Adjustable speed control, maintains constant speed at any Setting. Complete with ten rolls of double perforated tape. A wide variety of other practice tapes available at 50c per roll.

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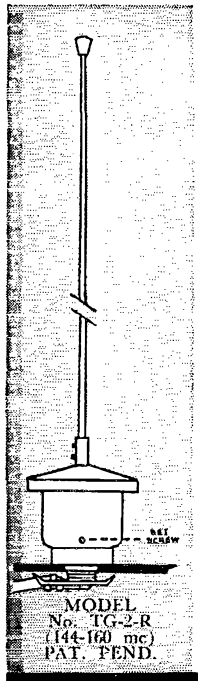

MODEL No. TG-2-R (144-160 mc) PAT. PEND.

AVOID CEILING BULGE

Now you can buy a miniaturized gain antenna for your "ROOF TOP" without ceiling bulge!

- Same db gain as TG-2
- SWR better than 1.5 to 1 with 52 ohm line.
- Hermetically sealed matching transformer.
- Less than 2¼" above roof.
- Will stand up to 150 watts RF power.
- Stainless spring steel whip, ½ wave long. May be cut to your specific frequency.

EASY TO INSTALL
no need to remove upholstery!

Mounts from outside by insertion through ⅞" hole.

Mounts flat; only uses ⅜" inside roof.

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SEE YOUR DISTRIBUTOR OR WRITE GAM DIRECT

G-A-M *Electronics* inc.

138 Lincoln St., Manchester, N. H.

To QST Readers:

THE state of the nation—pardon us, we mean the state of QST advertising—is about the same as reported on page 168 of the January 1961 issue. The amateur radio business is still being run by amateurs and QST display ads show many ham calls.

We counted 277 different calls* in 1961. How many can you find?

Mail us your list showing each call and the name of the company whose ad it was in. If you find 150 we'll send you an ARRL Log Book. Please arrange your list by call areas and alphabetically within each call area.

73,

ADVERTISING DEPARTMENT of ARRL
L. A. "Pete" Morrow, W1VG

* Not counted because there are so many: The calls in the Gotham ad in the April through June issues, the Hy-Gain ad in April, the Hallicrafters ad in May, the Allied ad in December. DO NOT put any of these on your list and DO NOT include Ham-Ads.

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.

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.

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 25th year. 90 day guarantee. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test", Novice, $1.50; General $1.75; Extra, $2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

TRIGGER. Cash paid for ham equipment. 7361 W. North Ave., River Forest, Ill. PR 1-8616. Chicago #TU 9-6429.

TOROIDS: Uncased 88 Mhy, like new. Dollar each. Five/$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif.

WANTED: Commercially-built transceivers and QST for any months of 1922, 1923, 1939 and 1940. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

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: All types of aircraft or ground radios. 17L, 618S, 388, 390, GRC, 51V, 51X2 units. Especially any item made by Collins Radio whatsoever. Also large type tubes and test equipments. For fast action write Ted Dames, W2KUW, 308 Hickory, Arlington, N.J.

SAN Francisco and vicinity: Receivers repaired and realigned. Factory methods. Special problems invited, any equipment. Associated Electronics, 58 South P Street, Livermore, Calif. Skipper, W6KF.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system, $50; 12 volt 50 amp system, $50; 12 volt 60 amp system, $60; 12 volt 100 amp syst. $100. Guaranteed no ex-police car units. Herbert A. Zimmermann, Jr. K2PAT, 1907 Coney Island Ave., Brooklyn 30, N.Y. Tel. DEwey 6-7388.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, 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 W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmany 8-8262.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

SELL 2 mf. G-E capacitors, 4000V DC, $5.00 or 2 for $9.00. Guaranteed. Dawson, 5740 Woodrow Avenue, Detroit 10, Mich.

TELEPRINTER Converter CV89A/URA8A, audio input, 2" 'scope indicator, copies any shift from 10 to 1000 cycles, $245.00; Collins 51J2, 51J3, R-390A receivers, Hammarlund SP-600JX. Teletype and Kleinschmidt printers. Alltronics-Howard Co., Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

WE Buy all types of tubes for cash, especially Eimac, subject to our test. Maritime International Co., 199 Front St., Hempstead, N.Y.

QSLS? WPE? Finest and largest variety samples 25¢. (refunded.) Callbooks: American $5.00, Foreign $3.00. QSL samples with bible verses, 25¢. "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Mich.

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 for 100 or $5 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS. Kromekote 2 & 3 colors, attractive, distinctive, different. Ball point pen with order. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

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. Samples, 10¢; with catalog, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, Box 375 M.O., Toledo, 1, Ohio.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢

SUPERIOR QSLS. samples 10¢. Ham Specialties, Box 3023, Bellaire, Texas.

QSLS, 3-color glossy, 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., Somerset, N.J.

QSLS-SWLS, 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

PICTURE QSLs. Cards of your shack, home, etc., Made from your photograph, 1000, $13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QSLS, 300 for $4.35, Samples 10¢. W9SKR, "George" Vesely, Rte. #1, 100 Wilson Road, Ingleside, Ill.

QSLS, SWLs, XYL-OMs (sample assortment approximately 9¾¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

QSLS-SWLS. Samples free. W4BKT Press, 123 No. Main, McKenzie, Tenn.

1½" Call QSLs (2 sides printed), 100, $2.75; sample free. Gariepy, 2624 Kroemer, Ft. Wayne, Ind.

STARTLING 3-D QSL cards. We've new automatic machinery now to give you quick service on these beautiful, world-acclaimed cards! Free sample brochure of 1962 designs in fabulous 3-D Metallic, Neon-Glo, Mirro-Sheen, and Fluorescent colors! Join the swing today to these new-process, completely different cards! 3-D QSL, 5 Wood End Rd., Springfield, Mass.

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: samples 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLS, $2.50 and up. Samples 10¢. RBL Print M.R. 12, Phillipsburg, N.J.

QSLS. Free Samples. W7HZ Press, Box 183, Springfield, Oregon.

QSLS, SWL's that are different, colored, embossed card stock, and "Kromekote". Samples 10c. Home Print, 2416 Elmo, Hamilton, Ohio.

QSLS-SWLS Free Samples, David Spicer, 4615 Rosedale, Austin 5, Texas.

RUBBER Stamps, $1.00. Call and Address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N. J.

QSL's 100 glossy 4 color $3.70 Postpaid. Samples 10¢, or send 25 for large assortment and free "Danger, High Voltage" sign. Dick, W8VXK, Rt. 1, Gladwin, Michigan.

EYEBALL QSO cards. Exquisitely distinctive. Samples, 10¢. 1,000 $5.00. Call Signs. Box 933, Aurora, Ill.

HUNDRED QSLS: 80¢. Samples, dime. Meininger, Jesup, Iowa.

QUALITY QSLs! New designs, samples 10¢. Giant 25¢. Savory, 172 Roosevelt Rd., Weymouth, Mass.

QSL Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS. New, different. Dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

$1.00 Frames 60 QSL cards in clear polyethylene. See our ad on page 152 this issue. Tennessee Paper & Box Co., P.O. Box 198, Gallatin, Tenn.

QSLS: Large variety of styles, cartoons, colors. Samples 25¢ (deductible). Paul Levin, K2MTT, 1460 Carroll St., Brooklyn 13, N.Y.

CERTIFIED QSLS-SWLS, unique designs, speedy service. Catalog 25¢ (refundable) Certified Printing, Box 1023, Whittier, Calif.

CANADIANS! QSLS in fluorescent colors, by silk screen process. Free samples. Martin, 314 Delatre St., Woodstock, Ont.P., Canada.

ORIGINAL Cartoon for your QSL. Particulars, 10ø. Sirrah, P.O Box 1461, Greenwich, Conn.

RUBBER Stamps for hams, sample impressions, Hamm, W9UNY, 542 North 93, Milwaukee, Wis.

QUALITY QSLS, Attractive, different. Samples 10¢. K8IAI Press, 19470 Derby, Detroit, Mich.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QSLS! We gottem! Dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSL-SWLS. 3-colors. 100 $2.00, samples dime. Bob Garra, Lehighton, Penna.

QSLS At discount prices. Samples free. Discount Card Club, Box 9445, Austin, Texas.

QSLS. $1.75 per 100 postpaid U.S. only. Glossy, red and green. All orders mailed within 10 days. Free sample. Hobby Print Shop, Umatilla, Fla.

QSLS & SWLS, samples, 25¢. Spicer, 4615 Rosedale, Austin 5, Texas.

QSLS. Large selection styles including photos. Lowest prices. Fast service. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

QSLS. Kromkote-3 color. Order 200, get 25 each of 8 different styles—many styles. Samples 10¢. Progress Printing, Box 1154, Biloxi, Miss.

QSLS. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS: Large variety of styles, cartoons, colors, Samples, 25¢ (deductible). Paul Levin, K2MTT, 1460 Carroll St., Brooklyn 13, N.Y.

CANADIANS: National NC-303, 1961, like-new, only about 50 hrs. operations. VE2BEJ, Box 128, 495 St. Hubert, Jonquiere, Que.P., Canada.

FOR Sale: Complete station, HQ-100 receiver, Johnson Viking II xmttr, with low-pass filter, mike D-104, 10-meter beam, prop-pitch motor, indicator map, selsyn motors, all coax, etc. Quick sale, $450.00. Moving. A. Hollinsworth, VE3WJ, 93 Queen's Drive, Weston, Ont., Canada.

CANADIANS! Hy-Gain Multiband Doublet, $46.00; Eico 425 'scope, $50.00; Knight Flyback checker, $25.00; Geloso VFO in cabinet w/p.s., $40.00; Polaroid Land camera w/flash, worth $65, (deal?). D. Poultney, VE3BJJ, RR3, Beaverton, Ont. P., Canada.

HAMS Vicinity Arcadia, Calif. Sold place S.O.S. for trade F.O.B. backyard at 123 Santa Cruz Rd., Arcadia. One new, creosoted and painted fully rigged 70 ft. cedar pole on or before Feb. 1962 for one 60 ft. crank-up tower f.o.b. as is. Clear easy access to pole. Write R. S. Cole at 216½ 43rd St., Manhattan Beach, Calif.

SSBers! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering good SSB operating; promoting advancement of SSB equipment; and disseminating SSB technical information. Read "The Sidebander", official publication of the SSBARA. Dues $3.00 yearly. Write for membership application sample "Sideband-er", to SBARA Membership, 1385 Richmond Court, East Meadow, N. Y.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Globe, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halstead St., Chicago Heights, Ill. Tel. SKyline 5-4056.

KWS-1, $900. W2ADD.

SELL: Johnson Thunderbolt $425.00; HT32, $425.00; SX101 rcvr., $225. All in new condx. Will sell complete station w/accessories. Write for details. K2SJJ/8, 4058 Herman Ave., S.W., Grand Rapids 8, Mich.

TELREX Tri-band TB7E, 20-15-10 beam. Has been assembled but never put up. Moving to new QTH. Will sacrifice. Best offer. W1JCW, 39 Florentine Gardens, Springfield 8, Mass.

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: QSTs for personal collection: January through September, 1916. ARRL Handbooks for personal collection: Editions 1, 2, 4, 5, 8, 13 (1936), 14 (1937), 15 (1938) and 17 (1940). W1CUT, Box 1, West Hartford 7, Conn.

WANTED: Two or more 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

SELL Highest offer: 455 kc. input, Panoramic adaptor BC-1031-A, in use now. RTTY Model 15 printer, ten hours use since major overhaul and lubrication, like new, in original shipping case. Heathkit VOX Model VX-1. KØMWM, 4504 W. 36th St., Minneapolis 16, Minn.

SELL: HRO-50T, in top condx. AA, B, C, D coils, $175.00. W. J. Tancig, K9MYZ, Beecher, Ill.

WANTED: Collins SC-101 station control unit and F455CO8 filter for 75A3 serial above 1300. State price and condx. Palmer, K3MTW, Smethport, Penna.

HQ-145 w/clock and calibrator, $190.00. No shipping, sry. K1MUN, Joe Phillips, 4 Naples Ave., E. Norwalk, Conn.

WANTED: QSTs before 1923 and CQ May 1945. Have QST 1931 to 1956 and CQ 1946 to 1956 at 25¢ each. W2HO, Rte. 2, Box 156, Monroe, N.Y.

LOWEST Prices. Factory fresh sealed cartons, Central Electronics, CDR, Dow-Key, Drake, Electro-Voice, Gonset, Gotham, Hallicrafters, Hy-Gain, E. F. Johnson, Mosley, P & H Electronics, Telrex. Self-addressed stamped envelope for lowest quotation on your needs. Gonset G-33 brand new factory sealed cartons, $75.00. Brand new PL-172 and socket, $125.00. Used, perfect Ranger, $150.00; Valiant, $275.00; SX-110, $125.00; SX-100, $180.00; DX-40, $50.00; Sonar-120, $50.00; Adventurer, $35.00. H D H Sales Co., P. O. Box 73, Rowayton, Conn.

PROCEEDINGS Of the I.R.E. 1918 through 1948. Most volumes complete. Will sell any copy or copies. Excellent price on entire lot. (Mrs. Miriam Knapp, W1ZIM, 191 Beechwood Rd., West Hartford 7, Conn. Tel. JAckson, 3-7560.

SELL: KWS-1, perfect, $895; 75A3, like new, $350.00. Will throw in several boxes of usable parts, transformers, tubes, coils, etc. Lamb, 1219 Yardley Road, Morrisville, Penna.

JOHNSON Viking Valiant with manual. Exc. condx. No scratches. $315.00 pick up. W9UZC, 146 N. Washington St., Lockport, Ill.

75A4 excellent, $595. W2JPQ, Brooklyn, N.Y. Tel. HY 7-1978.

QSTs. Continuous run 1948 through 1958. Also 1927. W9QDG, 610 Carlton, Wheaton, Ill.

WANT: Digital voltmeter, minimum price. Condition not important. All offers considered. Servo unit with balancing motor and amplifier, capable of taking 0 to 50 MV input. W1LWV, 99 Water St., Millinocket, Me.

WANTED: Old type Magnetic Horn spkr and Coop Ant. Geo. Leininger, W8QZF, 16412 Marquis Avenue, Cleveland 11, Ohio.

SELL: KWS-1, works like new. Looks like new. Serial 503 for first certified check $800.00. Will deliver up to 500 miles or meet you in your station wagon that distance. Berry Rozar, Box 654, Hobe Sound, Florida. W4ERT.

HRO-5 or earlier, long wave coils, set of three with case; cover 50 through 400 Kcs; $18.00. Six meter converter, Frank Jones design, $20.00. Items postpaid U.S.A. W9JIA, 7916 So. 86th Ave., Justice, Ill.

KWM-1 AC power supply, console speaker, SWR meter, excint condx. $650 or best offer. W9JKC, 634 Vernon, Glencoe, Ill.

OIL Paintings, scenic only, from your picture or kodachrome, 18" x 24" canvas, framed, one hundred dollar value. Satisfaction or no obligation. Exchanged for ham gear. Need two C.B. transceivers 12/117 volts. Ronald Poinsett, W2KVJ, Penn-Lawrence Rd., Trenton, N.J.

LET'S Trade, now in stock, new factory boxed 1962 Hammarlund receivers, with clocks, matching speaker, HQ-100AC, $213.95; HQ-110C, $273.95; HQ-145XC, $298.95; HQ-170, $288.95; HQ-180C, $458.95. Trade in your surplus BC-342, BC-348, BC-639, BC-779, BC-794, BC-1004, ARC-2, ARC-34, ARC-38, ARC-44, PRC-6, 8, 9, 10; RT-77/GRC-9, AN/GMD-1 test sets with SG, URM, UPM, USM prefixes, BC-221, ARR-5, ARR-7, ARR-15. Advise what surplus you have and Hammarlund receiver you'd like. Top trades given. Bill Slep Co., Drawer 178Q, Ellenton, Florida.

S-85 with S-meter kit and vernier tuning additions, $90.00. Jeff Sanders, Rt. 5, Box 502C, Tacoma 22, Wash.

NEED Money for college. Selling: HQ-150 in excellent condition, with instruction manual; $200.00. Dow-Key DK60-G2C, $10.00. Buyer must pay shipping from Freeport, Long Island. William B. Rubin, WA2ENK, Hill Residence, Box 105, Clarkson College of Technology, Potsdam, N.Y.

TRADE: RCA 27" TV, model 27-D-384. For photo and details see Sams, set 235, folder 10. New warranteed CRT. French Provincial cherry-wood cabinet in immaculate condition. Chassis is electronically and mechanically perfect. Will deliver within first 150 miles. Want good amateur band receiver and/or transmitter. All inquiries answered. Jack Fink, K7BJA, Box 443, Parma, Idaho.

KITS Professionally wired and tested. Very low rates. Bill Robinson, WA2DZB, 31 Franklin Ave., Pompton Plains, N.J.

MUST Clear attic. Many items, test gear, transmitters, receivers, tubes, etc. Super Pro ASP5X 2.5 to 40 Mcs mint, $175.00; BC779R, $75.00; TCS xmttr and rcvr complete, $75. Complete set Sig S and Navy catalogs, $75; 4-125A's, $15; 250THs, $17; 450THs, $17. Send stamp for list. W3KA, 10406 Insley St., Silver Spring, Md.

WILL Swap good used 35mm camera equip., Cannon IVS-2, 50 mm f/1.8 Cannon lens, case; for Heath Apache, Viking II B&W 5100B; or Exakta VX, 58mm F/2 Zeiss lens, excellent F/5.5, 400mm tele. lens plus Cannon for; Heath Apache and SB-10 Johnson Valiant, BC-610 or NC-300/calib or gud 75A3, Rodger, KØGBZ, Quinter, Kansas.

WANTED: Gonset Communicator III, 2 mtrs. Peter Goldberger, WV2VYK, Peddie School, Hightstown, N.J.

HAMMARLUND HQ-150 stable oscillator. Firm $150.00. Try it. Berner, K2GS. Tel. ES 7-1850, Brooklyn, N.Y.

DAGE Closed circuit television system, still in warranty, guaranteed. Acquired in debt settlement. Sell for best offer or will trade for ham gear. Camera and lens separate if desired. W8MYH, 2304 Culver Ave., Dayton, Ohio.

LINEAR Amplifier B&W L-1000-A with built-in B&W LPA-MU-2 matching unit for fixed output exciters, $220.00. W1-ZPG, 187 Garden St., Cranston, R.I.

COLLINS KWM-1 with factory-installed noise blanker, $495, mobile mount, $40.00; DC supply, $100. Bassett Triband antenna, $25.00. W9ECC, 770 7th West Bend, Wisconsin.

GRAD Student must sell NC-98, 20 meter beam, tower. K200F, 30½ Mellen St., Cambridge 38, Mass.

FOR Sale: Eico 720, $115; in A-1 condx. Heath DX-20, $35.00; Mosley 40 mtr. beam, $75.00; Hy-Gain TBW ant., $15.00; wanted: CQ-OST runs 1945-1960. 2 mtr. rcvr and xmttr. (can be home built). KN3ONY, 23 N. Market, Elizabethville, Penna.

FOR Sale: Collins KWS-1 xmtr, $1000; Collins 75A-4 receiver, $500.00; Jones 263 Micro-Match, $50.00. All equipment in mint condx. W4GGA.

HRO "E" and "F" coils. Best offer takes. KP4APR, Box 204, San Juan, P.R.

DUAL Oscilloscope, Waterman Twin tube Pocketscope, two CRT's, four separate amplifiers in one compact case. Not a kit. List $399, asking $125, make offer. W2OKO, 39 Canoebrook, Summit, N.J.

HEATH "Legato", $250.00; K2BIB, 307 Richardson Drive, North Syracuse 12, N.Y.

WILL Trade excellent Globe-King 500C transmitter (540 watts AM) and NC300 receiver with speaker for good used KWM-2 with power supply and speaker. Make offer. Dan Pang, K7-NOT, 7126-86th St., Tacoma 99, Washington.

RECEIVER: HQ-110C, like new condx, with matching speaker and calibrator, $155. Gonset G66B receiver with 3-way power supply, in excint cond. K6LJA, 1009 Riverlane, Santa Ana, Calif.

FOR Sale: KE-93 Pierson mobile and fixed station receiver. Excellent condition. AC supply with speaker and "S" meter, 6 and 12 volt DC supply, with manual, $250.00 WOCAV, William Tyree, P.O. Box 215, Boulder, Colorado.

NATIONAL HRO5OTAI receiver, power supply, speaker, bandspread coils, exc. condx. $140.00 F.o.b. Price low. Need dough. R. A. Eubanks, 601 E. 32nd St., Chicago, Ill.

GOING Gun bug, will sell or swap entire shack from the junk box to my new Valiant for guns and reloading equipment. Write for list. L. Churchill, 314 N. 7th St., Watseka, Ill.

FOR Sale: 2KW P.E.P. GG linear amplifier, pair 4-400A's, completely regulated bias and screen supplies, 4.000 VDC, powerstat, 48 in. rack, 5 Triplett meters, components value over $750. Gud condx. Write the Rev. Robert E. Picking, W3VOA, 407 Pine St., Danville, Penna.

CUP-Core inductances, excellent for sharp or band-pass 50 to 100 K.C. IF or BFO. Very high Q. Unused, cased, adjustable; solder terminals. Type 1, 2.9 Mh, type 17, 3.7 Mh. Dollar each postpaid U.S. Circuit suggestions included. Woods, 2346 Clover Lane, Northfield, Ill.

SELL: Collins Filter F455E-60, $20; LM frequency meter (with book), $35.00; tube tester Model TV3-B/U, $115; two 4CX300 sockets (Eimac SK-700), $10 each; vacuum variable USL500 (3KV), $25.00; transformers UTC S-44, $12.00; S-49, $18.00; capacitor dual 4 mfd. 2200VDC, $9.00. R. R. Huff, 106 Talos Ave., White Sands Missile Range, New Mexico.

CLEANING Shack: Heathkit; crystal calibrator, $9.00; balun coil, $5.50; Q Multiplier, $8.00; Knight, RFZ bridge, $4.50; G-30 grid dip meter, $20.00; code oscillator, $3.50; 12-1 Electronics Lab $15.00; Johnson; Speed-X key, $12.00; T-R switch, $22.00; G4ZU Birdcage 20/40 antenna in factory carton, $70.00, all in good condition with manuals prepaid to you. K5USR/3, 1461 John Clark Road, Dover, Delaware.

WANTED: Heathkit model RC-1 radiation counter. Larry Dodd, 115 West 11th St., Junction City, Kansas.

SALE: Cleaning shack. HP Sig. Gen. 205AG, $120.00; BC-221 with pwr. supply and cal. chart, $90.00; Sprague capacitor resistance bridge M-TO-4, $45.00; H.V. pwr. trans. chokes, other equipment and parts. W2ZCA, 18 west 34th St., Bayonne, N.J.

GOING To college. Must sell Hallicrafters S-85, $70.00. George R. Berlin, 116 Newport Drive, Youngstown 12, Ohio.

SELL: Collins 75S1 noise blanker. Brand new in original sealed package, $60.00. W6UO.

CASH for National HRO-60. State number of coils, accessories, age, condition, and price. All replies will be answered. G. Anderson, 3421 10th place North, Renton, Washington.

COLLINS 75A4 serial 5474 with Collins speaker and KWSI with power supply, serial 156, latest modification Collins factory, $1,300.00. Will not sell separately. Outfit is in excellent condition. I used it until approximately September 1st. Will deliver by car 175 miles radius of Augusta, Ga., or by private-plane 600 miles. You meet plane and pick up at airport. Reason for selling: Have two similar outfits. J. C. Hagler, Jr. W4SS, 2424 McDowell St., Augusta, Ga. Area code 404, PA 2-7781 during business hours, RE 3-4678 before 10:00 PM EST.

SALE: Gonset G-66B and G-77A mobile twins, 6-12 VDC, 117 VAC, $350.00; DX-100 w/push to talk, $120.00; HQ-160, $200; Matchbox, $35.00. L. Kinney, K6GVM, 766 Ocean Crest Rd., Cardiff, Calif.

FOR SALE, best offer, complete set of issues of QST from April 1923 to May 1930, inclusive; 85 issues in gud condx. Connell H. Miller, Madison St., Sligo, Penna.

FOR Sale: National NC-173 receiver with speaker. In beautiful condx, $125.00; Stancor kit type xmtr, 100 watts with homebrew preamp, and PP 807s modulator, $100.00; Philco 7" TV with enlarging lens, compact wood cabinet. Needs deflection condensers, $25.00. New York area only. Will deliver 100 miles. W2LVR.,

WANTED: Receiver BC794 or Super Pro. Need parts for KW final, 5V/30 amp., 110V AC transformer and GP50 coil. E. Shafer, 3479 Kersdale Rd., Cleveland 24, Ohio.

SALE: Beautiful Hallicrafters power supply, 1400 volts, 500 mils; 300 volts, 150 mils; minus 0-14 volts, 75 mils. Ideal for that KW 811A linear, $125.00. New tubes, 304TL, $32.00, 872A, $6.00. Dr. Charles Thompson, 103 West Main, Napoleon, Ohio.

FOR Sale: 3" square meters, $2.00 ea. 0-50 ma. 0-150 ma. 0-100 Ma. 0-250 Ma, 3" round 0-20 Ma. 0-100, 0-150 Ma., $3.50, 0-50 microampere ARC5 trans. 3-4 Mc., $5.00; 7-9 Mc. $4.00. Turn counter and variable inductance for 80-10, $5.00. Variable capacitors, 100/100 mmf 3000v $2.50 50/50 mmf, 3000v, $1.50; 80 mmf 4500v, $2.50; Varimatch modulation transformers, 10 watt, $2.00; 75 watt, $6.00. Chokes, 10H200 Ma., $1.00; 10h, 250 Ma., $1.00; 5-20h 200 Ma., $1.50; Microphones Shure 51 Sonodyne $15.00; 520SL, $15.00. All plus postage. Toivo Rae, W2JGF, 5 Oakbrook Rd., Ossining, N.Y.

FOR Sale: QST Magazines. Good condition. 1955 through 1961. WØDMY.

NC-183D w/spkr in mint condx, $190.00. F. Chiorello, 243 Second St., Trenton 10, N.J.

WANTED: RP-6 component unit for RS-6 surplus kit. Joseph T. Beck, K4AQT, 6211 S. MacDill Ave., Tampa 11, Fla.

LATEST DX100B, perf. condx, with Dow relay and extras. NC-98, BC348N receivers, best offer. Ed Pims, 601 E. 80th St., Brooklyn 36, N.Y. RN 3-3975.

FOR Sale: Johnson Viking II with VFO and push-to-talk, $180.00; Mosley 20M 3 El. vest pocket beam, $35.00. Leo Foley, K2SGH, 93-01 50th Ave., Elmhurst 73, N.Y. Tel. HA 4-6181.

G-E Progress Line walkie-talkie, 30-50 Mc., NBFM, spkr, fully transistorized rcvr, $330 on freq. or $310 less xtals. Pr. new Johnson citizen band units, 117V and 12V, latest models, coil cords, etc., $200. Used 1 hr. W9DSV, Box 261, Webster, Wis.

AMATEUR Radio and citizens radio equipment installed and serviced. Mystic Electronics, 119 New London Rd., Mystic, Conn.

THUNDERBOLT F/W f/b condition, $389. W4GMN, Box 371, Lebanon, Va.

WANTED: DX-100 and Valiant, regardless of condition. List condx and price. R. McLeod, Box 11, Hollins, Va.

FOR Sale: HT-32 excellent, $400. Paul Svetz, K1BJU, 88 Stanton Ave., Winsted, Conn.

WANTED: 0.5 cycle mechanical filter for Collins 75A4 rcvr. K4YVL.

SELL: Viking II, and Lysco 600, both good, $150 and $50 respectively. McGee, 58 Campus Dr., No. Buffalo 26, N.Y.

FOR Sale: Johnson Viking II transmitter, $125.00. In A-1 condx. W8AYS, 1564 Maple, Cleveland 21, Ohio.

SELL: Best offer. 432 QSTs, complete run Jan. 1925 thru Dec. 1960. All or minimum blocks of 5 consecutive years. 3 of older issues have cover missing. Also new PE-103A complete, Heath AM-1, GD-1B, B&W BCL turret. Used xtals, freq. std, with International Crystal Co. FO-1L and FMV-1. Lawson, W5ACL, 4010 River Drive, Houston 17, Texas.

COLLINS 75A4 receiver for sale, in mint condition. Joe Michaels, W2MNR, 80 Birch Lane, Woodmere, L.I., N.Y.

CONVERTED CRV Aircraft Receiver (200 kc-9 mc.), $30.00; new 10-meter Johnson Personal Messenger, $80.00. WA2QDJ, 525 Beech St., New Hyde Park, L.I., N.Y.

10-B, factory wired, QT-1, 458 VFO, like new, $140.00; SSB amplifier like "Little Firecracker", $45.00; 3" scope, $25.00; CREI Radio Course, complete, $25.00; VTVM, $15.00; Johnson low-pass filter, Variac, 100 Kc calibrator, code practice oscillator/key, 4½" 0-25 microammeter/case, 300 volt power supply, $7.00 each; 80 meter ARC5 rcvr, xmtr, B&W balun coils T17B and TS13F mikes, 11 crystals 40 & 80 meters, 14" high cabinet rack, $5.00 each; QSTs 1942-1954 inclusive, $25.00. Want 32S1, KWM1 or similar. A. Margolis, W2UPN, 196-43 69th Ave., Flushing 65, L.I., N.Y. Tel. OL 8-7419.

LEITZ Focomat enlarger and electric timer. Will trade for small transmitter, VFO and mike. Make offer. Schafer, 6726 Hendon Lane, Houston, Texas.

WANTED: Rider Channlyst, B&K television analyst; also need laboratory type electronic test equipment. Thos. Condon, 321 Moreland St., Staten Island 6, N.Y.C.

CLEANING House! 32V2, like new, $235.00; DX-100 Lynmar TRS 100B loading, $170; NC-300 with calibrator, $235.00; Heath MR-1, MT-1, MP-1 all-band antenna, $230.00; Amphenol Deluxe rotator, $50; tubes, parts, new or like new, 450Ts, 300Ts, 4-125s, 805s, 872s; Bud relay racks, cabinets, Add-A-Racks, enclosed meter panels, etc. Transformers, plate, bias, filament. Chokes. Variatrans. Thordarson, Stancor, UTC special series up to 1 KW. Modulation, 600W, 800 Ma. sec. Weston 301 meters, volt, Ma, RF thermo-couple, various ranges. B&W inductors, etc. 150W, 500W, 1000W. Many more items. Card for list. Your satisfaction desired. W8PIC, George, Oden, Michigan.

HALLICRAFTERS Model HA-1, T.O. keyer and Vibro-Key, $40.00. Also Vibroplex Blue Racer, chrome-plated bug, $10. WIMJD, Daniel F. Kelly, 1406 Mass. Ave., North Adams, Mass.

HAM Tube Specials: 6146, 6159, 6883 ur choice $2.47 ea. New, boxed, write for bargain sheet. Lou-Tronics, 131 Lawrence Street, Brooklyn 1, N.Y.

REAL Bargains: AF67, $95; PMR-6A, $50; PSR-12, $20; AF-67 mount, $5.00; PS2V, $25.00; coaxial relay, $5.00; PE-103, $8.00; MM Antenna, $15; Telrex rotator without control box, $40.00; KWM-1 mount and cable, $35.00; Globe-King 500-C, $500.00; HQ-129X, $100; B&W LPA-1 with LPAMU and LPS-1 power supply, $435.00. W3CAV, 29 Wine St., Uniontown, Penna.

WANT: 43-cycle vib. reed relay. W2RJ, West Milford, N.J.

FOR Sale: Johnson Pacemaker, Johnson Courier, Hammarlund HQ-150, all for $550. Will consider selling separately. Anybody want to trade a Volkswagen automobile for my rig? Call after 7 PM, CL2-3803. WA2DXV, Steve Starker, 1024 E. 12th St., Brooklyn 30, N.Y.

COMPLETE Station only: SX-71, Ranger plus 10-80 meter 380 watt plate modulated band switching pi-net final, antenna tuner, filter, SWR meter, trap doublet, 40 ft. telescoping mast; operating, 1st class condx $340.00. You pick up. K3KYC, 400 Poplar Road, Flourtown, Penna. (near Philly). VE 6-4529.

SELL Signal Corps receiver BC-342. Ham-converted with 9 extra metal tubes, good on 40 meters, $50.00. Arthur Blais, 5 Emerald Ave., Lawrence, Mass.

KWM-1 with AC power supply, in excellent physical and electrical condx, $575.00. Sol Myers, 1712 Crescent Dr., Pekin, Ill.

MUST Sell: G4ZU 20/40 mtr. Birdcage beam, never used, in original cartons. Landlord will not permit. Sacrifice for $49.00 or your best offer. Howard Shieber, K2UZT, 142-10 Hoover Ave., Jamaica 35, L.I., N.Y. Tel. JA 3-1656.

SELL: Heath DX-40 transmitter and VF-1 VFO, $65.00. Lyn Nall, K4TFP, 5659 Souchak Drive, West Palm Beach, Florida.

PREMIUM Quality used equipment. Over 1,000 units. Reconditioned with trial plan and full 90-day guarantee. Terms available. Write for free lists and top trade-in offer on your present equipment. World Radio Laboratories, Box 919, Council Bluffs, Iowa.

SELL Or swap. Old radio equipment, magazines, tubes, surplus gear, etc. All inquiries answered. Laverty, 118 N. Wycombe, Lansdowne, Penna.

FOR Sale: Hallicrafters SX-99 vy gud condx, $99.00. C. W. Bertschi, KØQVQ, 1220 S. 3rd, Atchison, Kans.

LAMPKIN 105B with ppm package, $225.00 or will trade for 2-way equipment. W4HFI, Lawrence Gooding, Rt. 1, Clarkton, N.C.

TUBES: 304TLs $20; 304TH $20; 250TH $12.50; 100TLS $6.00 W4WMX, 207 River Rd., Newport News, Va.

FOR Sale or trade: Central Elec. 100V & Hallicrafters SX101A. Looking for Collins S/Line or KWM2. Write W4AAB, 27 River Rd., Newport News, Va.

OLD Timer W5PE. Retiring from sea, 59 years old. Would like connection with organization that could use experience. Hold FCC 1st telegraph extra class ham, and U.S. Coast Guard Officers license. Shore experience includes 19 years world's largest radio company. Graduate Mulvay (Poor Richard), copy, layout, journalism. Could be assignments from coherers to tunnel diodes. Live on fabulous Gulf Coast, Galveston, Texas, be nice to hear from you. John P. Allen, W5PE, 2006 Avenue P, AR SK.

TRADE Or sell: 38 Mc. through 1000 Mc. receiver APR4 with tuning units, 8 Kc. mechanical filter, RTTY 2 to 3 Kc. Bandpass filters, toroids. W. Wessiund, WØDNW, 2801 Wright Ave., North Platte, Nebr.

ALMOST New Gonset G66B receiver with 3-way power supply, $185.00. Also, 6 meter Communicator III for $185.00. K5MBZ, Pete Williams, 2130 Hanover Drive, Waco, Texas.

SALE: 6-2-220 Mc. Tapetone converters, $42.00 each. Telrex, 29 EL, 220 Mc. long Yagi, and new 432 Mc. long Yagi, 220 Mc. Tecraft xmitr, new 432 Mc Centimeg xmtr, legal limit. Sell reasonable. W. Taylor, K2MLT, "Falcon", Hammondsport, N.Y.

SELL: KWS-1, perfect, $875; Fisher stereo tuner, $150.00; Bell 3030 stereo amp. and preamp., $100; Roberts 4-track stereo, $350.00; Concertone custom, professional, 5 heads, 10" reels 7½ and 15, carrying cases, $750.00. Everything like new. W3VDE.

SELL: Used 200V. Like new, $639.00. Organs & Electronics. Lockport, Ill.

BEGINNERS: Code bothering you? Now learned in one hour. New Method. Quick approach towards ham ticket. Used in Armed Services, Ham Radio, Scouting. "Ketchum's Hour Code Course", $1.00 postpaid. Guaranteed. Oaks Ketchum, 10125 Flora Vista, Bellflower, Calif.

SELL: Johnson TR switch Model 250-39 like new, $20.00. No trades! WA61FM. P.O. Box 244, Inverness, Calif.

WANTED: SP-44 Panadapter. All letters answered. B. A. Thunman, 71 Strawberry Hill Ave., Stamford, Conn.

WANTED To buy, Cheyenne transmitter. KØOTM. 1051 Kenmore, Kirkwood, Mo.

FOR Sale: E-Z Way GPRBS-50G crank down, tilt-over tower without ground post. Also Gonset 3220 beam, 3-el. Triband beam. Beam never fully assembled. Tower in vy good condx. Make offer. You must pick up. K2TWK, Robert E. Lee, 40 E. Palisade Blvd., Palisades Park, N.J. Tel. WI 4-8758.

SELL Or swap Berlant concertone 20/20 tape recorder for Central Electronics 600L. K9POU, 522 Park St., Batavia, Ill.

FOR Sale: Heathkits, DX-100, $150; RXL, $300; reflected power meter, $10; Q multiplier, $10; Balun coils, $5.00; Conelrad alarm, $10 and Vibroplex bug, $15; 1T30 mike, $10; NC98, $100; 1956 through 1959 CQs and QSTs at $3.00 per year. Richard Bedard, 15 Queen Street, Worcester, Mass.

SELL: 755 75S1 in mint condx, no mods; PMR6 mobile rcvr, perf. condx. WØAEP, 2723 B Ave., N.E., Cedar Rapids, Ia.

FOR Sale: Collins 75A4 with 3.1 filter and reduction knob for $450.00 F.o.b. George P. Rankin, W4BK, 920 Curry Drive, Macon, Ga.

GOING Homebrew, need parts. Therefore, offering for sale a complete 80-10 meter station in top condition. Instruction manuals included. SX-99, $109.00, K-49B speaker, $10. DX-40 VF-1 crystal mike, $88. And on package deal of all for $199. I will pay shipping in U.S.A. WA6JXH. Ric Hammond, Thacher School, Ojai, Calif.

CLEANING House; changed mind on linear. Have new Jennings UCS 375 1600V., new 4-1000A and blower. Pair used 4CX250B (Eimac) and air system sockets. Jennings UCSL 750 at 3000V. 4 used 4E27. Johnson 275 watt Matchbox, model 2 Micromatch. Model 19 keyboard. W5CNP, 1710 Laurel St., Jackson, Miss.

WANTED: Collins F455J31 filter. W. H. Kibbe, 2130 18th Ave., Monroe, Wisc.

SX-140 Factory wired rcvr. Pref. for Novice. Best offer or $80. WØDCB. 842½ 14th St., S.E., Cedar Rapids, Ia.

WANTED: Collins 75A4 state price, Serial No., filter; pick up 200 miles radius of Philly. Michaels, W3IGR, 241 Country Rd., Berwyn, Penna.

SELL: NC-109 factory aligned calibrated July '61. Two years old. WA2QKH.

TECHNICIANS: Now—a publication for and by Technicians. Send 25¢ for February issue. "The Technician," Box 465, Billings, Mont.

D-104 with G stand, $20.00; VFO, $10; milliammeters, RG-59/U, xtals, all $10.00. WA2OIM, 44 Parkway Road, Bronxville, N.Y. Tel. WO 1-5188.

SALE: Viking I, $115.00: SX-99, $90; 6146 60-watt Novice rig, $28.00; 75-watt Elmac mobile, $65.00; (w/pwr. supp., $75.00); 120-watt dual 807 phone rig, $65.00; 350-volt Mallory Vibrapack, $14.00; 600-volt Mallory dual Vibrapack, $22.00. Dave Austin, Box 269, Hamilton, N.Y.

SELL: Tape recorder, Geiger counter, diving equipment, cap VHF mobile, 2-meter FM gear, ARR-5 aircraft receiver, Wilcox crystal controlled VHF tower receivers, meters, old magazines, new recording tape (Audiotape), etc. Preparing to move and must sell out. Send for list or take 10% off old list prices. Need BC-639 or other VHF receiver, aircraft radio equipment. Dave Hale, W9RBX, 635 S. 21st Ave., Maywood, Illinois.

SELL: Superior Electric Type F1126 0-135V, 15 amp., 2 KVA auto-transformers. In exc. condx. Best offer. Ralph Moorhouse, W9DCG, Murdock, Illinois.

FOR Sale: Hy-Lite 15-meter beam, $30.00; TR2 (CDR) rotator, $15.00; new 1/2KVA Autoformer (BC191 supply), $15.00; RCA modulation xfmr, 550 mil, 80 mil screen winding, best offer. Clarence Crist, 14 Jameson Rd., Newton 58, Mass.

SELL: HQ-110, $170, new April '58, retubed May '61. K3GZK, 211 Crafton Rd., Bel Air, Md.

SELL: Heath Seneca, 6 & 2 meters, like new, $150; Globe Hi-Bander 6 & 2 meters, $80; Transcon transistor pwr. supplies: 300/150V 30 watt, $20; 600/300V 60 watt, $30.00. Deliver local. Phone HA 6-5331, Marietta, Penna. K3QAX.

FOR Sale: HQ-100. Perfect condition: $125.00. Rev. Sylvester Benack, 72-22 68th St., Brooklyn. Tel. VAndyke 1-2323.

STOP—Read—Write, homebrewers needing parts for power supplies, linears or finals. Send stamp for list. Have like new components. Bargain prices. Sell or trade for gear I need. W7HNV, 3113 Rocky Point Road, Bremerton, Washington.

WANTED: Collins 500 cycle filter for 75A-4. W1LCJ, William Page, 195 Lestertown Rd., Groton, Conn.

FOR Sale: Heath general purpose 3" 'scope, 10-21 wired and tested, excellent with manual, $52.00. W2EPZ, 80-44 259th St., Floral Park, N.Y.

A-1 RECONDITIONED equipment. On approval. Trades. Terms. Hallicrafters S-85 $79.00, SX-99 $99.00, SX-100 $199.00. SX-111 $199.00. SX-101A $299.00. HT-32, HT-37; Hammarlund HQ-100 $129.00. HQ-129 $129.00. HQ-110 $179.00. HQ-150 $199.00. HQ-160 $259.00. HQ-170 $289.00; National NC-183D $199.00. HRO-60 $345.00; Gonset G-50 $229.00; Central 20A $149.00. Viking II $159.00. Valiant $279.00; Thunderbolt linear $299.00. Collins 75S-1, 32S-1, 32V-1, 32V-3, 75A-4, KWM-2; Elmac, Globe, Gonset, Heath, Johnson, RME, other items. List free. Henry Radio Company, Butler, Missouri.

WANTED: Commercial or surplus aviation and ground transmitters, receivers, test sets. 18S, 17L, 51R, 618S, GRC, PRC, ARN14, MN85, Bendix, Collins, others. RITCO, Box 156, Annandale, Virginia.

SELL: NC-98 receiver, $78; Superior Model TV-50 genometer, $23.00; Heathkit T-4 sig. tracer, $14.00; BC-454 receiver with AC supply, $15.00; Johnson 250-39 T-R switch, $14.00; Heathkit AF-1 freq. meter, $17.00; Century FC-2 tube-tester, $25.00; RBL 15-600 Kc receiver, $30.00; Heathkit AT-1 transmitter, $17.00; new TV horiz. transf. Rogers No. EFR 90, 92, 98, 125, 132, 155, 179, 185, 186, 187. Ram No. 36, 45, 53, 72, 74, 77, 82, 86, X-131 $3.50 each, cost near $8.00. Robert Ireland, Pleasant Valley, N.Y.

SURPLUS. Have two new Navy 243 Mc transmitters. May be used directly on 220 Mc. just add xtal and retune or may be converted to 2 meters. Conversion supplied. One $13.95, both for $27.00. Postpaid. K2UNY. Richard S. Mead, RD #1, Owego, N.Y.

NC-98, $85.00; Viking II and 122 VFO, $165.00. F. W. K8DOR, Rawson, Ohio.

SALE: 75A1, in excellent condx. $200.00. W9PIO, Columbia, Ill.

WANTED: Merchant marine type LF receiver 15 to 550 KCS Radiomarine or Mackay. W3KWO, 542 S. Oakland, Sharon, Penna.

MODEL #15 RTTY complete, perfect operating condition. Bob Waters, WN8AXR, 14517 Oxford, Plymouth, Michigan.

SELL: New Telrex 10 meter 309B beam, $25.00: 2 large new 110 volt selsyns, $15.00; pair 400 cycle small selsyns Type SNJ, $10; Babcock Radio control xmttr and receiver with batteries, $35.00. D-104 mike, $13.00. Electro-Voice Mod. 950 mike and stand, $20.00. Electro-Voice Century Model 715 mike with Stand, $5.00. 2 vacuum condensers, new 20,000 volt $10.00 each. Complete files QST and CQ 1947 through 1960, $1.00 per year. K3MVP, 82MVP, 8258 Brittany Place, Pittsburgh 37, Penna.

GOT Collins for Xmas. Selling professionally wired SB10, $75.00. Apache, $225.00. W2ICW, Schickler, 1618 163rd St., Whitestone 57, N.Y. Tel. FL 7-7146.

KWS-1 excellent condx, electrically and mechanically with 4CX250Bs in final. Complete with cables and antenna relay for $900.00. Eric Johnson, W1RKA, 45 Maple St., Norwalk, Conn.

COLLINS 70E-8 PTO, on aluminum panel, AOK condition and calibrated, first check over $35.00 gets it postpaid. Gariepy, K9HHA, 2624 Kroemer, Ft. Wayne, Ind.

SELL: 4-400A, $15.00 with socket; filament xfrmers 5V., 13A, $3.50. K2EGI, 5 Stratford Pl., Babylon, L.I., N.Y.

Mechanical filters: Used surplus units each containing a 300 Kc. mechanical filter, band-pass about 3 kc. 6 IF coils; about 75 resistors; lots of silver micas and ceramics. Circuit of filter included. $12.50 each postpaid. W. R. Selden, 4021 W. Broad St., Richmond, Va.

HQ-170C, and matching speaker, like new condx, only $275.00. Fred Wiedenroth, Madison Lake, Minn.

MORROW 5BR1 all-band mobile converter, noise limiter, antenna mount, loading coils, 500V 200 Ma. dynamotor, $35.00; SCR522 xmttr, $18; Eimac 304TL, $12.50; Vibroplex Deluxe key, $15; prop pitch motor, $35.00. E. Pyle, 120 Appleton St., Cambridge, Mass.

FOR Sale: New Eimac 4-1000A with factory warranty, $65.00; TR-4 rotator, $20.00; Turner 33-X mike, $10; Millen Model 90651 grid dip meter, all coils and probe, $25.00; Cesco Reflectometer Model CM-52, complete, $22.50. All items like new. Henry Martin, Box 1275, Bluefield, W. Va.

TRADE: Collins 51J3 rcvr in excellent condition with 3.1 mech. filter for KWM2. Frank Juns, Jr., KØIIE, 2941 Westover Dr., Wichita, Kans.

COLLINS 75A-3, immaculate, $315. W8WGA, 3451 Ridge Ave., Dayton 14, Ohio.

SALE: Eico 720 transmitter with xtals, six months old, in excint condx. Sperber: 186-38 Radnor Rd., Jamaica, L.I. N.Y.C.

SILICON Rectifiers, axial leads, 0.5 amps., 400 PIV 59¢, 600 PIV 79¢; 800 PIV 99¢ plus postage. General Electronic Specialties, Box 1821-Q, Idaho Falls, Idaho.

GONSET Super Twelve, Perfect, used only few hours. College must sell. $59.00. I'll even pay shipping. KN4NTK, 226 Payne, Auburn, Alabama.

TOROIDS: 88 mhy with mounting hardware. Uncased, like new. Information sheet included. $1.00. 5/$4.00 postpaid. KCM, Box 88, Milwaukee 13, Wis.

LICENSE Renewal Reminder service. Don't let your ticket expire. Two-bits brings you renewal reminder sixty days before expiration. Register now. Attach twenty-five cents QSL card, print date license expires. Address Automatic Reminder Service, Box 1461, Evanston, Ill.

DX20 in good condition. Almost new. $20.00. Frank Kolarich, 5575 Jefferson Pl., Gary, Ind.

OFF To school, must sell: HQ-110, $150.00; Apache, $175.00, both are in excellent condition. No scratches, no modifications. K9MWI, 206 Aradia, Terre Haute, Ind.

SELL: 500 watt modulation transformer, $10.00; want Harvey-Wells TBS-50-C or D, Millen 90881, Teletype Model 19 metal table, 0-5B/FR, 0-5C/FR, Gonset 3-30; swap "Hi-Fi" items. W4NZY, 119 North Birchwood Ave., Louisville 6, Kentucky.

SELL: Drake 2B, $250; HT-40, $85, both perfect condition and purchased only recently. Cubex Tri-band quad with new spreaders, $38.00. K5LTV, 3516 West Ohio Ave., Midland, Texas.

SX-71, $95; vy gud condx, but doesn't work on 6 meters. Will consider trading down for a xmttr. K9YTR, Ben, 110 Hilltop, Columbia City, Ind.

HAM Kits, change x-tal frequency, including plated type. Safe method, ammonium bi-floride, containers, holders, instructions, $1.00. 5 element 2-meter beam, 9db gain coax or twin-lead feed aluminum complete, $3.00. Shipped postpaid Ham Kits, Box 175, Cranford, N.J.

"HORSE-TRADER"—Ed Moory, will not be Undersold; Bargains! Used Equipment & Guaranteed—HT-37, $329.00; Drake 2-B, $219.00; 75A-4, $498.00; 200-V, $639.00; 100-V, $479.00; KWM-2, $879.00; 20-A, $149.00; NC-173, $89.00 75A-3, Like New $359.00; 32V-3, $289.00; 30L-1, $389.00; Factory Reconditioned Thunderbolt, $389.00; Johnson Viking Valiant $279.00; GSB 101 Linear, $249.00; 30S-1 Linear $975.00; Wanted Clean 51J-3's & 51J-4's? SX-115 Used 2 Hours $459.00; HT-32B—Demonstrator $475.00; Immediate Delivery, 75A-3's & HT-41's; Terms: Cash; Ed Moory Wholesale Radio, Box 506, DeWitt, Arkansas. Phone—Whitney 6-2820.

SELL: Hammarlund Super Pro-200, 1250 kc. -40 mc. with pwr. supply, Bud xtal calibrator, and transistor Q-multiplier. Exc. condx. $125.00. WA2CWX, 158 Park Ave., Freeport, N.Y.

KWS1, $900; serial 479, all mods factory installed. Price includes many spares. Jeannette LaFantasie, K6GFH, 12946 Alexander, Sylmar, Calif. Tel. EM 1-2331.

FOR Sale: SX-111, original carton, manual, guaranteed, $195.00. Lettine 240, Heath VFO, coils/all bands, $60.00. R-46 speaker, $15.00. F.o.b. K1UAR/WØBIG, 3 White Road, Wayland, Mass. ELmwood 8-2036.

75S-2 Collins extended tuning range receiver. Complete, new, never used. $450.00. S. Wolf, 3 Lawrence Lane, Lexington, Mass.

W9UDD has retired and 40 years of much prized QSTs take up too much room for our new mobile home. In QST binders: 1922, except January and March; 1923 thru 1932. Separate copies: 1933 thru 1946. Some duplicates in run after 1938. Will take $250.00 or make offer. Or stereo units or kits. Will prepay truck shipping charges within 1000 miles or will pay half anywhere in U.S.A. Fred Haneline, W9UDD, 4811 Forest Ave., Ft. Wayne, Ind.

RECEIVERS for sale: NC-109 in perf. condx, original carton, with Heath Q-multiplier, $110.00; Hallicrafters S85 with Heath Q-multiplier, in good condx, $60.00; Heath AR-3, in perf. condx, $20.00. Robert Widmaier, K3JOP, 1711 Rockvale Rd., Lancaster, Penna.

FOR Sale: Collins 32V2 with manual, and late factory modifications, new 4D32. No scratches, $250; B&W Single sideband generator w/manual. Recently aligned and in perf. condx, $150.00. Both for $375.00. Cashier's check or M.O. Will ship truck prepaid. R. B. Ricketts, W9AMV, 6448 Broadway, Indianapolis, Ind.

VIKING Invader, in mint condx, original packing, $525.00. SX-101A, like new, $300. Cush Craft Triband vertical, $18.00. WA2OBZ, 3 Pryer Place, New Rochelle, N.Y. Phone NE 2-7450.

WANTED: Crosby Model 67A SSB converter. H. T. Cervantes, W2DB, 190 Croton Ave., Mt. Kisco, N.Y.

HQ-170, new in factory-sealed carton. Sacrifice for best cash offer. Durham Ipock, K8VWJ, Williamson, W. Va., Tel. BEImont 5-5088.

HALLICRAFTERS SX-101A with R48 speaker, used 20 hours, $310.00; Heath TX-1 Apache with S-200 mike, $190. W1UYU, 495 Water St., Framingham, Mass. 877-2755.

QSTS wanted, 1915 to 1922. Sell QSTs 1923 up. Bird 81-B 80 watt load, $25.00. Eddystone 888A rcvr, $400. W2DYU, 36 New Lawn Ave., Kearny, N.J.

VIBROPLEX Original key, in gud condx, $12.00. Ham Kits dummy load 200 watt, $5.00. W2UYH, 12 Bright Wood Ave., Pearl River, N.Y.

FOR Sale: Heath DX-100B with crystal microphone and Vibroplex Original standard bug. All in gud condx, $185.00 shipped collect. K5WYF, 5716 Chaparral Cr., N.W., Albuquerque, N.M.

WANTED: Mech. filters 75A4 .5 or .8 & 6 Kc. Vibroplex bug, Super Six or 12 converter, 10-meter ground plane, LP filter, 811 driver xfrmr; sell or swap: Mosley 10,15,20 vertical, $12.00. Turret sig. shifter, $20.00. Cathode modulator, $5.00. F.o.b. K1PNS, 24 Rockwood Dr., Waterford, Conn.

TRADE Viking II, NC-300, VFO, extras for 75A4. W2WLZ.

COLLEGE Bound! Factory wired: Johnson Challenger, $100; 6N2 VFO, $25.00 Tecraft 6M converter, $25.00; HBR-16 receiver (QST, Oct. 1959). Beautiful wiring job, $125.00. K9RBX/9. 1649 No. Farwell, Milwaukee, Wis.

WANTED: One or more 10 ft. sections Rohn #20 tower. W5LC1, Box 195, Wynne, Ark.

GLOBE Champion, 350A, in gud condx, less than 16 months old, $310.00. Will deliver within 30 miles, or F.o.b. Jim Russell, WA2OFK, 596 Rutland, W. Englewood, N.J.

APACHE. Clean, $200. K2CQG, 2514 Crompond Road, Yorktown Heights, N.Y.

WILL Trade 1960 Mercury 700 outboard and 1960 Thompson 17 ft. Sea Lancer with coupe top, side curtains, rear cover, full length cover, rear seat, de luxe cushions, tachometer, speedometer, etc. like new, total 38 hours use since new last July. Will trade for S Line equipment or equivalent. No duty payable on merchandise returning to USA. Write VE2ZO, 36 Birch Hill Road, Baie d'Udfe, Montreal, Que. P., Canada. Phone GLendale 3-6542.

COLLINS 75A-4 receiver, original owner selling with speaker, vernier tuning knob, 3.1 kc. filter. Serial No. 3653. In exclnt condx, $550.00. Kenneth H. Engstrom, W5CUM, 833 Oak Forest Dr., Dallas 32, Texas.

HRO-60 with matching speaker and coils A, AC, B, C and D. $300.00. K5AON, 867 Berkinshire, Dallas, Texas. Tel. DAvis 7-2200.

FOR Sale: 100V transmitter, used vy little, gud as new. $525.00. Best of references. Will ship in original case. Basil McGinty, W4ZS, River View, Alabama.

SELL: HT-32A, like new, with original carton, $425.00. F.o.b. shipping point. K1MMU, 30 Granaston Lane, Darien, Conn.

CRYSTALS Airmailed: SSB, MARS, Novice, Net, CD, 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. 20.001 to 30.000 $2.25. Overtones above 10 mc. Fundamental 10 to 13 Mc. $2.95. Add 50¢ each for .005%. Add 65¢ for HC-6/u hermetics. Special, FT-241-A 500 Kc. standards $1.50 with circuit. QST: Packaged crystals: "SB Package" June 1958: Sectionalized Receiver, October 1961; Either set (Five FT-243) $9.95, hermetics $13.95. Matched filter "SSB Package" $7.95.—also other project crystals and sets, write, Airmailing 9¢ per crystal, surface 5¢. Crystals since 1933. C-W Crystals, Box 2065-Q, El Monte, Calif.

COLLINS 75A1, in exclnt condx., matching speaker, $225.00; Apache, only year old, perfect, $225.00. Ron Adams, K8QEJ, 215 Franklin Ave., Cuyahoga Falls, Ohio.

FOR Sale: Heath Sixer used only few hours. $50.00. Must sell for college expenses. Jim Wilson, 204 Prather Hall, Austin 18, Texas.

WANTED: Modulation xfrmr for Meissner 150-B, match 811s to 813. K1TIJ, 415 Main St., South Grafton, Mass.

SELL: 75A4 with 3.1 filter, serial 5776 like new, original carton, $595.00. .5 filter $45.00; 2.1 filter, $35.00; Louis Fischman, 1725 Andrews Ave., Bronx 53, N.Y.

COLLINS 75A1, exclnt, $225; Collins 310B1, $140.00; CQ Dec. 1946-July 1956, $6.00; QST 1947-1961, $7.00; also 250THs, 4-125As, pwr. supplies, B&W HD coils, etc. Send for list. Horace Goss, W1AB, RFD 1, Essex, Conn.

WANTED: Central Electronics MM-2 analyzer with 455 Kc adapter, also 500 cycle mechanical filter F 455 J-05 for 75A4. Fair price. Dick Zucker, K2CR, DAvis 7-2208. Overbrook Rd., Upper Saddle River, N.J.

ELMAC AF-67, $90.00; Elmac PMR-6, $50. Gerard Moor, 375 Richmond, Providence, R.I.

HQ-150, $195. Needs new bandspread dial, otherwise perfect, need money for college. NE 7-9687, K1AJO, DeWitt, 14 Crescent Rd., Riverside, Conn.

HEATHKIT Mohican, painstakingly assembled. Best offer over $100. You pay shipping. WV2RRV, 813 Sanders Ave., Scotia 2, N.Y. Tel. DI 6-1067.

KWS-1, $950.00; 75A4, $450; HT-33A, new PL-172, $450.00; SX-111, $195. Peter Chowka, 10 Mansfield Place, Darien, Conn. Phone OL-5-4570.

APS 10 radar complete with all plugs and tech. manual, this is X band, 360° scan P.P. I suitable for marine use. Trade for 75A4 or cash. Ray Krause, K8VWK, 1200 Hampton, Grosse Pointe 36, Michigan.

HALLICRAFTERS, Model HT-32A transmitter/exciter: ultimate in design of self-contained transmitting equipment. Like new, one owner only, for sale, going to highest bidder f.o.b. St. Louis. Francis Beckwith, 10104 Niblic Drive, St. Louis 14, Mo.

CLEANING Shack: Preselector, DB-22, $6.00; GF-11 40-80 meter xmttr, mobile, $15.00; three 15 Mc. IF strips, $1.00 each. Webcor wire recorder, $22.50. Send stamp for list. K6KGB, 1441 65th Ave., Sacramento 22, Calif.

MUST Sell! Owner died, SX-71 receiver, used vy little. In excellent condx. Tunes 6 to 80 meters on 5 bands. $110.00 Wm. Ray, 36 Cortland St., West Hartford, Conn.

SELL: NC-173, $110.00; 6N2 converter, 26-30 Mc. IF, $55.00; HRO-M, modified, 9 coils, speaker, pwr. supply, $70.00. Ken Akin, K3DNO, 7413 Oak Lane, Chevy Chase 15, Md.

COLLINS 30S-1, used vy little, $995.00. Reason for selling: other hobbies need money too. Can be seen or heard by contacting Norman Smith, RR 1, Town Farm Rd., New Milford, Conn. EL 4-5460.

MUST Sacrifice Collins 75S-1, new condx, $345.00; Gonset Communicator Iv 2 mtrs, perf., $245.00; B&W L1000A pwr. supp., 3000v., at 500 Ma., $85.00. W1WNY, John Ashton, 12 Top O'Hill Rd., Darien, Conn. Tel. DAvis 5-2125.

SALE: HT-37 like new, original cartons, $360.00. Electro-Voice microphone #636 with Atlas floor stand, $35.00; Heathkit antenna impedance meter, $15. J. R. Perciful, W4PDC, Med. Arts Bldg., Louisville 17, Ky.

NC-188, exc., $75.00; SX-110, $85; KW Matchbox with built-in Heath reflected power meter, $85; Heath Q-multiplier $5.00; Millen antenna matching preamplifier with coils for 10 and 20, $5.00. Will ship collect. K3JHG, 2789 Highland Ave., Broomall, Penna. Tel: EL 6-0822.

FOR Sale: All transformers and filters from a dismantled 1 KW. Commercial, police transmitter. One 250TH included. Power supply for final mounted on panel for rack mounting. Beautiful equipment, $125.00. You pay freight. Ed Ballentine, 15361 Sprenger, East Detroit, Mich. W8PDZ.

SACRIFICE: Beautiful 813 KW, new parts and tubes, 80-10. Pwr. supply available. $110. Globe Chief 90, good, $30.00. K8EHD, 712 E. Sandusky, Findlay, Ohio.

SELL: HQ-180C, $310.00; Panadaptor SP-44, $45.00; Super Pro 400SX7, $150.00; HT31 linear, $125.00; PMR7 wps 6-12V, $95.00; AF67 wps (transistor), $135.00; Millen final tubes and coils, $45.00; Millen Deluxe VFO, $50.00; cleaning house. Send stamped envelope for list. J. B. Forman, P.O. Box 1032, Grand Central Stn., New York 17, N.Y.

HALLICRAFTERS SX-101A receiver. Like new and perf. condx. $295.00 or best offer. K9OYB, Phil, 306 N. Seminole, Ft. Wayne, Ind.

Index of Advertisers

DOC AULWURM, W6BBC, maintains contact with other Raytheon field engineers and headquarters staff personnel from his Piedmont, California home.

FIELD ENGINEERING WITH A FUTURE

Doc Aulwurm and his "traveling" ham rig

Arthur (Doc) C. Aulwurm, Senior Field Engineer, and his compact ham rig have traveled the world working on a wide variety of challenging assignments for Raytheon. Doc's story is highly typical of the Raytheon Field Engineer.

Since Doc joined Submarine Signal Company (a predecessor of the present Raytheon organization) in 1945, he has tackled specialized tasks in Karachi, Pakistan; Lakehurst, N. J.; and San Diego, California, among other places.

Doc is now working on sonar equipment at Mare Island Naval Shipyard, California. Future assignments may carry him to other parts of the world or to headquarters in Massachusetts.

Perhaps you too can qualify for a Raytheon field engineering future. Requirements are previous experience plus an E.E. degree or equivalent in practical know-how in guided missiles, fire control, ground and bombing radar or sonar.

Benefits: attractive salary, insurance, educational programs, relocation assistance, opportunity for advancement. For details, forward your resume to Ronald Guittarr, Electronic Services Division, Raytheon, Northwest Industrial Park, Burlington, Massachusetts.

RAYTHEON

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ELECTRONIC SERVICES DIVISION

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LPA-1 Linear Amplifier..... $219.00
5100 B Transmitter..... 269.00
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GC-1 Gated Compression Amp..... 39.00

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75A-2 Receiver..... 299.00
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312B-3 Speaker..... 25.00

Drake
2-A Receiver..... 229.00

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730 Mod. with cover..... 49.00

Elmac
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King (old model w/V70D's. 149.00
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Hallicrafters
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HT-32A SSB Exciter..... 449.00
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S-85 Receiver..... 79.00
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Knight
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V-44 VFO..... 19.95
C-11 CB Transceiver..... 25.00

Lakeshore
Phasemaster IIA SSB Exciter Brand new; closeout price. 229.50
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Lincoln
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Morrow
MBR-5 Receiver..... 75.00
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NC-183D Receiver..... 195.00
NC-183 Receiver..... 159.00
NC-66 3-Way Portable Receiver..... 49.00
HRO-50T Receiver..... 229.00

Pierson
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P & H
LA-400C Linear Amplifier.... 169.00

RME
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HF-10/20 (10-15-20 Meter) Converter..... 39.00

NO MONEY DOWN on Allied's New Credit Fund Plan—gives you up to 50% more buying power—up to 24 months to pay!

15-DAY FREE TRIAL: Try any of this equipment under your own conditions; if in 15 days you're not completely satisfied, return it for full refund, less only transportation costs.

90-DAY WARRANTY: Allied Reconditioned equipment is covered by the same 90-day warranty against defects in material or workmanship which covers brand-new equipment.

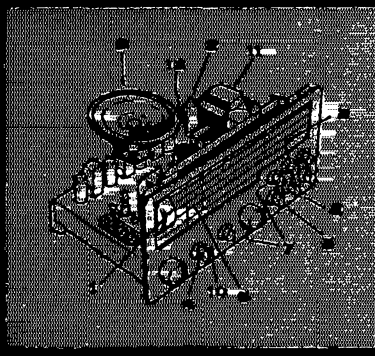
SELECT YOUR NEW GEAR from our complete 1962 444-page value-packed catalog. If you haven't a copy, write for it today.

IMPORTANT: Some items above are one of a kind...all items are subject to prior sale...send deposit to hold any item.

For reconditioned or new equipment, write to Don Koby, W9VHI, or stop in and meet Joe Huffman, W9BHD; Joe Gizzi, W9HLA; John Chass, K9LOK; Tasker Day, W9QBB. In Milwaukee: Lowell Warshawsky, W9NGV.

ALLIED RADIO
100 N. Western Ave. Dept. 15-A2 Chicago 80, Ill.

National's new, low-priced NC-105



1 Large illuminated edge reading "S" meter operates on all modes
2 Exclusive National peaking Q multiplier works on CW as well as AM
3 Separate product detector/BFO for CW and SSB reception
4 Continuous coverage from 550 KC to 30 MC in four bands
5 Automatic gain control operates for all modes of reception including CW and SSB
6 Bandspread calibration charts included for all popular amateur and foreign broadcast bands.
7 Separate RF and audio gain controls
8 Famous distortion-free National noise limiter
9 Built-in 5" speaker
10 Front panel headphone jack
11 Full wave transformer power supply
12 Exclusive tuner output

All the Features You Want and Need!

Very few beginners want to invest two or three hundred dollars in a first receiver. The choice has always been to spend either that much, or compromise on second-hand or inadequate equipment. Now, National gives you a new and better choice — a feature-packed, top quality receiver at only $119.95!

Look over the chart at the right. Have you ever seen so many advanced features at such a remarkable price? These are features the novice wants and needs. For example...exclusive National Q multiplier circuitry operates on CW as well as AM . . . where it's really needed. There are separate RF and audio gain controls. AGC works in all modes of operation!

Only National, with 47 years experience in the specialized design and manufacture of fine quality receivers could bring you gear like the new NC-105. If you are looking for an exceptional receiver at a modest price, ask your dealer for a demonstration. $119.95 in functional steel cabinet.*

Also available at $139.95 in hand-rubbed oiled walnut for living room or den.*

National Radio Company, Inc.
Melrose 76, Mass.
A Wholly Owned Subsidiary of National Company, Inc.
Export: Ad Auriema Inc., 85 Broad St., N. Y. C.
Canada: Tri-Tel Assoc. Ltd., 81 Sheppard Ave. W., Willowdale, Ontario

Q-01

Rush me complete details on your new NC-105

Name.....

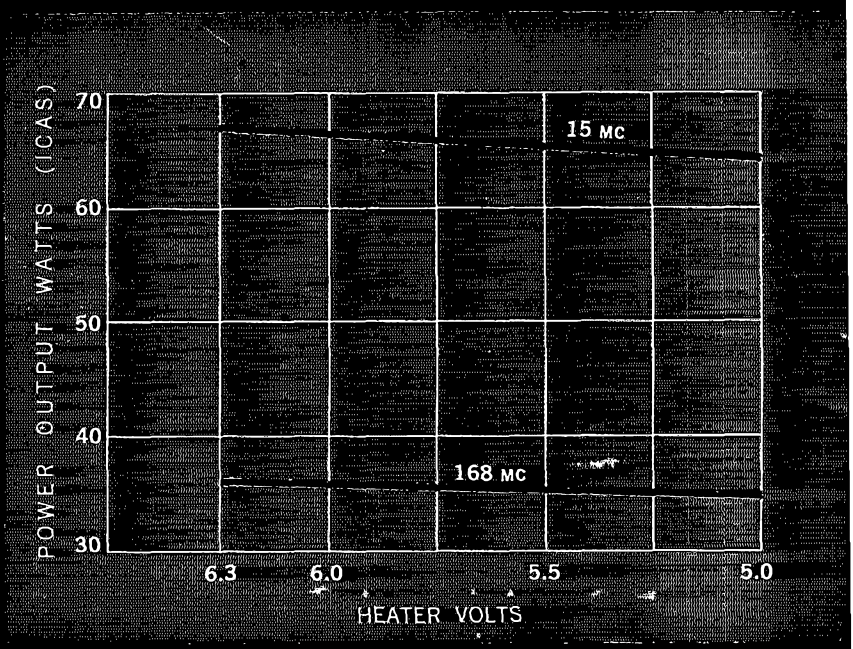
Address.....

City.....State.....

*Slightly higher west of Rockies and outside U.S.A.

designed specifically for the novice!

RCA-6146— FOR OUTSTANDING MOBILE OPERATION—
MEETS THE SAME PERFORMANCE REQUIREMENTS AS THE 6146A



Performance of typical RCA-6146 at 15 Mc and 168 Mc as heater voltage drops

RCA-6146—90 watts CW input up to 60 Mc; 67.5 watts AM

The RCA-6146 Closely Maintains Power Output— When Heater Voltage Drops

The original RCA-6146 design stands out. Here's a beam power tube that closely maintains power output even at maximum capability —when heater voltage drops. Look at the chart. At 5 volts, the drop-off is about 1 watt! The RCA-6146 does this easily—not only at 15 Mc, but also at 168 Mc.

You can be assured of top tube performance in mobile operation with the world famous RCA-6146. Specify the RCA-6146, or its companion types: the 12.6-volt heater version, RCA-6883; or the 26.5-volt heater version, RCA-6159. Order directly from your RCA Industrial Tube Distributor. A technical bulletin is available by writing Section A-37-M, Commercial Engineering, RCA Electron Tube Division, Harrison, New Jersey.

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