

QST



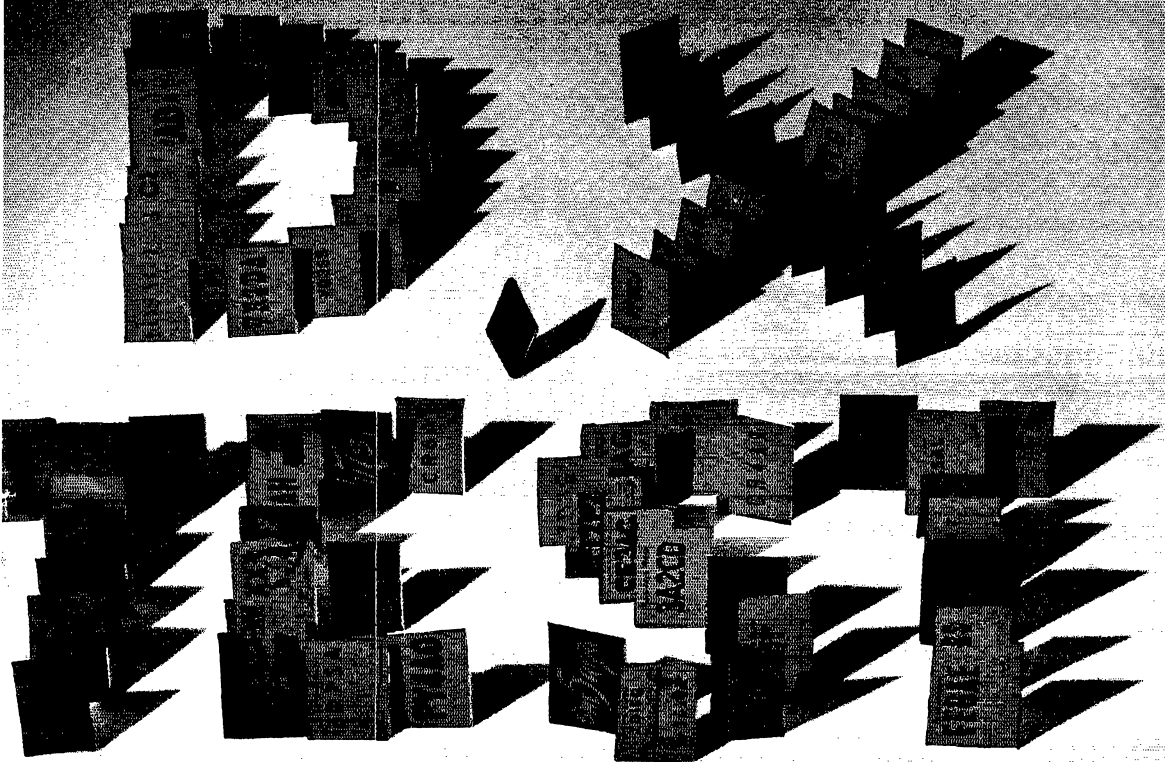
February 1960

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amateur radio



**The new ideas in communications
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helicrafters



Quality in communications equipment is built in three stages. First: *Imaginative design*. Second: *Uncompromising craftsmanship*. Finally—*positive proof of performance*. In the quarter-century since we manufactured our first receiver, the name Hallicrafters has earned a world-wide reputation for creative engineering. Behind that reputation is a story, little known and unpublicized, of quality control and performance evaluation unequalled in the industry. Here is where dependability is proven in advance, where the test of time is met *before the equipment leaves our factory* . . .

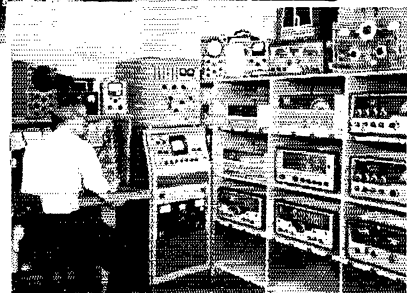
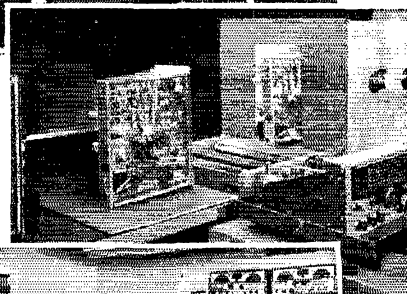
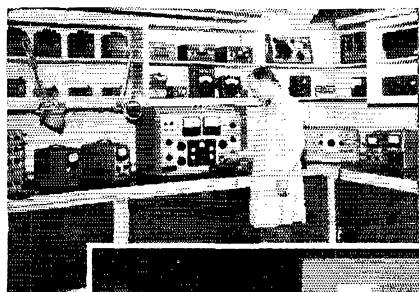
. where the test of time is only part of the story

Quality begins with quality components. Periodic samples of *more than 28,000 parts* are subjected to 100% inspection, rejected if exacting specifications are not met. Thousands of testing procedures are used in this department! Even the laboratory instruments used in our quality control and production procedures are calibrated periodically against the finest known standard devices in our Calibration Laboratory.

Why we shake and bake them. Extra care pays off in the long run. We virtually eliminate two common sources of trouble with the unusual procedures shown here. Loose or faulty connections are detected on the shake table. Later, assembled units ride smoothly through an oven—where heat far in excess of normal operation actually relaxes and equalizes tensions on all components to insure long term frequency stability.

Measuring VFO frequency drift vs. temperature is the sole function of this entire department. For more than four years, every HT-32 VFO has been subjected to this exacting and critical procedure. Units are placed in oven (center), and frequency drift is automatically plotted over a temperature range from 86° to 175° F. The slightest deviation from standard means rejection. Here's one of many reasons why Hallicrafters transmitters are famous for stability.

Worked for a lifetime in 30 days! In this department samples of daily production are measured against engineering standards by every conceivable operation check—for selectivity, sensitivity, alignment, hum and noise, distortion products, power, etc. Here too is another proving ground for Hallicrafters durability—continuous life tests where equipment is operated at full power for extended periods. These and many other test procedures we've developed over the past 26 years are your guarantee that the new ideas born at Hallicrafters are *proven ideas*.



We'd like to show you the complete story. Won't you drop in next time you're in the neighborhood, Monday through Friday, 8:30 to 5:00 PM?

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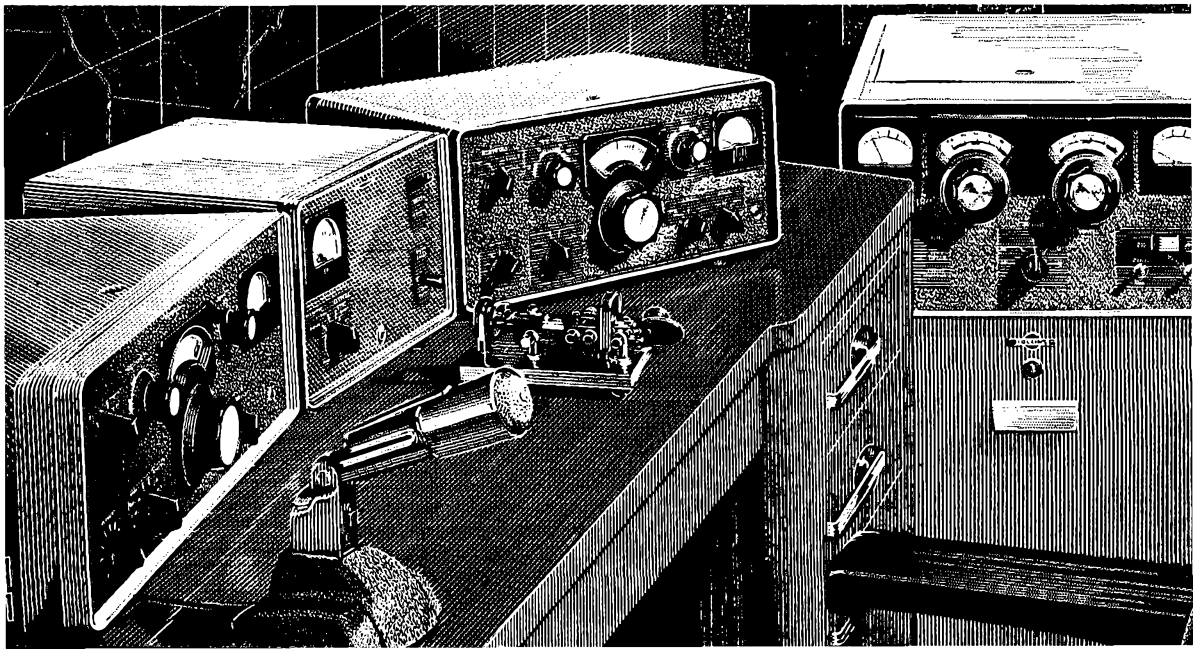
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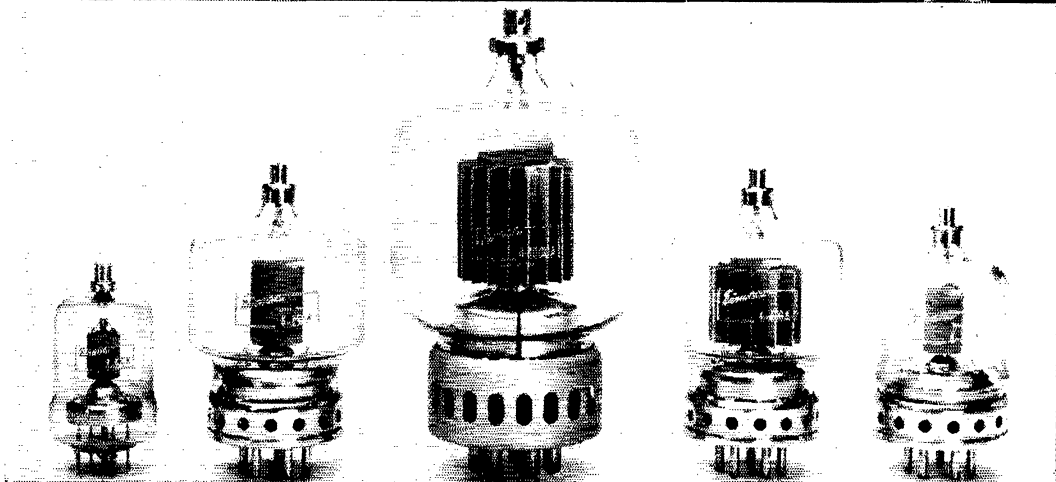
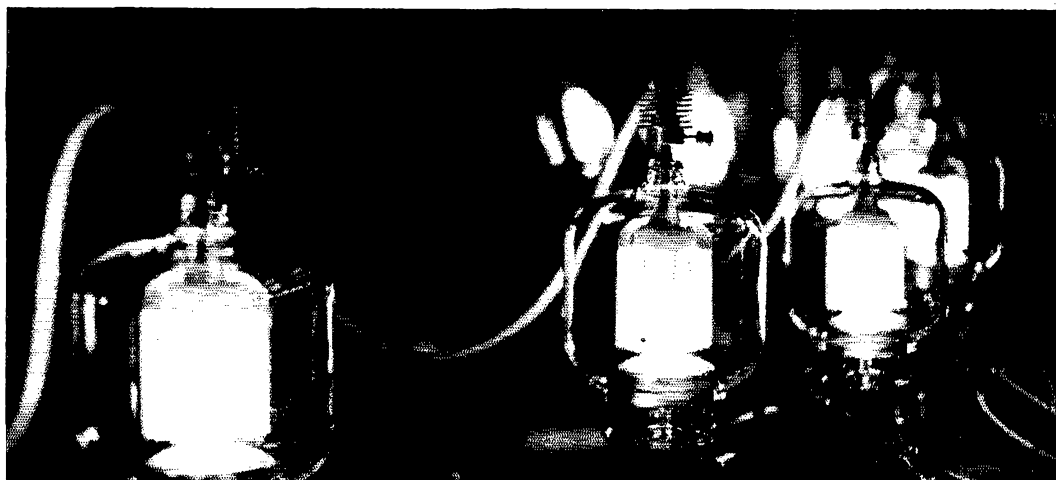
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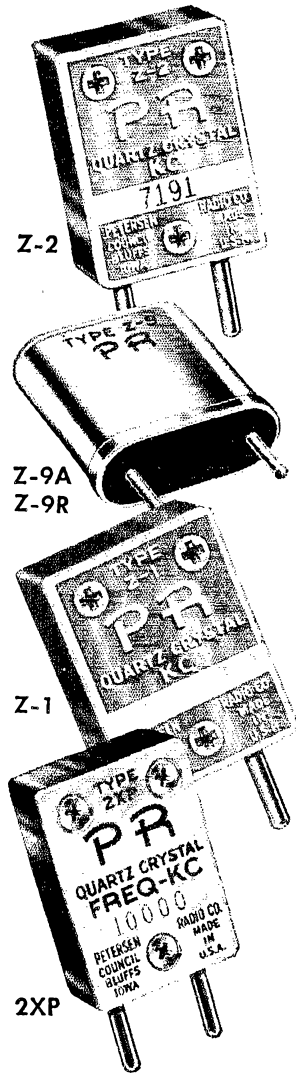
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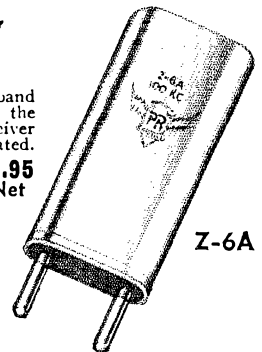
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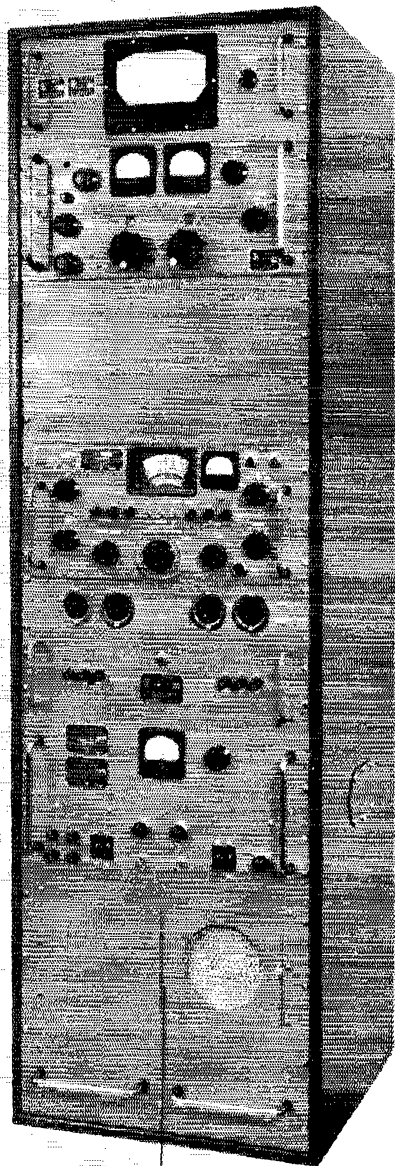
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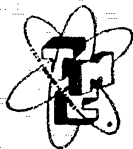
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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the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

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

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

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

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"It Seems to Us..."

BREAD-AND-BUTTER PUBLICITY

What do you read in the papers? Well, during just five days in December, Americans from coast to coast were reading community newspaper items like these: Clinchport Ham Expects Busy Holidays — El Dorado Hams Assist in Toy Drive — Four Initiated by Radio Club — Radio Club Officers Elected — Hams Get Test Alert — Ham Operators Elect Engineer as President — Ham Radio Classes — Girl, 11, Young Ham Radio Station Operator — Long Distance Caller — Ham Operators Aid Missionary — Ham Meeting Set — Lake Charles Ham Plans Career in Electronics.

These are actual headlines taken from a few of the newspaper clippings which come to headquarters in a steady stream. These are examples of bread-and-butter publicity, obtained by alert radio amateurs and clubs anxious that their neighbors shall understand and appreciate our hobby. These are the backbone of the ARRL publicity program, developed from experience over the years as the most productive program for an organization such as ours. No conceivable amount of money expended for a centralized public relations office could produce results comparable with those potentially available through 200,000 individual amateurs and some 1,200 radio clubs.

The effectiveness of locally-placed publicity lies in the fact that it is built around people known and respected in the community. Any unfamiliar and complicated subject becomes less remote when the names associated with the activity are familiar to the reader or at least identified as community residents. Then, too, neighbors who read about the Christmas message Joe Ham handled for another neighbor will be slower to raise Cain if they should hear his voice on their TV set.

A press association wire story — appearing, let's say, in a Chicago paper — describing Minnesota amateur communications activities during a tornado is good for our cause. But it is equally important for Chicagoans to see a locally-generated story on amateur radio's local communications setup and plans should a disaster ever strike that Illinois metropolis — it effectively brings the subject close to home. A continuing series of local news items, however minor they may seem and however little the impact of any single one, before long can get across the point that neighbor amateurs

are a community asset, active in the "public interest, convenience and necessity."

Because we think locally-placed publicity copy is so important and effective, League headquarters has developed a number of aids to be used in the field. Most important is the booklet, "Getting Newspaper Publicity for Your Club and Amateur Radio," containing five pages of how-to-do-it information, followed by 39 sample releases covering a wide range of ham events. (The large number of newspaper clippings of local stories following the pattern copy in our samples show that the booklet and its principles are being effectively used by many amateurs and clubs.) Another widely-used item is the sample speech for service clubs, church groups, youth organizations and civil defense personnel. Then there is a sample interview-type radio or TV broadcast script. For the guidance of feature writers we have "Your Interview on Amateur Radio," a compilation of questions actually asked frequently by reporters, with up-to-date answers. Then there is a script with slides for television use, showing typical kinds of interference, the causes and cures. Finally, the headquarters furnishes sheets of blank news-release paper with an eye-catching headline. With these aids, all available on request to ARRL headquarters, there is nothing to stop every ham in America from being an effective "public relations expert" on behalf of his hobby.

DX TEST

We got talking about the ARRL DX contest here at the office not long ago, and mentioned to one of our colleagues that we might write a brief editorial on the subject. This chap — perhaps still frustrated from unsuccessfully calling a rare one early that morning — said, "Well, tell 'em not to bother unless they're running a kilowatt." We have heard sentiments like this before, but we're of a slightly contentious personality, so we dragged out the October 1959 issue of *QST* and did a little digging.

We found — to our own surprise, we must admit — that in ten ARRL sections the c.w. leader was using 150 watts or less! In thirteen others, the c.w. section winner was using less than 500 watts. Well, c.w. is pretty efficient stuff, we mused, and maybe it isn't too sur-

(Please turn the page)

prising after all. When we get back to the phone section, it'll be different — that's *really* kilowatt alley.

It was different all right — but in the other direction! Nineteen phone section winners ran 150 watts or less, another nineteen 500 or less! Granted, the lower-powered stations who were winners were in ARRL sections with relatively-low contest participation, but it still shows that high power is not an absolute necessity. The second and third layers were even more liberally sprinkled with low and medium-powered rigs, and this was true even in the competitive sections.

Others have said, "Why should I get in? You have to spend the whole 96 hours to get a

decent score." This, too, proved to be less true than we had assumed. In the c.w. contest, only eleven section winners put in 80 hours or more. An additional twenty-one leaders spent sixty hours or more in the test. Eighteen were in the 40-59 hour group and twelve worked less than 40 hours. On phone, again the results were astonishing. Only four put in more than 80 hours; sixteen operated 60 to 79 hours, twelve 40 to 59 hours, and twenty-six were in the contest less than 40 hours!

You can draw any number of conclusions from all these statistics. We hope the one you draw is that you'd better check the rules on page 49 of January *QST*, and then join in the fun! QST

26th ARRL International DX Competition

Phone: Feb. 5-7, March 4-6; C.W.: Feb. 19-21, March 18-20

All amateurs are invited to take part in ARRL's annual DX Competition. Each of the four 48-hour contest periods starts on Friday at 7 P.M. EST and ends on Sunday at 7 P.M. EST on the dates shown.

Certificates will be issued to the highest-scoring c.w. and phone operator in each country and each United States and Canadian ARRL Section. And there will be special certificates for club leaders and multioperator stations and a cocobolo gavel to the top club entry.

The DX will be shooting to trade contest data with as many W/K/VE/VO/KHG/KL7 stations as possible. U. S. and Canadian amateurs will transmit RS and RST reports plus states or provinces, while the returns from overseas will be five- and six-figure numerals indicating signal reports and powers input.

Free contest forms, though not required by the rules, are now available from the ARRL Communications Dept. When requesting them, please advise whether you expect to enter the c.w. section, the phone section, or both.

The complete rules announcement may be found in the January issue of *QST* (p. 49).

NOVICE ROUNDUP REMINDER

Event: Ninth Annual ARRL Novice Roundup! Starts: January 31, 1960, 6:00 P.M. Local Time. Ends: February 15, 1960, 9:00 P.M. Local Time.

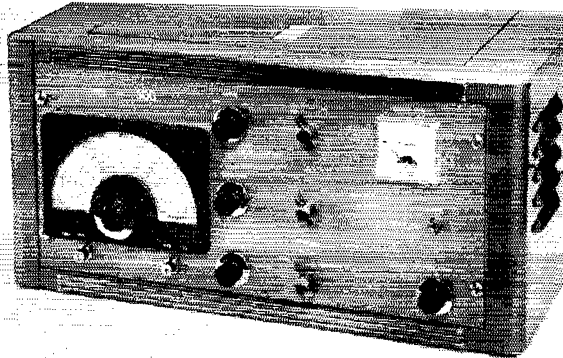
Complete information, including a sample log form, may be found in the January issue of *QST* (p. 61).

Get off those cards, radiograms or letters for ARRL's convenient log forms.



In late December, after General Manager Budlong's return from the Geneva Conference, members of the Headquarters staff presented him with a rather handsome scroll which expresses their appreciation of his part in the successful outcome of the conference. In the accompanying photo we see senior staff member Dave Houghton presenting Bud with the scroll, which reads in part, "We . . . realize better than any other group the importance of success at Geneva and the many difficulties in achieving it . . ." The successful conclusion of this conference from the amateur point of view can largely be credited to the many months of preparatory work by W1BUD and to his years of experience in allocations matters dating back to World War II. (Incidentally, this is one item the Editor of *QST* did not see before publication; sometimes the Managing Editor has to take things into his own hands!)

Front view of the receiver, showing the placement of panel controls. Left bottom, antenna trimmer, 100-kc. calibrator switch; center, left, top to bottom, noise-limiter switch, volume control, sensitivity control; center, right, b.f.o. switch, a.v.c. speed, selectivity; right, headphone jack, b.f.o. pitch control. The dial is a National ICN, and the S meter is a Triplett Model 227-PL, 1 milliampere. The front panel is 8 3/4 inches high. The receiver is mounted in a Bud CR-1741 rack cabinet.



BY KENNETH C. LAMSON,* WIZIF

If you've been sold on the necessity for protection against cross-modulation, along with a straight-sided band-pass, here's a way to get it while still leaving a few dollars in the bank. The principal ingredient is the willingness to roll your own.

Selectivity, Sensitivity

and Stability for

Today's Demands

Double-Conversion Amateur-Band Superheterodyne

THE receiver described in this article was designed primarily to meet a need for a better-than-average ham receiver requiring a minimum of mechanical work and using standard and easily obtainable parts. It incorporates such features as a 100-kc. calibrator, provision for reception on all ham bands from 80 through 10 meters, adequate selectivity for today's crowded bands, and stability high enough for copying s.s.b. signals. Dubbed the DCS-500 because of its 500-cycle selectivity in the sharpest i.f. position, it is a double-conversion superheterodyne receiver capable of giving good results on either a.m., c.w. or s.s.b.

The Circuit

The block diagram, Fig. 1, shows the receiver broken down into its main sections. The combination of i.f. amplifiers may appear rather unusual at first glance, since one might expect that a cascade crystal filter in the high-frequency i.f. would make further selectivity unnecessary. This would be true with highly-developed filters,¹ but two filters are needed if the best possible job is to be done on both phone and c.w., and such filters are expensive. With inexpensive surplus crystals such as are used in this receiver it would be difficult, if not impossible, to match the performance of the high-class filters; in addition, special test equipment and extreme care in adjustment would be necessary. The approach used here is to use the surplus crystals without such

special adjustment, thereby achieving a good, if not quite optimum, degree of selectivity against strong signals near the desired one, and then to back up the filter by a low-frequency i.f. amplifier that will give the "close-in" straight-sided selectivity needed in present-day operation. The overall result is a high order of protection against strong interfering signals at considerably less cost, for the entire double-i.f. system, than that of two high-performance filters alone. The choice of 4.5 Mc., approximately, for the first i.f. was based on the availability of surplus crystals around this frequency, with due consideration for minimizing spurious responses. A second i.f. of 50 kc. was chosen because it lent itself nicely to the utilization of low-cost TV horizontal-oscillator coils as i.f. transformers.

Front End

The use of plug-in coils for the front end eliminated the mechanical problems of a band-switching tuner, and also offered the possibility of realizing higher-*Q* tuned circuits. Gauged tuning of the r.f. amplifier along with the h.f. oscillator and mixer circuits was decided against because of the complexities it would cause in coil construction to solve problem of keeping three stages tracking with each other. The r.f. amplifier has to be peaked separately by the antenna trimmer, but separate peaking insures maximum performance at all frequencies. A pair of gain-control ("muting") terminals in the cathode circuits of the r.f. amplifier and i.f. amplifiers allows the front end to run "wide open" in reception and provides, with suitable keying, a

* Laboratory Assistant, *QST*.

¹ Goodman, "What's Wrong with Our Present Receivers?," *QST*, January, 1957.

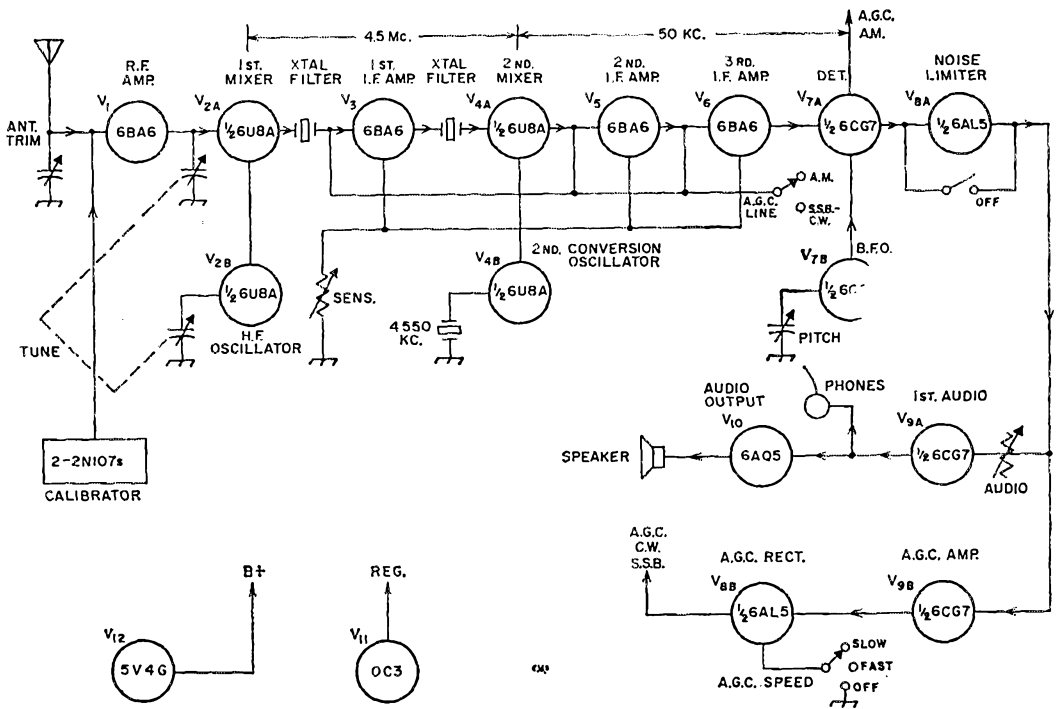


Fig. 1—Block diagram of the DCS-500 receiver.

means for rapid break-in without having the front end "lock up." The muting terminals are shorted during receiving, as indicated by the dashed line in Fig. 3, and opened for stand-by. The switching can be performed by a relay tied in with the station control or keying system.

Again the old problem of what tuning capacitor to use came up. A Hammarlund HFD-30-X was finally decided upon because it is readily available from most radio-supply houses.

Because preliminary sketches showed that chassis space would be somewhat at a premium, and also to keep power-supply requirements to a minimum, it was decided that dual tubes would be used for the oscillator-mixer combinations. The 6U8A fills this bill nicely, using the triode section as the oscillator and the pentode section as the mixer. The plate voltage on the oscillator is kept low to reduce drift and is regulated to secure best over-all voltage stability.

I.F. Section

As shown in Figs. 2 and 3, the output of the first mixer, V_{2A} , at 4.5 Mc. goes into a half-lattice crystal filter and then into an i.f. amplifier stage, V_3 . A second half-lattice filter follows the amplifier, and the two provide the necessary attenuation for the 50-ke. i.f. images (100 ke. removed) as well as for strong signals nearer the desired frequency.

The second mixer, V_{4A} , is followed by two i.f. amplifiers at 50 ke. which contribute the necessary adjacent-channel selectivity. Three degrees of selectivity are available, depending on the

degree of capacitive coupling between i.f. transformers T_1 - T_2 , and T_3 - T_4 . The greater the number of capacitors switched in parallel—that is, the larger the coupling capacitance—the lower the coupling between the windings and thus the greater the selectivity.

Detectors, A.G.C. and Audio

A standard diode detector develops the audio output for all reception modes. The output of the detector is simultaneously applied to both the first audio amplifier and the audio a.g.c. circuit. A series-type noise limiter is used on a.m. to reduce impulse-noise interference, but this type of noise limiter is ineffective on c.w. or s.s.b. because of the large amplitude of the b.f.o. injection voltage.

The b.f.o., a Hartley-type oscillator, can be tuned from 3 ke. above to 3 ke. below its 50-ke. center frequency by means of the tuning capacitor, C_{13} .

The first audio stage, V_{9A} , is a normal Class A voltage amplifier with its output either coupled to the grid circuit of the audio output tube or to a phone jack. High-impedance headphones (20,000 ohms a.c. impedance or higher) are required. Plugging in the phones automatically disconnects the speaker. The shunting capacitors across the first audio amplifier tube grid resistor and the primary of T_8 limit the upper range of audio frequencies to about 4000 cycles.

The audio output transformer is intended for coupling to a low-impedance (3.2-ohm) speaker. The 47-ohm resistor across the secondary pro-

fects the transformer in the absence of a speaker load.

The audio output of the detector is also amplified separately in the audio a.g.c. circuit and then rectified to develop a negative voltage that can be used for a.g.c. on c.w. and s.s.b. Two different time constants are used in the rectifier filter circuit, for either fast- or slow-decay a.g.c.

Calibrator

The 100-kc. calibrator, Fig. 2, employs two 2N107 p-n-p transistors, one as the oscillator and the second as a 100-kc. amplifier. The transistors obtain the necessary operating potential from the cathode resistor of the audio output tube. The output of the 100-kc. unit is capacitively-coupled to the antenna winding of the r.f. coil. Calibrating signals at 100-kc. intervals are avail-

able on all frequencies covered by the receiver.

The calibrator unit is constructed in a separate metal box so that it can be plugged into the accessory socket of the receiver or used as an individual unit powered by penlite cells.

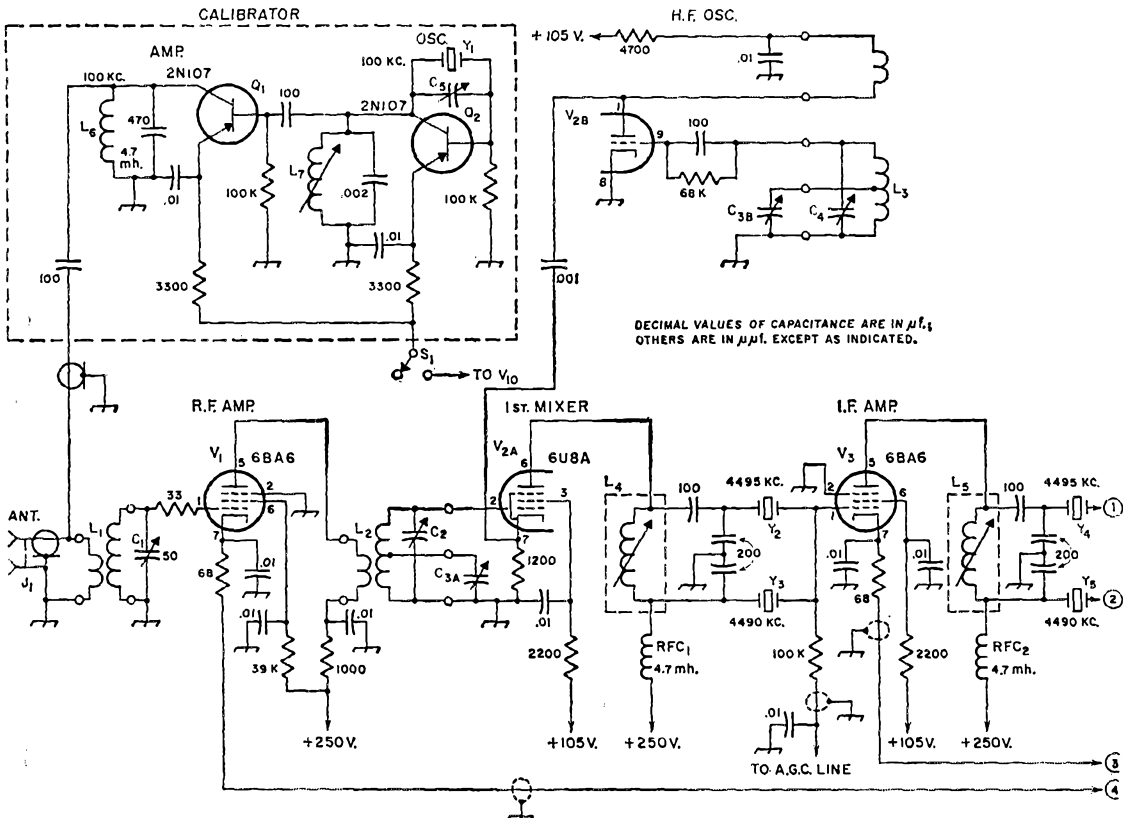
Power Supply

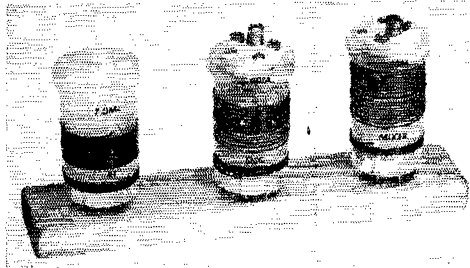
The power supply, Fig. 4, is conventional, using a full-wave rectifier with a choke-input filter. It provides approximately 250 volts d.c. under load. A 0.25- μ f. capacitor is shunted across the 10-henry filter choke to form a parallel-resonant circuit at 120 cycles; this provides an increased impedance to the ripple component and thus reduces hum in the output of the supply.

Power-supply requirements are 250 volts at 110 milliamperes, and 6.3 volts at approximately 5 amperes. Any transformer-choke combination that fulfills the requirements can be used.

Fig. 2—Front-end circuit of the receiver. Unless otherwise specified, resistors are $\frac{1}{2}$ watt; 0.01- μ f. capacitors are disk ceramic, 600 volts; fixed capacitors below 0.01 μ f. are mica.

- C₁—50- μ f. variable (Hammarlund HF-50).
- C₂, C₄—See Table I.
- C₃—2-section variable, 5-28.5 μ f. per section, double spaced (Hammarlund HFD-30-X).
- C₅—3-30- μ f. ceramic trimmer.
- J₁—Coaxial receptacle, chassis mounting (SO-239).
- L₁, L₂, L₃—See Table I.
- L₄, L₅—18-36- μ h. slug-tuned (North Hills 120E coil mounted in North Hills S-120 shield can).
- L₆—4.7 mh. (Waters C1061).
- L₇—1-2-mh. slug-tuned (North Hills 120K).
- RFC₁, RFC₂—4.7 mh. (Waters C1061).
- S₁—Rotary, 1 section, 1 pole, 2 positions.
- Y₁—100 kc. (Knight H-93).
- Y₂, Y₄—4495 kc. (surplus).
- Y₃, Y₅—4490 kc. (surplus).





Each set of coils is provided with a wooden base for storage. C_2 and C_4 are mounted in the recesses at the tops of the oscillator and mixer coil forms.

Construction

The receiver is constructed on a 12 × 17 × 2-inch aluminum chassis with an 8 $\frac{3}{4}$ × 19-inch aluminum front panel, which permits it to be installed in a table-type rack cabinet. The general layout of components can be seen in the photographs. A good procedure to follow when starting to wire the receiver is first to complete the power supply and heater wiring, and then start wiring from the antenna toward the speaker. This allows proceeding in a logical order so that the work can be picked up readily at any time after an intermission.

The use of good quality ceramic tube and coil sockets, particularly in the front end, is highly recommended. When mounting the sockets orient them so that the leads to the various points in the circuit will be as short as possible.

Millen coil shields (80008) are used around all coils in the front end — i.e., the r.f., mixer and oscillator — and the shield bases are mounted with the same screws that hold the ceramic coil sockets. All plug-in coils are wound with No. 26 enameled wire on Amphenol polystyrene forms, and Hammarlund APC-type air-padder capacitors are mounted in the recesses at the tops of the

coil forms. After finishing a coil it is a good idea to fasten the winding and the trimmer capacitor in place with Duco cement. Decal each set of coils for a particular band and mount the coils on wooden bases as shown in one of the photographs. When finished, paint or stain each of the coil bases. The final result will be a convenient and neat-looking arrangement for holding each set of coils. Plug-in coil data for each band are given in Table I.

The tuning capacitor is mounted on the chassis and reinforced by a bracket to minimize any rocking movement that might result from flexing of the chassis when the tuning dial is rotated. This bracket is triangular in shape with a right-angle flange at the bottom for mounting to the chassis. It is drilled to take the front bearing sleeve of the tuning capacitor and held firmly to it by the capacitor mounting nut and a lock washer. Flexing of the chassis can be minimized by the use of lengths of angle stock bolted to the chassis at strategic points throughout the receiver. The placement of the angle stock can be determined by studying the photographs. Exact alignment of the tuning capacitor with the dial shaft is not always possible, so a flexible coupling (Millen 39016) is used.

When wiring the crystal filter keep leads as short and direct as possible, as this will minimize stray coupling between the input and output ends, which would deteriorate the performance of the crystal-filter circuits.

The 50-kc. i.f. circuits used Miller 6183 TV horizontal-oscillator replacement coils as i.f. transformers. These coils must be altered before they can be used. As they are supplied, the terminal lugs are brought out at the top of the can; these lugs must be reversed before the can is mounted. By applying slight pressure to the phenolic coil form the assembly will slide out of the aluminum shield can and then can be reversed. However, before reassembling the unit a few slight changes must be made. There are actu-

TABLE I — COIL DATA

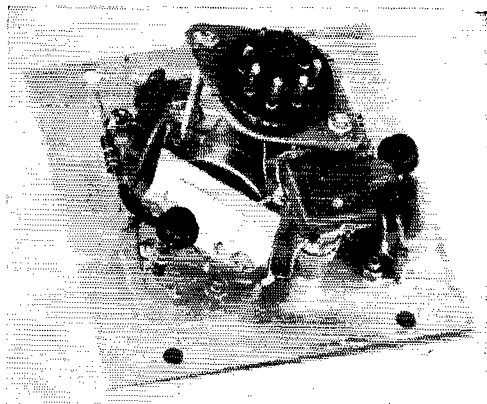
All coils wound with No. 26 enameled wire on 1 $\frac{1}{4}$ -inch diameter polystyrene forms. R.f. coil forms are four-prong (Amphenol 24-4P); mixer and oscillator coils are five-prong (Amphenol 24-5P). C_2 and C_4 are Hammarlund APC-50 except on 3.5 Mc., which takes APC-75. Taps are counted from ground end. Primaries and ticklers are close-wound in the same direction as the main coil; they are at bottom of coil form.

Band	Secondary	Primary or Tickler
3.5 Mc.	L_1 , 45 $\frac{1}{4}$ turns close-wound.	10 $\frac{3}{4}$ turns, $\frac{3}{8}$ -inch spacing from secondary.
	L_2 , 36 $\frac{3}{4}$ turns close-wound, tapped at 26 $\frac{3}{4}$ turns.	11 $\frac{3}{4}$ turns, $\frac{1}{4}$ -inch spacing from secondary.
	L_3 , 28 $\frac{3}{4}$ turns close-wound, tapped at 19 turns.	7 $\frac{3}{4}$ turns, $\frac{1}{4}$ -inch spacing from secondary.
7 Mc.	L_1 , 26 $\frac{1}{4}$ turns, close-wound.	7 $\frac{1}{4}$ turns, $\frac{1}{4}$ -inch spacing from secondary.
	L_2 , 18 $\frac{3}{4}$ turns spaced to 1 inch. Tapped at 9 $\frac{3}{4}$ turns.	6 $\frac{3}{4}$ turns, $\frac{3}{8}$ -inch spacing from secondary.
	L_3 , 17 $\frac{3}{4}$ turns spaced to $\frac{5}{8}$ inch. Tapped at 4 $\frac{3}{4}$ turns.	7 $\frac{3}{4}$ turns, $\frac{1}{4}$ -inch spacing from secondary.
14 Mc.	L_1 , 13 $\frac{1}{4}$ turns spaced to $\frac{5}{8}$ inch.	6 $\frac{3}{4}$ turns, $\frac{5}{16}$ -inch spacing from secondary.
	L_2 , 10 $\frac{3}{4}$ turns spaced to 1 inch. Tapped at 3 turns.	5 $\frac{3}{4}$ turns, $\frac{5}{8}$ -inch spacing from secondary.
	L_3 , 5 $\frac{3}{4}$ turns spaced to 1 $\frac{3}{16}$ inch. Tapped at 1 $\frac{1}{2}$ turns.	3 $\frac{3}{4}$ turns, $\frac{3}{8}$ -inch spacing from secondary.
21 Mc.	L_1 , 9 $\frac{1}{4}$ turns spaced to $\frac{4}{8}$ inch.	6 $\frac{3}{4}$ turns, $\frac{5}{16}$ -inch spacing from secondary.
	L_2 , 7 $\frac{3}{4}$ turns spaced to 1 $\frac{1}{4}$ inches. Tapped at 2 turns.	5 $\frac{3}{4}$ turns, $\frac{5}{8}$ -inch spacing from secondary.
	L_3 , 6 $\frac{3}{4}$ turns spaced to 1 $\frac{3}{16}$ inch. Tapped at 2 turns.	3 $\frac{3}{4}$ turns, $\frac{3}{8}$ -inch spacing from secondary.
28 Mc.	L_1 , 6 $\frac{1}{4}$ turns spaced to $\frac{7}{16}$ -inch.	5 $\frac{3}{4}$ turns, $\frac{1}{4}$ -inch spacing from secondary.
	L_2 , 5 $\frac{3}{4}$ turns spaced to 1 $\frac{1}{4}$ inches. Tapped at 2 turns.	4 $\frac{3}{4}$ turns, $\frac{1}{4}$ -inch spacing from secondary.
	L_3 , 4 $\frac{3}{4}$ turns spaced to $\frac{3}{4}$ inch. Tapped at 1 $\frac{1}{2}$ turns.	2 $\frac{3}{4}$ turns, $\frac{1}{4}$ -inch spacing from secondary.

ally two separate windings; each one will be tuned and used either as a primary or secondary for the 50-kc. i.f. transformer. The tap on the large winding must be lifted off the soldering lug C, taped, and tucked away, being careful not to break it; this leaves just the lead from the small winding on terminal C. Terminals A and F represent the large winding. The small coil is tuned by connecting a 680- μf . mica capacitor between terminals C and D; this capacitor should be fastened on the soldering lugs inside the shield can. The can is then slipped back over the coil and capacitor, keeping in mind that the lugs must come out the bottom, and the assembly is ready for mounting on the chassis.

The b.f.o. coil is also a Miller 6183, and the procedure for reversing the assembly before mounting is identical to that followed with the 50-kc. transformers. However, it is not necessary to alter any of the wiring in the b.f.o. transformer, since only the large winding (A-F) and its tap (C) is used.

Point-to-point wiring is recommended, along with generous use of both insulated tie points and ground lugs. Use of shielded wire facilitates routing wires throughout the receiver as the shields can be spot-soldered to ground lugs and to each other in bundles. When wiring, mount components at right angles to the chassis sides wherever possible; this helps give the finished unit a neat appearance. In critical circuits, however, do not sacrifice short and direct leads for the sake of

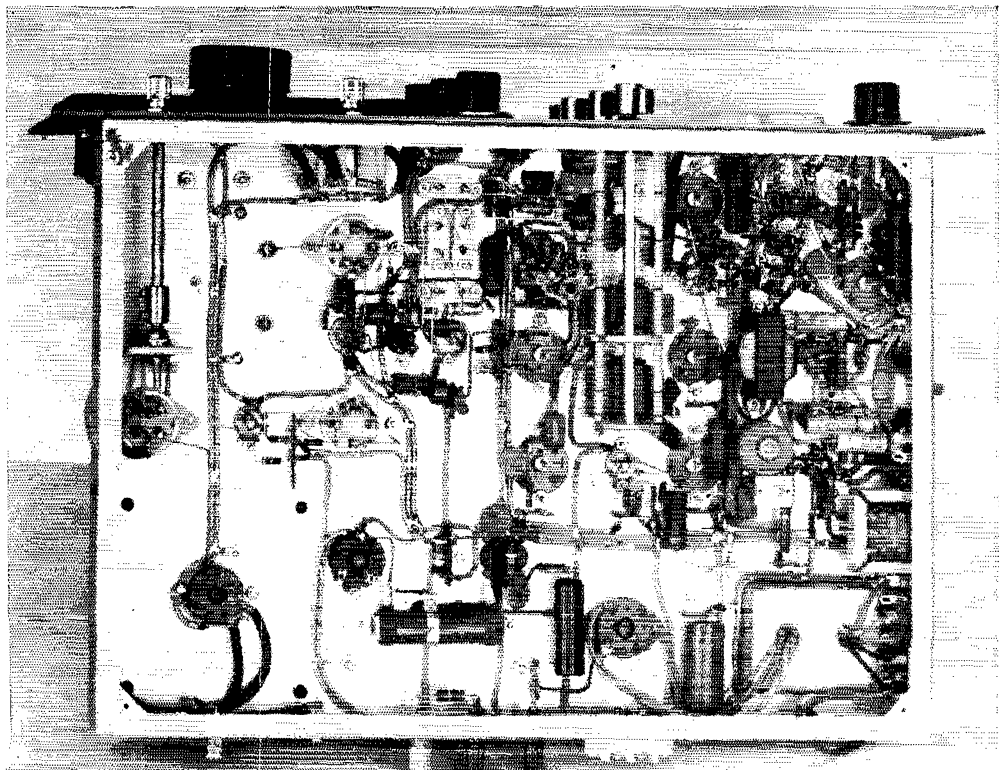


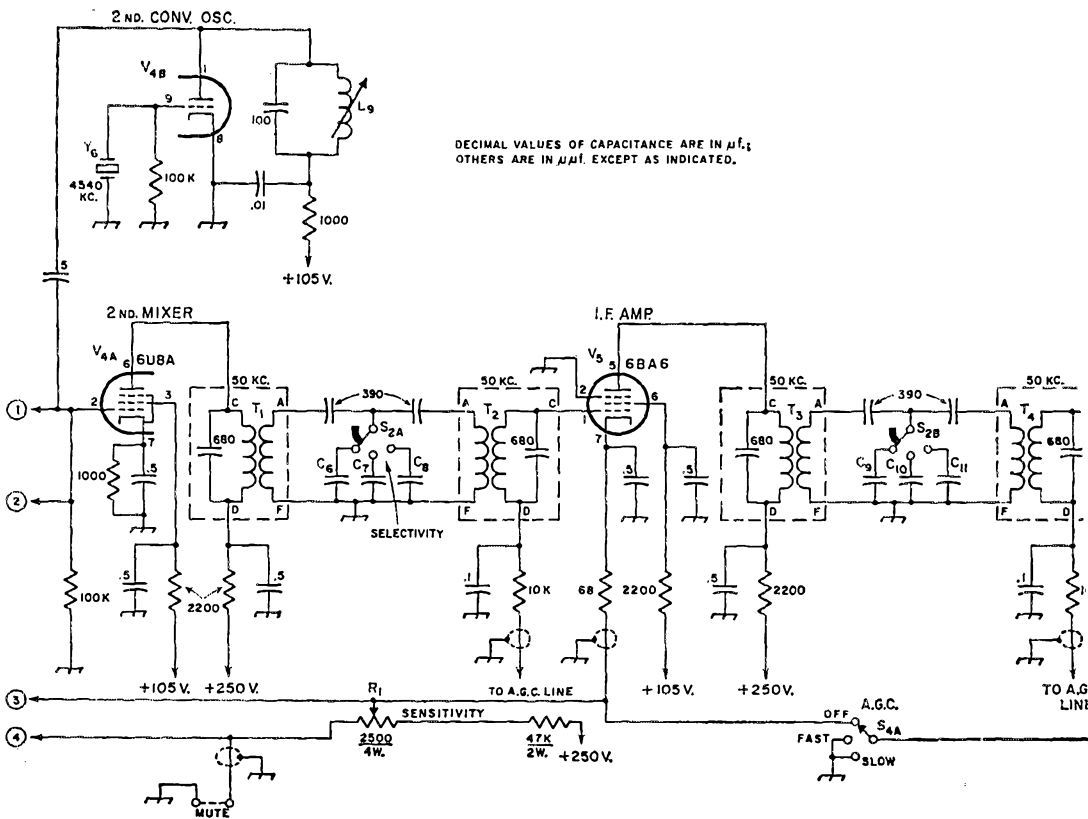
inside view of the calibrator unit. The 100-kc. oscillator coil, L_7 , is at the right, the oscillator transistor, Q_2 , is in the foreground mounted to the crystal socket, and the amplifier transistor, $1Q$, is mounted at the right on a terminal strip. The 100-kc. crystal (James Knights H-93) is mounted horizontally between the plate and the octal plug. The plug can be mounted on 2-inch screws as shown in the photograph, or on the bottom plate of the box with flexible leads to the circuit. If the calibrator is to be used as a self-contained unit (see text) the octal plug is not necessary.

making the unit look pretty.

Placing the receiver in a rack cabinet and marking all controls on the front panel with decals also helps in giving the finished receiver a neat and "commercial" appearance.

The potentiometer for S-meter adjustment and the audio output transformer are on the right chassis wall in this view. The 50-kc. i.f. trap is located just above the power transformer in the lower right-hand corner. The antenna trimmer is located at extreme left center. The crystal filter sockets are at top center, and to their left on the front wall is the calibrator switch S_1 . To the right of the calibrator switch is the sensitivity control, followed to the right by the selectivity switch S_2 and the b.f.o. pitch-control capacitor. The octal accessory socket for the calibrator is at the lower left. As shown, shielded wire spot-soldered together in bundles can be routed conveniently to various points in the receiver. Ceramic sockets are used throughout the front end (center left). Mounting components parallel with the chassis sides helps give the finished unit a neat appearance.





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

Fig. 3—I.f. amplifier, detector, a.g.c. and audio circuits. Unless otherwise specified, resistors are $\frac{1}{2}$ watt; 0.01- and 0.02- $\mu\text{f.}$ capacitors are disk ceramic, 600 volts; 0.5- $\mu\text{f.}$ capacitors are tubular paper, 400 volts; capacitors below 0.01 $\mu\text{f.}$ are mica; those with polarities marked are electrolytic.

- $C_6, C_7, C_8, C_9, C_{10}, C_{11}$ —0.01 mica (Aerovox CM-30B-103).
- C_{12} —9-180- $\mu\text{f.}$ mica compression trimmer.
- C_{13} —50- $\mu\text{f.}$ variable (Hammarlund HF-50).
- C_{14} —0.1- $\mu\text{f.}$ paper (Sprague 2TM-P1).
- J_2 —Phono jack.
- J_3 —Closed-circuit phone jack.
- L_9 —125 mh. (Meissner 19-6848).
- L_{10} —9-18 $\mu\text{h.}$, slug-tuned (North Hills 120D).
- M_1 —0-1 d.c. milliammeter (Triplett 227-PL).
- R_1 —2500-ohm, 4-watt control, wire-wound.
- R_2 —0.5-megohm control, audio taper with push-pull type switch (S_6) (Mallory No. PP55DT1683).
- R_3 —1000-ohm, 1-watt control, wire-wound.
- S_1, S_3 —Rotary, 1 section, 1 pole, 2 position.

- S_2 —Rotary, 2 section, 1 pole per section, progressively shorting. Switch section Centralab PA-12, index Centralab PA-302.
- S_4 —Rotary, 1 section, 5 poles per section (4 poles used), 3 positions used, Centralab PA-2015.
- S_5 —Rotary, 1 section, 2 poles per section, 2 positions used, Centralab PA-2003.
- T_1 — T_5 , inc.—50-kc. i.f. transformers made from TV components (Miller 6183); see text.
- T_6 —B.f.o. transformer (Miller 6183); see text.
- T_7 —Audio interstage transformer, 1:2 ratio (Thordarson 20A16).
- T_8 —Audio output transformer, 5000 to 4 ohms (Stancor A-3856).
- Y_6 —4540 kc. (surplus).

Calibrator Construction

The 100-kc. calibrator is built in a separate $4 \times 4 \times 2$ -inch aluminum box and plugs into the accessory socket at the left rear of the receiver chassis. The accessory socket provides the necessary operating voltage for the transistors and offers a convenient means for coupling the 100-kc. harmonics out of the calibrator into the receiver. If the calibrator is to be used as a self-contained unit it must be supplied with approximately 7-10 volts. A series arrangement of penlite cells, or a mercury battery, can be used. A battery clip mounted on the side of the box is a convenient

way to hold the internal batteries. Also, if the unit is to be self-contained, a separate output jack for the calibrator must be provided. A phono jack may be used. Wiring is not critical and an arrangement similar to that shown in the photograph may be followed.

I.F. Alignment

Before starting alignment of the receiver, first determine whether the audio stages are functioning correctly. An audio signal should be coupled to the top end of the volume control, and varying the control should change the output level of the audio signal. If an audio signal is not available,

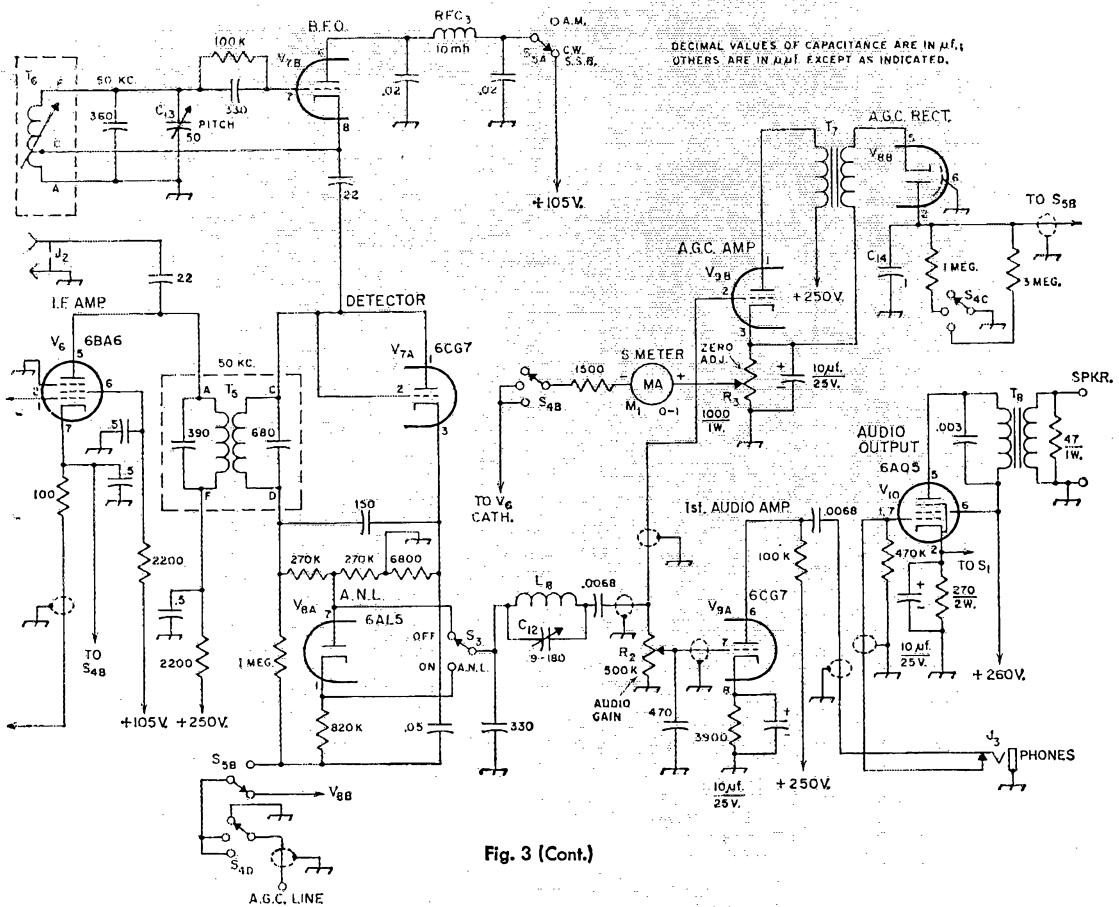


Fig. 3 (Cont.)

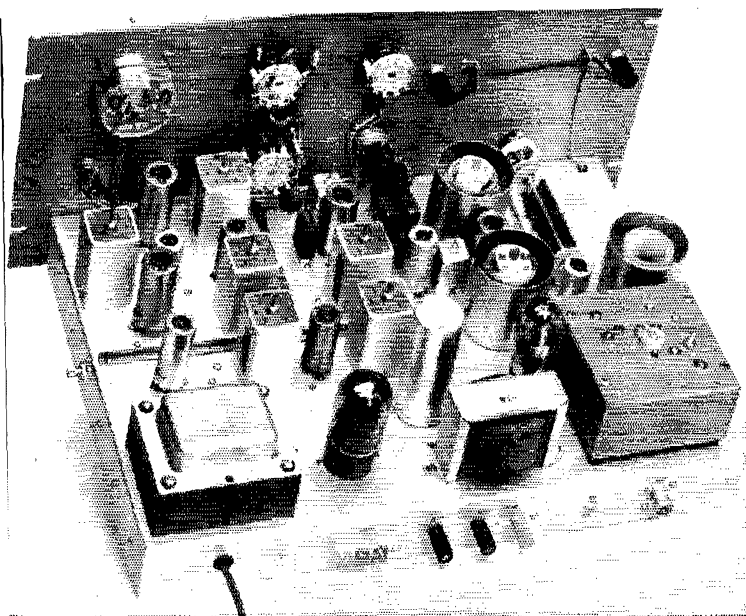
the 60-cycle filament voltage will provide a convenient audio signal for checking.

There are various ways to approach the alignment problem. A 50-kc. signal generator can be used; however, these are hard to come by. Some of the better audio oscillators go as high as 50 kc. and can be used for alignment purposes. A second, and possibly superior, method is to use any of the numerous signal generators which will deliver 4.5-Mc. output; fed into the first i.f. amplifier grid, the 4.5-Mc. signal will beat against the second conversion oscillator to produce a 50-kc. i.f. signal which then can be used for alignment. This method also insures that the first i.f. signal will fall within the crystal filter bandpass in case the crystal frequencies are not exact. When aligning, connect a high-resistance d.c. voltmeter or v.t.v.m. across the detector load resistor, turn the i.f. gain control about three-quarters open, and tune both the plate circuit of the second conversion oscillator and the 50-kc. i.f. transformers for maximum output as indicated on the meter. The output of the signal generator should not be modulated, and at the start will most likely be "wide open." However, as alignment progresses

the output of the generator will have to be progressively decreased. When aligning the i.f. transformers there should be a definite peak in output as each circuit is brought into resonance. If a particular coil does not peak, that coil and its associated circuits should be checked. After peaking one winding of a transformer, go back and recheck the other; it may need touching up because of the slight coupling between the windings. After alignment of all the 50-kc. coils is completed, go back and "rock" each coil slug to be sure it is peaked for maximum output. This completes the 50-kc. alignment.

Leave the signal generator on, set the b.f.o. pitch control at half capacitance, turn the b.f.o. on, and adjust its coil slug for zero beat with the 50-kc. i.f. signal. Varying the pitch control over its range should produce an audio tone with a maximum frequency of 3 kc. either side of zero beat.

Next, the 50-kc. trap in the output circuit of the detector should be adjusted. Connect the vertical input terminals of an oscilloscope between the plate of the first audio amplifier and chassis, turn on the b.f.o., and adjust C_{12} for minimum



Top view from the rear. The power supply is built along the rear edge of the chassis. The power-supply filter capacitor and voltage-regulator tube are close to the filter choke. The crystal calibrator unit at right is cushioned by rubber bumpers mounted on the receiver chassis. C_5 is on top of the calibrator unit. Front-end coil shields are at the top right in this photograph, along with the tuning capacitor bracket and flexible coupling. The on-off switch, on rear of the audio gain control, is a new push-pull type. Filter crystals are grouped near the volume control, and the second conversion oscillator crystal is slightly to their left. The 4.5-Mc. i.f. coils (in the small shield cans) are close to the filter crystals. The b.f.o. coil is at the extreme left in this view; all other aluminum cans contain the 50-kc. i.f. transformers. Connections on the back chassis wall, from left to right, are the muting terminals, B-plus output, speaker terminals, i.f. output (phone jack), and antenna input connector.

50-ke. signal on the scope. This trap, made up of C_{12} and L_8 , attenuates any 50-ke. feed-through and helps insure that just audio is present at the grid of the first audio amplifier.

The first-i.f. coils at 4.5-Mc. should next be adjusted. Couple the signal generator to the grid of the first mixer and peak L_4 and L_5 for maximum deflection of the voltmeter across the detector load resistor, using a signal-generator frequency midway between the two crystal frequencies. The i.f. system of the receiver is then completely aligned.

Front-End Alignment

To adjust the front end, plug in a set of coils and check the h.f. oscillator frequency range either with a calibrated wavemeter or on a calibrated general-coverage receiver, the latter being preferable. Keep in mind that the oscillator works 4.5 Mc. above the signal on 80, 40 and 20 meters, and 4.5 Mc. below the signal frequency on the 15- and 10-meter bands. This means that on 15 and 10 meters the oscillator trimmer capacitor, C_4 , must be at the larger-capacitance setting of the two that bring in signals. After establishing the correct frequency range of the oscillator, inject a signal at the low end of the band into the antenna terminals and peak the mixer capacitor, C_2 , and the antenna trimmer for maximum signal. Then move the test signal to the high end of the band and recheck the mixer trimmer capacitor (the antenna trimmer also will have to be rechecked) for correct tracking. If C_2 has to be readjusted, spread the mixer coil turns apart or compress them together until the signal strength is uniform at both ends of the band, without readjustment of the trimmer. If the mixer trimmer capacitance has to be increased at the high-frequency end of the band to maintain tracking, the coil tap is too far up the coil and the turns below the tap must be spread apart or the

tap itself must be moved down. If the trimmer capacitance has to be decreased the tap is too low. Coil specifications might possibly have to be altered slightly from those given in Table I, particularly on the higher frequencies, because of variations in strays from one receiver to another.

Calibrator Adjustment

Adjustment of the calibrator is relatively straightforward, and should present no problems. Turn on the calibrator and you should hear the 100-ke. harmonics on whatever band you happen to be using. Once it is determined that the unit is working correctly, the only adjustment necessary is to set the frequency of the calibrator exactly. Any signal the frequency of which is known precisely and which is at an even 100-ke. interval can be used as a reference. This includes WWV and any broadcast station on a frequency which is a whole-number multiple of 100 kc. The frequency tolerance for standard broadcast stations is 20 cycles, thus b.c. stations represent a source for accurate frequency determination.

Using a general-coverage or b.c. receiver, tune in either WWV or a known broadcast station and adjust the calibrator trimmer C_5 for zero beat. This establishes the accuracy of the unit, and no further adjustments should be necessary. The calibrator will then provide accurate 100-ke. signals that can be used for frequency determination and band-edge marking throughout the frequency range of the receiver.

General

The first i.f. frequency can be altered slightly to facilitate the use of particular sets of crystals available. However, if the deviation is more than 20 kc. or so, slight changes may be needed in the h.f. oscillator coil specifications to maintain the proper bandwidth.

If the receiver is to be installed in a rack cabinet

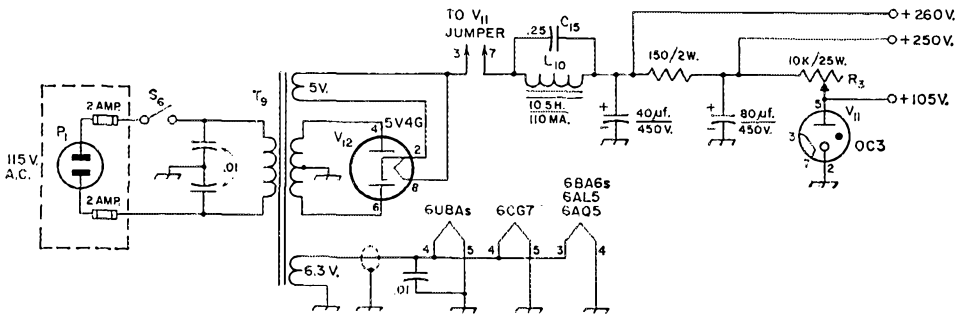


Fig. 4—Power-supply circuit. Capacitors marked with polarities are electrolytic.

C₁₅—0.25-µf. paper, 600 volts.

L₁₀—Filter choke, 10.5 henry, 110 ma. (Knight 62 G 139).

P₁—Fuse Plug.

T₀—Power transformer, 700 v. c.t., 120 ma.; 5 v., 3 amp.; 6.3 v., 4.7 amp. (Knight 62 G 044).

as shown in the photograph, or if a cover plate is attached to the bottom of the receiver chassis, minor touching up of the alignment may be necessary.

Spraying the receiver chassis with a light coat of clear plastic lacquer before mounting any of the components will prevent fingerprints and oxidation of the chassis, and thus prevent degrading the appearance of the finished receiver.

The audio output stage has adequate power to drive a 5- or 6-inch speaker, which may be mounted in a small open-back metal utility box.

The i.f. output jack at the rear of the receiver provides a convenient way for attaching accessory devices such as an oscilloscope for modulation checking.

There is no panel-operated stand-by switch in

the receiver because it was assumed that in actual station operation this function would be controlled automatically through the "muting" terminals. If the builder wants to include such a switch, a panel-mounted s.p.s.t. toggle can be connected across the "muting" terminals.

A side-by-side comparison of the finished receiver with some of the better-quality commercial units will show that this receiver can hold its own in sensitivity, selectivity and stability. Needless to say, the more care taken in construction, wiring and alignment the better the finished product.

Probably the most satisfying result is being able to tell the fellow at the other end of the QSO "Yes, OM, the entire station here including the receiver is homebuilt." QST

Strays MOJO

KN3KAU feels this is a record of some sort—he answered three CQs and got in order: father, KNØWNU; son, KNØVMZ; and mother, KNØWNT, all from Winona, Mo.

— . . . —

The Radio Club of Haiti has established an HH-20 award. Certificates go to any foreign amateur who makes contacts with 20 Haitian stations on c.w. or phone or both on any amateur

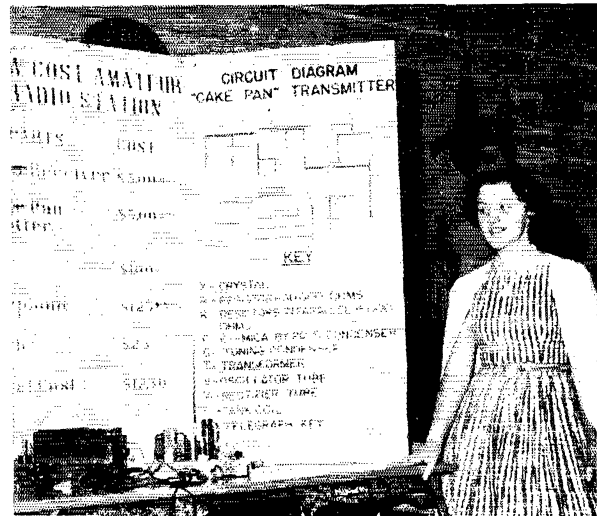
bands. The certificate will be endorsed to show all A-1 or all A-3 contacts.

Applications go to the Radio Club president, P. O. Box 943, Port-au-Prince, Haiti. Applications must be accompanied by a list of 20 stations, checked and certified by the secretary of the ham's local radio club. The Haiti club asks one dollar to cover mailing charges. Certificates will be mailed after verification of contacts by the Haiti club.

Fourteen-year-old Mary Allport, WH6DBA, of Lihue, Hawaii, created more excitement in losing first prize at the Hawaii Science Fair than anyone else did in winning.

Mary built her transmitter on a cake pan for \$5 and constructed the rest of her rig for an additional \$7.50. Her rig did not win a prize, but Wien Somekul, supervisor of vocational and industrial education in Thailand, saw it and was fascinated.

"In my country, girls don't like to study electronics," he said, and tried to buy Mary's transmitter to show Thailand teachers what youngsters can be taught to do. Mary said she wouldn't sell it—but she'd be glad to give it to him as a gesture of good will. The resulting flurry of newspaper pictures and stories made Mary much better known than the prize winners



28-Mc. Hand-Carried Station for Short-Range Communication

BY WILLIAM J. ENGLE, JR.,* W3KKO

The construction of a hand-carried station of the type described in this article is bound to be attractive project for those interested in transistors. Too, the resulting equipment is useful for emergency and c.d. work, and in numerous activities where compactness and light weight are essential but long range is not needed.

A Transistorized Handi-Talkie

THIS article illustrates what can be done in the field of transistor application to provide extremely compact equipment, using standard components, for reliable line-of-sight voice communication on the ten-meter amateur band.

As can be seen by inspection of Fig. 1, this equipment uses nine transistors. With proper switching, the transmitter audio section could be used for the receiver also, thereby reducing the number of transistors to six. However, the author developed the receiver and transmitter as separate projects and preferred not to alter them to add the more complex switching required.

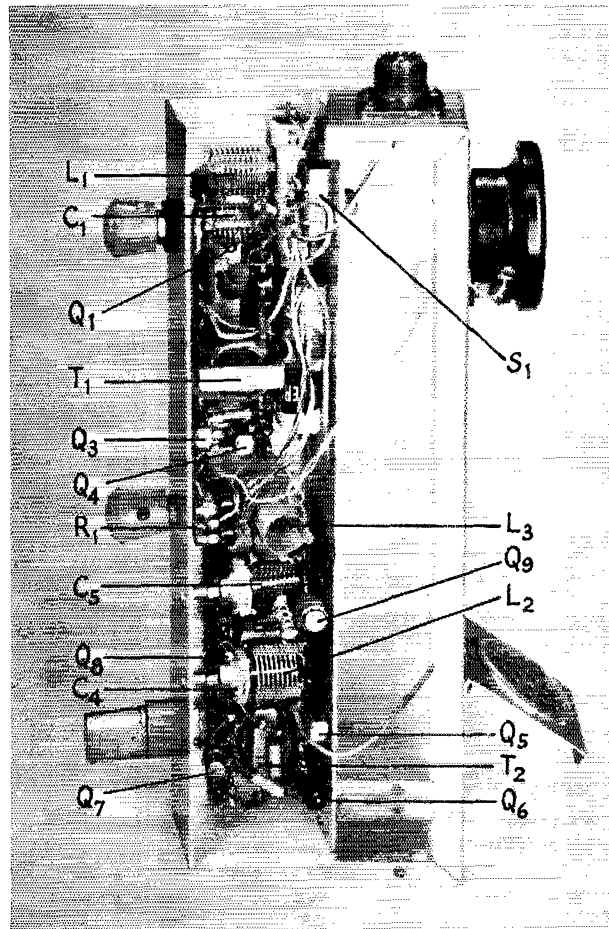
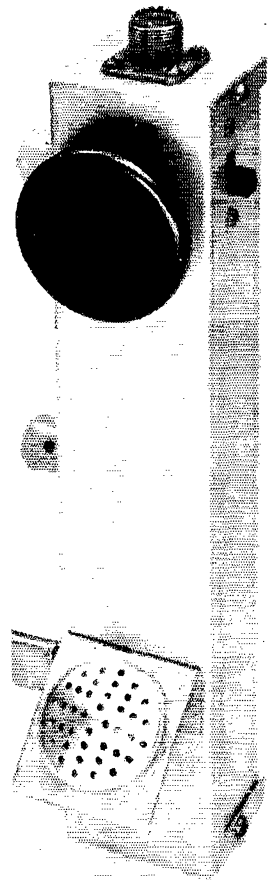
*1264 N. Bodine St., Philadelphia 40, Pa.

Receiver

The receiver employs a superregenerative detector using a Philco SB100 series transistor. Out of about a dozen SB100s, only three performed successfully in this circuit above 26 Mc. It is probable that other transistors with better high-frequency characteristics, such as the 500-series types, would eliminate this problem, but none were available at the time the receiver was developed, and to date have not been tried. All receiver circuit values were carefully chosen for optimum performance for a specific layout, and may need slight alteration for different layouts or individual transistors. Three detectors of this type were constructed, and all showed slightly

The transistor handi-talkie, left, has a convenient shape for one-hand operation, being constructed in a 10 × 2 × 1½-inch Minibox. The slide switch at the upper right is the send-receive switch. On the left side the upper knob is for the receiver tuning and the one near the center is the regeneration control. The earpiece is from an old headset and the microphone is a replacement crystal unit mounted on a metal bracket fastened to the case.

Inside the handi-talkie, right, with major parts identified. Q₂ is not visible, being mounted below T₁. All components except those with external controls are mounted on tie-point strips. In the upper section two 10-point strips are used, mounted ¾ inch apart with the right-hand one (visible just to the left of the dry cells) offset toward the top by the distance between two tie points. In the lower section two 12-point strips, facing and mounted one inch apart, are used. The strips are mounted on the 10 × 2-inch side of the box.



different characteristics.

Various types of coils were used at J_1 , and ones using air-wound Miniductor proved most successful. The emitter tap will vary with coil types, transistors, and layout, but in any case will be about 25 per cent from the cold end. Choose it for best superregenerative action.

The audio transformer, T_1 , is Philco part 32-8820,¹ an audio interstage transformer for

¹This component is available from Accessories Plant 3, C St. above Westmorland, Philadelphia 34, Pa.

transistor radios, and similar units by other manufacturers should perform as well. A two-stage audio amplifier gave a fair account of itself, but an additional stage proved worth while. Audio circuitry in the receiver is conventional, and the earpiece is from a Murdock headset of a few thousand ohms impedance.

After completion of the receiver it was found that by proper choice of values, a regeneration control as such could be eliminated, and fixed forward-bias resistors substituted. By their very nature superregenerative detectors are broad and the strongest received signals usually dominate. Because of the limited range of the transmitter, this is no great disadvantage since the desired signal usually will be the dominant one.

Transmitter

The transmitter section consists of an overtone crystal oscillator driving an amplifier which is collector modulated by a single-ended transformer-coupled modulator. Any of the SB-100 transistors tried worked very well in the oscillator. Forward bias on the oscillator was adjusted so 4 ma. of collector current flows when the transistor is not oscillating. The tuning should be adjusted for as nearly maximum output as possible, consistent with positive operation.

Unlike the detector in the receiver, any type coil, either slug-tuned or air-wound, worked well. Even the L/C ratio didn't seem to be critical over a reasonable range. The position of the tap on the coil is critical, however, and with the 47- μmf . coupling capacitor the tap was at about the midpoint of the coil for most efficient amplifier excitation. Before the 2N502 in the amplifier was available, another SB100-series transistor

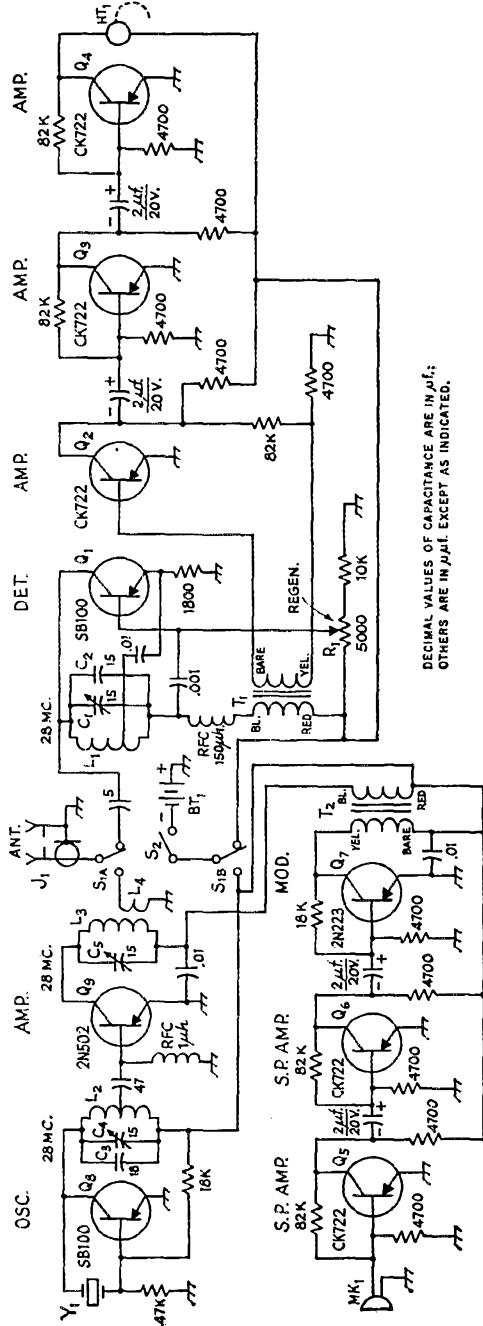


Fig. 1 — Circuit of the transistor hand-talkie. Resistances are in ohms; resistors are 1/2 watt. Capacitors with polarities marked are miniature low-voltage electrolytics; others not listed below are ceramic tubular or disk.

$B T_1$ — 4.5 volts, penlight cells.
 C_1, C_5 — 15- μmf . midgap variable (Hammarlund MAPC-15-B).
 C_2 — 15- μmf . ceramic, NPO.
 C_3 — 18- μmf . ceramic, NPO.
 C_4 — Headphone unit; see text.
 J_1 — Chassis-type coax connector.
 L_1 — 10 turns No. 20, 3/8-inch diam., 16 t.p.i., tapped 2 3/4 turns from end connected to r.f. choke (B & W 3007).
 L_2 — 9 1/2 turns No 20, 3/8-inch diam., 16 t.p.i. (B & W 3011).
 L_3 — 18 turns same coil material as L_1 .
 L_4 — 5 turns hookup wire wound around L_3 at cold end.
 MK : — Crystal microphone element (Lafayette Radio PA-27 or similar).
 R_1 — 5000-ohm composition control.
 S_1 — D.p.d.t. slide switch.
 S_2 — S.p.s.t. mounted on R_1 .
 T_1, T_2 — Transistor interstage audio, approx. 20,000 to 1000 ohms impedance ratio, primary to secondary (Philco 32-8820 or similar).
 Y_1 — 28-Mc. overtone crystal (International Crystal FA-9).

was used. It worked well, but the input ran only 20 milliwatts with the available drive and bias voltage. Substitution of the 502, without any other changes, about doubled the input.

The r.f. choke between the 2N502 base and chassis ground is not critical as long as it is at least 1 μ h. The smallest value usable without loss of drive was chosen because of physical size.

The amplifier tank circuit was designed for good efficiency and is a section of air-wound B & W Miniductor tuned by a Hammarlund MAPC-15 capacitor. The link for antenna coupling consists of 4 turns of insulated hookup wire wrapped around the cold end of the tank coil. This link is effectively in series with the helically wound antenna (see Fig. 2) and the combination is brought to parallel resonance with the 3-30- μ mf. trimmer on the antenna.

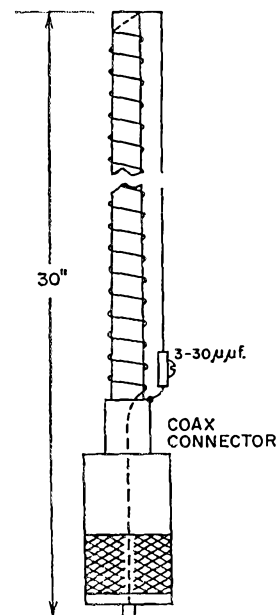


Fig. 2—Helix-type antenna used by W3KKO with the handi-talkie. The coax fitting goes on the "ANT" coax receptacle in Fig. 1. The helix is wound with No. 20 enameled wire on a section of plastic fishing rod, with approximately 1/4-inch spacing between turns. If plastic tubing is used the return lead can be fed down through its center. The bottom end of the helix connects to the center contact of the coax fitting through a hole in the plastic rod.

Oscillator and amplifier adjustments were initially made using a milliammeter in the amplifier collector return circuit and tuning the oscillator for maximum amplifier collector current with the amplifier out of resonance. With a supply of 4.5 volts the off-resonance current will be 10 to 12 ma., and at unloaded resonance it will dip to 1 ma. or less. Tuning the antenna trimmer to resonance will pull the collector current back to 10 ma. or so when fully loaded. Some slight

readjustment of the amplifier tank may be necessary after the antenna is brought to resonance. Final adjustments of the amplifier and antenna were made using the S meter on the regular station receiver, tuning for maximum.

Modulator

The original speech and modulator circuit used three CK722 transistors, but it was soon apparent that this type of transistor would not do the job as a modulator without overload and non-linear operation if it was kept within its dissipation rating, so a 2N223 was substituted. A push-pull Class B modulator would have been an even better choice, but lack of suitable driver and modulation transformers, as well as space limitations, made it impossible.

Forward bias on the modulator was adjusted for as nearly linear operation as possible, and the collector current runs about 20 ma. At an input of 40 milliwatts the 502 is loading, and with increased bias the input could be increased considerably. Excitation and modulation capabilities may be inadequate, however, if this is done.

T_2 , the modulation transformer, is the same type as used in the receiver. Transformers of various turns ratios were not available for trial, so it is not known whether some other type would be superior. However, when used in this fashion with a step-up ratio it performs satisfactorily, with good modulation quality and level.

Purists may frown on the use of a crystal microphone with no attempt at impedance matching, but it works well in this case with no need for an input transformer, and doesn't require power for operation as a carbon element would. The crystal element is available at local wholesale houses for less than \$2.00.²

Performance

Field tests with the unit indicate that reliable communication at line-of-sight distances of at least a mile can be expected. Greater distances can be covered with a beam antenna in fixed operation, using a more selective receiver. Numerous contacts with fixed amateur stations have been made with the unit in the field, and one nearly solid contact was made via sporadic-E skip with a station in Toledo, Ohio, from the author's home in Philadelphia, using a three-element beam and the regular station receiver. QST

² In using this — or any — crystal microphone in portable work, make sure that it is not exposed to temperatures of 100 degrees F. or more; in particular, don't leave it locked up in a closed car in the hot summer sun. — Editor.

Strays

Wayne Morris, KN4YEV, can beat the December stray on WV2IMH and WV2IMP's crossbanding between 7 and 21 Mc. KN4YEV and K4MOJ chatted from Bolivar, Tenn. to Memphis — K4MOJ on 40 fone and KN4YEV on 15 e.w.

Ed Tenney, W1ICC, reports he had an FB QSO with Forrest D. Pilgrim, W4JD, on Thanksgiving Day.

Tenney is from Milton, Mass., but this Pilgrim has landed in Kingsport, Tenn.

Methods and Recent Developments

BY JOHN R. AMEND,* W7UIY

This article constitutes a review of the various propagation paths used in radio communications, and their characteristics. Some readers will undoubtedly be surprised at the modes found most reliable in some commercial circuits.

Radio Propagation

AN understanding of the various methods of radio propagation can be valuable knowledge for the serious amateur. With this in mind, it is the goal of this article to provide a simple outline of the basic concepts of electromagnetic wave propagation as applied to communications. References to commercial systems and engineering techniques are made throughout in the belief that the reader will profit from an awareness of the state of the art as applied by industry.

During the course of this report, we will discuss six major types or methods of propagation used for communication; i.e., ground-wave, ionospheric-refraction, ionospheric-scatter, tropospheric-scatter, diffraction, and line-of-sight microwave. The more common types of propagation will be touched on only briefly, while more recent discoveries will be treated in greater detail.

Propagative Media

Before we begin a discussion of the various types of propagation, it would be wise to stop for a moment and examine the atmosphere around us in which this propagation takes place, as illustrated in Fig. 1.

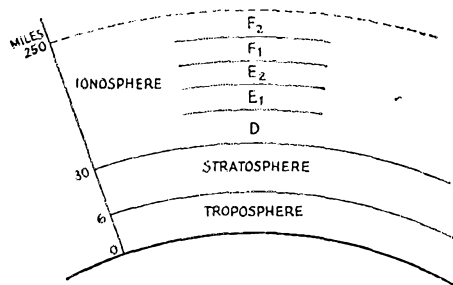


Fig. 1—Sketch showing the various regions above the earth through which radio propagation may take place.

The *troposphere* is the area from sea level to approximately six miles. It is within this area that almost all of our weather takes place. The *stratosphere* extends from about six miles, the upper limit of the troposphere, to approximately

thirty miles. The stratosphere has considerably less water vapor content than the troposphere, and the air pressure is much reduced in this region. The *ionosphere* extends from the upper limit of the stratosphere to approximately two hundred and fifty miles. The ionosphere is an area of ionized air molecules. This region is divided into several layers which have significance as far as refraction, or "skip" propagation, of radio waves is concerned. Beyond the ionosphere, it is assumed that space begins. This region has not been explored much; in fact, it was never entered until the recent satellites were launched.

Ground Waves

From the historical aspect, ground-wave propagation was the first type recognized. Ground-wave propagation is just what the name indicates—propagation along the surface of the earth. The first radio systems used ground wave, as do the standard broadcast stations today in covering their primary areas. Ground wave is pronounced and provides long range at low frequencies, but becomes irrelevant at medium and high frequencies. However, very low-frequency ground-wave propagation is still used for some communication links, because of its reliability. Ionospheric disturbances and sunspots have negligible effect on the ground wave. High power, huge antennas, and narrow band width are characteristic of commercial low-frequency circuits.

The Ionosphere

It was predicted by the late 19th century mathematicians that the range of radio waves would never exceed a distance in the neighborhood of 175 miles. This figure was based on ground-wave and atmospheric refraction. Soon, however, it was noticed that signals from stations far beyond this limit were sometimes received. As research advanced, it was discovered that the signals were being bent and reflected somewhere above the earth. The area that possessed this property of refracting radio waves became known as the *ionosphere*. In recent years much work has been done by universities, private concerns, and the Bureau of Standards, to learn more about the structure and function of the ionosphere.

It was discovered that there are certain layers in the ionosphere that will refract a radio wave

* 11205 Third Avenue South, Seattle 88, Wash.

enough to return it to the earth. The angle of this refraction is dependent on the frequency of the wave and the condition of the ionosphere. This gives rise to a "skip" transmission (see Fig. 2) where the radio wave is refracted through an

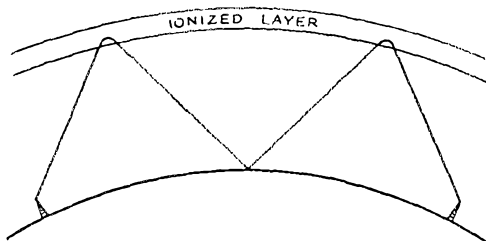


Fig. 2—Signals in the 2- to 50-Mc. range may be refracted and bent back toward earth at a distant point. The wave may be reflected back to the ionosphere and refracted again several times (multi-hop transmission).

ionospheric layer, turned back to earth, and perhaps reflected back from the earth to the ionosphere once more before being received.

The Central Radio Propagation Laboratory, a division of the Bureau of Standards, has compiled information concerning ionospheric-refraction propagation, and has developed a method of predicting the times a given path will be open on a given frequency. Their method has proved to be over 95 per cent accurate, and has greatly increased the reliability of high-frequency ionospheric-skip communication.¹

Useful ionospheric refraction occurs at frequencies principally between 2000 kc. and 50 Mc. This portion of the spectrum, especially that from 4 to 20 Mc., has been used from the early 1920s for long-haul radio communications. However, there are some disadvantages in this type of propagation. The aurora and ionospheric disturbances can sometimes cause a radio "black-out" which can last for hours or days. This is a real problem in the far north. Also, the comparatively low frequency does not permit much bandwidth and, with the growing communication systems of today crying for more channels, it does not appear to be the answer to the commercial traffic problem.

The reader is referred to the propagation chapter of the ARRL *Handbook* for a more complete discussion of ionospheric skip.

Ionospheric Scatter

The ionosphere also possesses the ability to diffract or scatter signals in the very-high frequency (50 to 300 Mc.) range. (See Fig. 3.) This v.h.f. scatter propagation is used for short- and medium-range work on v.h.f. frequencies. The signal is beamed toward the receiving site and, as it enters the ionosphere, it is diffracted and a small portion is deflected in the direction of the receiving antenna. Ionospheric scatter is also affected by ionospheric disturbances such as aurora.

¹ *Basic Radio Propagation Predictions*, CRPL Series D. Issued monthly. Available from the U. S. Government Printing Office, Division of Public Documents, Washington 25, D. C.

Tropospheric Scatter

Until fairly recently, ionospheric and l.f. ground-wave propagation were depended upon almost exclusively for medium- and long-haul work. Just a few years ago, a new type of communication system providing civilian and military communication throughout most of Alaska was constructed. This system has very high channel capacity and is not affected by aurora or other ionospheric disturbances. In fact, since the system has been operating, there has not been a single outage due to propagation difficulties. This network is called "White Alice," and uses a recently-investigated type of propagation called "tropospheric scatter." Commercial tropospheric-scatter systems utilize a fairly high frequency (around 900 Mc.) and a wide band width for large channel capacity. The radiation from a troposcatter system is diffracted in the troposphere, thus making it immune to ionospheric disturbances. Its path length is somewhat more limited than the previously-discussed systems; a path loss in the neighborhood of 200 db. seems to be the

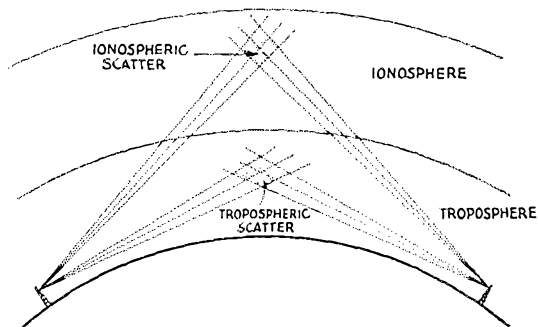


Fig. 3—The geometry of scatter propagation.

maximum allowable loss at the present state of the art. This figure, however, is for a multichannel system. There is speculation on larger parabolas and even higher power to increase the possible path length. A commercial tropospheric-scatter system is characterized by high power and huge antennas.

Scatter

The scatter propagation of light is a well-known phenomenon. When we stand outside in the evening and view the sunset when the sun can no longer be seen, we are witnessing the scatter propagation of light. At night, when a powerful searchlight is beamed toward the sky and we see the light miles away behind hills and other obstructions, we are viewing the scatter propagation of man-made light beams. The recent development of high-gain antennas and efficient transmitting equipment has permitted us to control this light-like phenomenon and to utilize it to provide reliable radio communication circuits.

Although the radio waves are scattered all along their path through the troposphere, only that energy deflected in the "scattering region" common to the view of both antennas is useful.

Perhaps a comparison with the searchlight of the previous paragraph will help to explain the theory of the scattering region. Light from the searchlight is scattered by striking droplets and dust particles in the atmosphere, or troposphere. These particles are called "blobs" in the terminology of tropo-scatter men, and each blob re-radiates its received energy with a polar pattern similar to that in Fig. 4. It is the side lobe that

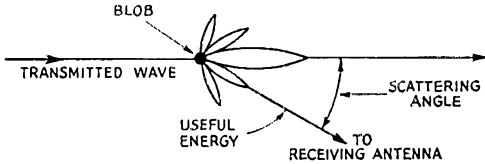


Fig. 4—Polar pattern of a "blob."

transmits the useful energy. This is the deflected energy. It has been shown that the signal received varies as the inverse function of the fourth power of the scattering angle.

In effect, the signal received is an accumulation of the energy from each one of the myriads of blobs. The magnitude of the signal received will depend on the number of radiating blobs in the volume illuminated in common by the transmitting and receiving antennas. A scatter path might be considered as a free-space path broken in the middle by the scattering volume. The effective attenuation of the scattering region adds to the free-space attenuation value to determine the total path loss and, as mentioned before, is a function of the angle formed by the rays from the transmitting and receiving antennas. (See Fig. 5.)

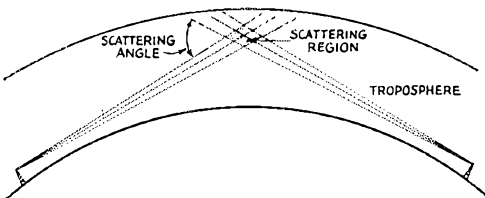


Fig. 5—The geometry of tropospheric scatter.

Scatter-Path Attenuation

When considering path attenuation for a tropospheric-scatter path, there are two factors we immediately consider; the attenuation on either side of the scattering region, and the attenuation of the scattering region. The first factor is called free-space loss, and is given in decibels by the equation

$$\text{Attenuation (db.)} = 34 + 20 \log f + 20 \log d$$

where f is the frequency in megacycles and d is path length in miles. Both are in the same units.

The attenuation of the scattering region is a variable, dependent on weather conditions. In actual engineering work, the total path attenua-

tion is determined approximately by referring to corrected free-space attenuation charts. This method seems accurate enough for primary surveys. As mentioned before, the final design work is left until the path has been tested several times to make sure that there are no unknown factors affecting the results. Incidentally, the free-space loss equation is also used in microwave line-of-sight path studies.

Path attenuation is not the only factor to take into consideration when working with system design. The receiving and transmitting antenna gains, the transmission-line losses, the receiver sensitivity, and the transmitter output power also determine whether the path is workable. This may be represented graphically as in Fig. 6.

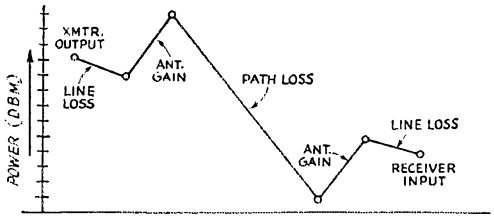


Fig. 6—Graph indicating various losses between transmitter output and receiver input.

We might comment for a moment on the two units used in the preceding formula. The decibel is strictly a ratio ($\text{db.} = 10 \log P_2/P_1$). The term *dbm.* means decibels above one milliwatt. By giving the transmitter power output in dbm., adding the antenna gains in db., and subtracting the transmission-line losses and path loss in db., we come up with the receiver input in dbm. If we know the receiver input impedance, we can calculate the signal level at the antenna terminals in microvolts.

Obstacle Gain

While experimental path studies were being made, it was observed that when the path was obstructed by a mountain or some sharp obstacle, the attenuation of the path was lessened, rather than increased. So-called "knife edges," or quite sharp obstacles were best in this respect. This effect became known as *obstacle gain*. Obstacle gain is not really a gain, but just a reduction of path attenuation over a comparable scatter path. This phenomena was explained as one of diffraction. According to Huygen's principle, a waveform striking a knife edge is diffracted over the edge of the obstacle, and the effective path is bent. (See Fig. 7.)

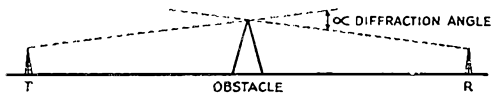


Fig. 7—Diffraction or obstacle path.

The transition between a true scatter path and a diffraction path is dependent on the frequency and the angle formed between the rays from the

transmitting and receiving antennas to the obstruction point. If the angle is negative, the path is clear or line-of-sight. If the angle is very small (either positive or negative), the path might be considered a diffraction path. As the distance increases beyond the diffraction zone, the signal received from diffraction over the earth's surface diminishes to zero and now the source of signal is primarily scatter. The angle at which the transition between diffraction and scatter takes place will depend upon the frequency. For the case of 100 Mc., the transition occurs at about 10 milliradians or approximately 0.6 degree.² At higher frequencies the angle of transition becomes smaller. Diffraction is basically an optical phenomenon, and quite accurate path calculation methods using the Fresnel integrals have been developed.

Ducts

Occasionally a great increase in signal strength is noted on tropospheric paths. This high level may last for minutes or hours. It is theorized that this decrease in path loss is due to so-called propagation *ducts*. Ducts, which usually occur over water, are sporadic phenomena caused by a refraction. Propagation ducts can be a problem when path-loss measurements are being made. If one happens to be using a duct, the measurements will not reflect the normal operating conditions, and may result in a circuit which doesn't work when installed. For this reason, path measurements are made several times and under different conditions before the final antenna and transmitter designs are submitted. Conversely, these propagation ducts can be extremely valuable to the amateur interested in sporadic v.h.f. DX contacts. Propagation ducts are discussed further in the propagation chapter of the ARRL *Handbook* under the heading of "Tropospheric Bending."

Line of Sight

The region from 1000 Mc. to 20,000 Mc. is considered the microwave region in the terminology of the communications man. Microwave energy behaves much like light. It is scattered somewhat in the atmosphere, and passes through the ionosphere without any refraction to speak of. Because of its short wave length and consequent likeness to light, microwaves are used for short point-to-point circuits where a line-of-sight path is available. The short wavelength permits small high-gain antennas and a narrow beam width, making low power a possibility. Most microwave systems have power inputs of less than ten watts.

True line-of-sight paths are modified by refraction in the atmosphere. Refraction is one of the basic phenomena of optics. According to Snell's Law, when a wave passes into a medium with a different density or refraction index, the direction of the wave is changed. (See Fig. 8.)

The refractive index of air depends upon the temperature, the atmospheric pressure, and the

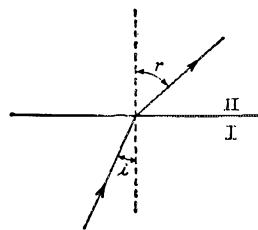


Fig. 8—Refraction and Snell's Law.

$$\frac{\sin i}{\sin r} = n, \text{ where } n = \frac{\text{Velocity of light in Medium I}}{\text{Velocity of light in Medium II}} = \text{relative index of refraction of second medium with respect to first medium.}$$

water-vapor content of the air. Since the temperature, pressure, and water-vapor content of the troposphere decrease approximately uniformly with increasing elevation, this results in a uniformly decreasing index of refraction. In accordance with the laws of refraction, a light or radio beam transmitted through the troposphere will be bent away from the normal to a line dividing media of differing refractive index, and will therefore follow a curved path. The curvature of this path varies between 0.8 and 3.0 times the earth's radius, with a value of 4/3 generally found to be in agreement with average conditions in the atmosphere.

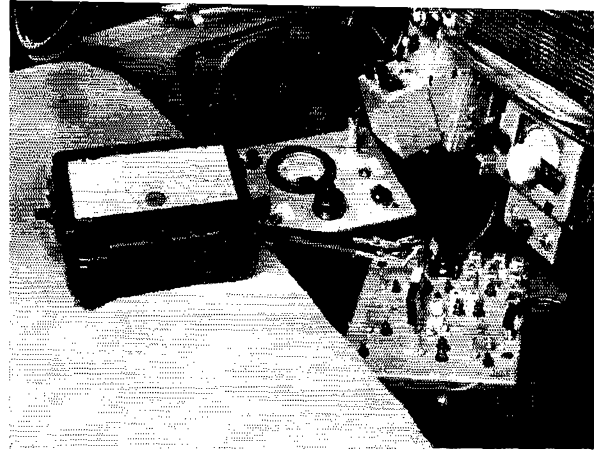
The actual path over which radio waves are propagated is called the radio path, and the radio horizon is the point at which such a path is tangent to the earth. Radio horizons and path-attenuation values based on 4/3 times the true earth's radius are found to be in agreement with values determined by field-strength measurements. In other words, a line-of-sight path is now considered to be a curved path of the same curvature as a sphere having a radius 4/3 times the earth's true radius. This concept is especially important in microwave work, and in diffraction-path calculations.

Since the path length is line-of-sight, without obstructions, higher power is not necessary for the possible paths. The average commercial path is on the order of 30 to 50 miles between repeaters. Microwave transmission is not affected by ionospheric disturbances, and is as reliable as wire communication. Microwaves are fast becoming the standard for long-line telephone communications. In fact, in the past several years, the parabolic microwave dishes and the Western Electric TD-2 cornucopias have become a common sight around our countryside. There is much amateur experimentation occurring in the field at this time, as is evidenced by a glance at recent *QSTs*.

Perhaps in summary it would be valuable to examine again the frequencies associated with each type of propagation. Ground wave is predominant from the low end of the radio spectrum to about 2000 kc. Ionospheric skip usually occurs between 2000 kc. and 50 Mc. From 50 to 3000

(Continued on page 152)

² RCA Service Co., Inc. *Point to Point Radio Relay Systems, 44 to 13,000 Mc.*, RCA Electronic Training series, September, 1954. Published by RCA Service Company.



Some Suggestions for Improving Mixer Noise Figure and Reducing Noise Pickup

BY HARRY B. DUNLAP,* W6ZNM

Quieting Mobile Transistor Circuits

OUTSTANDING among the problems that I encountered in the conversion of my 75-meter mobile installation to transistors was the one of filling in the gap between the theoretical and the practical phases of the semiconductor field. From a given requirement I selected the most promising circuit available—and then spent hours making it perform. One redeeming feature in all of this was the opportunity for a little “oatmeal type” research.

The first time that I fired up my 3-ke. bandwidth transistorized receiver with my Gonset converter I was thrown back by the terrific noise blast from the speaker. A quick check with a noise generator showed the noise figure to be in excess of 20. Changing the mixer transistor did not improve the noise figure, consequently I was forced to probe into the workings of the circuitry. The photograph shows my mobile laboratory. The noise generator uses the circuit given in Fig. 1, page 11, July 1953 *QST*. The output of the noise generator is connected to the antenna input terminals of the Gonset while the output of the transistorized receiver is connected to a Simpson Model 269 multimeter. A Heath Model O-11 oscilloscope is used to observe circuit voltage characteristics.

Mixer Noise

The factors influencing the internal noise in a transistor mixer circuit which can be controlled by the amateur are (1) transistor type, (2) level of emitter d.c. bias current, (3) oscillator injection level to the mixer emitter, and (4) the mixer input-circuit resistance (source resistance). Of the four, the first two are the easiest to satisfy while the last two are the most difficult to control, considering the average amateur's “do-it-yourself” facilities.

The primary requirement in the selection of a transistor is that the upper cutoff frequency, f_c , must be higher than the highest frequency applied to the mixer (1888 kc. in my mixer). In the final selection I try to minimize the ratio of transistor cost to f_c . Also, I prefer the n-p-n type in mobile operation because of the isolation provided by the collector circuit against noise on the car wiring system.

Transistor receivers can be pretty noisy unless care is used to achieve the optimum operating conditions, especially in a mixer stage. Here is some practical information that will help you in getting better effective sensitivity from transistor frequency converters.

The mixer emitter d.c. bias current should be maintained at a low value for low noise. The usual suggested value is in the vicinity of 250 microamperes, but some sources recommend values in the range of 25 to 80 microamperes. I found that the relation between the magnitude of the

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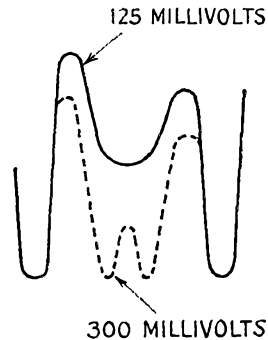


Fig. 1—Mixer collector-voltage waveforms at 1888 kc. with 300 millivolts peak oscillator-voltage injection to mixer emitter, dashed curve, and 125 millivolts peak injection, solid curve.

emitter d.c. current and noise was not too critical, and therefore selected a value of 200 microamperes.

Oscillator Injection

It is known that for optimum mixer functioning the oscillator voltage injected in the mixer emitter circuit should be just sufficient to cut off the transconductance over a small portion of the cycle. The usually-recommended value of oscillator injection voltage to the mixer emitter is in the neighborhood of 250 millivolts peak. I selected 300 millivolts peak oscillator injection voltage, but subsequently discovered that this value far exceeded the optimum value for my circuit, and accounted for the greater portion of the noise generated in the mixer (noise figure in excess of 20). This represented an overdriven condition, and is illustrated by the mixer collector-voltage waveform at 1888 kc. shown by the dashed line in Fig. 1. Reducing the oscillator injection voltage to 125 millivolts peak gave the mixer collector-voltage waveform shown by the solid line in Fig. 1 and a resulting noise figure of 5.

The adjustment for satisfactory oscillator injection level to the mixer is probably the most difficult of all to accomplish. For this adjustment I removed turns from the secondary of L_3 (Fig. 2) until only one turn remained. This gave 125 millivolts. An alternative method would be to reduce the oscillator base bias either by increasing the value of the emitter resistor (3800 ohms)

or by reducing the bias resistor (15,000 ohms). Trial selection of the best transistor in my collection reduced the noise figure to 4 and put me into business.

Signal-Source Resistance

While rummaging around in the matter of mixer signal-source resistance I was influenced to investigate the effects of the base-bias resistance network values and connections upon mixer noise, in the belief that an improvement in the match between the signal source and the transistor base could be achieved for optimum signal-to-noise ratio. The signal-to-noise ratio for a transistor mixer depends partly upon the signal-source resistance.

Fig. 2 shows two circuits for the frequency converter. The circuit in A has the mixer bias connected in shunt while in the circuit in B the mixer bias is series connected; otherwise the two circuits are identical. Fig. 3 shows the resulting receiver noise figure for each connection, for several values of base bias resistance. It is of interest that, first, the series bias feed produced the lowest noise figure and, second, the minimum noise figure occurred for the lower values of bias-network resistance. This illustrates that for this particular input circuit the series bias connection with low values of resistance is most suitable. I was unable to determine the effect of the unbypassed current feedback resistance (470 ohms) in the mixer emitter upon mixer noise be-

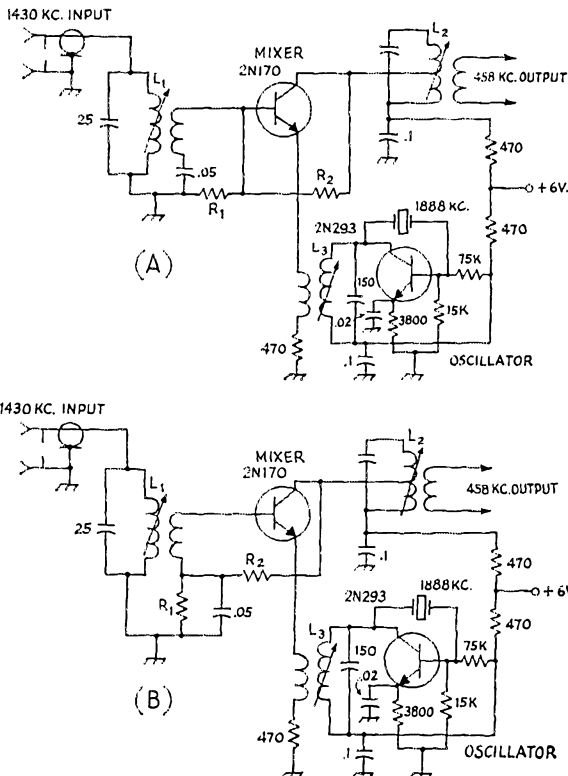


Fig. 2 — Oscillator-mixer circuits using (A) shunt bias network for mixer and (B) series bias network. Values of R_1 and R_2 are discussed in the text. Decimal values of capacitance are in μf .; others are in $\mu\text{m.f}$. Resistors are $\frac{1}{2}$ watt.

L_1 — Vari-loop broadcast antenna. Remove 10 turns from outer end and add an 8-turn secondary of No. 28 enam. wire close-wound on inner end.

L_2 — 455-kc. transistor-type i.f. transformer (Lafayette MS-268).

L_3 — Same as L_1 except secondary at inner end is one turn.

Frequencies shown are for conversion from the Gosset converter output frequency to an i.f. amplifier using a 3-kc. bandpass filter.

cause of inadequate test facilities. I elected to leave the 470-ohm resistor unbypassed.

In the series-fed circuit the value of R_1 can be made consistent with a desired value of R_B , and R_2 selected to give the desired value of emitter bias current. The value of R_2 for the series connection is equal to 7 times R_1 when R_1 is in the vicinity of 1000 ohms and to 16 times R_1 when R_1 is in the neighborhood of 3000 ohms. I selected the series bias connection with R_1 equal to 3000 ohms and R_2 equal to 47,000 ohms. These values gave an emitter d.c. bias current of 200 microamperes and a noise figure of 3. I selected resistance values near the upper limit since I wished to connect R_2 to the collector for the purpose of providing maximum isolation from car system noise. The higher value placed less loading on the collector circuit.

Adjustment

Mixer noise may be minimized without extensive instrumentation by tuning in a weak station just above the noise level and varying each of the four factors, particularly oscillator injection level, for maximum signal-to-noise ratio. This is actually the most practical test and the one which I used for checking after each session with the noise generator. Also, I always conducted a road test after each circuit change. The mixer transfer gain, which may also be affected by the circuit adjustments, is not too much of a problem since a loss of gain may be compensated for by the gain of the following stages.

Noise Pickup from Car Wiring

Another receiver noise problem of consequence occurred in the audio output stage. The p-n-p transistor, when used in an installation where the car battery negative is grounded, contributes to noise output because of its habit of simultaneously functioning as a grounded base amplifier for car-system noise input to the emitter. A husky noise filter containing 2400 μ f. of shunt capacitance and a series inductor connected in the 6-

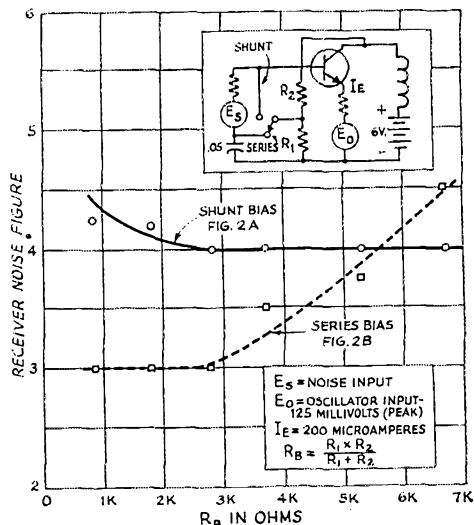


Fig. 3—Receiver noise figure versus mixer base bias resistance.

volt system did not reduce speaker hum to the negligible level. As a solution I replaced the normal 2-ohm protective resistor in the emitter circuit of the 2N255 with a small r.f. choke (Miller No. 4632, 100 μ h., 2 ohms). This change reduced the speaker hum, caused by the car radio vibrator, about 4 db. to a non-disturbing level.

In the early stages of the transition from tubes to transistors in my 75-meter installation it was discovered that the ordinary r.f. choke (I prefer the iron-core or ferrite type) provided the most effective isolation between the desired signal and the unwanted noise. The capacitor made the poorest showing for two reasons, (1) the low impedance of the car noise circuit, and (2) the susceptibility of transistors to signals of very low amplitude. In some cases, "bypass" capacitors actually functioned as coupling capacitors to bring in additional noise. QST

Strays

The new mayor of Fort Wayne, Indiana, is K9CXX.

K5ORB reports he worked K0GGI of Coopers-town, N. Dak., who is called Art. Finishing the QSO, he next contacted W2FSU of Cooperstown, N. Y. — also called Art.

G3IDG reports with some surprise that he has just received a Novice QSL that was *not* addressed to "Chief Operator."

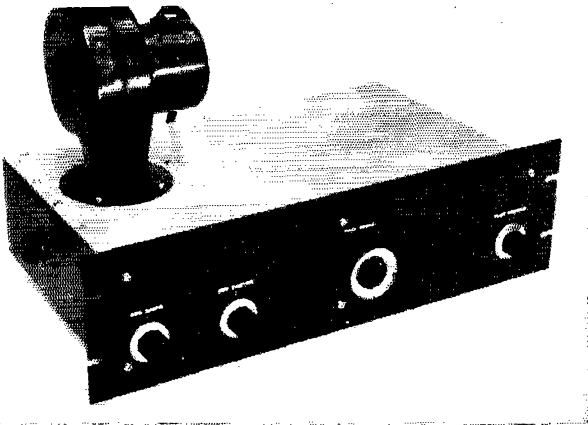
Overheard on 40 c.w. or, still wondering what that guy's name was:

"What did you say your name was? Bk"
 "Name hr is Mutt? Matt? Mvtt Bk"

KN3KHN has troubles. He keeps hearing what sounds like a sideband station whenever he is playing his electric organ. He can't identify the station, although he has determined that it is not a local. He would welcome suggestions.

In the Hampden County (Mass.) Radio Assn. newssheet, this ad appeared recently: FOR SALE: DX-20 in excellent condition. Never driven over 10 w.p.m. Ex-KN1HLW.

K1GCX has a tie clip with his call letters engraved on it. A restaurant cashier noticed it and said: "What a nice tie clip with your name on it. How do you pronounce it?"



The 2-meter amplifier is a compact package only 4 by 10 by 17 inches in size, on a 5/4-inch panel. Air can be fed into the back wall of the chassis to save rack space, if necessary. Front-panel controls are the grid tuning, input coupling, plate tuning and output coupling capacitors. Knob at the end is for the differential capacitor in the grid circuit.

Linear, C. W. or A. M.

Phone, with 4CX300As

A High-Efficiency 2-Meter Kilowatt

THERE seems to be no inexpensive way to efficient high-power operation on 144 Mc. Tubes that can be picked up cheaply, used or on the surplus market, simply do not "have it" on bands above 50 Mc. The amplifier to be described here was built by W1DXE, West Hartford, with high performance as the main objective. Admittedly it cannot be duplicated for pennies, but it is unlikely that a way will be found to develop many more watts of useful and legal c.w. power at 144 Mc. than this handsome package provides.

The urge to build an amplifier of this kind resulted from many months of satisfactory service with a single-ended amplifier built and described by W1VLH.¹ That transmitter was used nightly, mostly as an a.m. linear, at W1DXE for about two years. Though the AB₁ linear is certainly no high-efficiency device from the standpoint of power out for power in, 100 watts of well-modulated a.m. output on 144 Mc. without the use of heavy-iron modulators was attractive. The low drive requirement of the linear was also appealing. If one tube worked so well, why not go all the way and put in two in push-pull?

The W1VLH amplifier used a 4X250B, in a design that made possible operation on 144, 220 and 432 Mc. The new job uses a pair of 4CX300As, which are quite similar in design, except for the use of ceramic rather than glass insulation. It is designed for 144-Mc. service only, though only slight modifications would be needed to put it on 220. In its service at W1DXE it is currently operating as an a.m. linear, delivering a solid 200 watts to the antenna, at an input of 600 watts. The exciter is a pint-sized unit ending in a 5763 doubler. The exciter-modulator, on its 3 × 4 × 17-inch rack chassis, is a far cry from the equipment needed to produce anything like this amount of modulated signal with a high-level audio system!

The setup is also ready to go on s.s.b. or c.w. at full power, at the flip of a switch. For highest

¹Southworth, "Using the 4X250B on 144, 220 and 432 Mc." QST, February, 1957, p. 31.

efficiency on c.w. the drive should be increased to 15 watts or so, but even under the AB₁ conditions the power output capability is on the order of 600 watts on c.w. or s.s.b. The amplifier has not been operated with plate modulation, but the single-tube version is being run at 300 watts input, c.w. or a.m. phone, at W1HDQ, currently on 220 Mc.

Construction

The amplifier is built inside a standard 4 × 10 × 17-inch aluminum chassis, and is mounted on a 5 1/4-inch rack panel. A partition of 1/8-inch aluminum isolates the grid and plate circuits, and provides support for the tube sockets. It is mounted so that the plate compartment is 11 3/16 inches long. The blower is mounted on the cover plate, facing downward, but provision is made for running air into the back of the chassis, in case it should be desirable to save rack space. An air hose to a remote blower is a logical way to handle this. The air flow is into the grid compartment, through the tube sockets, and out through the open ends of the plate line. Screened holes in the end of the chassis provide for air escape.

The tank circuits are the principal items of interest. The grid circuit, Fig. 2, is a half-wave line of copper tubing and strap. A small differential capacitor, C₁, in parallel with the main tuning capacitor, C₂, enables the operator to balance the drive precisely. This is important if truly high efficiency is to be achieved. It will be seen that provision is made for measuring the grid current to each tube separately. The differential capacitor is adjusted to give the same grid current on each side of the circuit.

The plate line, Fig. 3, is made of 1 5/8-inch copper tubing, silver-plated. This tubing is a standard plumbing size, available almost anywhere. It fits over the anode structure of the various tubes of this type, and need not be sawed for clamping. Stainless steel hose clamps, available in auto accessory stores, are used. The only item in the amplifier that requires appreciable hand labor is the shorting device on the plate line.

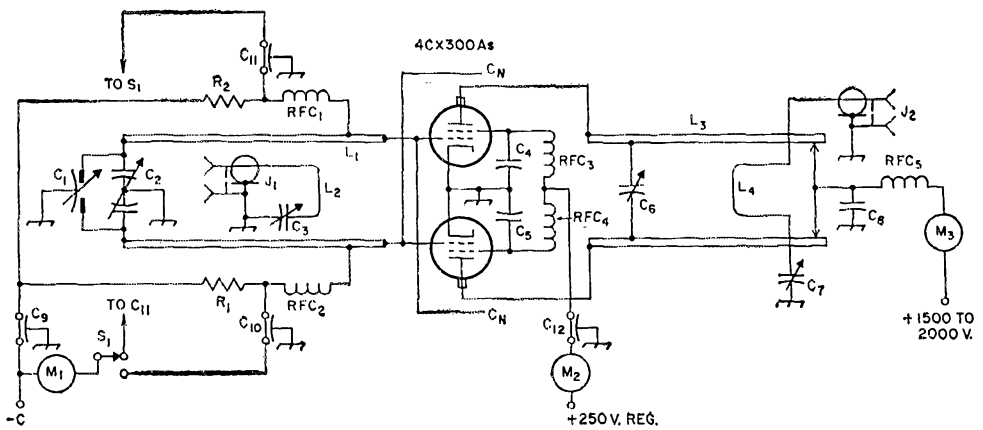


Fig. 1—Schematic diagram of the high-powered 144-Mc. amplifier.

- C₁—5- μ f. miniature differential capacitor (Johnson 160-303).
- C₂—30- μ f. per-section split-stator variable (Hammarlund HFD-30-X).
- C₃, C₇—50- μ f. variable, double-spaced (Hammarlund HFA-50-B).
- C₄, C₅—Screen bypasses built into tube sockets (Eimac SK-710).
- C₆—Variable disk capacitor; see text.
- C₈—500 μ f. 10,000 volts (Centralab TV3-501).
- C₉—C₁₂ inc.—500- μ f. feedthrough capacitors (Erie 327-102).
- C_N—Neutralizing wires; see text and photographs.
- J₁, J₂—Coaxial receptacle, SO-239.

- L₁—See Fig. 2. R.f. chokes should be connected at point of lowest r.f. voltage.
- L₂—Input coupling loop; see Fig. 2.
- L₃, L₄—See Fig. 3 for details of line, movable short and output coupling loop.
- R₁, R₂—Shunt to suit meter.
- M₁—Grid-current meter. Range depends on class of service; 10 ma. desirable for linear service, 100 ma. for others.
- M₂—100-ma. meter.
- M₃—1000-ma. meter.
- RFC₁—RFC₅, inc.—2- μ h. r.f. choke (National R-60 or Ohmite Z-144).

This was cut from $\frac{1}{4}$ -inch copper plate, in order to provide a low-resistance low-inductance short across the plate line. These qualities are of extreme importance in the achievement of a high-*Q* line. Like other r.f. components, it is silver plated.

The shorted end of the plate line is supported on a TV-type 500- μ f. bypass capacitor, C₈. A short length of coax is used for the high-voltage lead from the terminal on the back of the chassis to the r.f. choke, RFC₅.

Driving power is fed into the grid circuit by means of a tuned loop (L₂, C₃) at the point of low r.f. voltage on the line. A similar coupling circuit (L₄, C₇) at the shorted end of the plate line takes the power from the plate circuit. The second wire near the end of L₄, visible in the photographs, was added to make the loop tune with the 50- μ f. series capacitor. A shorter loop would serve equally well, of course. Follow dimensions in Fig. 3. The coupling loops are supported on ceramic standoff insulators. The leads from the ends of the loops to their tuning capacitors are silver-plated copper strap. This was employed to keep the inductance of these leads to a minimum.

The plate circuit is tuned by means of a variable capacitor, C₆, made from 2 $\frac{1}{2}$ -inch diameter copper disks obtained from a local hobby shop. The shafts are threaded $\frac{1}{4}$ -inch brass rod. As may be seen from the photographs, a brass nut is threaded onto the end of each rod to serve as backing for the disk. The rod is run through the hole so that its end is flush with the inner surface

of the disk and then the nut and rod are soldered to the disk. The rods run through threaded holes in the tubing comprising L₃. Note that the stationary rod has a knob on its outer end. This was used in the initial tuning of the plate circuit, to set up the capacitor so that its normal tuning range would come with the plates approximately centered between the two sides of the plate line.

A source of ideas for this transmitter was a similar design by WIREZ. Ray recently reported that he was able to increase the efficiency of his amplifier by making provision for balancing the plate circuit. He mounted a grounded fin of copper adjacent to the back half of the line, and then adjusted the position of it with respect to

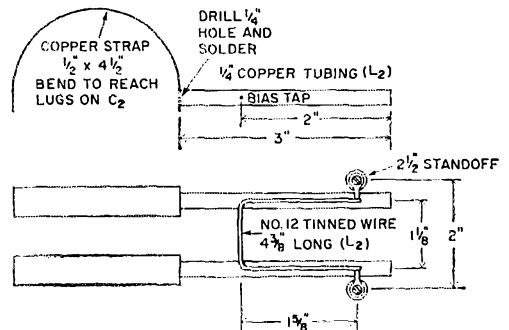


Fig. 2—Details of the grid circuit for the 144-Mc. amplifier. The bias tap should be at the point of lowest r.f. voltage on the line, approximately 2 inches from the grid end.

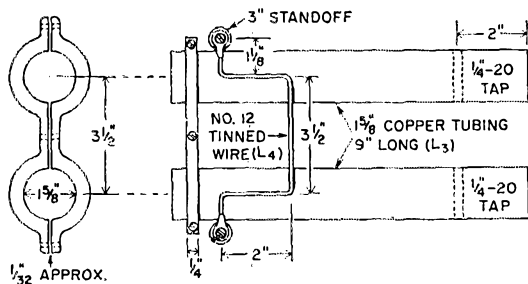


Fig. 3—Plate circuit of the kilowatt amplifier for 144 Mc., showing the movable short and the output coupling loop. All r.f. components are silver plated.

the line (retuning C_5 as needed) until maximum output was obtained. The type of insulated coupling and the tuning shaft material might have some bearing on this. Note that a fiber roll is used to turn the coupling. A metal rod cannot be used, as it will unbalance the circuit. Poly or lucite rods will not stand the heat. Ceramic or high-grade fiber materials are best.

All copper and brass parts of the tuned circuits are silver-plated. How much good this did is not known, as the silver plating was done before the first tests were made on the completed amplifier. The single-ended amplifier by W1VLH seems to work well with no silver plating whatever, but the plating job certainly does no harm. Where the best possible contact is important, as at the short on the plate line, the plating may be a considerable asset.

Conventional cross-over neutralization is employed. The amplifier was operated without neutralization at first, but the stability requirements of a linear amplifier are very stringent. The neutralization definitely was necessary in order to achieve consistently satisfactory operation. It is readily accomplished. Insulated wires from the grid terminals are run through the partition into the plate compartment, and their position adjusted until r.f. indication in the plate compartment is reduced to an absolute minimum. The setting of the wires will be found to be very critical by this test, but some care in the neutralization process pays off in beautifully stable operation.

Linear Amplifier Service

Because it is an essential part of almost every single sideband station, the linear amplifier is gaining attention for a.m. and c.w. service as well.

Top-front view of the kilowatt amplifier for 144 Mc. built by W1DXE.

Potential users should recognize its limitations in a.m. applications, however. These have been set forth in detail before², so they will not be discussed completely here. The references in the footnotes are "must" reading for the fellow who is attracted by the idea of driving a high-powered amplifier from small "packaged" transmitters such as the Communicator. Part of one of the *QST* articles in footnote 2 is reproduced below, edited to fit the operating conditions encountered in setting up the W1DXE amplifier for a.m. linear service.

The linear cannot be run at its maximum c.w. output. You have to leave some for the modulation upswing. It must also be operated within close tolerances. Overdrive it, or underload it, and the thing simply will not follow the modulation of the driver stage as it must if it is to be linear. If it is not linear, it will sound undermodulated or distorted; and likely both.

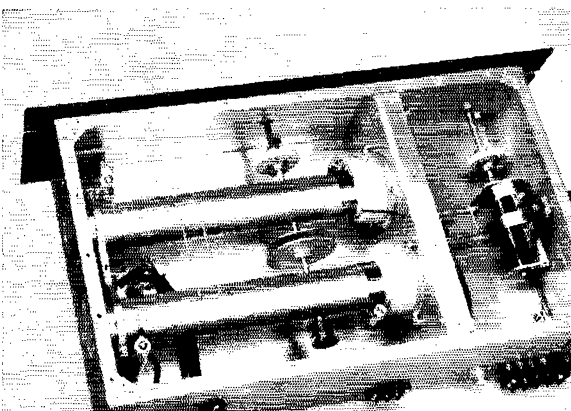
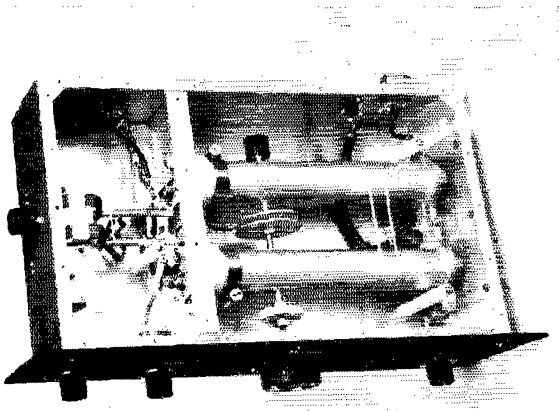
So, to get your money's worth from a linear amplifier you need to adjust it with care, and watch its operation closely. Begin by setting the fixed bias level so that the plate current is about 200 ma. Plate voltage can be anything from 500 to 1500 volts, so long as the no-drive plate current is held to around 200 ma. Now couple to the driver stage.

Remember this is a Class AB₁ amplifier. It should not draw grid current at any time. The grid voltage will be the only evidence in the grid circuit that drive is being applied. Start with little or no drive, without modulation. As the driving voltage is increased, output will appear and the plate current will rise. When the drive is

² Grammer, "Linear Amplifiers for A.M.," *QST*, February, 1956, p. 39.

Tilton, "Linear Amplifiers for the V.H.F. Man," *QST*, December, 1956, p. 28.

Top-rear view, showing grid circuit details.



increased to the point where the tubes just start to draw grid current, adjust the antenna loading for maximum output with as much plate current as you feel safe in running.

Now back off on the drive until the plate current drops to 400 ma. and apply modulation. If the amplifier is operating linearly, its plate current will be the same whether or not you are modulating. Talk up until grid current just shows on modulation peaks. If the plate current changes with modulation, try more antenna loading and reduce the unmodulated grid drive to keep the plate current at 400 ma. Continue until plate current stays steady whether or not you are modulating up to the grid-current point. A modulation indicator such as a neon or fluorescent lamp should show the normal modulation brightening even though there is no change in plate current.

Output will be no more than about half the rated plate dissipation of the tubes used. To play it safe it is well to be satisfied with less, especially at 144 Mc. Experience has shown that this amplifier runs nicely with 1500 volts on the plates and 400 ma. plate current, delivering better than 200 watts to the antenna.

It is important that the driver stage be well modulated. If it is not emitting a good-quality signal, the linear will certainly not do so. But if the driver is modulated cleanly and well, the characteristics of the signal radiated by the linear will be equally good, if it is adjusted properly.

Getting a 5-watt phone rig to work properly should be a relatively simple matter. From there on to a good-sounding signal of up to 200 watts or so of output is mostly a matter of getting the

linear to operate with complete stability, and show upward modulation. This should not be difficult, if adjustments are made with a little care, and checked regularly.

The amplifier can be shifted from linear operation to full-power c.w. or high-level modulation service with a minimum of fuss. Control of bias and regulation of the screen voltage at 250 volts facilitates this. Though Eimac recommends a maximum of 350 volts on the screens, this amplifier has been found to adjust more readily in linear service with 250 volts, regulated, on the screens. No change is made in the screen voltage when shifting to other classes of service.

Up to about 500 watts output on c.w. can be obtained merely by increasing the grid drive slightly. Changing to 2000 volts on the plates permits up to 600 watts output on c.w. with low drive. Running up the grid drive further makes it possible to obtain up to 800 watts output on c.w., or 470 on plate-modulated phone. The driver stage should be capable of about 15 watts output for the full-output conditions.

As with all tetrode amplifiers, the screen dissipation should be watched closely. This is not a factor in linear service, as the screen dissipation is always low if the amplifier is working correctly. Sudden removal of load can change this radically, however. Some form of screen protection is desirable, in order to prevent damage to the tubes in case trouble develops. At W1DXE the screen is fed through an overload relay that is set to open at 60 ma. This protects both the tubes and the screen meter, and it has been well worth the small investment.

— E. P. T. QST

Strays

Here are the February schedules for the various MARS technical nets.

First Army MARS

(Wednesday evenings, 2100 EST, 4030 kc.
upper sideband)

- Feb. 3 — Application of Quartz Crystals in S.S.B. Filters.
- Feb. 10 — Design Philosophy of a Modern S.S.B. Transceiver.
- Feb. 17 — Harmonic and Intermodulation Distortion in High Fidelity Amplifiers.
- Feb. 24 — High Power Transmitter Stations.

AF-MARS Eastern

(Sundays 1400 EST: 3295, 7540 and 15,715 kc.)

- Feb. 7 — Principles of Infra-Red.
- Feb. 14 — U.H.F. Radiotelephone Systems.
- Feb. 21 — Oscillator Circuit Considerations.
- Feb. 28 — Quality Control Techniques.

AF-MARS Western

(Sundays 1400 EST: 7832.5, 3295 and 143,460 kc.)

- Feb. 7 — Mobile and Portable High Frequency Antennas.

- Feb. 14 — Modern Telemetry Techniques.
- Feb. 21 — Technical Net Session, Conversion Discussion and Project Reports.
- Feb. 28 — L3 Carrier System.

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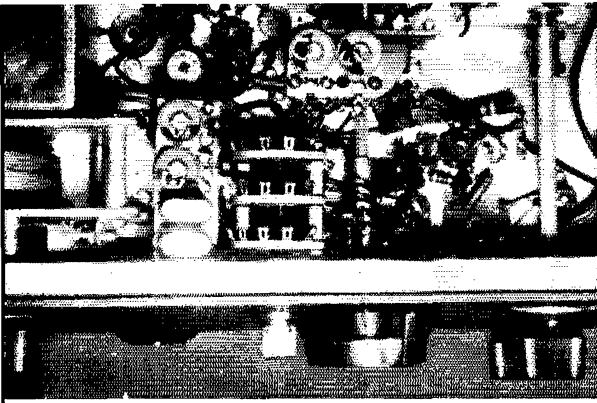
The fellow who tells this one swears it is true — and we couldn't resist passing it along.

A ham in White Plains had a call from the FCC office regarding a TVI complaint. The caller asked if there were other people of the ham's name residing at the same address (which *could* happen in a large New York area apartment house).

When the ham said he owned his own home, a single house, the FCC man replied: "Well, in 25 years in this game, I thought I'd seen everything, but this is a new one on me. I've got a TVI complaint from your wife!"

— . . . —

ZL3DC was working on his S40-A receiver when he noticed its number, 100237, was the same as the number on the S40-A receiver he used in the Royal New Zealand Navy. "Looks like it is following me," he says.



Detail photo showing mounting of crystals and switch.

BY ROBERT W. GODWIN, M.D.,* W6EVX

Some Simple HT-32 Modifications

The simple alterations described here by W6EVX make use of the VOX control system for c.w. break-in operation. Crystal switching on 10 meters facilitates coverage of this band.

AN HT-32 has given almost flawless operation at this station over the past two years on s.s.b. operation. With the modifications to be described, it has completely filled the writer's needs for more complete rapidly-available ten-meter coverage, and c.w. break-in operation, making use of the VOX relay and coaxial antenna relay. Now when ten-meter DX is open, and a new country is heard in the c.w. band or on a.m. above 29.0 Mc., the HT-32 can be quickly switched to these frequencies. Operating c.w. break-in is a pleasure — no switches to throw — just start sending. With the first dot of the bug set at 20 w.p.m., the HT-32 and the home-built linear with coaxial antenna-relay switching are on the air. Normal sending keeps the transmitter in operation but, upon stopping, the relay opens for receiving with the same antenna. It has always seemed a shame to the writer not to make such use of the elaborate VOX circuits of s.s.b. excitors on c.w. as well as phone. Inspection of the circuits of several commercial excitors suggests that the adaptation described here for the HT-32 could also be applied to the VOX circuits of other units. The simple addition of push-to-talk control added the last refinement.

The second alteration that the author made in his HT-32 was in the system for covering the 10-meter band. The HT-32 covers the 10-meter band in four 550-kc. segments, requiring the manual changing of crystals and readjustment of two trimmers in going from one segment to another. It is not difficult to incorporate the convenience of switching to these segments.

*5500 El Parque St., Long Beach 15, Calif.

Added Convenience in C. W. and 10-Meter Operation

C.W. Break-In and P.T.T.

This modification permits break-in c.w. operation making use of the VOX relay, and provides push-to-talk control when desired. It requires only simple wiring changes and the addition of one potentiometer, a fixed resistor, and substitution of a two-prong microphone connector for the original one-prong unit. No drilling for the potentiometer is necessary. It is mounted in an unused hole that will be found at the rear of the chassis. The second terminal of the microphone connector goes to Terminal 6 of P_3 , the grounding of which provides push-to-talk operation.

The diagram of the break-in circuit is shown in Fig. 1, with the added connections shown in dotted lines.

With the controls in the MOX and c.w. positions, and the added potentiometer R_1 with its series-connected switch S_1 turned to the off position, the operation is unaltered from the original, with operation controlled by manual STAND-BY-TO-MOX switching. With R_1 turned to close the switch, R_1 provides a control of the length of hold-in of the break-in circuit. With the first light dot contact of the key or bug, the blocking bias on the grid of the VOX amplifier V_{17B} (and stored in the 0.22- μ f. capacitor C_{85}) is discharged through the low forward resistance of diode V_{16A} , and the VOX relay immediately closes. On opening of the key, however, the 0.22- μ f. capacitor must charge slowly through the high resistance of the added 8-megohm fixed and 5-megohm variable resistors until a blocking voltage for the VOX amplifier tube V_{17B} is reached. The adjust-

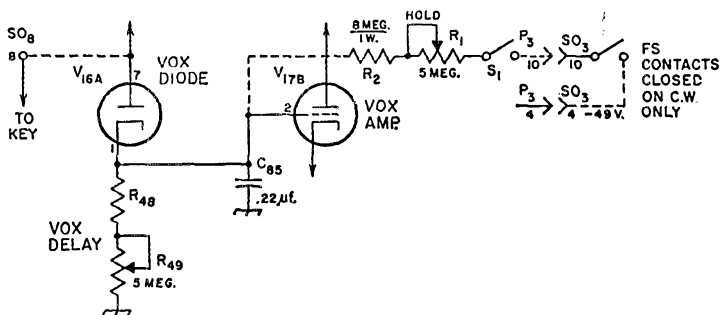


Fig. 1—Diagram showing modifications in HT-32 circuit for c.w. break-in. Dotted lines indicate added wiring. R_1 , R_2 and S_1 are new components. R_1 is a volume-control potentiometer with built-in switch S_1 .

ment of the potentiometer provides proper "hold" so that the relay remains closed during average sending, but opens promptly when the operator stops sending. This hold adjustment is made after setting the voice VOX hold control which has a unilateral interaction with it. The added hold control is disconnected in all but the c.w. position, however, and does not affect the VOX hold adjustment.

With this modification, closing the key or the bug-shortening switch grounds the VOX diode plate and disables the VOX circuit. The writer finds this useful at times when the S9 junior ops invade the shack and start merrily tripping the VOX relay. Closing the bug switch disables the VOX circuit quickly and p.t.t. operation is used until the "harmonics" can be attenuated.

Modification Procedure

Mount a 5-megohm potentiometer (R_1) with switch (S_1) in the unused hole of the correct size in the rear of the chassis, between SO_3 and the coax output.

Mount a 1-watt 8-megohm resistor (R_2) on the end and fourth unused tie points of the tie strip near R_{53} . Connect as shown in Fig. 1.

To provide -49 volts for the c.w. position only, modification is made within the sideband generator subassembly shield. The cable shield connected to Terminal 10 of P_3 for grounding is connected to ground through an added short piece of flexible wire to free Terminal 10 of P_3 and SO_3 for this connection.

There are two possible methods of providing switch contacts closed in the c.w. position. The writer used the method of modifying switch FS_{5R} , which apparently was found to be superfluous and not wired, as shown in the schematic of my model HT-32 Mark I. The end of the switch blade is easily filed and broken off with pointed pliers so that it closes Contacts 3 and 5 in the c.w. position only, instead of in both c.w. and d.s.b. positions.

Another possible method is to use the portion of FS_{1R} that connects 8 and 9 in c.w. only without modification. This switch also seems to be superfluous since the key connected through it in c.w. only is connected through SO_{1R} in MOX only, and the key line to which it

is connected is grounded through FS_{2R} and the VOX relay contacts — which are closed in MOX in all positions except c.w. anyway. These terminals, however, are hard to get at, and it was easier for me to make the modification of the accessible FS_{5R} as above.

Either of these switch contacts closing in c.w. only are used to connect the -49 volt bias supply from Terminal 4 of SO_3 to Terminal 10 of SO_3 made available for this purpose. The added wiring is completed by making the connection between Pin 7 of V_{16A} and Prong 8 of SO_3 .

Crystal Switching

This modification is made by adding a 3-pole three-deck switch (CRL PA 2009 nonshorting steatite) in a hole drilled through the front panel to the lower right of the band-selector switch where a small metal National HRM knob matches the appearance of the dial-drag knob to the lower right of the v.f.o. knob.

The front section is used for the selection of the 10-meter heterodyne-oscillator crystal provided (32.5 Mc. for 28.5 to 29.0 Mc.) or added crystals (32.0 Mc. for 28.0 to 28.5 Mc., and 33 Mc. for 29.0 to 29.5 Mc.). If desired, a fourth crystal and associated padders could be added to cover that last 200 kc. from 29.5 to 29.7 Mc. An additional 47-ohm $\frac{1}{2}$ -watt resistor (see R_{27} in the original circuit) was added from the ground side of the added crystals to the oscillator-tube ground point for better r.f. circuitry.

The second section of the switch selects the existing heterodyne-oscillator plate trimmer, C_{64} , or added similar trimmers (two CRL 822-AZ, 4.5 to 25 $\mu\mu\text{f.}$, NPO). These and two sockets for the added crystals were mounted on a small aluminum bracket running between the front and back ends of the bolt on the v.f.o. side of the switch.

The third section of the switch selects the existing trimmer, C_{78} , in the plate circuit of the second mixer, V_7 , or one of two similar added trimmers (CRL 822-BN, 7-45 $\mu\mu\text{f.}$, N650). It is desirable to have the crystal-frequency trap circuit ($L_{24}C_{77}$) in the circuit for all three crystals and set for the highest crystal frequency (33 Mc. in this case) as described in the HT-32 Manual, page 20, paragraph 7-20. To accomplish

(Continued on page 164)

The control systems in most ham stations "just grow," with the eventual result an octopus of extension cords, whose individual functions are soon forgotten. The control described here by WIKYO follows a simple system that covers almost every conceivable requirement, present and future, and trusts little to memory.

Flexible Arrangement Covering Most Amateur Needs

BY RICHARD E. PERKINS,* WIKYO

A Universal Control System

DID you ever get some equipment built and want to try it out before hitting the sack, just so you would have something to worry about to get you to sleep? Yes? Then go to hook up a power supply to it and find that you had a Jones barrier strip on the new equipment and an octal socket on the power supply, and no plug to fit the octal socket? Or move from one location to another and forget which way went where?

After putting up with such a condition for twenty years, I figured to get off the dime and work out something that would let me enjoy my retirement years.

Basic System

The control needs for most amateurs can be summarized as follows:

- 1) A connection that provides automatic grounding of all chassis for safety purposes.
- 2) A connection for the common a.c. wire, that is not fused at any point, and which serves as a common a.c. return.
- 3) A connection to the ungrounded side of the a.c. line through a switch that will apply power to all equipment that will run continuously during operation of the station on c.w. In addition

*37 School St., Manchester, Mass.

to filament supply for the r.f. stages and power-supply rectifiers, this will often include such units as low-voltage r.f. plate supplies, r.f. bias supplies and blowers.

4) A connection to the ungrounded side of the a.c. line through a switch that will apply power to circuits that are energized only when transmitting (c.w.). This usually includes the high-voltage and screen supplies for the final, antenna relay and sometimes a receiver-muting relay.

5) A connection to the ungrounded side of the a.c. line through a switch that will apply power to the modulator circuits that normally run continuously during operation of the station on phone. These may include such units as a monitoring scope, and a relay that "unshorts" the modulation-transformer secondary, as well as filament, bias and low-voltage supplies in the audio section.

6) A connection to the ungrounded side of the a.c. line through a switch that will apply power to all audio circuits that are normally energized only while transmitting. The principal unit in this category would be the high-voltage supply for the modulator.

In addition to these basic requirements, I added the following which others may find useful.

Fig. 1—Wiring diagram of the control box. Designations P₁ through P₆ are not used.

I—115-volt panel lamp.

J₁, J₃, J₄, J₅, J₆—Dual a.c. outlet.

J₂—Single a.c. outlet or any two-wire female outlet.

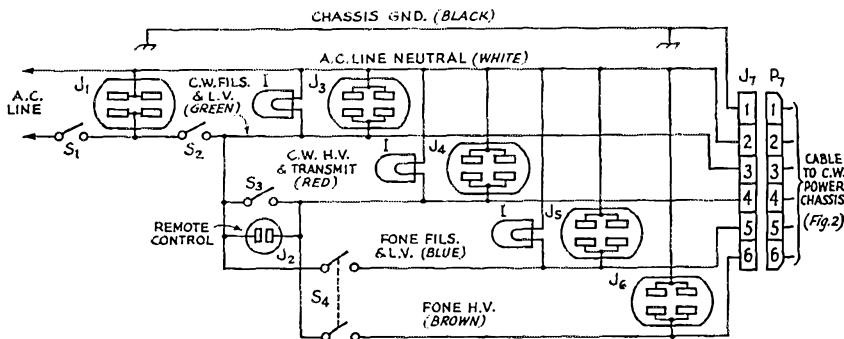
J₇—6-prong chassis receptacle (Amphenol 77-MIP-6 tube socket).

P₇—6-pin plug (Amphenol 86-CP6).

S₁—Key-lock switch.

S₂, S₃—15-ampere s.p.s.t. wall or toggle switch.

S₄—15-ampere d.p.d.t. wall or toggle switch.



7) A safety key-lock switch preceding the switch of (3) cutting off all power from the station to keep the harmonics out of trouble when the fundamental isn't around.

8) The switch of (5) should be connected to the a.c. line through the switch of (3), and the switch of (6) should be connected to the line through the switch of (4) so that circuits for both r.f. and audio may be controlled simultaneously by (3) and (4) when on phone.

9) Provision for the interchanging of supplies connected to c.w. and phone controls so that the c.w. supply can be used on the modulator section, and the phone supply for the r.f. section, should this become desirable.

10) Provision for units having built-in power supplies.

This may sound like a very expensive setup. However, without resorting to Boolean algebra, it was found that everything could be accomplished with three 15-ampere wall or toggle switches, plus a d.p.d.t. toggle switch at each of the two main power chassis. All connections between the control box and the equipment are made by means of standard plugs and receptacles. Only two types are necessary to guarantee that power-output cables won't be plugged into control outlets, or control cables into power-output sockets.

Control Box

Let's discuss the a.c. input and control circuits first.

The diagram of Fig. 1 shows the wiring of the control box. The numbering on J_7 corresponds to the first group of six numbered paragraphs above which describe the functions. S_1 is the safety key-lock switch. S_2 is the first control switch; see (3) above. S_3 is the transmit switch; see (4) above. The function of S_3 can also be performed remotely by a switch, relay, transmitter "turner-onner," or p.t.t. circuit plugged into J_2 .

The double-pole switch S_4 —see (5) and (6) above—is closed for phone operation. Lines (5) and (6) are then controlled by S_2 and S_3 , respectively; see (8) above.

Three of the four controlled circuits have an indicator light (I), and all four have double outlets so that any new unit can be easily and quickly tied into the control circuit for test or temporary use. There is also a double outlet preceding S_2 that can be used for the receiver and, with sufficient outlets added in parallel, for such things as a soldering iron, a lamp, or a clock.

Any number of 6-wire outlets, as needed, can be wired in parallel with J_7 , using a plug and

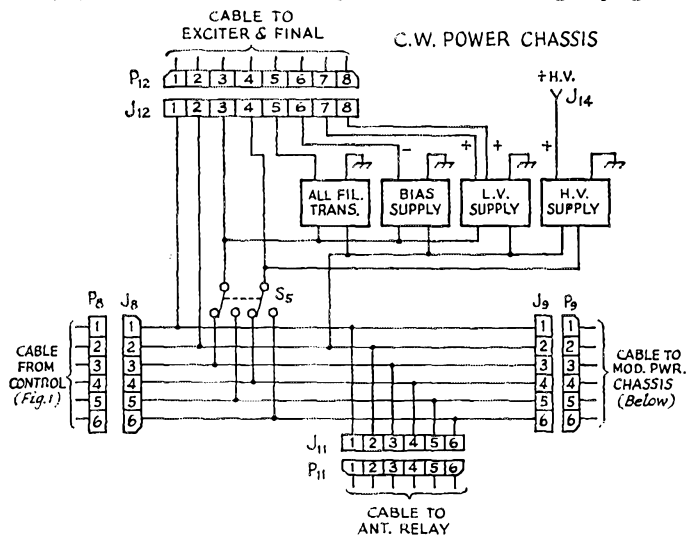
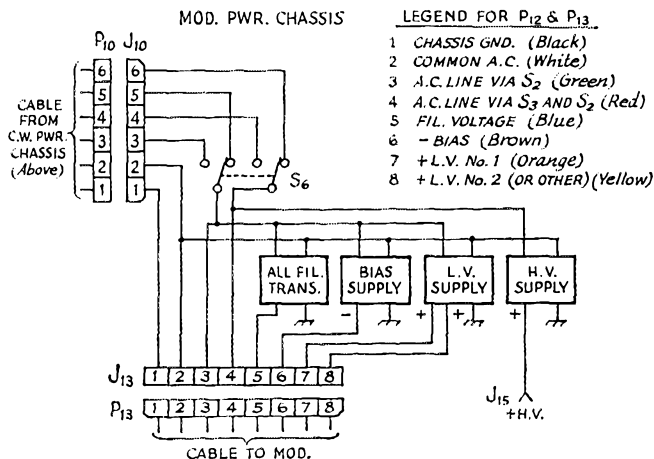


Fig. 2 — Diagrams showing control and output connections at power-supply chassis.

- J_8, J_{10} —6-prong chassis-mounting male connector (Amphenol 86-RCP6).
- J_9, J_{11} —6-prong chassis-mounting receptacle (Amphenol 77-MIP-6).
- J_{12}, J_{13} —Octal chassis receptacle (Amphenol 77-MIP-8 tube socket).
- J_{14}, J_{15} —Millen safety terminal.
- P_8, P_{10} —6-prong female plug (Amphenol 78-S6).
- P_9, P_{11} —6-pin male plug (Amphenol 86-CP6).
- P_{12}, P_{13} —Octal plug (Amphenol 86-CP8).
- S_5, S_6 —D.p.d.t. toggle switch.



cable carrying all 6 wires, but using only those connections needed at the equipment end. Example: A unit having a built-in power supply would have connections made to Nos. 1, 2, 3 and perhaps 4 or 6, depending upon whether the unit is for c.w. or phone operation. Carrying all 6 wires through to each equipment unit permits changes to be made in the equipment without the need for recabling, and also permits extending the control through the equipment to other units.

Power-Supply Connections

While there are a variety of ways in which equipment can be cabled into the control system, Fig. 2 shows the system used by the author. With this system, only a single cable is needed between the control box and the transmitter rack.

The 6-wire cable from the control box enters the c.w. power-supply chassis via P_8-J_8 , and is carried through to the modulator power-supply chassis via J_9-P_9 at the c.w. power chassis and $P_{10}-J_{10}$ at the modulator power chassis. Fig. 2

also shows a second outlet, $J_{11}-P_{11}$, for the control of the antenna relay at this point. Other control outlets may be added in parallel here, too, of course.

Output connections are made by means of octal plugs and jacks ($J_{12}-P_{12}$ and $J_{13}-P_{13}$). In addition to the output connections for filament, bias, and plate voltages of 400 or less, the output jacks carry chassis ground (1), a.c. common (2), and two control wires for any filament, bias or low-voltage supply that may be built into the r.f. or audio units.

Whether a power-supply unit is to be controlled by the c.w. controls or by the phone controls, see (9) above, in the control unit depends on the settings of the d.p.d.t. switches S_5 and S_6 on the two power-supply chassis. With S_5 and S_6 in the positions shown in Fig. 2, the c.w. supply is controlled by the c.w. controls in the control box, and the phone supply is controlled by the phone control. By throwing both S_5 and S_6 to opposite positions, the controls are reversed. The legend of Fig. 2 shows the color coding used in the output cables.

Wires carrying voltages higher than 400 are not cabled. Individual wires, terminated in Mil-len safety plugs and receptacles, are used for this purpose.

Construction

The enclosure used by the author is a steel box 7 by 8 by 10 inches, but any standard metal box of desired dimensions may be substituted, of course.

The Amphenol 6-prong plugs will accommodate No. 14 thermoplastic-covered wire very nicely. However, No. 16 will carry the 10 amperes or less required for a medium-power station and is easier to handle. Even smaller wire may suffice for the a.c. lines in the output cables, depending upon how much power is to be handled. High-voltage wire should be used for output leads carrying more than 400 volts.

The safety ground connection (1) should be run with wire

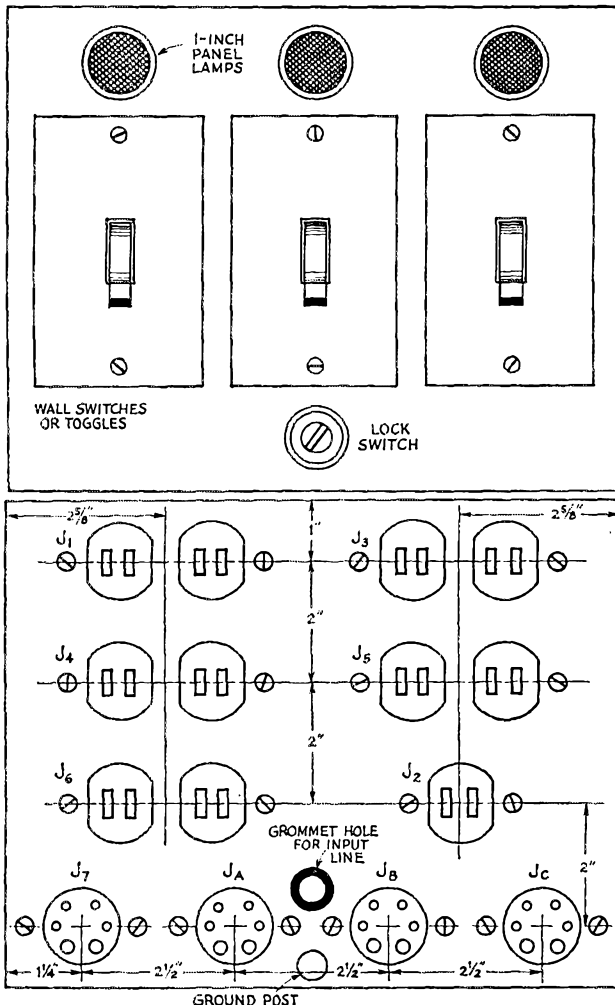


Fig. 3 — Typical panel and rear-side layouts for the control box. Receptacles J_1 through J_6 refer to Fig. 1. J_A , J_B and J_C are additional control outlets in parallel with J_7 .

of sufficient size that will not be easily broken by accident, and a good connection should be made to the nearest water pipe. The grounded side of the a.c. line should be checked out with a lamp bulb, and if the a.c. line input connection is to be made to a wall outlet, the outlet and plug should be of the polarized type so that polarization, once determined, cannot be reversed. A fuse block is mounted against one of the inside walls, although some may prefer to have it more readily accessible, and will therefore

provide more space for mounting it externally. If the system is to be used in a high-power installation, it may be advisable to substitute an electrically operated power contactor for S_2 , and possibly S_3 .

This system was put into use some time ago, and it has worked out very well. The cost of components is very low. I have moved three times since the control unit was installed and there has never been a question of "which what went where." QST

Strays

MORE D-A-N-G-E-R

Fredrick L. Olsen, K7GRR/6 had an idea that proved to be real flashy — unfortunately. Here's his advice on how NOT to string an antenna.

"Last spring while operating portable near Memphis, Tenn., I set to work erecting a 75-meter doublet. Not being lucky enough to have a pair of trees or other natural masts handy, I paced off the distance between a utility pole and a power pole.

"The setup was near perfect. I could locate the center of my antenna right over the shack and have 40 feet of nylon line on each end to isolate the antenna and secure it to the poles. I found out the power company did not permit such use of their poles, but usually wouldn't say anything as long as the lines didn't hamper the linemen.

"After measuring the antenna and feedline, a friend and I began the simple task of securing the antenna to the poles. I mounted the lamp post and secured that end while Pete stood by on the ground. Pete said the power pole was on him and up he went. I told him he was plenty high and he said he could see a good place just two steps higher.

"As he took the second step, I saw a gigantic blue flash — Pete sprang away from the pole at least six feet and fell 25 feet to the ground. When I reached him he was unconscious but breathing. I ran to phone an ambulance and raced back. He was delirious. Becoming more coherent, he said his arm felt broken and he couldn't feel his legs.

"At the hospital we learned that no bones were broken, but Pete had suffered second and third degree burns on his right arm and six inches below his left armpit. The power company said 7200 volts had passed through his body.

"Pete is okay now and still game to become a ham. But neither of us will ever again tie an antenna to any kind of active power pole.

"I assume from the number of such antennas the power company removed after this accident that more than a few of us use power poles to support our antennas. Stay away from 'em altogether, fellows — Pete swears he was nowhere near the wires."

— . . . —

Joe Turkal, K8EKG, of Massillon, Ohio, says

he likes this description — found in his local newspaper — of a compact transistorized transmitter-receiver for police work. The reporter said:

"The lightweight units are simple and compact. They consist of a receiver with an earphone and a transmitter with a microphone."

— . . . —

The Quarter Century Wireless Association is holding a QSO Party starting at 1600 PST February 12, and ending at 1600 PST February 14. The c.w. frequencies are 3655, 7125, 14,110, 21,100, and 28,100 kc. The a.m. frequencies are 3950, 7210, 14,240, 21,340, 28,900, and 50,200 kc. The s.s.b. frequencies are 3990, 7205, 14,280, 21,415, and 28,675 kc. Logs should be sent to Dr. F. Clifford J. Spike, W7OS, 1015 Medical Arts Building, Tacoma 2, Washington.

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Two Hundred Meters and Down, by the late Clinton B. DeSoto, is a 184-page history of early amateur radio (to 1936) which has been out of print for about ten years. The League has arranged for reproduction, through a photographic process, of a limited number of copies of this book and has a few still in stock at a price of \$2.00, approximately our cost. Address ARRL Hq., West Hartford, Conn.

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W9NGW/2 was checking his February 1954 log recently and came across several c.w. contacts on 40 meters that had not been QSL'd. One was WN0NNX (now W0NNX), Dad Aughenbaugh. Back came this reply:

"Nov. 1, 1959. Boy, that QSO had long gray whiskers. Sig report says you had a chirp Old Timer! Wonder if you fixed it. I am now 70, have 7 sons, 1 daughter, 14 granddaughters, 15 grandsons, and 6 great-grandchildren. Time has marched on!"

Says W9NGW/2: Sounds like Dad Aughenbaugh may have a record there. P.S. Chirp on the old BC458A was corrected. Now have a Johnson Pacemaker operating on 15 s.s.b. and 10 a.m.

Choosing a Transmission Line

Some Information on Lines, Antennas, and S.W.R.

Part II*

BY LEWIS G. MCCOY,** WIICP

WHETHER or not to match the antenna and transmission line is a question that depends, among other things, on how efficient you want your antenna system to be. A given amount of loss may be acceptable to some amateurs but not to others. The important thing is to have the information necessary for making an intelligent decision.

Table I (Part I) showed the attenuation of different types of lines when matched by a load impedance equal to the characteristic impedance, and Fig. 3 (Part I) showed the additional loss caused by standing waves. Fig. 2 (also in Part I) can be used for converting from decibels to power ratios to find what the actual power loss will be.

It has already been pointed out that the two important reasons for matching are power-handling considerations and reduction of line losses. As far as permissible Novice power is concerned, practically any line will be adequate regardless of the standing-wave ratio. However, there is one other consideration. With TVI an ever-present problem, most amateurs use low-pass filters for TV harmonic attenuation. These filters are designed for certain impedance values, usually 50 or 75 ohms. If such a filter is used in a line that has a high standing-wave ratio there is danger that excessive voltages or currents will develop and damage the filter components. It is almost a "must", therefore, to have the line "flat" when using a filter.

If you decide to match the line and antenna there is one hard-and-fast rule you should know. The *only* place where the matching can take place is at the antenna feed point. Some misguided amateurs believe that the standing-wave ratio on the feed line can be changed by "pruning" the line. As has already been stated, the standing-wave ratio is determined only by the impedance of the load (the antenna) in relation to the characteristic impedance of the line. Adding or subtracting line length is not going to change either of these impedances, and so can't affect the s.w.r.

Matching is accomplished by installing a "matching network" between the antenna feed point and the line. Such a network is simply an

impedance transformer whose input terminals will show the same impedance as the characteristic impedance of the line when the network's output terminals are connected to the antenna. There are many different systems for matching — too many to cover here — so we will confine the present discussion to antenna-feeder systems that either are inherently well matched, or else are deliberately operated with a mismatch. Details of other systems using matching networks between the antenna and line can be found in the *Handbook* or the *ARRL Antenna Book*.

Typical Example

In order to clarify some of the points that have been discussed let's take a few examples of different types of feeds and antennas. A very common and widely used antenna is a half-wave dipole. Such an antenna is shown in Fig. 4.

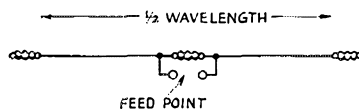


Fig. 4—A half-wave dipole. Actual wire length in feet is determined from the formula $\frac{468}{f}$ where f is the frequency in megacycles.

It usually consists of a length of wire, an electrical half wavelength long, cut at the center with an insulator inserted. The feed line is attached here, one side of the line to each half of the antenna. The impedance of such an antenna usually is somewhere between 25 and 100 ohms, depending on the antenna's height above ground, proximity to nearby objects, and other factors; on the average, it will be from 50 to 75 ohms and will be practically a pure resistance because the antenna is designed to be close to resonance at the operating frequency.

Suppose we have to choose a feed line for such an antenna. Let's assume in this case that the antenna is for 80 meters. Type RG-58/U coaxial cable is inexpensive, has a characteristic impedance that is fairly close to being matched by the antenna impedance, and is easy to handle. This cable would be a reasonably good choice for the 80-meter antenna because the match is good enough to make the s.w.r. in the line fairly low,

* Part I of this two-part article appeared in the December, 1959, issue of QST.

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and the loss in the line at this frequency would be negligible.

If the antenna is to be used only on 80 meters we can use RG-58/U (or RG-59/U, which will work just as well) with confidence, and not give other types any consideration. However, a center-fed antenna like this can also be used on other frequencies than the one at which it is actually a half-wave dipole. It will radiate power on practically any frequency fed to it, and with good efficiency at all frequencies *higher* than its resonant frequency. Thus it can be used as a multiband antenna if we want. *But* — its impedance at the feed point may be widely different from its impedance at the frequency for which its length is a half wavelength.

Thus multiband operation of the antenna has a very important bearing on the choice of transmission line. For example, if an 80-meter dipole is used on 40 meters, the impedance at its feed point will be a few thousand ohms. With RG-58/U cable this would result in a very high standing-wave ratio. In such a case RG-58/U — or any flexible coaxial cable — would be a poor choice because the losses resulting from the high standing-wave ratio would be prohibitive. An open-wire line should be used, as shown later.

Nevertheless, there are some instances where a dipole will be a fair match for coax on more than one band. For example, a 40-meter half-wave dipole provides a fair match for coax on 15 meters as well as on 40. This combination works out quite well for the Novice operator who wants two-band operation using coax feed, without using a matching network or similar devices.

There are a couple of other schemes for obtaining multiband operation while maintaining a low standing-wave ratio in a coax feed line. One of the more popular methods is to use traps in the antenna. Fig. 5 is a diagram of such a system. In essence, the traps serve to make the

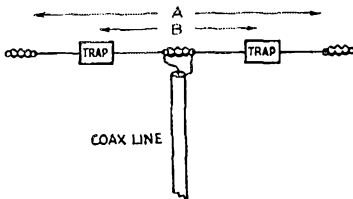


Fig. 5—Trap antenna for two bands. B is one-half wavelength at the higher of the two frequencies; A is an electrical half wavelength (including the loading effect of the traps) at the lower frequency. More than one pair of traps can be used when several bands are to be covered.

antenna “look like” a half-wave dipole on whatever bands the system is designed for, which in turn keeps the standing-wave ratio at a reasonable level.²

Another system of coax-fed multiband operation consists of two or more half-wave dipoles,

² The design of trap antennas is beyond the scope of this article. In general, the proper constants for the traps must be determined experimentally. For constructional data on practical systems, see the chapter on Antennas in *The Radio Amateur's Handbook*.

one for each band to be used, connected together and fed at the center. This system is shown in Fig. 6. Each individual dipole provides a fair match for the coax feed, and while the other dipoles have some effect on the impedance at the feed point it is not great enough to cause serious trouble.

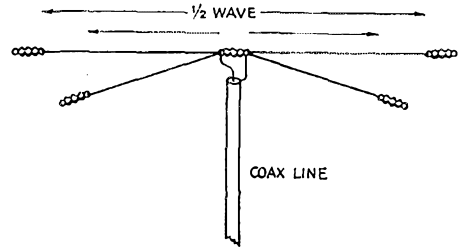


Fig. 6—Coax-fed antenna for multiband operation, making use of half-wave dipoles connected in parallel with a common feed. A separate dipole, its length calculated from the usual formula (Fig. 4) must be provided for each band to be used.

The primary reason for using coax feed directly from the transmitter to the antenna is one of convenience. The reasoning is that no extra controls are required, as would be needed if an antenna coupler were used. However, this is true only when there is a good match between the antenna and the coax line. Furthermore, such a system has no provision for harmonic suppression. A low-pass filter can be installed in the coax line to take care of harmonics that fall in the TV channels and cause TVI, but many amateurs ignore the possibility of lower-frequency harmonics. Unfortunately, these harmonics can win you citations from the FCC. Most transmitters don't have enough built-in harmonic attenuation to prevent radiation of second and higher-order harmonics, so special precautions are needed. If you decide on either of the two multiband systems just mentioned it would be wise to study the sections in the *Handbook* devoted to harmonic suppression.

Open-Wire Feeders

Getting back to our 80-meter half-wave dipole, let's assume we are going to use it on other bands, too, and therefore have chosen to use open-wire line with it. Such a system is shown in Fig. 7. The standing-wave ratio on an open-wire (air insulated) line is relatively unimportant because even with a high s.w.r. there is very little loss in the line itself. Thus the feed-point impedance of the antenna also is unimportant, because when the loss is low we need not be concerned about matching the line. Because of this, the system can be used on any frequency, even though the value of the antenna feed-point impedance may be widely different on different frequencies.

The primary problem in using such a system is that of getting the transmitter to load properly. Nearly all transmitters these days have output tank circuits designed to work into coaxial line,

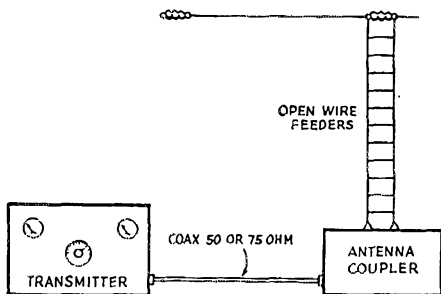


Fig. 7—Dipole with open-wire feeder. Although not shown in the drawing, such accessories as an s.w.r. bridge, antenna relay, and low-pass filter would normally be installed in the coax line that connects the transmitter to the coupler.

and this naturally brings up the question of how one uses open-wire line, or any type of balanced line, when the transmitter is equipped for single-ended output into coax. The common method is to use a short length of coaxial line between the transmitter and an "antenna coupler", the latter being used as a combined impedance transformer and device for going from the unbalanced coax to the balanced parallel-conductor line. The coupler transforms whatever impedance it "sees" at the input end of the parallel-conductor line into an impedance equal to characteristic impedance of the coax link between the coupler and the transmitter. The "matching" that the coupler does is just in the coax link circuit, not in the feeder that runs to the antenna. The coupler is an adjustable device and can operate over a wide range of impedances, so it doesn't make a great deal of difference whether the line connected to the coupler to the antenna is matched to the antenna or not.

To adjust a coupler properly an s.w.r. bridge should be inserted in the coax line between the transmitter and the coupler and then the coupler adjustments should be varied until the bridge shows a 1-to-1 standing-wave ratio.³ The transmitter is then working into a load equal to the characteristic impedance of the coax, and there should be no difficulty in getting the final amplifier stage to load up.

The principal inconvenience in using open-wire line in this way is that the coupler controls must be changed for each band. However, the advantages of using such a system are several. First, there is very little loss in the line; second, with a properly adjusted coupler the transmitter will always be working into an optimum load; third, there is considerable harmonic attenuation because of the tuned circuit in the coupler, and last, the antenna length is not critical. The reason why the antenna length is not critical is the same one that permits the antenna to be used on any frequency — the feed-point impedance is not important in a system where a high s.w.r. can be tolerated. In fact, the antenna can be much shorter than one-half wavelength on the lowest-frequency band and still do a fair job, although it is better to use all the length you have room for.

³ Details of the adjustment procedure depend on the coupler circuit used. See the transmission-line chapter in the *Handbook* for step-by-step method.

The Folded Dipole

One other simple antenna system deserves mention because, like the half-wave dipole fed with coaxial line, it provides a good match between the radiator and transmission line without any special adjustment. This is the folded dipole fed with 300-ohm Twin-Lead. This is the ideal application for 300-ohm solid dielectric line, because the s.w.r. is low and the losses in the line therefore are at a minimum. Furthermore, Twin-Lead has lower inherent loss than coax, so power is transferred from the transmitter to the antenna with higher efficiency.

There are two principal disadvantages to the folded dipole with 300-ohm line. The first is that the line is balanced, and so it is necessary to make some provision for changing from balanced feed to the unbalanced output of the transmitter. The antenna coupler that was just discussed in connection with open-wire line offers one way to do this. Another method that is quite popular is the use of "balun" coils which will transform a balanced 300-ohm impedance to an unbalanced 75-ohm impedance. These coils do not require any adjustment, but lack flexibility since they are limited to a 4-to-1 impedance transformation. This is no disadvantage with the folded dipole and 300-ohm Twin-Lead. However, such coils can work properly only when the line is well matched; they cannot do the job that can be done by the antenna coupler when there is an appreciable s.w.r. on the line. They are not useful, therefore, in a multiband system such as the one described earlier using open-wire line.

Also, 300-ohm solid-dielectric line preferably should not be used as a substitute for open-wire line in the center-fed multiband system described. On bands where the s.w.r. is high the losses will be excessive. This brings us to the second disadvantage of the folded dipole — it has the same restrictions as to bands on which operation is possible as the plain dipole fed at the center with coaxial line. It is primarily a one-band antenna, although it will work reasonably well at three times its fundamental frequency — e.g., a 40-meter folded dipole also can be used, with fairly low line loss, on 15 meters.

The antennas just described are only a few of the many different types that amateurs use. Even these have not been discussed in the detail

(Continued on page 164)

Some Notes on the "Side-Band Package"

BY BERNARD WHITE,* W3CVS

W3CVS offers some kinks and a modification of W6TEU'S popular sideband transmitter, based on his experience with the circuit.

FROM comments heard on the air concerning the Sideband Package,¹ and from those who contemplate building it, it appears that this unit will become increasingly popular as time goes on. Since the construction and alignment of this transmitter are not as simple as in the straightforward transmitters most of us have been used to building in the past, some of the experiences here at W3CVS may be helpful to those who are planning to build it or may be experiencing troubles with it.

Before starting construction of this unit, the builder should pick up the January, 1959, issue of *QST* where, on page 160, the author describes some changes which are desirable for the proper operation of this exciter.

Alignment

One of the first problems we ran into after completing the filter section was insufficient output as measured across L_{101} (Fig. 4 in the original article). The author calls for $1\frac{1}{2}$ to 2 volts, but we were only able to measure a little more than 1 volt. By placing the tip of a soldering gun into the hollow cores of the dowels in T_1 , T_2 and T_3 it was possible to melt the wax enough to move the windings closer together by about $\frac{1}{4}$ inch. This was enough to raise the output voltage to the required figure.

In attempting to align the various transformers and coils throughout the exciter, it was found to be far simpler and more certain to set up these adjustments by using a grid-dip meter. This method avoids the possibility of aligning on a harmonic, which is very easy to do. In the writer's exciter it was not necessary to use some of the 3-30- μ f. trimmers across the 6AK6 coils because the distributed capacitance, along with the grid tuning capacitor, was sufficient to tune the coils to the proper frequency with the grid capacitor just about in the middle of its range.

Stabilizing

After completing the exciter and giving it its first tryout, it was found that the 6AK6 and 6146 stages were very unstable because of feedback. The 6AK6 stage was cleaned up somewhat by shortening and carefully dressing the leads to

the socket. This stage oscillates very easily, and particular attention should be paid in wiring the socket to keep the grid and plate connections as far apart as possible. By mounting a metal plate across the socket between the grid and plate prongs and grounding it, this stage was made completely stable on all frequencies. Finally, with careful neutralizing, there was no indication of voltage output on a v.t.v.m. with its r.f. probe touched on the plate connection of the 6AK6 tube, at any frequency.

The 6146 stage was next tackled, and it was quickly found that the coax running from the link output coil to the J_{101} connector was contributing a considerable amount of feedback through being terminated under the chassis by means of a feed-through terminal. This terminal was removed and the coax brought directly to the top of the chassis, where it was terminated by a stand-off insulator to make connection to the link.

The limiter d.c. leads were also shielded. The lead from the plate of the limiter tube should go directly to the plate of the 6146, of course, and should not run under the chassis.

The author, W6TEU, in recent correspondence with the writer, also pointed out these changes.

Coil L_{105} was found to be contributing some feedback. This was corrected by placing the coil in an aluminum box.

After these changes the exciter was very stable, without a trace of feedback or instability on any band.

Control Circuit

In the final operation of the exciter, tube noise (Continued on page 15B)

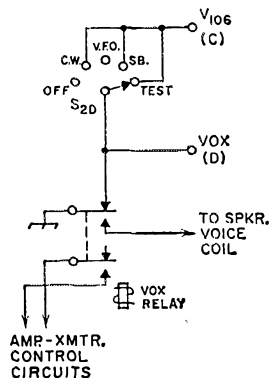


Fig. 1—Modified control circuit using a d.p.d.t. relay in the VOX circuit. This eliminates noise from the final amplifier during receiving, short-circuits the receiver speaker voice coil during transmitting, and provides a control circuit for a linear amplifier, antenna relay and other accessories.

¹ Bigler, "A Side-Band Package," *QST*, June, 1958; *Single Sideband for the Radio Amateur*.

*7311 Campfield Road, Pikesville 8, Maryland.

• Recent Equipment —

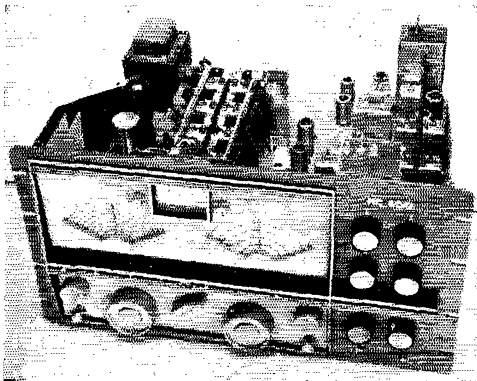
The National NC-400 Receiver

THE NC-400 might well be described as "the receiver for the man who wants everything." As befits a new entry into the high-priced receiver market, it offers just about everything anyone could want in the way of communications receiver features, either as standard equipment or as extra-cost accessories. Here is a list of options open to anyone who can afford them: diversity modification kit, crystal-controlled fixed channels, plug-in crystal calibrator with 100-ke. and 1000-ke. crystals, plug-in mechanical filter (to replace the crystal filter that is standard equipment), and crystal-controlled b.f.o.

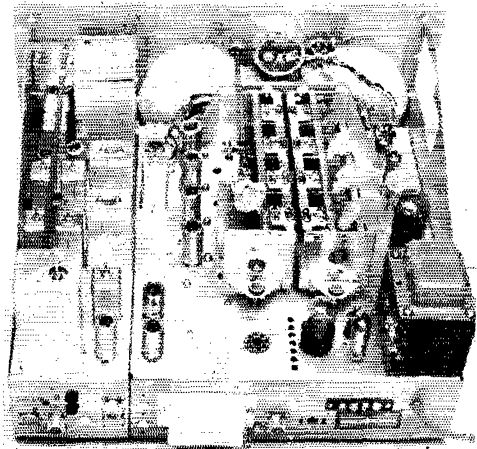
Even without any of these things, the NC-400 is a de luxe model general-coverage job for 540 kc. to 31 Mc. There are seven positions on the bandswitch, and calibrated bandspread ranges for the 80-, 40-, 20-, 15-, and 10-meter bands. All the usual communications receiver features are provided, plus some not-so-usual ones.

The receiver has two tuned r.f. stages, with three tuned circuits used on all bands. Next come two mixers, one working directly into the 455-ke. i.f. system on the four lowest-frequency bands, and the other into a 1720-ke. i.f. and crystal-controlled second mixer, converting to 455 kc. The double-conversion arrangement comes into play at 7 Mc. and higher frequencies, for maximum image rejection. The two mixers are completely separate, being selected by a section of the bandswitch that closes the cathode circuit of the proper tube.

Separate detection systems are provided for a.m. and c.w.-s.s.b., for optimum performance in all kinds of reception. The a.m. detector is the conventional diode, with a.g.c. and automatic noise limiter included. S.s.b. and c.w.



The NC-400, with case removed. The panel is $\frac{1}{8}$ -inch aluminum, arranged for rack mounting. Die-cast aluminum trim fits over the rack screw slots when the receiver is in the case.



Back view of the NC-400. The i.f. system is built on a separate chassis, at the left. Socket at the center rear is for the crystal calibrator. Tubes at the right rear are the heater-current and plate-voltage regulators for the oscillator.

signals go to a heterodyne detector, followed by a manually controlled noise limiter and a special a.g.c. arrangement for s.s.b. reception. Selection of the proper combinations is automatic with the mode switch.

The second i.f., 455 kc., is essentially a dual-channel system, with a choice of six positions, BROAD, MEDIUM and SHARP without the crystal filter, and VERY SHARP, SIDEBAND 1 and SIDEBAND 2. When the i.f. selector switch is in the VERY SHARP position, a 5-position crystal filter can be switched in to give degrees of selectivity ranging from 3.5 kc. to 150 cycles. The variable-selectivity feature is operative only on the c.w. and a.m. positions of the mode switch. In the s.s.b. positions there are 14 tuned circuits, providing a steep-sided response curve with a baud pass of 3.5 kc. at 6 db. If a higher degree of selectivity is wanted in s.s.b. reception the i.f. can be switched to the vs position, and the mode switch to cw. The crystal filter can then be brought into play.

Conversely, the c.w. operator can use the s.s.b. position on the mode switch if he wishes, and the a.g.c. system then is available. The v.h.f. man, who may wish to switch back and forth between c.w. and phone reception at frequent intervals, may find it convenient to use the s.s.b. position for c.w. reception, as it is adjacent to the a.m. position on the mode switch. When the receiver is set up for any of the c.w. or s.s.b. conditions the noise limiter is manually controlled. This is helpful in weak-signal work, as

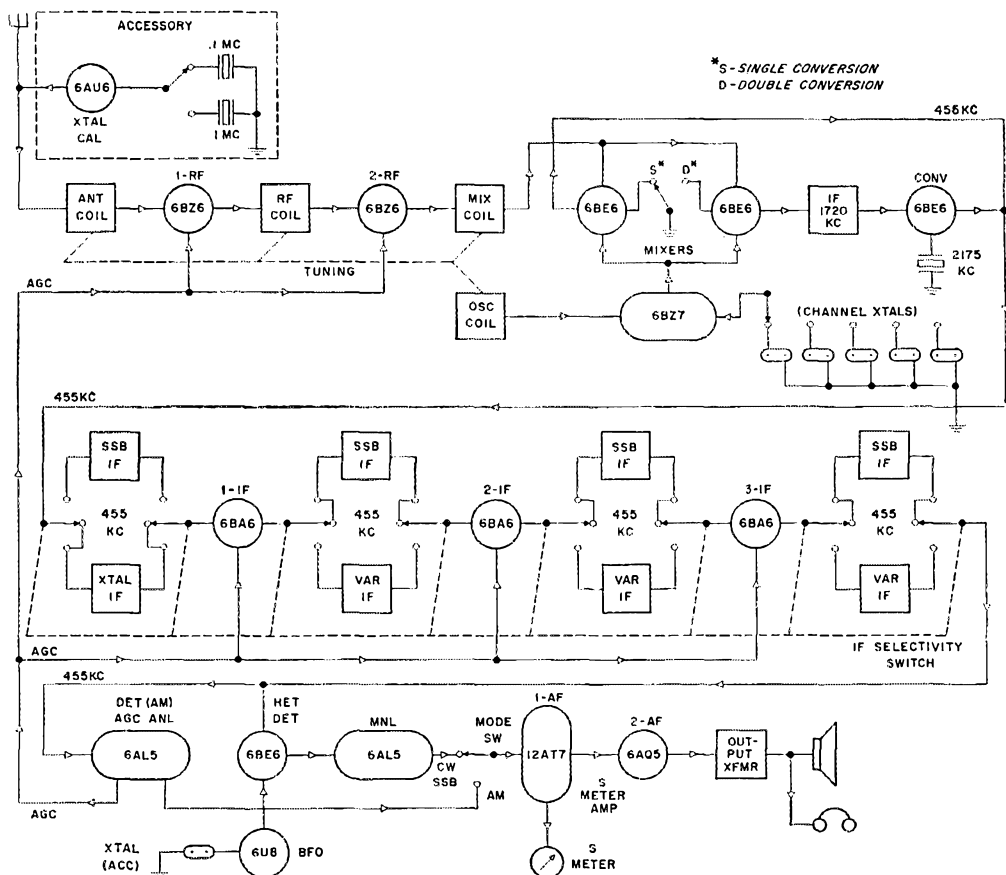


Fig. 1 — Block diagram of the NC-400, showing tube complement and basic circuit functions. Two i.f. channels are available through a ganged switching arrangement in the i.f. system. Single or double conversion at the first mixers is selected automatically by the band-switch, the double conversion coming into play at 7 Mc. and higher frequencies. Separate detectors are used for a.m. and c.w.-s.s.b. The crystal calibrator, fixed-channel crystals, and crystal-controlled b.f.o. shown here are optional accessories not included in the basic receiver.

the degree of limiting can be adjusted for optimum readability at any signal level. Sideband switching is done in the i.f. by adding or removing fixed capacitors, to change the center frequency of the 14 tuned circuits. It can be employed in any kind of reception by manipulation of the i.f. switch.

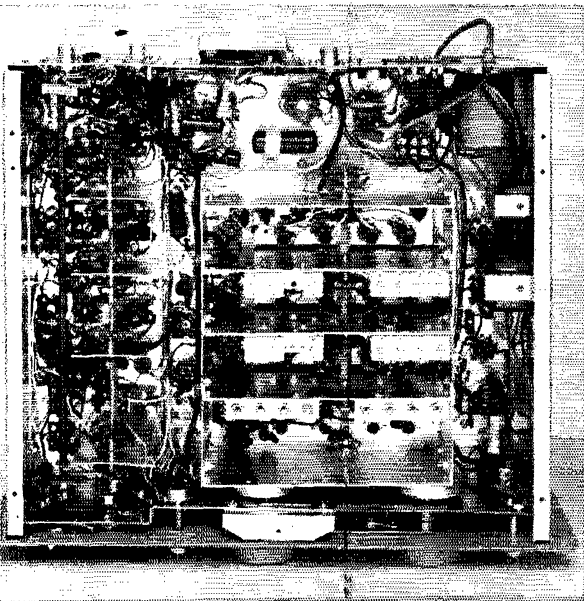
You have to go beyond routine amateur uses of a communications receiver to appreciate the true versatility of the NC-400. A look at the rear wall of the chassis reveals some of the possibilities. Here we find coaxial fittings for high-frequency oscillator input or output and i.f. output, as well as the more common accessory socket and terminals for send-recv operation from a remote position. There are also numerous removable plugs for connection of the diversity modification kit. The antenna connector is a coaxial fitting—a long-overdue innovation in receiver design. Test points for the i.f. and b.f.o. are also mounted on the rear panel.

Inside the case are sockets for the plug-in calibrator and five high-frequency oscillator

crystals, the latter being for the fixed-channel option. Another socket has a resistor plugged into it, as furnished; the resistor may be removed and a 455-kc. crystal substituted, for converting the b.f.o. to crystal control. The crystal filter housing is removable, permitting the installation of three mechanical filters, with bandwidths from 500 cycles to 16 kc.

The crystal calibrator accessory is of interest in that crystals for 100 and 1000 kc. are employed, but there is no crystal switching. Both crystals are in the circuit at all times, and selection of the desired calibrating frequency is by means of a filter in the output circuit. Provision is made for zero-heating the crystal standard to WWV, should crystal or component aging make this necessary over long periods.

Throughout the NC-400 no expense has been spared to provide both long- and short-term stability. The plate voltage for the high-frequency oscillator is regulated and its heater is current-regulated. Ceramic coil forms are used in the oscillator circuits, and their padder ca-



Looking into the bottom of the NC-400, we see the mode switch on a long fiber shaft at the left, the i.f. system, with its variable selectivity switch, and the r.f. assembly, center. The oscillator section of the r.f. unit is at the front of the compartment. Ceramic coil forms and air padders contribute to the receiver's high stability.

pacitors are air trimmers. The front panel is $\frac{1}{8}$ -inch aluminum, further stiffened by heavy die-cast aluminum trim. A stability of .002 per cent after warm-up is claimed, and observed warm-up drift is almost nil.

In appearance the NC-400 bears a family resemblance to the NC-183-D and the NC-300 and -303. Dials are rim-driven white plastic, with a red pointer at the side of each to indicate the band in use. Each has a logging scale, in addition to its calibrated ranges. Finish is grey and black crackle. Dimensions: 11 by 19 by 16 inches. Power consumption: 130 watts, at 115 or 230 volts, a.c. Tube complement: 2 6BZ6, 4 6BE6, 1 6BZ7, 3 6BA6, 2 6AL5, 1 6U8, 1 12AT7, 1 6AQ5, 5U4GB rectifier, 4H4C and 0B2 regulators.

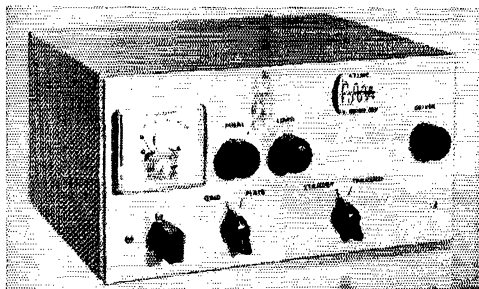
— E. P. T.

The Centimeg 432-Mc. Transmitter

LOOKING at the Centimeg 432-Mc. transmitter* from any angle the first impression is one of simplicity. The amateur with u.h.f. experience is immediately curious to learn how several watts of power at 432 Mc. can be developed with so few tubes and circuit components. Actually the secret lies mainly in the use of fixed-tuned circuits, good layout and wiring techniques, and the elimination of any circuit complications not required to achieve the main end.

The end, in this instance, is about 10 watts of plate-modulated r.f., crystal controlled, in the four-megacycle center segment of the 420-Mc. band beginning at 432 Mc. It is accomplished with only seven tubes, including two in the modulator. Here's how: A 5763 crystal oscillator, using 8-Mc. crystals, triples to 24 Mc. This drives

* Centimeg Electronics, Inc., 312 East Imperial Highway, El Segundo, Cal.



The Centimeg 432-Mc. transmitter is a compact package delivering about 10 watts output, crystal controlled. Modulator is included.

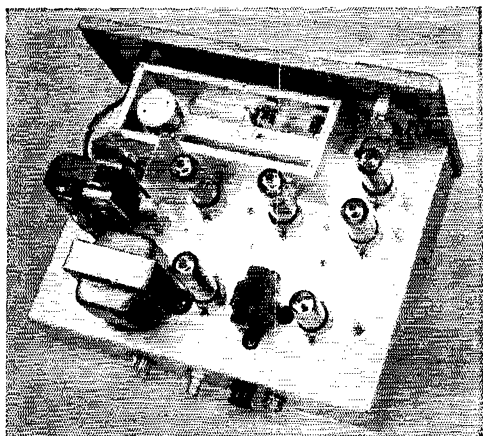
another 5763, tripling to 72 Mc. The next stage is a 6360 push-push doubler. A 6360 push-pull tripler to 432 Mc. drives the final stage, a grounded-grid 2C39A amplifier.

Several interesting circuit features contribute to the over-all simplicity, yet serve additional purposes. Double-tuned circuits are used for interstage coupling throughout. Except for the final tripler and amplifier circuits they are fixed-tuned, and do not require readjustment in operation over the 432 to 436 range. These double-tuned circuits also provide a measure of selectivity, holding down the level of unwanted harmonics that reach the final amplifier.

Anyone who has struggled for grid drive at 432 Mc. may be interested in the means used to enable a 6360 tripler to drive a 2C39A amplifier. The tripler plate circuit is a half-wave line of silver-plated copper, visible at the left side of the bottom-view photograph. The input circuit in the cathode of the 2C39A is a series-tuned loop inductively coupled to the 6360 plate line.

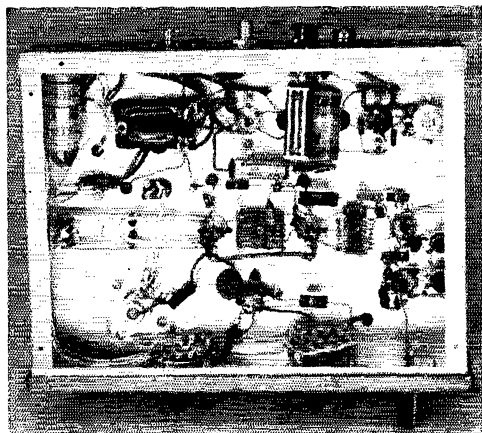
Principal features of the final amplifier plate circuit are seen in the top view. It is a shielded half-wave line, silver-plated inside and out. The inner conductor is a rectangular line about 1 by $\frac{1}{2}$ inch in size, made of thin sheet stock. The outer conductor, or shield, is a box with a top cover of perforated metal, also entirely silver-plated. Cooling is by means of a small fan blowing air through a screened hole in the edge of the box. The tuning capacitor at the far end of the line and the output-coupling loop and loading capacitor can be seen in the photograph.

The modulator is a 6360, push-pull, driven by



Top view of the Centimeg transmitter, showing the 2C39A amplifier assembly with its perforated cover removed. Oscillator and multiplier stages are to the left and alongside the coaxial tank circuit.

a 12AT7 speech amplifier having adequate gain for use with a crystal microphone. Audio is applied to the tripler screen, as well as to the final plate, in order to modulate the power that is fed through the amplifier from the driver stage. This is done by means of a 0.01- μ f. capacitor from the audio line to the tripler screen pin.



The double-tuned interstage coupling circuits may be seen at the right and across the middle of the chassis. The 6360 tripler plate and 2C39 amplifier grid circuits are the silver-plated components at the left. Modulator components are in the upper portion of the picture.

With 400 volts on the 2C39A the loaded input is about 30 watts. This is enough to give 10 watts output to a 50-ohm load. Grid current is as high as 40 ma., if all stages are peaked at the operating frequency. Power required: 400 volts at 300 ma., 6.3 volts at 5.5 amp., and 115 volts a.c. for the small fan. Case size: 8½ by 11½ by 5¾ inches.

— E. P. T.

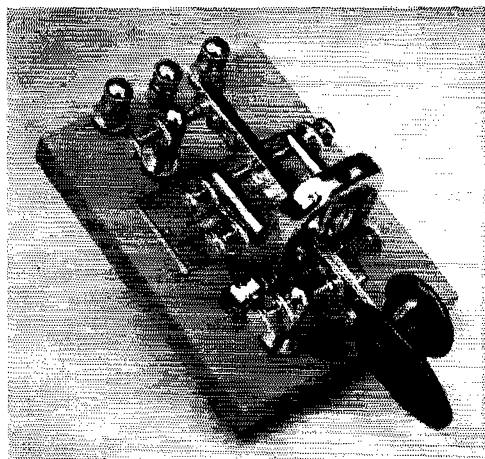
● New Apparatus

Vibroplex "Vibro-Keyer"

THE Vibro-Keyer is a keying mechanism designed for use with electronic keyers. There is no mistaking it for other than a Vibroplex product; it has that same old familiar "feel" of the Vibroplex "bug." The key is a single-pole single-throw switch that is actuated by moving the normally-centered control lever either side of center.

Using the same main frame, trunnions, lever and contacts as the Vibroplex semi-automatic "bug," the Vibro-Keyer measures 3½ by 4½ inches and weighs 2¾ pounds. Connections to the keyer are made to three binding posts mounted at one end of the base. The base is finished in wrinkle gray and all the upper parts are chrome plated, except for the red plastic finger and thumb pieces. Of course, the key may also be used as a sideswiper, in addition to its primary job as a switch for electronic keyers.

— E. L. C.



🐕 Strays 🐕

Even a dog can resent a threat of TVI. Tom Trovillion, K4OWI, reports he took his 300-ohm TV line down to replace the bamboo poles and found next morning that his neighbor's dog had

chewed it into tiny pieces. "I have heard of irate neighbors cutting guy wires and chopping down towers," says K4OWI. "Do you suppose these fellows sent the dog to do the dirty work?"



Hints and Kinks

For the Experimenter



SOLDERING-IRON-TIP SAVER

THE circuit shown in Fig. 1 consists of a 150-watt lamp, I_1 , a 117-volt receptacle, J_1 , and an s.p.s.t. toggle switch, S_1 . If a 200-watt soldering iron is plugged into J_1 with the lamps switched in

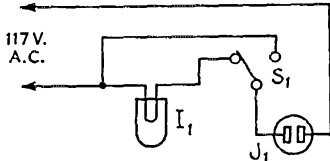


Fig. 1—WA2DCA's soldering-iron-tip saver.

series with the iron, the iron will operate at reduced heat sufficient for small jobs but low enough to prevent the tip from deteriorating due to prolonged heating. When maximum heat is required, switch S_1 is positioned to place the full 117 volts on the iron, which will reach full heat almost immediately. Of course, an iron of any

wattage may be used as long as the lamp has a wattage about equal to that of the iron. In addition to this tip-saving feature, the receptacle may be used as a checker for shorts in electrical appliances and equipment. When a unit under test is shorted, lamp I_1 will light up to full brilliance; if it has an open circuit the lamp will fail to light.
—John B. Powell, WA2DCA

SPARK-PLUG LIGHTNING ARRESTER

A LIGHTNING arrester for open-wire feedline can be constructed by soldering two automotive spark plugs together. The bases of each of the plugs should be cleaned prior to soldering. Soldering is done with a torch since an iron probably wouldn't have the capacity to do the job. Once the plugs are connected, a length of No. 8 or 10 copper wire is soldered to the joint between them. Connect the lead-in to the electrode connector at the top of each plug. Ground the copper lead, gap the plugs for minimum space without shorting, and your lightning arrester is completed.

—Charley Lugar, W9CGI

LECHER WIRES

ALTHOUGH Lecher wires are not new, they still make a convenient and accurate device for measuring the wavelength of v.h.f. and u.h.f. radio waves. Conventional Lecher wires are constructed with one end electrically open and with a pickup loop on the other end.¹ In actual operation, the Lecher wires and an external indicating device, such as a low current flashlight bulb and loop of wire, are coupled to a transmitter under test. A shorting bar across the Lecher wires is slid along the wires until the lamp gives a sharp dip in brightness. This point is marked and the shorting bar is moved along again until a second dip is reached. The distance between these two points is measured and is equal to half the wavelength.

This method works well with a multistage transmitter but often in the u.h.f. ranges the transmitter consists of a single oscillator, and tight coupling between the Lecher wires and the oscillator will sometimes pull the oscillator off its normal operating frequency. This loading effect

can be overcome if the Lecher wires are loosely coupled to the transmitter as shown in Fig. 2. Here the wires are coupled to the transmitter by a pickup loop, but because of the sensitivity of the system can be placed far enough from the transmitter to prevent pulling. The basic operation of this system is similar to the older method except that the indication appears in the form of a meter dip rather than a dip in light-bulb intensity. To calculate the frequency in megacycles after the two "null" points have been determined, use the following formula:

$$F \text{ (Mc.)} = \frac{5006}{\text{length}} \text{ (inches)}$$

or, if the length is measured in meters, the formula is:

$$F \text{ (Mc.)} = \frac{150}{\text{length}} \text{ (meters)}$$

The only important construction point to remember is that the Lecher wires should be at least a wavelength long and entirely air insulated except, of course, where supported at the ends.

—Donald R. Wesson, K4HCZ

¹ "For the Junior Constructor — A Lecher Wire System for U.H. Frequency Measurement," *QST*, October, 1941.

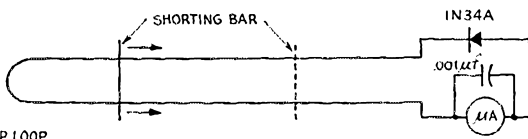


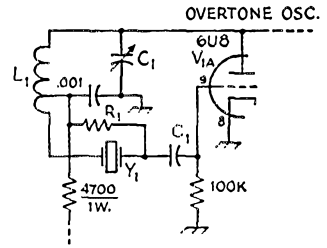
Fig. 2—Lecher-wire wavelength measuring device. The wires are made of No. 16 copper and should be spaced about 1½ inches apart. They should be at least one wavelength long.

CRYSTAL SAVER

I CONSTRUCTED the 6-meter transmitter in the 1959 edition of the *Handbook*, page 435, and in *QST*, October 1958. However, after I used the rig for a short period of time, the crystal (Υ_1 in Fig. 3) failed—apparently due to too much feedback in the oscillator circuit. W1HWM suggested that I insert a loading resistor R_1 and a capacitor C_1 in the circuit to reduce the feedback and thus protect the crystal. I tried the circuit and found that it functioned perfectly.

— Dick Solomon, W1KSZ

Fig. 3—New oscillator circuit for the *Handbook* 6 meter transmitter.



C_1 —.001- μ f. ceramic. R_1 —1 megohm, 1/2 watt.

TRANSISTOR TWO-METER TRANSMITTER-RECEIVER

THE diagram in Fig. 5 shows my two-meter transistor transmitter-receiver. Although novel in some respects, the circuit is simple, straightforward and easy to construct. I assembled my unit on a piece of perforated phenolic board.

The oscillator stage is tuned by adjusting the slug of L_1 for the best oscillation.

compartment to carry on after the roads run out in a transmitter hunt.

— John W. Roberts, jr., W2HRG

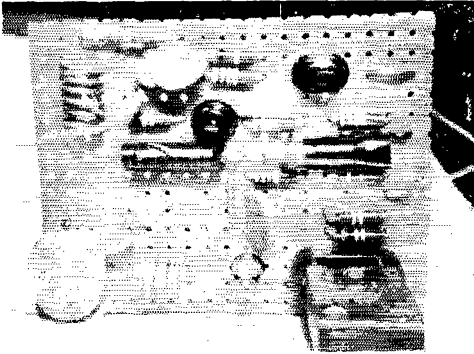


Fig. 4—Parts for the 2-meter transmitter-receiver are mounted on a piece of perforated phenolic board.

A crystal detector followed by two audio amplifiers make up the receiver. Although not particularly sensitive, the receiver is certainly easy to adjust!

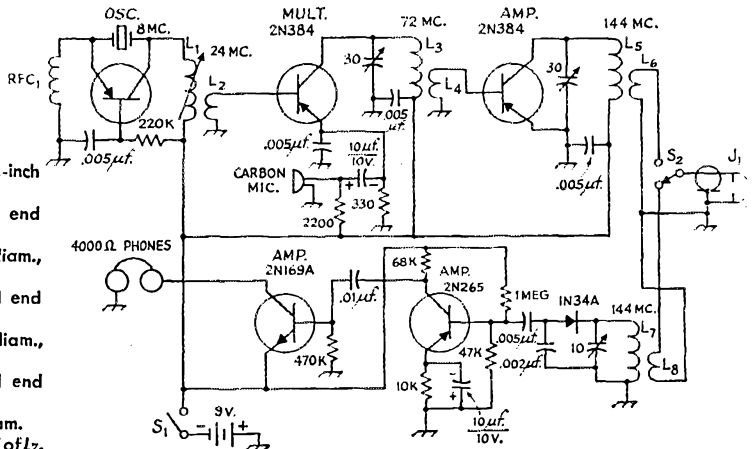
The range of the transistor rig is only about 5 blocks, but it can be carried in the car's glove



W2HRG's sister, KN2IBL, gives the rig a tryout.

Fig. 5—Diagram of W2HRG's 144-Mc. transistor transmitter-receiver. Unless otherwise indicated, capacitances are in μ f., resistances are in ohms, resistors are 1/2 watt.

- L_1 —11 turns No. 32 on 1/4-inch diam. slug-tuned form.
- L_2 —3 turns No. 20 over cold end of L_1 .
- L_3 —9 turns No. 20, 1/4-inch diam., 1/2 inch long.
- L_4 —2 turns No. 20 over cold end of L_3 .
- L_5 —4 turns No. 20, 1/4-inch diam., 1/2 inch long.
- L_6 —1 turn No. 20 over cold end of L_5 .
- L_7 —6 turns No. 20, 1/4-inch diam.
- L_8 —1 turn No. 20 over cold end of L_7 .



IMPROVED KEYING AND DRIVE FOR THE DX-100

I HAVE found two modifications to the original article "Diode Time-Sequence Keying for the DX-100" (*QST*, April 1959) that may be of interest to those using the circuit. The first change involves the addition of a 100,000-ohm, $\frac{1}{2}$ -watt resistor (R_1 in Fig. 6) in the grid circuit of the

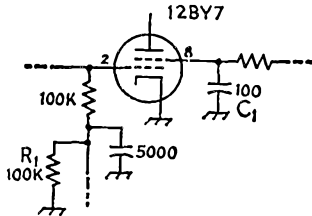


Fig. 6—Additions to the DX-100 to improve keying and drive.

12BY7 tube. This resistor will reduce the blocking bias on the tube when it is used as a crystal oscillator and allow the use of less active crystals. The change will not affect the performance of the circuit in v.f.o. operation.

Also, a 100- μ f. mica or ceramic capacitor, C_1 , may be added between the 12BY7 screen grid and ground. See Fig. 6. This capacitor will reduce screen degeneration and increase the drive avail-

able to the final amplifier. The Model DX-100B already incorporates this capacitor.

— Philip J. Reich, W2HUG

IMPROVING BUZZER PERFORMANCE

AFTER using a high-frequency buzzer and key for code practice about a month, the buzzer became unstable and started to emit an erratic, unsteady tone. Touching up the adjusting screw on the buzzer did not help. I found that a small piece of sponge or felt glued to the outside end of the vibrating armature seemed to suppress the spurious vibrations and give the buzzer a more satisfactory tone.

— Joel Thurtell, KN5PSV

PEN-LIGHT CELL CAUTION

WHILE wiring a series of pen-lite cells for use in transistorized equipment the writer encountered trouble with intermittent operation. It was traced to a new type of leak-proof construction which encases the zinc cell inside a paper sleeve with a plastic insert in the top and a metallic insert in the bottom. The latter makes contact only by pressure against the bottom of the zinc case. This is fine in flashlights, but almost always guarantees trouble in applications where the cells are not subject to pressure on both ends. To wire these cells in series remove the metal insert from the bottom and solder directly to the zinc case.

— Edward P. Tilton, W1HDQ

AUTOMATIC C.W. MONITOR

I CALL the monitor shown in Fig. 7 the Automatic C.W. Monitor because it never needs to be turned on or off—it's always ready to operate automatically. The monitor is inserted in series between the transmitter key jack and the sending key. It receives its power from the voltage drop across resistor R_1 in Fig. 7.

The monitor can only be used with cathode-keyed transmitters and any of the common inexpensive transistors can be used. Tone oscillator transformer T_1 along with T_2 are common interstage audio transformers. T_3 is a universal audio output transformer that I just happened to have in my junk box. T_4 is also an output transformer but it has a center-tapped primary winding.

As seen in the diagram in Fig. 7, cathode current passing through resistor R_1 develops a voltage which is used to power the tone modu-

lator and amplifier. The value of R_1 can be calculated by using Ohm's law and the amplifier cathode current. Any value of voltage between 5 and 12 volts will operate the monitor satisfactorily.

When using the monitor, plug in the headphones and key and connect the proper leads to the receiver and transmitter. When the key is closed a tone will be heard in the headphones. Audio from the receiver can also be heard. Switch S_1 allows switching between a small low-impedance speaker and the headphones. Receiver volume is controlled at the receiver while the monitor level can be adjusted by changing the voltage developed across R_1 .

If the tone oscillator fails to oscillate, or if the frequency isn't just right for your ears, try changing the values of the capacitor and resistor in the base of the tone oscillator transistor.

— Frank A. Walker, W9KFG

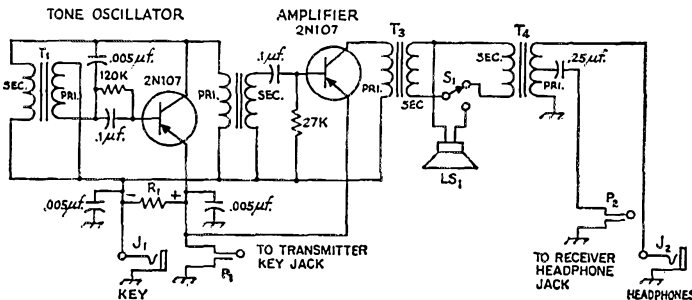


Fig. 7—Automatic C.W. Monitor.

- J_1, J_2 —Phone jacks.
- LS_1 —Small 3.2-ohm speaker.
- P_1, P_2 —Phone Plugs.
- R_1 —See text.
- S_1 —S.P.D.T. Switch.
- T_1, T_2 —Audio interstage transformer.
- T_3, T_4 —Audio output transformer.

REDUCING STAND-BY NOISE IN THE VIKING RANGER

USE of a t.r.-switch with my Viking Ranger allowed for fast, quiet antenna switching. However, when the Ranger was in **STANDBY** position an annoying hash, caused by the diode noise generated in the Ranger's final amplifier, was piped into my receiver through the switch. To do away with this noise I merely connected the -28 volts used for modulator bias to the final amplifier grid and thus cut off the amplifier tube. See Fig. 8 for the connection. Of course, this arrangement

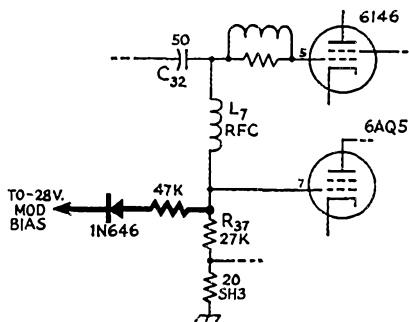


Fig. 8—Applying -28 volts bias to the final amplifier grid reduces diode noise.

stopped the action of the clamp tube so the -28 volts was disconnected from the amplifier during c.w. operation.

Use of this circuit also reduced the level of my v.f.o. to a comfortable volume during zero beating. These modifications are only applicable to Rangers with bias rectifiers.

—G. D. Rolls, K6BWC

VARIABLE A.C.-D.C. POWER SUPPLY

ANYONE who has done electronic construction or experimentation has certainly found need for both a d.c. and a.c. voltage source which can be varied over a reasonably-wide range. The supply shown in Fig. 9 will supply 0 to 135 volts a.c., variable d.c. voltage and 6.3 volts a.c. The maximum d.c. output will depend on the plate transformer (T_2) used and whether choke or

MOBILE LOGGING TIPS

THE job of keeping an accurate log of mobile contacts is sometimes a problem and even a hazard. I have found an effective solution to this problem in the use of a colored china-marking pencil (grease pencil) for keeping a rough log on the metal dash cowling of the car. The information can be copied later in the official log book and the grease pencil scribbling wiped off with a rag. The markings are easily removed and don't seem to harm the dash finish. An extra coat of wax on the dash will make removal of the scribbles ever easier.

—William Vandermay, W7DET

LOG keeping and mobile operation just don't go hand in hand. To simplify the job of keeping a log while in motion, I use a "Magic Slate" sold in most toy stores. This pad consists of a sheet of plastic material covering a gray back-up sheet. When the pad is written on with a special pencil furnished with the pad, characters stand out in a vivid black. However, when the plastic cover sheet is lifted and separated from the gray backing the writing disappears. The action of writing and erasing can be done over and over again. At the next convenient stop, the information can be transferred from the temporary log to the official log.

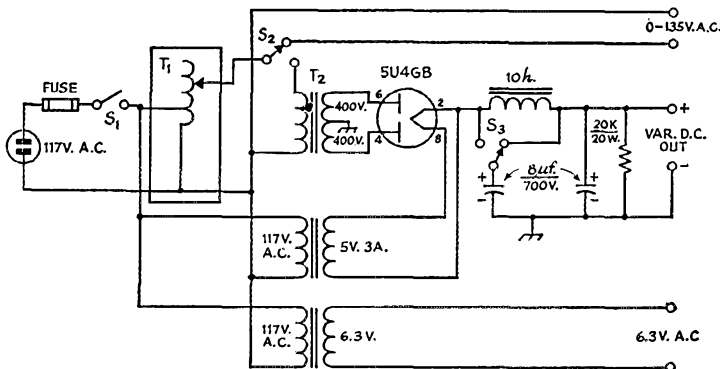
—R. Bruce Campbell

DISTILLED WATER

WHEN your NYL is defrosting the family refrigerator, ask her to save the ice that forms on the surface of the freezing compartment. It is almost pure water when melted and is a convenient source of mineral-free water for use in storage batteries.

—Julian N. Jablin, W2QPQ

Fig. 9—KØGDW's variable a.c.-d.c. power supply.
 S_1 —S.p.s.t. toggle switch.
 S_2 —S.p.s.t. toggle switch.
 S_3 —S.p.s.t. switch (high-voltage insulation).
 T_1 —Variable-voltage transformer (General Radio Variac, Superior Powerstat, Standard Adjust-A-Volt).
 T_2 —Plate transformer.



capacitor input is used in the filter. Switch S_3 allows switching the filter circuit between choke or capacitor input. Switch S_2 switches the variable a.c. voltage from T_1 either directly to the variable a.c. output terminals or to the primary of the plate transformer. S_1 switches the entire supply on or off by control of the line voltage.

—William D. Rexroad, KØGDW

• Technical Correspondence

A DESIGN CONCEPT FOR S.S.B.

1424 North 40th St.
Lawton, Oklahoma

Technical Editor, QST:

A designer has a choice of methods to generate an s.s.b. signal at a nominal frequency, but regardless of whether the filter or phasing method is used there still remains the problem of getting the signal to the desired output frequency. A popular technique is to heterodyne the basic s.s.b. signal to the desired output frequency using crystal oscillators. This requires one or more crystals for each band. Also, if a requirement exists for selection of either the upper or lower sideband, an additional oscillator with two crystals is normally used. Present-day commercial and home-built exciters require from five to twelve crystals to cover the 10- through 80-meter bands. Disadvantages of this technique are the cost of the crystals and the close frequency tolerances required.

An optimum system would be one which requires only one crystal oscillator and a v.f.o. The design concept outlined below is not optimum — it requires two crystals and a v.f.o. — but does provide selectable sideband operation on all bands, 10 through 80 meters.

Research on crystal filters led to selection of Hermes Electronics (formerly Hycon Eastern) model 3MUA. This filter is similar to the model used in the selective receiver in the 1959 ARRL Handbook, page 138, except that it is designed for s.s.b. operation in the h.f. bands requiring audio frequencies of 300 to 3000 c.p.s. (Kosowsky, "High-Frequency Crystal Filter Design Techniques and Applications," *Proc. IRE*, February, 1958, vol. 46, page 419). The filter operates at a carrier frequency of 3200 kc., passes the upper sideband and gives a minimum attenuation of 40 db. of the unwanted (lower) sideband.

Fig. 1 is a block diagram of the exciter. A crystal oscillator operating at 3200 kc. provides the carrier for the s.s.b. generator at the filter frequency. This same crystal is used

to select the upper or lower sideband by the method given by G. K. Bigler, W6TEU (*QST*, June, 1958). Briefly, the fundamental frequency is quadrupled and then mixed with the s.s.b. signal to give an upper sideband signal at the 2nd intermediate frequency of 16.0 Mc. ($4 \times 3.2 = 12.8 + 3.2 = 16.0$). Or the fundamental frequency is doubled and then tripled to give the lower sideband by the McLaughlin principle ($3.2 \times 6 = 19.2 - 3.2 = 16.0$). Thus, with one crystal we have the s.s.b. signal at the 2nd i.f. of 16.0 Mc. and a choice of either upper or lower sideband.

The heart of this design is the frequency synthesizer consisting of the 3.5-Mc. crystal oscillator, a doubler, a tripler, and a mixer. The oscillator feeds the doubler and tripler in parallel, making the inputs to the mixer 7.0 Mc. and 10.5 Mc. The output of the mixer consists of the two input frequencies, 7.0 Mc. and 10.5 Mc., plus the sum, 17.5 Mc. and difference, 3.5 Mc., frequencies. Any one of these frequencies may be selected by switching the appropriate tuned circuit into the output of the mixer. As shown in Table I, the injection frequency obtained from the synthesizer heterodynes the 16.0-Mc. s.s.b. signal to a third i.f. which is above the desired output signal by the frequency of the v.f.o.

As an example, follow the process for the 40-meter band: When the 16.0-Mc. s.s.b. signal is mixed with the 3.5-Mc. output of the synthesizer the difference frequency forms a 3rd i.f. of 12.5 Mc. This is then mixed with the v.f.o. frequency, again using the difference ($12.5 - 5.5 = 7.0$) to put the s.s.b. signal in the 40-meter band. Notice that by using the sum of the 3.5-Mc. synthesizer output and the 16.0-Mc. signal the 3rd i.f. becomes 19.5 Mc., which when mixed with the 3.5-Mc. v.f.o. gives a difference frequency of 14.0 Mc. putting the output in the 20-meter band.

The frequency range of the v.f.o. is a matter of personal choice. My design switches in another tank circuit (5.0—4.4) to provide 28.5- to 29.1-Mc. output without changing the tuning rate of 20 kc. per turn. The important point is to have the v.f.o. tune from 5.5 Mc. down.

— Lt. Col. George V. Gillette, W7GMT/5

Table

Band	Fund. Osc. Freq.	Multiplier	Synthesizer Output Freq.	Mixer Output	3rd I.F.	V.F.O.*	Output Freq.
80 m.	3.5	$\times 2$	7.0	16.0 - 7.0	9.0	5.5 to 4.9	3.5 to 4.1
40 m.	3.5	$\times 1$	3.5	16.0 - 3.5	12.5	5.5 to 4.9	7.0 to 7.6
20 m.	3.5	$\times 1$	3.5	16.0 + 3.5	19.5	5.5 to 4.9	14.0 to 14.6
15 m.	3.5	$\times 3$	10.5	16.0 + 10.5	26.5	5.5 to 4.9	21.9 to 21.6
10 m. (1)	3.5	$\times 5$	17.5	16.0 + 17.5	33.5	5.5 to 4.9	28.0 to 28.6
10 m. (2)	3.5	$\times 5$	17.5	16.0 + 17.5	33.5	5.0 to 4.4	28.5 to 29.1

*Note: V.F.O. frequency decreases for an increase in output frequency. (All frequencies in megacycles)

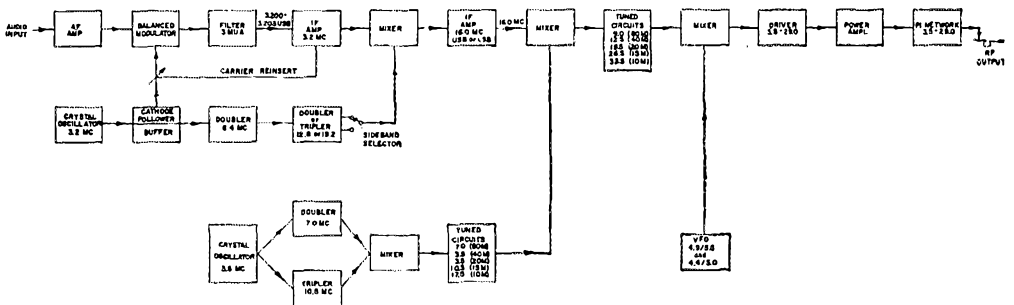


Fig. 1—Block diagram of s.s.b. filter-type exciter requiring only two crystals for converting the basic frequency to all amateur bands from 80 through 10 meters, with sideband selection on each band.

THE LUNIK SIGNAL

Massachusetts Institute of
Technology
Cambridge 39, Mass.

Technical Editor, *QST*:

Although it is impossible to give a definite "yes" or "no" to Mr. Flaherty's question (*QST*, December, 1959, page 81) of whether or not what he heard was the Lunik, some evidence is available. (I assume that the word "Lunik I" was a typographical error, for it was Lunik II that crashed on the moon.) Mr. Flaherty reports an S6 signal on 20.05 Mc. beeping at about 24 beeps per minute, and ceasing at about the time the Lunik crashed. We will proceed from there.

First, the frequency. So far as is known, the Lunik used no transmitter at 20.05 Mc. There was a signal at 20.003, some 47 kc. away. Since Doppler shift on a receding body pulls frequency down, not up, we may eliminate frequency distortion.

On the matter of signal strength, Mr. Flaherty was on the wrong side of the earth for reception at the time of the crash, so we must look to ionospheric skip to provide him a signal. My experience with ionospheric skip and space vehicles is that such a skip signal will be considerably weaker than a line-of-sight path, but in order to avoid argument, consider a line-of-sight propagated signal at a range of 200,000 miles from Earth, with a transmitter of the order of one or two watts and a Spunk-type antenna. This is the system we believe the Russians used. Calculation puts this strength at about -130 dbm., or about S1 on a standard S meter with 50 ohms input impedance, allowing 10 db. gain in the receiving antenna. This is not S6 by any stretch. Remember, too, that the actual skip-bounced signal will be much weaker than this, and this skip signal is what Mr. Flaherty reports S6 on. Considering the skip, it would take an c.r.p. in the high kilowatt or even megawatt range to approach S6. This the Lunik certainly did not have.

It was my good fortune to have heard Lunik II when it was much closer to Earth, and with the Earth turned so it was line-of-sight. It was on 20.003, with a beep rate a bit higher than reported, about 35 to 40 per minute, as I remember. This jibed with Radio Moscow signal records perfectly, and the strength was very weak, certainly no S6 nor even S4. I was utterly unable to hear the crash, as was Uncle Sam. Lunik was simply on the wrong side, and had grown so weak it required a radio telescope to track, even line-of-sight. In America, it was impossible to hear, although many military and NASA stations tried.

So then, the evidence: The receiver was not tuned to the correct frequency, the report strength was many orders of magnitude too high, and the observer was on the wrong side of the Earth. My vote is cast in the negative.

—Raphael Soifer, K2QBW

GLOBAR RESISTORS

Global Plant
P.O. Box 330
Niagara Falls, N. Y.

Technical Editor, *QST*:

In the April, 1959, issue of *QST* there is a letter from Mr. Carl Milner, W1FVY, which refers to our Globar non-inductive resistors as being used for dummy load resistor elements.

You are correct in your statement that Globar resistors are not sold through distributors and we agree that this makes it difficult for ham radio operators to obtain one or two pieces for building equipment. Unfortunately, in the past no distributor has shown any interest in looking for markets for dummy load resistors in the ham radio field. However, Workman TV Inc., 309 Queen Anne Road, Teaneck, N. J., has recently begun to stock certain of the Globar resistors in watt ratings and resistance values which show promise of being marketable in reasonable quantities. I am sure that if any hams having an interest in obtaining Globar resistors will get in touch with this company, they will be glad to cooperate with them in setting up a small stock of resistors in the sizes and resistance values required.

We at Globar are, in turn, always glad to recommend suitable designs for Globar noninductive resistors in terms of resistance value and power handling capability. The

design recommendation could then be referred to Workman TV for ordering.

—H. R. Emes, Manager
Resistor Sales Dept.

—♦♦♦—

1210 E. Calla Road
Poland 14, Ohio

Technical Editor, *QST*:

Your note regarding Globar resistors in April, 1959, *QST* reminded me that such a resistor is used in the RCA BTA5F broadcast transmitter as an audio parasitic suppressor.

This is a 100-ohm 20-watt unit 1 inch in diameter and 4 inches long.

Two of these in parallel should make a dandy 50-ohm 40-watt dummy load.

These are available as a replacement part from all RCA parts distributors under the stock number 17217.

—W. L. Worden, W8IMK

SINGLE-LINE FEED FOR TRI-BAND QUADS

Meade Ave. Ext.
Hanover, Pa.

Technical Editor, *QST*:

With reference to my article on single-line feed for tri-band quads, which appeared in the August, 1959, issue of *QST*, please disregard the given front-to-back spacing of 6' 2" for the 10-meter points. Keep the 20-meter points at 13' 9" and drop the 15- and 10-meter loops from their respective points, as shown. Keep the bamboo poles *straight* from the bracket to the 20-meter points.

The 20-meter reflector is 18' 3 3/4" on each side, not 18' 6" as given.

Some letters I have received voice confusion over the *total* length of wire given. The total length is not used. There is enough wire to make the loops and tie off the ends either to the feed point or in order to close a reflector loop.

—Merrill G. Hess, W3QEF

EMERGENCY POWER

40 Schley Ave.
New Rochelle, N. Y.

Technical Editor, *QST*:

One reason for ham radio's existence is that it makes contributions to the welfare of the nation, particularly in the field of communications, and especially in emergency communications. The biggest problem in emergency communications lies in having power available under any conditions. A car is not always at hand; gas for a generator will be used up; a hand generator requires two men, is not a very stable source when used alone and becomes bulky when used with batteries; and so on.

However, there is a possible combination of fairly new devices which will make possible a power source which will not be exhausted under any conditions, day or night; it is so obvious that it is probably being worked out right now, but a few details may inspire further investigation.

Use a small hand generator to charge a sealed nickel-cadmium battery. Use a completely transistorized receiver, eliminating wasted heater power. The generator can be very simple — an Alnico magnet rotating in front of a soft iron horseshoe upon which is wound the output winding. The rotating magnet can be geared to the handle through a flywheel if necessary, although speed or inertia problems do not seem critical. Westinghouse will probably be glad to supply magnets and their "Hiperco" looks like a good soft-iron core material. Such a generator has no slip rings or commutator. Use a silicon rectifier between the output winding and the battery. It has very high reverse resistance, low forward resistance; so it is efficient and the battery will not discharge through the generator; thus there is no need for switches in that circuit.

Although the thing seems to be simplicity in itself, it requires a little development. The complete package would be something really worthwhile. It should not be too hard to reach 3.5 Mc. with the new h.f. power transistors, and the receiver circuit can be swiped from those already published in *QST*.

—L. S. Baker, W2HAN

UH, — UH-H-H AND AH-H-H, AH-H-H

BY E. B. BLETT,* WSCBM

SHADES of T.O.M.! I wonder what "The Old Man" would have had to say about what s.s.b. is doing to some of us, had he lived until today.

I am not writing about the technical aspects of single sideband, that permits more stations in a given band, the practical elimination of selective fading, the elimination of heterodynes, the more efficient modulation, greater talk power, etc., etc.

I mean the misuse and abuse of the English language perpetrated by an alarmingly large number of the s.s.b. fraternity. Here are a few brief examples picked up in a very few minutes, "—on the uh-h-h, on the uh-h-h, uh-h 75S-1, uh-h-h did I tell—uh, did I tell ya, uh—," "I can't—I can't come up with any reasons, they still, they still gotta uh-h, uh andah-h-h, I tell ya, I tell ya what," and so on ad nauseum.

"Uh's" and "ah's" and repetitive phrases are used for punctuation, to kill time while a very slow mind works, to keep the VOX relay from kicking out and to keep the other fellow from sneaking in a transmission until you're good and ready to listen to him.

C.w. was too slow for communications, many of the early phone men thought. But now they have, with VOX, an effortless system that's much too fast to be fed by the brain box of an alarmingly large number of humans. But they try—and try, and out come uhs, ahs and a's and *occasionally* words. The really unfortunate part of it is, that while you can easily tell a fellow ham that his signal is weak, his modulation cockeyed or that his signal is drifting, no one yet has steeled himself to tell him the noise his station is emitting closely resembles that which one would expect from a blathering idiot.

If the present tendency continues, it will soon require a computer to sort out the words required to convey thought from all of the many meaning-

less sounds and repetitive partial phrases that dominate some s.s.b. conversations. The same conversational highlights in public would probably result in a concerted effort to get the utterer into a sanitarium where he could get adequate psychiatric help. Please, fellows, if you do talk like that in public, don't let anyone know you are a ham. The uninitiated think we're all a little strange and your demonstration would not help our cause.

There are a few other types that have appeared in the s.s.b. picture whom we can get along with-out. You'll recognize them if you have spent as long as an hour or two listening to sideband.

There are some of the lads who have a lot of that green stuff or who have held out on the XYL's grocery allowance and managed to buy a very nice and very expensive commercial s.s.b. rig. By virtue of owning this beautiful piece of gear they have assumed the mantle of a hot-shot s.s.b. engineer—know all about it and can, in detail, point out all of the short-comings of any equipment other than theirs, which naturally is the best—because they own it. I saw s.s.b. at the Bell Labs about 15 years ago so I hardly think a KAG or even a K6 invented it.

Closely akin to the s.s.b. operator who became an "engineer" (?) by buying some good equipment, are the few who have become sideband snobs. They sometimes show extreme tolerance and work someone who is operating less expensive or lower power equipment but they would much prefer to work someone running equipment similar to theirs. Then there are some others, fortunately fewer in number, who have characteristics similar to those attributed to road hogs or any other kind of hogs. They assert their legal rights to operate when they please, even brag about how they can break up an a.m. QSO on the frequency they want or consider theirs. Like the reckless motorboat or car operator, they require an audience to really do their stuff. One of the best ways to get one is to break up a state net that was established and doing some useful work before they got their novice licenses.

Since most of these juvenile (?) s.s.b. delinquents go for the mode as a status symbol, maybe the cure is to compliment them about their wonderfully melodious voices. They might then abandon radio for the concert stage.

One word to the c.w. and ancient modulation operators. There are some nice sideband operators. The oafs, lads, etc., that show up are the fringe element attracted by anything that sets them apart from the herd—the status seekers. They'll go away eventually if no one works them. Who knows, maybe the nice guys who ah-h-h-h and uh-h-h-h because they're afraid of a VOX relay will read this and realize there is nothing

* 19176 Forrer St., Detroit 35, Mich



shameful in letting that VOX relay pop while they think of something to say.

This wail of anguish cannot be terminated without mention of another bad operating practice that started on s.s.b. and is slowly being picked up by impressionable new "Generals." That is, "This is W8 — for i.d." It is presumed that they mean, and they sometimes say, for identification. But why say it? Is there *any*

other reason for giving your call?

I don't expect that this article will have too great an effect in curing the evils injected into s.s.b. It will for a short time, however, supply a need for the s.s.b. operators who have the means of communications and nothing to say — they can — uh-uh-uh-h-h, scream about how unjust this article is and what a sorry specimen its author must be. QST

The Axioms of Home Brew

BY PAUL AMIS,* W7RGL

IN the past few years the ranks of Hamdom has experienced growth as never before. It is to be expected, therefore, that many of this vast army of new amateurs will, at one time or another, begin to notice a gnawing dissatisfaction with the features and prices of their commercial equipment, and will surge into the never-never land of home-brew modification, leaving a trail of torn and bleeding kits and decimated "boughten" equipment in their wakes.

Sometime during this electronic puberty, they will discover a schematic for a gimmick which exactly covers a function they have been hungering for. Moreover, after viewing the embryonic junk box, they will find that there is actually enough material kicking around to construct said gimmick, and will promptly do so. One will get you six this fledgling hay-wire will work like a chrome-plated charm — the first one always does. Fired by the consuming clinker of construction, they will build more and more, only to discover a family of parasites lurking in this bed of roses. Herein lies the crux of this article.

In the endeavor to save these tyro cumshaw artists (may their tribe increase!) the inevitable ulcer electronics construction begets, the following list of Axioms are hereby set forth.

AXIOM 1. The most vital part of any schematic stands the greatest chance of being omitted.

AXIOM 2. With any expensive Standing Wave Bridge, you will find that signal reports, reception, and s.w.r. readings will decrease simultaneously.

AXIOM 3. If a hay-wired unit functions perfectly, the rebuilt, permanent model will malfunction.

AXIOM 4. In calculations, any error which can creep in will do so.

AXIOM 5. Any urgently needed expensive trans-

mitting tube, which has been back-ordered for three months, will finally arrive with an open filament.

AXIOM 6. In any formula, the constants (especially those obtained from engineering handbooks) are to be treated as variables.

AXIOM 7. Parts that positively cannot be assembled in improper order will be.

AXIOM 8. Any well-thought-out home brew unit, utilizing the junk box and a minimum of expensive purchased parts, when completed, will cost 1.7 times as much as a commercial kit of equal versatility and power.

AXIOM 9. Interchangeable parts won't.

AXIOM 10. Any wiring error in any construction will be in the direction of the most ruin to the greatest number of expensive components.

AXIOM 11. Any hastily constructed, hay-wire antenna, flung up during a blizzard, will consistently out-perform any commercial antenna.

AXIOM 12. If a component is carried by only one distributor, the price will be unreasonable.

AXIOM 13. Any home-built and home-designed three-element beam will have a front-to-back ratio of no more than 4 db.

AXIOM 14. Identical parts which test in an identical manner will not behave in an identical fashion when used.

AXIOM 15. If a gross of #6-32 nuts are purchased, they will prove to be too small for your #6-32 nut-driver.

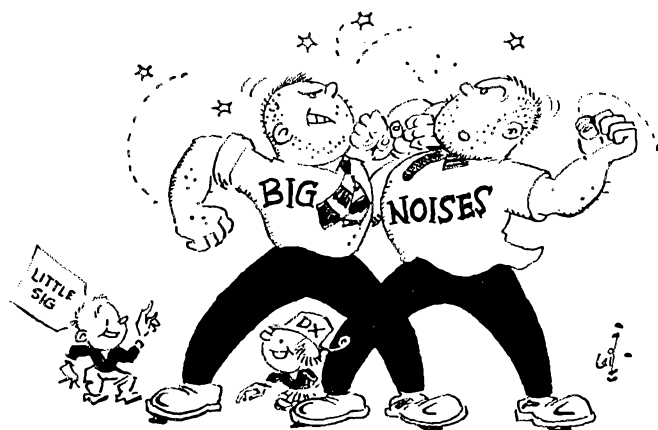
AXIOM 16. As soon as an established construction practice is utilized so as to achieve the highest efficiency, an ingenious idiot will promptly publish a method to improve said efficiency with half the parts.

AXIOM 17. Warranty and guarantee clauses are voided by payment of the bill. QST

* Route 1, Box 438, Poughsbo, Wash.

BY STANLEY DAVIES,*

VK9AD



Working DX

MY claim to fame has been just a simple five-letter group — VK9AD. A simple CQ and apparently the world is at my call, a world containing a majority of W or K calls. Any band at any time, the W and K boys far exceed all others. The joy of being wanted! It goes to our head! Delirious with the excitement, it whoops over and over. My wife has kicked me out of the marital berth, CQ goes the call from my dreams.

But that was all long, long ago. The joys of working pile-ups and rat races are at an end, and this article presents my idea of how to achieve a QSO and a QSL from the resident of any rare DX location. In actual fact, I should be the last one to write such an article, my own DX rating proving that I'm not as good as I would like to be. But then, could it be any other way? I chased the Navassa DXpedition, only to find that my cathodes were shorted to ground at the tube, instead of going through the keying jack! I couldn't miss this one, so I grabbed the hot lead carrying 800 volts d.c. and dah-di-dahed with those 800 volts dancing between the "key" contacts. What beautiful flashes! I made the contact, but what happened? The U. S. pile turned its beams toward me! Part of pile was calling Navassa, the other was calling me. Sorry, fellows, working under such conditions I must QRT. One station says, "Typical phone station, comes on c.w. to work a DXpedition, but won't work the boys on c.w." That, of course, at the time was just about as true as true could be, but what about the other end of it?

I spend long hours on c.w., saying "hello" and "goodbye." What is the text of such a QSO? Him to me, "Tks for the call, OM. You are a new country to me, please QSL. My QTH is . . . You make number . . . What is your QTH? Please QSL. I will QSL direct." And so on and so on. I am sure that if those preceding words were sent on c.w. at 100 w.p.m. I wouldn't miss one of them! So, may I be so bold as to suggest

that you omit the lot of it. If the DX station is not ragchewing, then he is trying to give the c.w. boys a new one — just a humble entry in the log, a report, and then on to the next one. Surely you can find the QTH from the *Call Book*, and the QSL procedure from anyone who has previously received a card.

And don't give a short call whilst he is reading another station. He hasn't got two pairs of ears, one listening to the station in QSO and the other listening to you. Apart from which, you do nothing except to cause a longer QSO with the station trying to be worked, because of repeats and so on. This is even worse on a.m. phone. I defy anyone to copy two S9 signals at the same time on the same frequency!

That brings me to the point of using the DX station's frequency. Ten up, ten down, and so on . . . It doesn't mean a thing! After working a dozen or so stations, his own frequency has been forgotten in the melee. His fingers are always on the dial and a dozen or so stations on one frequency are impossible to copy. How many receivers are capable of tuning ten up or down accurately in a dog pile. Slide up 30 or 40 kc. Give nothing more than a three by three, and I'll guarantee results. In my log there are a few R5S3 reports. Those stations were nowhere near the main pile-up frequency, that's for sure. When a DX station is engaging in quickies, don't join the pile if you only want to say, "I received your card about a month ago, just wanted to say thank you, have you got mine, if not then I'll mail you another, thanks again for the QSL, very pleased to get another new country confirmed! Etc., etc." Or conversely, "Have you received my QSL card, I sent it a week ago, it's a red one with black letters, I haven't received yours yet." Oh, brother! Here's another typical line — "Thanks for your card, etc., etc. Just wanted to say thanks. I have a friend on the frequency who has been trying to QSO you for ages. Would you listen for . . ." No, I certainly won't. Anyone doing that sort of caper gets a line right through

* Douglas Drive, Norfolk Island.

the log, and on to the next.

The DX station does like to contact other amateurs in other countries! Between 14,100 and 14,200 he has a reasonable chance of doing so on phone, providing those idiotic. . . . Words fail me! Don't put a kw. on my frequency and start using c.w. to attract my attention. On c.w. it is nearly impossible to work anyone outside of the U. S. on 20 meters. I was on 20 meters 8 months before logging my first G contact. I heard them O.K., but every time I called one, a dozen W stations would come back, obliterating the G. So, I used the other approach, "CQ G, CQ G, CQ G, only G-land pls." Who answered? Ws, Ks, PYs, XEs, all of North, Central and South America. But nary a G!

S.s.b. operating lends the mostest to working DX, providing you stay on s.s.b. If a DX station is operating between 14,300 and 14,350, and is working DX, leave him alone. In my particular case, European DX comes in for not much longer than 30 minutes to an hour, while W stations are in for nearly 16 hours. Need I say more?

A few words on QSL cards. How about looking at your own card. Can you extract your own address from it? Haven't you noticed the many cards that have the state in one corner, the street and number in another corner, and the town in another. When you design your next batch of cards, how about putting the address all in one complete box, just the way it should be written. That would be a great help to the DX station that has to send out cards by the hundred, even if he does use the bureau.

In conclusion, I would like to add a list of do's and don'ts, the sole intention being to permit the rare birds to enjoy their operating hours to the fullest. Of course, this applies generally only to

the residents of some of the rare spots, since the DXpedition stations expect pile-ups. I have no doubt but what all is fair in love, war, and DXpeditions!

But in the case of the "permanent" rare DX stations, find out from others what hours you are likely to be able to QSO them. If you can hear an individual station, note how he is operating. If he is giving a new contact to all and sundry, join in (off the frequency) (way off if it is a real pile-up) and give a short three by three call. Do not have itchy bug fingers and call whilst he is either listening to a particular station or sending himself. (I personally use full break-in, and some of the stuff that I hear while transmitting you just wouldn't believe!) The same applies equally to an itchy p.t.t. (push-to-talk) on a.m. or a whispering VOX on s.s.b. Any one of them prolongs the QSO with the station the rare DX is trying to work, and in any case your call doesn't get through because of the QRM.

If the DX station is ragchewing, leave him alone — he can't dedicate his whole life to working a string of Ws!

Don't ask him to listen for your friend who works QRP. The DX station is probably using QRP too, so let your friend get him under his own steam. Far more credit to him for doing so!

In conclusion, remember that the amateur in the rarer part of the world started off in his hobby exactly the same as yourself, either through an interest in electronics, or ragchewing, or any of the other things that make amateur radio one of the finest hobbies available. It was you who gave him a false sense of being something better or different. So just give him a fair go and make his hobby as pleasant to him as yours is to you. QST

Socorro Island, XE4B

July 6-10, 1959

BY LUIS CUEVAS MEDINA,* XE1XX

SOCORRO ISLAND is situated in the Pacific Ocean, about 400 miles due west of Mazatlán, which is a seaport directly across the Gulf of California from the southernmost tip of Lower California. Mexico has recently established a naval weather station on the island, and for this reason, has restricted access to navy personnel and Mexican citizens on bona fide business. This fact was not known until late last year, when an American DXpedition was refused permission to operate from XE4.

Because of the citizenship requirements, a group of Mexican hams began laying plans early in 1959 for an expedition to Socorro. After many months of preparation (and one cancellation) XE4B became a reality for 96 hours, July 6 thru July 10, 1959. With the full cooperation of the

Liga Mexicana de Radio Experimentadores (The Mexican League of Radio Amateurs) and the Department of Telecommunications, the call sign XE4B was issued, provided the expedition could make arrangements for its own transportation, food, equipment, etc. At first this seemed impossible. A little investigation revealed that Socorro depends upon the mainland for all of its water, food and fuel, and was supplied by periodic visits of a Mexican coast guard cutter from Manzanillo.

A visit to the Naval Department by XE1XX, XE1CV, XE1BI and XE2AM, brought an invitation to meet Cutter #31 at Manzanillo in early July for a quick supply trip to Socorro. Of course, the four agreed readily to be considered as navy personnel, to obey all military orders and to limit their activities on the island to 96 hours. The former requirements were merely a formal-

* E. Elorduy 105, Mexico 20, D. F.



DXpeditioners Carlos de Leon Zambrano jr., XE1CV; Luis G. Guevas Medina, XE1XX; Eliezer Erosa Irabien, XE1BI, and Agustin C. Munoz, XE2AM, on Socorro Island.

ity, because the coast guard quickly became infected with the air of the expedition and its enthusiastic cooperation assured complete success.

Four modes of operation were agreed upon: c.w., a.m., s.s.b. and RTTY. Luckily, XE1XX is the Mexico City distributor for the Collins Radio Company and he made available a KWM-1 and a 32S1/75S1 combination. For c.w. and a.m., a Heath Apache was taken along and performed perfectly. The teletype equipment was supplied by XE1BI. This equipment was presented to XE1BI by two fine American RTTYers, Boyd Phelps, W0BP, and Adolphus A. Emerson, W0ITQ, during their recent visit to Mexico. In memory of their untimely deaths in an automobile accident while returning to the United States, it had been decided that XE4B would also operate RTTY. This is probably the first time that RTTY went on a DXpedition and we all hope it won't be the last.

The first leg of the trip was by car from Mexico City to Manzanillo, about 500 miles to the west. It was a relief to finally start, because after a wild buying spree in the stores and markets, the numerous dry runs on the equipment, etc., everyone was pretty well keyed up and eager to get started.

As planned, the Mexican coast guard was waiting for us in Manzanillo and Cutter #31 put to sea on July 3. The weather was balmy and the sea as smooth as glass. Unfortunately, such admirable maritime-mobiling conditions did not last. A few hours out, a tremendous tropical cyclone blew up and forced the cutter to return to port. This met with everyone's approval, because sea sickness and ham radio don't mix very well. Back in port, the coast guard received a message from Socorro that supplies, particularly fresh water, were dangerously low. It was decided that the run would have to be made the following morning, regardless of the weather.

The next day was calm, the embarkation smooth and the trip to Socorro (36 hours) very pleasant. During the trip XE4B/MM was used as the maritime mobile call sign. XE4B was not used until the equipment was actually in operation on the island, although XE4B/MM was again used during the return trip to the mainland.

Landing at Socorro was uneventful with one exception. The treasured teletype spent a brief spell on the bottom of the bay. While its new

owner, XE1BI, was contemplating various salvage methods, he abruptly found himself on the bottom of the bay also. Not knowing how to swim, he quickly surfaced, but, with good presence of mind, brought the RTTY up with him. After several days of rinsing, drying and adjusting, the equipment was as good as new and W6OWQ found himself in QSO with a new country.

The rest of the equipment was immediately set up and the first XE4B QSO was made at 1606 GMT, July 6, with XE2FL in Monterrey on s.s.b. W6VVR came back to the first c.w. CQ and XE1BBU was firstest with the mostest on a.m. Activity was closed at 1200 GMT, July 10, when 73s were passed on to K4TUA. During the allotted 96 hours, XE4B operated a total of 91 hours 50 minutes. Contact was made with 2024 stations in 45 countries. Of these, 356 contacts were on a.m., 884 on s.s.b., and 782 on c.w. Who says c.w. is dead? Two contacts were made on RTTY.

Although the pile-ups were tremendous, the large majority of calling stations were courteous and knew their business. Unfortunately after working us, one lid remained zero beat on our frequency and spent hours informing the rest of the world that XE4B was a "pirate". We all know who he is, and the only thing bothering us is whether or not to send him a QSL.

The antenna was a Hy-Gain Tri-bander and the power plant was a 1200-watt Fairbanks-Morse, which never skipped a beat during the entire expedition.

Since it takes two to make a QSO, we want to thank everyone we worked for the fine cooperation. We had a wonderful time and are already looking forward to a repeat performance in the future.

QST

Strays

And now that you've read about DX, how about working some. The annual DX ARRL DX competition starts in February, and we refer you to the reminder on page 10 of this issue, and to the complete rules which were carried in the January issue, commencing on page 49. Also, look at this month's cover, to see some of the choice QSLs that *might* be yours.

A Plea For Dignity

BY J. W. SIKORSKI,* WØRRN



IN the language of today — I've had it! First of all, I'm the secretary of a darned good ham club in a state that must be almost as rare as Delaware judging from the number of tearful, pleading pleas of "Please, please QSL" we receive.

Our club is fortunate to have a postoffice box to which most members have their QSL cards sent. As club secretary, it's one of my duties to remove the mail from the box and distribute cards to the members — and therein lies the subject of my lament.

Naturally, I have to read the address. I'll even be honest and admit that I read the entire card. About fifteen of our members are Novices and most of their cards come from other Novices — and they should be ashamed!

Throughout history, hams have been variously labelled as nuts and screwballs, which to some extent we may be, but our hobby has dignity (or had, at one time) and operates in the public interest, convenience or necessity. In many circles, we command considerable respect, and rightfully so.

Now, however, that dignity is taking a beating and to some extent, our respect is hitting the skids, and here's one of the reasons — those QSL cards.

In recent years, it has become quite common to receive cards addressed to "W—, chief op. Joe," and had it remained right there, it wouldn't have been quite so bad, although even that is superfluous. But something new has been added. Now the "chief op." has been promoted, and in lots of cases is "Chief Engineer, Joe." That's another title we could live with, but that's just a beginning.

I might not have written this had a postal clerk not asked me one day "what is a Chief YL Chaser?" And that did it! None of these little incidents I'm about to quote is an isolated case — they're repeated over and over. In twelve cards we received in one week, there were three

addressed to "TVI Palace."

We're infested with "Chiefs." Just take a gander at these — all gleaned from cards we have received in recent months: "Chief Fuse Blower," "Chief Brass Pounder," "Chief Key Klicker," "Chief Key Bender," — and — brace yourself for this one — it actually showed up as the address on a card, "Chief QRM Maker HI HI Dick." Whoever sent that one was really in orbit.

But those aren't the worst ones yet. How about this little dilly — "Joe, the Main Fuse." Or maybe you prefer something more delicate like "Dick, the Fist." Or perhaps something dignified such as "Emission Master, Dick."

We received one that might be appropriate — "Amateur Radio Productive Unit," which might be shortened to ARPU — the last two letters of which would be very close to the point.

These all showed up on one month's cards. Sickening, isn't it?

During the same month, we received two cards addressed to "KØ . . . , South Thirteenth St., South Dakota." Needless to say, those cards are still in our files. And some eager beaver is doubtless cussing a South Dakota ham for not sending back a QSL. The same applies to the card we received addressed to "QSL Manager,



* 1900 S. Menlo Avenue, Sioux Falls, South Dakota.

South Dakota."

Wonder how the postoffice clerk felt, or what he said, when he saw the one card on which a space about one by three inches was devoted to address, and the balance of the address side of the card was completely covered with "PSE QSL." There wasn't a quarter of an inch that wasn't covered with "PSE QSL."

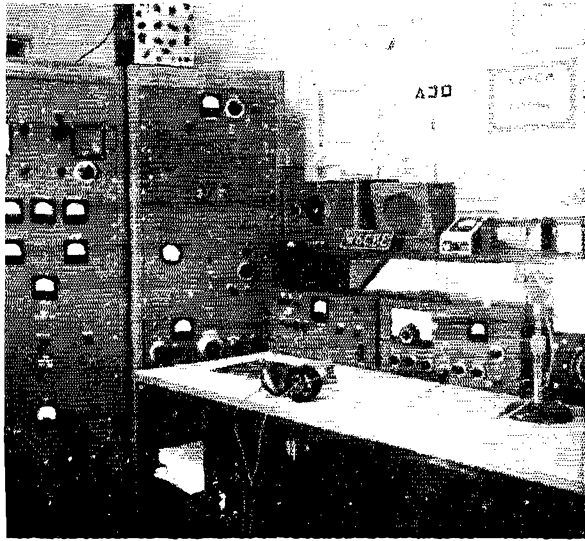
We've received numerous cards addressed to "Sioux City, South Dakota, or Sioux Falls, Iowa, or Sioux Falls, North Dakota. A little investigation would reveal that Sioux Falls is in South Dakota.

Two of our members brought in cards on which the sender was either in a hurry, or the

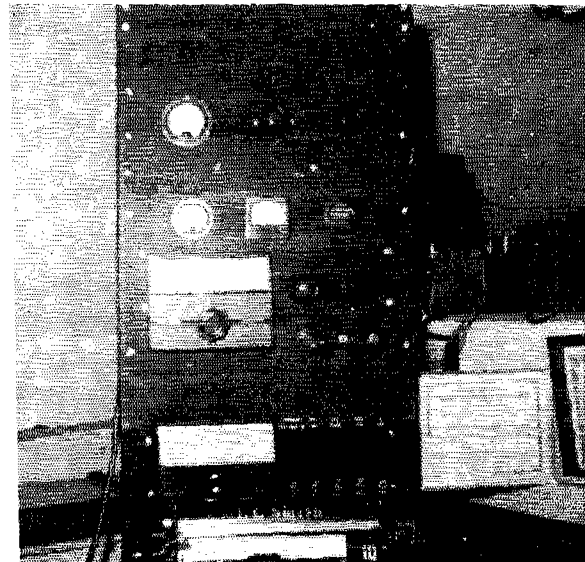
printer wasn't paying attention to his business. One was from Pittsburgh, Pa., and had no street address of the sender. The other was from some place in the United States, but the postmark was blurred, and there was no town of origin printed on it.

It all boils down to this. If you want to receive QSL cards, you've got to send 'em out correctly addressed. And, if you want ham radio to maintain its stature and command the respect that's due it, forget those "cute" titles. A card addressed to Amateur Radio Station KN- . . . , 7777 South 77th Street, with the city and state," will get there, and you won't be labelled as some punk kid trying to show off. QST

Home-Built Stations



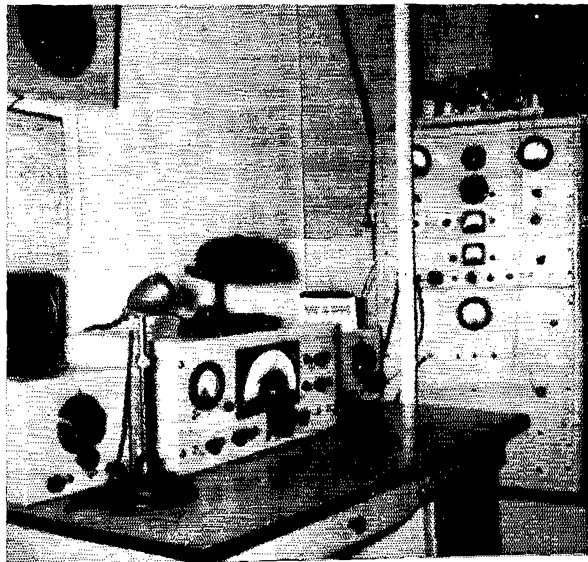
W1QMB, pictured below, has his complete station built in a six-foot relay rack. At the top is an antenna tuner, below that a transmitter with a pair of 6146s, and at the bottom a 17-tube receiver. Out of sight below the typewriter is the power supply chassis. Tuning is done with the left hand, keying with the right.



Several months ago, after having published a picture of the station at W1LW, it being completely home-built, we asked for pictures of other amateur stations in which all the gear was similarly home-built. On these pages we show some of the photos we received. If any others have photos of their home-built stations, please send them along.

The list of gear that W6CBE has built covers more than two single-spaced typewritten sheets, and it ranges all the way from simple audio oscillators to the most complicated sideband exciters. When he wrote us about this photo, he pointed out that it was already obsolete, as much of the gear had been replaced with some that was more recently constructed. He also built the operating desk and a 40-foot tower outside. Even though he has spent a great deal of time building this gear, the certificates on the wall show that he has worked an impressive amount of DX.

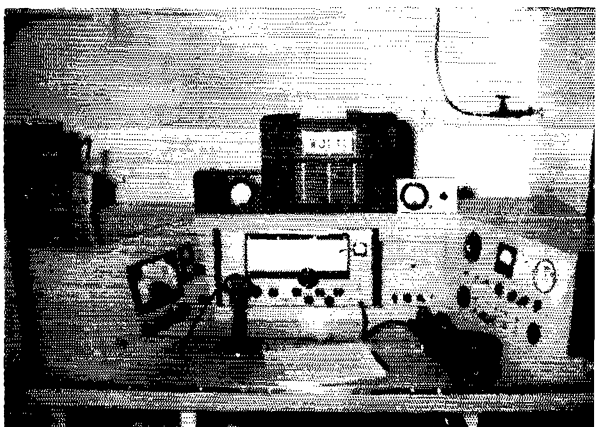
W4PM, below, has a 15-tube double-conversion receiver with Q multiplier and a regenerative preselector. Also on the operating table is a v.f.o., while the 813 bandswitching rig is in the rack at the right. That pipe alongside the operating table extends through the roof of the garage and both supports and turns a tri-band beam.



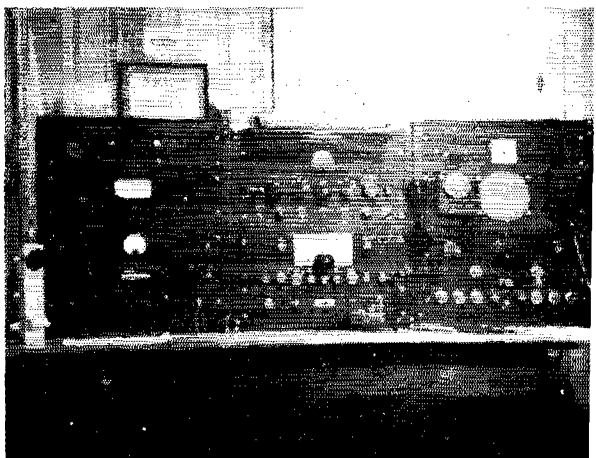
K8AYI has a 16-tube double conversion receiver with 100-kc. calibrator and product detector, a "Side-Band Package," and an 813 running Class AB₁. A t.r. switch, a "Mickey Match," a lo-pass filter and a direction indicator round out the equipment inside the shack. K8AYI also built his own beam and beam rotator.



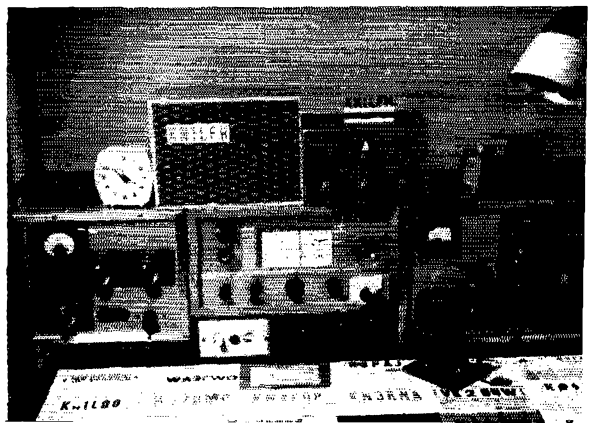
W0PYI has a pair of 813s in a rack out of sight at the left, while next to it (on the left-hand side of the table) are the v.f.o. and exciter. In the center is a dual-conversion receiver and outboard signal slicer. The panel at the right contains the beam indicator, s.w.r. meter, and various operating switches. W0PYI operates 80 through 10, a.m., c.w., and d.s.b. An s.s.b. exciter is under construction. The antenna is a home-brew tri-band quad.



W3KKO has a 16-tube dual conversion receiver with a tunable cascode front end and is bandswitched 160 through 10 meters. His transmitter ends up with a pair of 811As in a linear amplifier, driven with either an a.m. or s.s.b. exciter. Other items include a conelrad monitor, reflectometer, c.w. monitor, and a transistor handi-talkie (which is described on page 20 of this issue).



Last but not least is an example of some outstanding Novice construction. KN1LFH has taken several of the units described by W1ICP in QST and fancied them up a bit. The only deviation from the other stations we have described is that this fellow has a kit receiver. However, he did make a few changes in the AR-3, and so he has redeemed himself somewhat. The rest of the gear, as we said, has appeared in various QST and Handbook articles.



Use Your Amateur License in the Naval Reserve

BY W. E. HUGHES,* W5PYU

EACH year many radio amateurs enter or leave the Armed Forces. Many of them feel that it has been a dull and unrewarding experience. If you are a young amateur and Uncle Sam has not yet pointed his finger your way, this article should be of interest to you. I am going to tell you about the U. S. Naval Reserve.

First, let us assume that you are the typical red-blooded American boy and come the day you reach your eighteenth birthday you will make the usual visit to become acquainted with your local draft board. You will, no doubt, survive this ordeal and be registered, assigned a number, and placed in a certain draft category, depending on your educational status as well as your state of health. Then will come the long period of waiting. Exactly when, and under what circumstances you will be drafted is hard to say. However, one thing is certain, unless you are not a good physical risk, or unless you become a theological student or exempt yourself in some other way, you will eventually receive the "Greetings". And once you do, there is no telling where you will end up and what "field of endeavor" will benefit by your presence.

But there is a much better way. If you are between the ages of 17 and 26 and hold a General or higher class of amateur radio license, your skill and knowledge will pay you great dividends with the military right away. At the beginning the Naval Reserve will generously enlist you two pay grades higher than the ordinary recruit. Further, they will designate you as a Radioman "Striker". This means that regardless of where you report for duty you will be officially recognized as a potential Radioman. You may be advanced to the rate of Radioman third class (equivalent to the old Army rank of Buck Sergeant) without regard to time in rate if you can pass the written examination. If you appear to be really on the ball you may be enlisted as a Radioman third class under the Special Ratings program if you can demonstrate your ability to transmit and receive code at the rate of 18 w.p.m.

After you enlist, you normally will commence attending weekly meetings with your local Naval Reserve Unit. Here you are given an opportunity to further your knowledge of electronics and increase your ability as an operator. In addition, you will be taught the basic fundamentals of Navy life (you suspected this). At the time of enlistment, if you have no prior military service (consider this to mean two years or more) you must agree to perform two years of active duty with the Navy. You may select any date within the next three-year period to start your active duty. Present regulations provide a means

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whereby members enrolled in college may be deferred until completion of college by accepting an administrative discharge and reenlisting prior to the conclusion of the first three years.

In the meantime, let's extoll upon the virtues of membership in the Naval Reserve and show why you cannot afford to miss out on this offer. First, we told you that you would be given additional training in your chosen field — radio communications. By this we mean that most likely your training will be divided between classroom instruction and on-the-job training. At our Training Centers and Electronics Facilities you will learn to use modern transmitters, receivers and test equipment. Presently, a large number of our units are being equipped with radioteletype equipment. (Yes, you can put it on the ham bands). It will be your job to learn to operate our equipment, make repairs and perform routine maintenance. Obviously, the degree of responsibility assigned to you will be commensurate with the ability and initiative you display.

On the more pleasant side (it has been work up to here), you will find that as a licensed amateur you are eligible to participate in the individual craftsmen training (ICT) program. This will permit you to check-out surplus radio equipment which has been made available for you to take home, rebuild, junk, and re-hash to your heart's content. If you like to do a little on-the-air operating, there is the individual Naval Reserve Radio Net which is available for your use (see p. 10, Dec. *QST*). Individual nets are assigned to Navy frequencies normally near the amateur bands, and each week individuals are welcome to participate in communication drills for the purpose of checking their equipment and improving their traffic handling ability.

Many of the District Control Stations (such as NDF/W5USN) run code proficiency tests similar to those run by W1AW, and all hands are encouraged to submit copies for determination of their eligibility for Code Speed Certificates.

Incidentally, you are paid one day's pay for each meeting you attend at the Naval Reserve Unit. Of course, the rate of pay will increase with each advancement and advancement opportunities are practically unlimited for radiomen and electronics personnel in the Naval Reserve.

There are a number of other compensations involved in Naval Reserve membership which are not necessarily monetary in nature. The principal benefit is probably the feeling of satisfaction and pride that comes from knowing you are a part of the first line of defense. Another is the sharing of the strong bond of fellowship that exists among us. When I was stationed at the U. S. Naval Re-

serve Training Center in Beaumont, Texas, the entire radio gang was made up of hams. The Naval Reserve Radio Drill had all the aspects of a ham club meeting. No one went home immediately after the meeting. There were new rigs to be built and field days to be planned. Needless to say, the Navy was pleased with the results. Here was a group of fellows who loved radio and communications and who could be depended upon in event of an emergency. In the Sabine flood disaster in 1953 the Naval Reserve Communications Facilities were ready and on the job, furnishing emergency communications along the Gulf Coast and offering assistance where needed.

Now, you may not find a large gang of amateurs at every Naval Reserve unit, but the word is getting around and more and more amateurs are realizing that they can capitalize on their ham tickets and their knowledge of radio by joining the Naval Reserve. You will find in most cases that the Reserve units will be staffed by competent, well-qualified communications personnel — many of whom hold Amateur and Commercial licenses, and they are ready and eager to instruct you in radio and communications.

To use a personal example, several years ago when I was first assigned to the Electronics Program I had little knowledge of amateur radio. I was of the opinion that hams were nuts who tried to get twice as much power from a transmitter as the technical manual specified, and who in most cases sent code with a "slur". Yet I realized there must be more to this hobby than was apparent to the ordinary citizen. So, armed with an old

copy of the *Handbook*, a *License Manual* and the facilities of the Naval Reserve, I decided to "Join 'em" as it was obvious I couldn't "whip 'em." Now the proud possessor of an Advanced Class Amateur license (as well as an FCC Commercial Radio Telephone First Class and Radiotelegraph First Class ticket), I have learned that Electronic circuits are the same in military, amateur and commercial equipment (basically, at least), and that by taking advantage of my amateur and Navy training I have prepared myself for a good job in the electronics communications field when I retire.

In conclusion, let me remind each amateur of the invitation to visit the Naval Reserve Training Facility in your community, operate the equipment on the ham bands and get to know the people who are working to train our youth in this fascinating and most important field.

Let me say to the young amateur who is faced with military service — don't "goof" and end up in service as a truck driver or a bull-dozer operator. Come on in the Naval Reserve with a higher rate of pay and assure yourself of a job in communications when your active duty with the military comes up. If you have already been in service, do not feel slighted. The Naval Reserve can use you too. If you have civilian experience in radio you may be eligible for enlistment in pay grades up to and including Chief Petty Officer. Your nearest Naval Reserve Organization has the information. Ask them about the Special Rating Program.

QST

Strays

To help blind persons interested in amateur radio, W0GXV has donated two 30-minute tapes, one on learning code and a second on becoming an amateur, to the Voicespondent Club. The club librarian, L. E. Griffith, 103 Boulevard St., Sandwich, Ill., will copy either or both texts without charge on tapes supplied him, provided only that the material is to be used by blind persons.

K3HNP (David Heller, 14 Darkleaf Lane, Levittown, Pa.) is co-editor of *Tag Collector*, a small publication devoted to the study of auto license plates. He would like to hear from anyone else interested in this hobby, or from anyone who has historical information of any sort regarding license plates.

W5FPB points out that the Government Printing Office issues a number of publications on radio and communications that some of our readers may not know about. Some of the titles include *Basic Electricity*, *Basic Electronics*, *Radio Receivers*, *Troubleshooting and Repair of Radio Equipment*, and others. The best thing to do is to write to the Superintendent of Documents, Government Printing Office, Washington 25,

D. C., and ask for the free price list Number 82, covering radio, electronics, radar, and communications.

W4PVA says that K4PCT has been considering mounting an 80-meter rhombic on floats in a farm pond so that it can be rotated.

The world above 50 Mc. is being expanded. *Electronic News* reports that Rome Air Development Center in New York is about to let a contract for the investigation of modulation and detection techniques on optical frequencies for communications, while similar contracts have already been let by Wright Air Development Center. Researchers are particularly interested in the optical band in the hope that certain specific problems connected with the operation of space vehicles will be solved.

Clif Evans, K6BX (Box 385, Bonita, Calif.), is engaged in a one-man campaign to send *Call Books* to DX stations who can't afford to buy them. Instead of discarding your old *Call Book*, write to K6BX for the name of someone who would like to receive it. Don't send the *Call Books* to K6BX!



CONDUCTED BY EDWARD P. TILTON,* W1HDO

THE current sharp drop in maximum usable frequency for *F*-layer propagation is "separating the men from the boys" on 50 Mc. A substantial percentage of all present occupants of the band have never known a time when it was not possible, at some season of the year, to work worldwide DX, or at least to get in some S9-plus contacts over transcontinental distances. Many new 6-meter men came to take this kind of DX for granted, as a permanent, if seasonal, part of the 50-Mc. picture. Now that it has for all practical purposes become a thing of the past, these fellows are eyeing the 10- and 15-meter bands with more interest than before.

This may be a good thing in some ways. If the lure of easy DX provides the incentive for Technicians to progress to a higher class of license, nobody will quarrel with that. But before we drop 50 Mc. from our operating schedules we should consider where the true value of the band lies. Working *F*₂ DX has been fun, and we have learned a great deal through our intensive observation of the band during high-sunspot conditions, but using the band for this purpose alone is to nibble the frosting and leave the cake.

The person who considers leaving 50 Mc. now that worldwide DX is no longer a daily feature simply does not appreciate the true potential of the band. It is worth remembering at this time that our v.h.f. bands were considered fertile fields, worthy of the best efforts of many of our leading amateurs, for years before working out of the country was more than the vaguest of possibilities. There is plenty of interesting work left to be done, and with fewer DX sessions coming up we will have more time to devote to making the band pay off in other departments.

There is still sporadic-*E* skip. With little or no tie-in with solar cycles, this form of DX can be expected to provide thrills every year. It is by no means a summer phenomenon, either. Though the major season is May through July, sporadic-*E* skip can occur at any season, as we saw in the openings around the year end. The way it seems to burst forth out of nowhere, at times when you least expect it, gives *E* DX an appeal all its own. Quite a few of the early holders of 50-Mc. WAS made it with only this medium to help them catch the hard ones at distances beyond 800 miles.

Tropospheric propagation will always be with us, and it also has an angle that sustains interest: its association with the changing weather patterns. Study the weather maps, watch the clouds, the changes in barometric pressure, the tempera-

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50 Mc. WAS

1 W6ZJB	19 W30JU	38 W7ILL	57 W1SUZ
2 W6BJV	20 W6TMI**	39 W6DDX	58 W1AEP*
3 W6CJS	21 K6EDX	40 W6DX	59 W5LFH
4 W5AJG	22 W5FW*	41 K9DX	60 W6NLZ
5 W5ZHL	23 W6BRE	42 W6ABN	61 W7MAH
6 W5OCA	24 W9ALU	43 W6BAZ	62 W8ESZ
7 W6OB	25 W8CMS*	44 VE3AET	63 W2BYM
8 W6INI	26 W6MVG	45 W9JFP	64 W7ACD
9 W1HDO	27 W6CNM	46 W6QXT	65 K6PYH*
10 W5MJD	28 W1VNH	47 W6WWN	66 W4HQB
11 W1LL	29 W6OLY	48 K9ETJ	67 K6JJA
12 W1LL	30 W7HEA	49 W6FKY	68 K6RNQ**
13 W6DZM	31 K6GQG	50 W8LFD	69 W9OWT*
14 W6WJV	32 W7FE	51 W6ZTW	70 W6EDC*
15 W6WKB	33 W6PFP	52 W6GGV	71 K6VLM**
16 W8MJ	34 W6BJI**	53 W2RCG	72 K6GOX**
17 W8OGW	35 W2MEU	54 W1DEJ	73 W8EDM
18 W7ERA	36 W1CLS	55 W1HOY	74 W9JCI*
	37 W6PUZ	56 W6ANN	75 W6LLU*

*49 states

**50 states

VE7CN	45	VE4HS	41	LU9MA	26	LA7Y	20
KL7AUV	44	SM6ANR	30	ZS3G	26	VQ2PL	18
VE1EF	42	CO2ZX	30	CT1CO	24	JABAO	18
XE1GE	39	SM7ZN	29	CO6WW	21	JABBU	17
VE2AOM	38	PZ1AE	28	LA9T	21	JAI1AAT	17
KH6UK	37	SM6BTT	28	LU3DCA	20	JAI1AUH	16
EI2W	37	ZE2JV	26	SM5CHH	20	VP5FP	7

ture, wind velocity and direction, and you may find yourself a new side hobby, to go with v.h.f. hamming.

Auroral propagation still gets all too little play from many v.h.f. operators. Some think it a high-power man's game. High power helps, but it is not necessary. Knowing when, how and whom to call is more important. Fear of the code keeps too many from enjoying this aspect of v.h.f. work. Don't let that throw you. Everyone has to start somewhere, and every speed merchant you hear on c.w. was sending 5 w.p.m. at first. Nobody is going to burn you up because you're slow. Practice makes perfect, and getting started is the way to work up. Once you've tried your hand at c.w. contacts you'll wonder why you ever struggled to do aurora work on voice. Bouncing off the aurora is an unbeatable way to pick up the hard states that lie inside the skip zone for sporadic-*E* and beyond the tropospheric range.

Then we have the more esoteric forms of DX: tropospheric and ionospheric scatter, and meteor-burst communication. Like aurora work, these are essentially code media, and consequently they are lost on the phone-only operator. But they are among the most interesting means of v.h.f. communication, and they deserve more attention than they've been getting. Now is as good a time as any to learn more of their potential, if for no other reason than that they offer unending means of picking up ARRL Sections in a v.h.f. contest that the phone boys can't touch unless there is a major band opening of some sort.

It is well to remember that the true v.h.f. man

does not live by DX alone. The real heart and soul of v.h.f. is the local or near-local contact. Where else can you maintain reliable communication around the clock, for a radius of 100 miles or more, with only moderate power, and with almost complete freedom from QRM?

All that has been said above is labelled "50 Mc." but most of it applies to any band from 50 Mc. up. The whole point of the argument is that, while it is fun to work DX or do any of the other things that lower frequencies have to offer, there is no need to move to lower bands just because we are on the downward slope of a sunspot cycle. The v.h.f. bands kept thousands of alert hams interested in the years before we worked our first DX. They can do as much for you. Interest is where you find it; there is plenty to do in the world above 50 Mc., regardless of the state of sunspot activity.

Here and There

One of the most ambitious projects for the ARRL IGY program was the unattended beacon station operated by W5FHS. With the cooperation of the United Gas Corp., Shreveport, La., this station ran many months of continuous beacon service. Being situated near the edge of the TE zone, it provided a good check on the northerly extent of many openings. It was also logged via E-layer propagation at various points around this country. Because it now seems to have served its main purpose, and TE openings that include it are becoming increasingly rare, the beacon was closed down for good Dec. 23.

To Edwin Nuttall, W5FHS, and his associates, who gave it so much time and effort, go our deepest appreciation. This was no ordinary beacon setup, to be run when it suited the convenience of the operator. W5FHS had an automatic conrad close-down system and various other safeguards, which enabled the licensee to qualify for special FCC authorization for unattended continuous operation.

Several six-meter operators around Joliet, Ill., have a special claim to fame. They believe that they made the first wheel-chair mobile contacts. When K9JMZ was confined to the Silver Cross Hospital with a fractured leg, the boys fixed him up with a 6-meter Communicator, complete with halo and storage battery. He was thus able to work K9KLU, K9QMB and W9DBJ, while actually "mobile" in the hospital corridors. The sight of the halo mounted over Vic's head was something of a shock to the more sensitive hospital patients!

The Geminids meteor shower, Dec. 10 to 14, seems to have attracted little attention, outside of the circle of dedicated meteor-burst enthusiasts. Schedules kept were well distributed over the country, but we have only a few positive reports thus far. W4LTU, Springfield, Va., says that the shower seemed to peak the night of the 13th and the following morning. Walt completed but one 144-Mc. QSO, that with W5PZ, Ponca City, Okla., between 0600 and 0730 Dec. 14. Bursts were no more than about 5 seconds each. Previous to this he had heard only pings from W5PZ. The same was true of a series of skeds with W0OHP, Lincoln, Neb., kept at 2300. The first of these that produced anything readable was on the 13th, but then only the call of W0OHP was copied.

W4LTU and W3GKP heard several different signals of meteoric origin while monitoring the band more or less at random. Identified were W0JAS, Salina, Kan., and W5JWL, Gurdon, Ark.

W1AZK, Chichester, N. H., got a new state and call area on an 0709 schedule with W0IHD, Overland, Mo., Dec. 14. This sked had been running since the morning of the 10th, and at first Don was sure that nothing was going to come of it. In fact, he heard nothing from W0IHD and W5JWL on the 10th and 11th. On the 12th he got just one burst from W5JWL in the hour beginning at 0530. W0IHD was identified this morning, but little else came through. On the 13th there were a strong short bursts from W0IHD. Skeds with W0BFB, Mitchellville, Iowa, were more productive from the start, though no contact was completed. Bursts S5 to 6

220- and 420-Mc. STANDINGS

220 Mc.

W1AZK.....	9	3	412	W4UMF.....	11	5	420
W1HDQ.....	11	5	450	W5RCL.....	8	5	700
W1OOP.....	12	4	400	W6NLZ.....	3	2	2540
W1RFU.....	11	5	480	K6GTG.....	2	2	240
W1UHE.....	11	4	385	W6MMU.....	2	2	225
W2AQC.....	13	5	450	K7ICW.....	1	1	250
K2AXQ.....	8	3	250	K8XU.....	3	5	680
K2CBA.....	9	3	225	W8LIG.....	3	5	475
K2IDL.....	4	3	140	W8LPD.....	6	4	480
W2DWJ.....	14	6	740	W8NRM.....	8	4	390
W2DZA.....	12	5	410	W8PT.....	8	4	550
W2NTY.....	8	4	200	W8SVL.....	6	4	520
W3AHQ.....	4	3	180	W9QJC.....	8	4	740
W3FEY.....	8	4	296	W9FCB.....	5	2	340
W3LCC.....	8	5	300	W9JFP.....	9	4	340
W3LZD.....	15	5	425	W9OVL.....	5	2	390
W3RUE.....	6	4	225	W9UFD.....	4	4	605
W3UJG.....	11	5	400	W9ZIH.....	5	2	270
W3ZHF.....	5	4	112	K9GUB.....	1	1	2540
K4FTT.....	8	4	400	W93AT.....	7	4	450
W4UBY.....	7	5	320				

420 Mc.

W1HDQ.....	8	3	210	K2UUR.....	5	2	110
W1RFU.....	8	4	410	K3EOF.....	6	3	250
W1OOP.....	9	3	390	W3FEY.....	5	2	225
W1UHE.....	3	2	430	W4HHK.....	3	3	520
W2AOD.....	6	4	290	W4VVE.....	6	4	410
W2HIV.....	11	5	560	W5ICT.....	5	3	600
W2DWJ.....	8	4	196	W7LHL.....	3	1	180
K2CBA.....	5	3	225	W8HCC.....	3	2	355
W2DZA.....	5	3	130	W8NRM.....	3	2	390
W2NTY.....	3	2	100	W9GAB.....	7	4	600
W2OTA.....	5	3	150				

came through on an average of one per minute after about 0825 on the 10th, with somewhat poorer results on the 11th. This sked was off until the 14th, which may have cost the participants a QSO, for the circuit was quite good the last day.

W9OEV, DeKalb, Ill., reports partial success with W0AZT, Denver, on 144-Mc. skeds kept Dec. 11, 12 and 13. Lon thinks that the shower was below average. W4RMU, Jacksonville, Fla., also lists the Geminids as a disappointment. Allen had skeds with W0QDH, Salina, Kan., W1DUB, Nashua, N. H., and K2KIB, Newark, N. J. Nothing came of the first, very little of the second, and a near-miss on the third. K2KIB and W4RMU nearly made it at 0600 on the 14th, but this was the only one of the skeds that was at all productive.

There are indications as we write that the Ursids shower, scheduled for Dec. 22, may turn out to have been a "sleeper." The meteor shower table by W4LTU in April, 1957, QST shows this to have a 13½-year period, peaking in 1959. It is supposedly a one-shot affair for the 22nd, but the writer's observations indicate that activity was picking up for several days prior to that date. The mornings of Dec. 19 and 20 showed WWI, 49.72 Mc., loaded with whistles and groans, so frequent as to make its signal far above average level. The previous week end, the peak of the Geminids, this signal had little more than the customary occasional bursts superimposed on the S1 or 2 normal signal.

One of the best auroras in a long time was observed over widely scattered areas the night of Nov. 27. W9OEV reports working W3LNA W0IFS W0UBA W0RYG W4OLK W4VVE and W4ZXI on 144 Mc., between 2015 and 0015 CST. He heard but did not work W1AZK. This sweep around an Illinois location to Minnesota, Nebraska, North Carolina, Virginia, Pennsylvania and New Hampshire gives some idea of what phone-only operators miss in 144-Mc. potential.

And while we're at it, some Technician and Novice operators are heard to bewail the tendency on the part of those holding higher classes of license to tune only the low edge of the 144-Mc. band during auroras and other DX sessions. If these fellows are interested in building up their c.w. ability we should do our best to help them. Calling CQ on c.w. and mentioning "145 up" at frequent intervals should help this situation. And remember, take it *easy!*

Recent months have seen an increase in c.w. activity on 6 in many areas. V.h.f. men are finding that c.w. can be fun, as well as a means of working choice DX. At W1HDQ we hear c.w. CQs on 6 at all hours of the day and night, regardless of whether there is any possibility of DX or not. This is all to the good, and to be encouraged by positive results, whenever possible. (Hint to those plagued by audio TVI: c.w. is one means by which you can work on the v.h.f. bands

without getting into phonograph amplifiers, hearing aids, church p.a. systems, TV and broadcast receiver audio stages, and the like.)

Use of fairly high-powered c.w. has paid off on both 50 and 220 Mc. for K7ICW. Las Vegas, Nev., formerly K6PBW. Al has had regular 50-Mc. contacts with W6NLZ, near Los Angeles, and W7RUX, Phoenix, Ariz., both about 250 miles away, and over about as rugged terrain as can be found anywhere. K7ICW worked K6IBY, Costa Mesa, Cal., also about 250 miles, on 221.5 Mc. for the first time Nov. 10. K6IBY runs 100 watts and 2 1/2-element Yagis, and K7ICW 375 watts and 4 11-element Yagis, both horizontal. This contact came about as a result of a series of schedules, during which K7ICW was heard in the Los Angeles area on some of the earlier tests when he was running only his 35-watt exciter.

2-METER STANDINGS

Figures are states, U.S. call areas, and mileage to most distant station worked

W1RFZ	22	8	1300	W5SWV	10	3	600
W1AZK	27	8	1205	W5YYO	5	3	1330
W1KCS	24	7	1150				
W1RFU	23	7	1120	W6WSQ	14	5	1390
W1AJR	23	7	1100	W6NLZ	2	5	2540
W1HDO	21	6	1020	W6DNG	9	5	1040
W1MMN	20	6	900	W6AJF	6	3	800
W1IZY	19	6	875	W6ZL	5	3	1400
K1CRO	19	6	800	W6MNU	3	2	950
W1AEO	17	6	820				
W1AEP	17	6	675	W7VMP	15	5	1280
W1CLH	17	5	450	W7JRG	10	4	1040
				W7CJM	5	2	670
W2NLY	37	8	1390	W7LHL	4	2	1050
W2CKY	37	8	1360	W7JIP	4	2	900
W2ORL	37	8	1320	W7JU	4	2	353
K2GOI	32	8	1200				
W2AZL	29	8	1050	W8KAY	38	8	1020
W2BLV	27	8	1020	W8SDJ	35	8	990
K2IEJ	25	7	1060	W8PT	34	8	985
W2AMJ	25	6	960	W8IFX	34	8	980
W2DWJ	23	6	860	W8LOP	33	8	1060
K2HOD	23	7	950	W8RMH	32	6	910
W2PAU	23	6	753	W8VLF	30	8	1080
W28MX	22	6	940	W8SFG	30	8	1000
K2CEH	22	8	910	W8BHW	29	8	860
W2LVT	21	6	700	W8LPD	29	8	850
W2RXT	20	6	790	W8WRN	28	8	680
W2UXG	19	7	880	W8BAX	28	8	960
W2RGV	19	6	720	W8QOH	26	8	975
W2WZR	18	7	1040	W8DX	26	8	720
W2FSK	18	5	850	W8ILC	25	8	800
K2RLG	17	6	980	W8JWV	25	8	940
				W8AXU	24	8	960
W3RUE	30	8	975	W8GFN	23	8	540
W3TDE	29	8	1050	W8LCY	21	7	610
W3GKP	29	8	1020	W8LNL	21	7	610
W3KCA	28	8	1170	W8GTK	17	7	550
W3SGA	27	7	700	W8NRM	17	7	550
W3EPH	22	8	1000				
W3BYE	22	6	860	W9KLR	41	9	1160
W3LNA	21	7	720	W9VOR	40	9	1150
W3NKM	20	7	730	W9GAB	39	9	1075
W3LZD	20	7	650	W9AAG	32	8	1050
				W9REM	31	8	850
W4HJQ	33	8	1150	W9ZIH	30	8	830
W4HRK	35	9	1280	W9LVC	27	8	950
W4ZXT	34	8	950	W9EQC	27	8	820
W4AOC	30	8	1120	W9OJL	26	8	910
W4LTD	30	8	1160	W9ZHL	25	8	700
W4MKJ	28	8	850	W9HPV	25	7	1030
W4UMF	28	8	1110	K9AQP	24	7	900
W4VLA	26	8	1000	W9FPB	24	8	820
W4EQM	25	8	1040	W9LFS	22	7	825
W4WNH	24	8	850	W9KPS	22	7	690
K4FTS	24	6	765	W9CUX	21	7	800
W4UJY	23	6	725	W9DEV	19	7	750
W4VVE	21	6	720	W9PMN	19	6	800
W4PLV	20	7	1000	W9ALU	18	7	800
W4IKZ	20	6	720				
W4OIK	20	6	720	W8SMJ	29	9	1075
W4AIB	19	7	840	W8IHD	27	7	890
W4RAM	18	7	1080	W8BFB	27	8	1060
W4CPZ	18	6	650	W8QDH	24	9	1300
W4RFR	18	7	820	W8RUF	23	7	900
W4MDA	17	6	750	W8MNT	21	6	830
K4NUX	16	8	530	W8UOP	21	7	900
W4LNC	15	6	1080	W8TGC	21	7	875
				W8RYG	20	8	925
W5RCT	34	9	1215	W8IC	16	7	1240
W5DFU	25	9	1300	W8LFS	16	6	710
W5AJG	25	8	1360				
W5LRS	25	8	1060	VE3DIR	30	8	1330
W5PZ	23	8	1300	VE3AIB	27	8	1340
W5KTD	23	8	1200	VE3BQN	19	7	790
W5JWL	21	7	1150	VE3DER	17	8	1340
W5VKH	15	5	720	VE3AOG	17	7	1300
W5ML	12	5	700	VE3HY	15	7	550
W5RSC	12	5	1390	VE3AOR	13	5	550
W5HEZ	12	5	1250	VE3BBP	14	6	715
W5EYZ	12	3	735	VE2EJ	2	1	365
W5CVW	11	5	1180				
W5NDE	11	5	625	KH6UK	1	2	2540
W5VY	10	3	1200				

K7ICW has yet to work his own state, hence the 1 — 1 — 250 listing in the 220-Mc. box. He'd like to hear from 220-Mc. prospects in Nevada, Arizona, New Mexico, Utah, Colorado — or anywhere else where there are fellows with what it takes to work over the mountains. Skeds should be set up fairly soon, as Al may not be around Las Vegas indefinitely.

W1AZK has a gripe that certainly is legitimate. Don wonders why some people he writes for m.s. skeds give no reply at all, though he includes stamped self-addressed envelope or card. This frequently results in some available time being unbooked, having been held out tentatively for someone who did not take the trouble to reply.

Looking for good microwave information? W6NLZ recommends *Generation and Transmission of Microwave Energy*, TM 11-673, price \$1.25, from the Superintendent of Documents, Washington 25, D. C. John sends along another tip: a new tube with interesting v.h.f. and u.h.f. r.f. amplifier possibilities is the 6CM4 by Amperex. This is a well-shielded short-lead job with a transconductance of 14,000. It is mass-produced for television, so it is moderately priced. Performance should be a little below 417As, but better than other less costly types.

Some of us who have tried m.s. work on 6 or 2 meters have wondered if s.s.b. might not be a good mode for this kind of communication. W4RFR, Nashville, Tenn., brings up the question, and he would like to try it with any interested and qualified party. Doing it on 144 Mc. would require fantastic accuracy in setting up and reading frequency, but it could be done. On 6, there is usually enough signal in evidence to provide something to tune in, so very precise frequency information would not be a prerequisite to successful skeds. They could be started on c.w. on 50 Mc. On 144, you'd just about have to know where to set the receiver, as few meteor bursts last long enough to do any tuning. If you want to have a go at it, write H. I. Savage, W4RFR, 1200 Bell Grimes Lane, Nashville 7. Red has a 10B and a 6524 mixer, driving a 4X150A on 144.07 Mc.

From the PRP Reports

The drop in the F₂-layer m.u.f. is clearly evident in the record of November, 1959, when it is compared with the same month of the previous two years. This is the peak period for work involving high-latitude paths, but there was very little 50-Mc. DX work on east-west circuits this year. Transequatorial paths held up well, however.

ZL1BJ reports working only one U. S. station on 6: W6PZA, Nov. 2. He heard Japan on the 10th, KI6CAU on the 4th, and signals below the band edge from the direction of Hawaii on several occasions. VK6BE, VK4ZGL and VK9XK report the band not open quite as frequently as previously. Their most consistent DX is still Japan and Korea. VK3AHL says that reappearance of sporadic-E is helping to enliven the Ross Hull Memorial V.H.F. Contest, Dec. 1 through Jan. 31.

LU7AT, LU3EX and CX9AJ, three of our most faithful South American reporters, found the band open almost as regularly as ever. About 10 countries are included in the lists of these three, but KH6 and JA, worked in spring and fall before, are noticeably lacking. Their work seems mainly TE, over the shorter and most-favored north-south paths. They apparently caught only one U. S. opening, to California on the 27th. LU7AT reports working LU7AAC/MN, near the Falkland Islands. CX9AJ worked LU6VU, San Carlos de Basilioche, in far-south Argentina, his first LU worked over a skip path to the south.

The TE path from ZE2JV to ZC4WR continued to provide regular openings, though the observations by ZC4WR were held down somewhat when the automatic keyer at ZE2JV was out of service for several days at the end of November.

HC1PS and HC1JW seemed to hold a near monopoly on 50-Mc. work from South America to northern U. S. A. They were reported by stations almost all over the country, nearly every week end through the fall of 1959.

V.H.F. Clubs and Nets

V.h.f. emergency nets are fine, and so are drills, conducted at regular intervals. But to be of greatest value an emergency organization should be set up so that its facilities can be marshalled at any time. With this in mind, the Jackson County V.H.F. Club conducted an unannounced workout Dec. 4 at 2000. Within 10 minutes, four mobiles (K8KMC

K8KCU W8AOL and W8WQP) has been rounded up, and fixed stations K8DSZ K8JKK and K8NIUS had checked in.

Regular net sessions are held each Wednesday at 8130, on 50.15 Mc. The club is just 6 months old, and now numbers 15 members. A certificate is offered to anyone working 10 of them, with an endorsement for working all 15. This information from K8HZF, 1123 Linwood, Jackson, Mich.

Another net certificate available to 50-Mc. operators is offered by the Rebel Net of the St. Louis area. Local residents must work all 11 members to qualify. Mobiles passing through the area and DX stations need work only 6. Apply to Ches Poole, K6PWS, Rt. 1, Box 211C, Fenton, Mo.

W9OEV tells us of the Kishwaukee Radio Club Net, DeKalb County, Ill. This group meets on 145.6 Mc. each Sunday at 2200.

If you have a club or net activity that is of interest to other v.h.f. groups, send us the details for listing in this space. If it is a net, be sure to give time, date, frequency, name and purpose of the operation. Details of v.h.f. club projects also welcome.

OES Notes

K1CIG, Manchester, N. H. — Emergency nets recently set up by Manchester Radio Club operate each Friday at 1900, on 29.0, 50.4 and 145.1 Mc., which are also the calling frequencies for the area.

W1FVY, Hartford, Conn. — M.u.f. peak for the fall of 1959 was apparently reached Nov. 15. Heard BBC video, 51.75 and sound 53.25 Mc. briefly.

W1LMZ, Concord, Mass. — HC1JW very strong Nov. 28, working mostly other U. S. areas.

W3FEY, Lancaster, Pa. — Check on 220 Mc. in ENE direction nightly at 2145, and 432 Mc. in all directions, 2200 to 2215. Would like 1298-Mc. skeds. Frequencies: 220.17, 432.17 and 1296.5 Mc.

K4EUS, Chester, Va. — Call CQ in southerly direction nightly at 2045, on 144.068, Aurora of Nov. 27 brought in signals from 1, 2, 3, 4, 8 and 9 on 144 Mc. No results on 144 Mc. during sodium vapor release of Nov. 18.

W4FNR, Ft. Lauderdale, Fla. — November was first month since September, 1957, that contacts were not made outside continental U. S. A. on 50 Mc.

W4FWI, Doraville, Ga. — European video heard Nov. 15, but only amateur DX heard in the 50-Mc. band has been from South America.

W6OYM, Sherman Oaks, Cal. — Simultaneous two-way work on 144 and 50 Mc. with W6NMIK, Encino, provided interesting opportunity to observe tropospheric and aircraft fading effects. On aircraft flutter the fading rates are of the order of 3 to 1, as might be expected from the frequency ratio.

K6UMM, Santa Monica, Cal. — Would like to know identity of unmodulated signal heard from NE direction on 50.15 Mc. Heard 8 mornings in November, with meteor pings, but no identification.

W7MAH, Reno, Nev. — Would like to see 2- or 6-meter activity in Elko or Winnemucca. Copy police on 42 Mc. in Winnemucca, so should be O.K. for amateur work. Now running a.f.s.k. on 144 and f.s.k. on 50 Mc., as well as other modes on both bands.

W7QDJ, Clearfield, Utah — Stations heard from direction of Midway Island on 49.62, 49.63 and 49.77 Mc. Am now holding m.a. skeds on 50 and 144 Mc. Hear W6NLZ regularly on 50-Mc. scatter. Expect to be in business on 222 Mc. soon.

W6BJI, Fresno, Cal., also reports the signals believed to have come from Midway. He has heard them as early as 1120 and as late as 1530 EST. One on voice identified as ABA 21, and gave his power as 40 kw. This was on 49.61. Strong teletype was heard on 49.73 Mc. QST

NEW BOOKS

Transistor Manual, published by the General Electric Company, Charles Building, Liverpool, New York. 6 by 8½ inches, 227 pages, including index. Price, paper cover edition \$1.00.

This latest edition of the Transistor Manual contains 60 new pages and includes in its twenty chapters information on basic semiconductor theory, transistor construction techniques, biasing, switching characteristics, transistor radio servicing, and several chapters on practical circuits. New chapters, not included in the 3rd edition, are titled Small Signal Characteristics, Large Signal Characteristics, Radio Receiver Circuits, Transistor Radio Servicing Techniques, Basic Computer Circuits, Silicon Controlled Rectifiers, and Rectifier Specifications. In addition, the book contains a revised and up-to-date listing of American transistor types with basic specifications and interchangeability information.

— . . . —

Fundamentals of Transistors, by Leonard Krugman. Published by John F. Rider Publisher, Inc., 116 West 14th Street, New York 11, New York. 5½ by 8½ inches, 168 pages, including index. Price, paper cover edition \$3.50.

The second edition of Fundamentals of Transistors (the first edition was reviewed in February 1955 *QST*, page 126) has had several portions rewritten to bring them up to date. The book deals with the theory, construction and operation of most semiconductor devices, including surface-barrier, drift, avalanche and spacioistor types. Illustrative circuits and design theory are included with applications in amplifiers, oscillators, and other components. Each chapter ends with review questions which emphasize the major topics of the chapter. Also included are lists of references for those who desire more advanced treatment of a specific subject.

Basic Theory and Application of Transistors, Department of the Army Technical Manual TM 11-690, published by the United States Government Printing Office, Washington 25, D. C., 1959. 8 by 10¼ inches, 264 pages, card-board cover. Price, \$1.25.

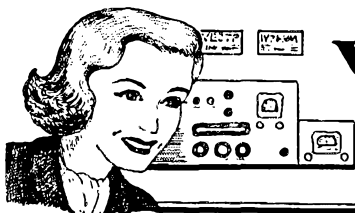
"This manual is for the electronic technician who has a detailed knowledge of the theory and application of electron tubes." So says the first page of this book, in starting off with the fundamental theory of transistors. But thanks to excellent diagrams, sketches and photographs, even a reader with little electronic background should be able to grasp most of the fundamental principles. He will shortly realize, however, that he has slowly but smoothly progressed into more advanced subjects such as transistor parameters, equivalent circuits and characteristic curves.

The book is divided into 13 chapters, some of which are then broken down into as many as six sections. Representative chapters include: Bias Stabilization, Audio Amplifiers, Tuned Amplifiers, Wide-Band Amplifiers, Oscillators, Pulse and Switching Circuits and Modulation-Mixing and Demodulation. Appendix material includes, among other things, transistor letter symbols and a reference glossary.

Chapter 10 (Oscillators) is a typical chapter; it begins with a section on the comparison of input and output differences between vacuum tubes and transistors, frequency limitations, frequency stability and the basic transistor oscillator circuits. The following section covers LC resonant feedback oscillators, including tickler-coil oscillators, Colpitts, Clapp, Hartley, and crystal oscillators. Section III, entitled Resonant Feedback Oscillators, contains information on multivibrators, saturable-core square-wave oscillators, and blocking oscillators.

All of the chapters are chock-full of practical circuits, charts, graphs, block diagrams and photographs. The amateur will find this book extremely useful as a general all-round transistor reference work.

— E. L. C.



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

THE DX pages of *QST*, December 1959, featured an impressive display of Japanese OM amateurs. Honorable DX column editor W9BRD summarized that "Japan has become one of the world's ham radio strongholds, boasting an impressive body of capable communicators and technicians."

A recent Reuters news release stated that the number of amateur radio stations in Japan, totaling 8,000 at the last count in June, is expected to reach 10,000 by the end of the year. An estimated 20,000 Japanese are qualified as operators, and about 40,000 persons are preparing either to open stations or to obtain qualifications as hams, according to the Japan Amateur Radio League.

Among Japan's "capable communicators and technicians" are a growing number of YL operators. Here we're happy to display an even dozen too of the capable lady operators of JA land.

ELEVENTH ANNUAL YL-OM CONTEST

Calling all OMs:

Consider the delights of contacting privately (?) a few hundred girls one scintillating weekend or two. The opportunity is yours to seize come the annual YL-OM Contest sponsored by the Young Ladies Radio League. Just make yourself available at the proper time (see hours and dates

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

listed below), then relax, and enjoy female attention, the likes of which happens to OMs but once a year.

PHONE Contest —

Starts: Saturday, Feb. 27, 1960, 1:00 P.M. EST
Ends: Sunday, Feb. 28, 1960, 12 Midnight EST

C.W. Contest —

Starts: Saturday, March 12, 1960, 1:00 P.M. EST
Ends: Sunday, March 13, 1960, 12 Midnight EST

Eligibility: All licensed OM, YL and XYL operators throughout the world are invited to participate.

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

Procedure: OMs call "CQ-YL." YLs call "CQ-OM."

Exchange: QSO number, RS or RST report, name of state U. S. Possession, VE district or country.

Scoring: (a) Phone and c.w. contests will be scored as separate contests. (b) One point is earned for each station worked, YL to OM or OM to YL. A station may be contacted no more than once in each contest for credit. (c) Multiply the number of QSOs by the number of different states, U. S. Possessions, VE districts and countries worked. (Maryland and the District of Columbia count as one state.) (d) Contestants running 150 watts input or less at all times may multiply the result of item (c) by 1.25 (low power multiplier).

Logs: Copies of all phone and c.w. logs, showing claimed score, must be postmarked not later than March 31, 1960, and received not later than April 15, 1960, or they will be disqualified. Please file separate logs for each mode of operation. Send logs directly to YLRL Vice-President Lillian E. Beebe, W5EGD/3, 923 Kent Avenue, Baltimore 28, Maryland. Be sure to include zone number in address.

Awards: YL — First Place Phone — Cup

First Place C.W. — Cup

OM — First Place Phone — Cup

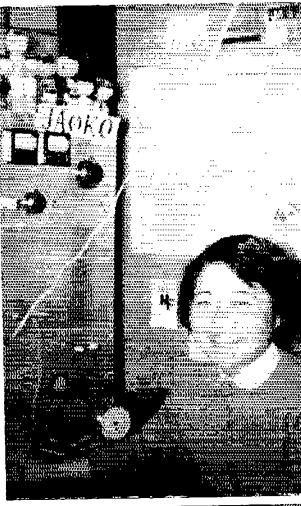
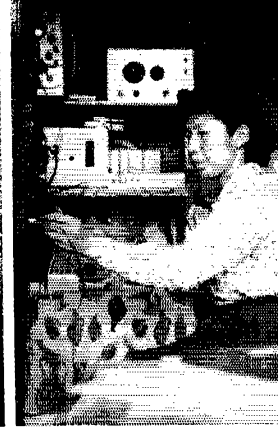
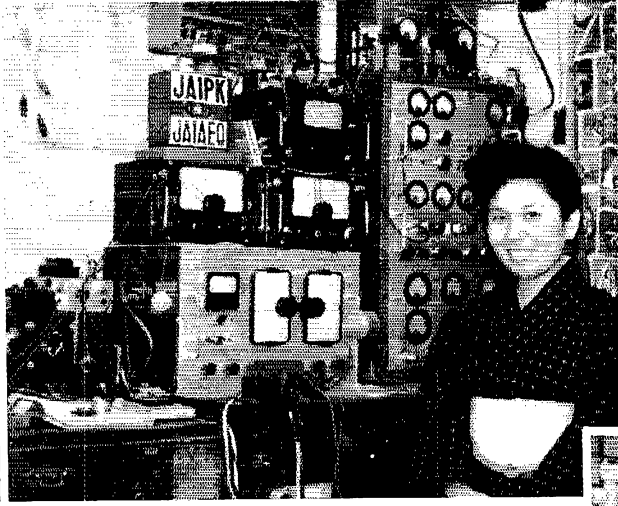
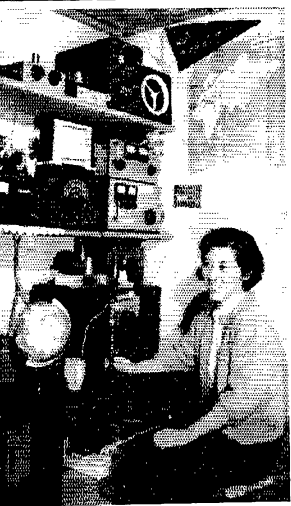
First Place C.W. — Cup



On JA land page, at right, YLs shown reading left to right, beginning top left, are JA1YL, JA1BBL, JA1CHD, JA1CFS, JA1AEQ, JA1CLM, JA1ZA, JA6KH, JAØKO, JAØEC, JA1CLL and JA1CLL.

(Photos courtesy W5ERH)

Amateur radio's "first lady," Mary Dosland, W5DEW/Ø, wife of ARRL President Goodwin L. Dosland, WØTSN, displays a pennant awarded to her by the German Amateur Radio Association. The pennant, given annually by the Germans to the outstanding amateur of the year, was presented to Mary when the Doslands were in Europe for the International Telecommunications Conference at Geneva. It doesn't look possible but Mary has been an amateur, internationally known, for twenty-eight years.



Name of Contest.....

Page No....

Station..... Operator.....

QTH.....

Mode of Operation.....

Power.....

Time	Band	SENT			RECEIVED				Multiplier
		Nr.	RPT	QTH	Station Worked	Nr.	RPT	State or Country	

The winner of the phone cup is also eligible for the c.w. cup. Certificates will be awarded to high place phone and c.w. winners in each district, U. S. Possession and country.

YL CLUBS

A list of all of the active YL clubs which have come to our attention is given below. Later in the year we hope to make another complete listing of the clubs with up-to-date information on membership, place and frequency of meeting, officers, nets, special activities, etc. (The Dec. 1957 column contained the last complete schedule of this type.) All of the 25 clubs welcome new members.

International

Young Ladies Radio League

East

- Women Radio Operators of New England
- Rhode Island Young Ladies Radio Club
- New York City Young Ladies Radio League
- Penn-Jersey YL Club
- Washington Young Ladies Amateur Club
- Georgia Peaches
- St. Petersburg Amateur Radio Club YLs
- Floridors YLs

Mid-West

- Ladies Amateur Radio Klub
- Chicago Young Ladies Radio League
- Hoosier Amateur Woman's Klub

Texas

- Texas YL Round-Up Net
- Women Ham Operators of Texas (Dallas)
- Women Ham Operators of Tarrant County (Ft. Worth)
- Gulf Area Young Ladies Amateur Radio Klub
- Alamo Ladies Amateur Microphone Organization

West

- Portland Roses
- Camellia Capital Chirps
- Bay Area Young Ladies Radio Club of San Francisco
- Los Angeles Young Ladies Radio Club
- San Diego Young Ladies Radio Club

Others

- Polar Amateur Radio Klub of Alaska
- KH6 YL Amateur Radio Club
- South African Women's Radio Club

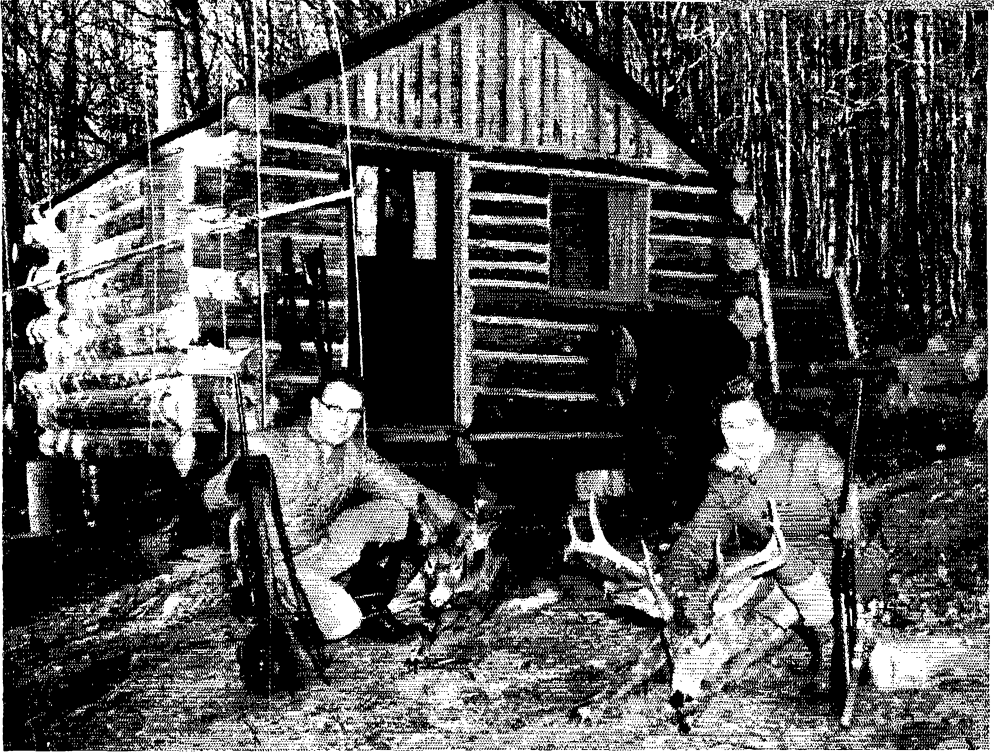
CALLING ARIZONA YLs

Wondering about the seeming lack of publicity on Arizona YLs, Inez Morton, W7PUV, of Scottsdale, stepped up and introduced herself, which gesture is much appreciated!

"So far as I can learn, there are no YL clubs in the state. However, there are a few of us who keep plugging along. I, myself, enter the contests and do very well considering the fact that I have only a Globe Scout 65A, xtals only, and a folded dipole, with an old HQ129X receiver. The OM isn't a ham. He is a Presbyterian minister, and I must try and keep my little rig going all by myself. I worked 54 YLs in the



Seventy-year-young K5IOG, Clara May Elkin of Water Valley, Miss., skeeds her Methodist minister son, K5CFG/4, in Greenville, S. C. daily. "Of course hamming interferes with housework," Clara May admits, "but it's lots more fun." K5IOG is a regular check-in to the Magnolia Emergency and Southern Bell nets.



Annie, W1OAK, (as in Oakley) has done it again—she bagged another deer during the hunting season in the Green Mountains of Vermont. (The Jan. '57 column showed Ann with her first buck.) The hunter on the left, W1F1F, shot his first deer after hunting 15 years. Ann Chandler's own OM, W1MMN, was ruled out of the picture because he was one of the unlucky would-be deerslayers.

Former SCM of Vermont, W1OAK is well-known on 80 c.w., with a long list of traffic activities to her credit. Ann and George built the cozy log cabin shown in the photo on "Hurricane Hill," which they own near Orange, Vermont. Site for several FD operations in the past, the Chandlers plan to use that nine-element beam for 1960 FD, a la Podunk Hollow style.

(Photo by Woodward)

recent contest and have WAC, WAS, and YLCC — all on c.w., as I have never owned a mike!"

W7PUV went on to introduce another Arizona YL and a close neighbor of hers.

"Melba Beard, K7ANT, mother of two and a licensed pilot since 1929, flew her thirty-year-old plane to second place in a recent air show in Tucson, Arizona. In 1935 Melba gained national recognition when she won the Amelia Earhart trophy in Cleveland, Ohio. She is an active member of the Antique Airplane Association and the OX5 Group, which is composed of early time fliers who fly planes built before 1940. The XYL of W7QGR, Melba has held the calls W6PEB, W9VPI, and W2LZS, and soon hopes to spend more time "on the air" instead of just "in the air."

NOTE, PLEASE

With YL get-togethers of all kinds becoming increasingly more numerous, reports of the results of such affairs will, for the most part, have to be foregone in this column. As much as we would like to print news received of all get-togethers, it will be possible to use only items or photographs of exceptional interest concerning such affairs.

COMING YL GET-TOGETHERS

Second All California YL Get-Together — March 4-6, 1960, at the new Hotel El Mirador in Sacramento. The affair comes during Sacramento's sixth annual celebrated Camellia Festival. Activities include luncheon, dinner party (OMs included), open house party, and trip to the Memorial Auditorium for the Camellia Show. Wanda Gluck, K6ENK, is Convention Committee Chairman.

Midwest YL Convention — The tenth annual will be held in Indianapolis, Indiana, May 20-21, 1960. Pre-registration is \$2.00. W9RTH is chairman; K9LXD, co-chairman.

YLRL International Convention — June 17-19, 1960, at the Hotel Commander near Boston, Mass. WRONE is

hostess club. Co-chairmen are W1ZEN and W1SVN.

KEEPING UP WITH THE GIRLS

DL6YQ, Erika, was awarded DXCC certificate #4443. . . . K5BJU, Harriett, is YL news editor for *Yaame News*. . . . K2MGE, Dorothy, alternate NCS of the new YL SSB net (Wed. 1300-1500 CST, 14,280 kc., K5BJU NCS) reports an average check-in each week of 30 YLs. . . . W6GAI, who operated maritime mobile around the world on the Flying Enterprise II, is off on another ocean jaunt. This time Fran is aboard the Santa Fe, a Grace line ship, to Central America for some five weeks. . . . W4VCB/3 and her OM are off to Alaska to a new post. Evelyn recently received BERTA and WBE awards. . . . W5RZJ, Louisa, YL editor of *CQ*, received a silver cup for her entries in a New Mexico flower show (19 ribbons out of 31 entries). . . . K6OQD, Jean, is a contributing editor of YL news to the *Western Radio Amateur* monthly. . . . BAYLARC of San Francisco now has 18 full members and 10 associate members. . . . New TYLRUN officers for 1960 are Pres. K5ALF; V.P. W5FFPH; Secy-Treas. K5MTW; Pub. Chmn. K5JXD. . . . New executive committee of WRONE includes Wis COL, HOY, UKR, K1s ADY and GPE. . . . A cook book compiled by the Camellia Capital Chirps is now ready for sale at \$1.75 a copy postpaid. K6ENK advertises that the recipes are from hams, by hams, and for hams, including a few suggesting what to do with hams. The Chirps collected recipes from YLs everywhere, and they are real good — extra good, in fact, according to Wanda. . . . TV and radio star W6NAZ was the subject of an interesting article in *See and Hear* magazine a few months back. Currently Lenore is hostess of the "Purely Personal" program on KFWB in Los Angeles, which is a series of one minute features heard 35 times weekly. In recognition of her exceptional talent, Lenore was awarded The Radio and TV Women of Southern California Merit Award for 1959. **GET**

Silent Keys

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

W1ACO, John Edward Pomeroy, Bath, Maine
W1FI, Chesleigh C. Chisholm, Milbridge, Maine
(formerly of Squantum, Mass.)

W1FW, George H. Bibber, Wrentham, Masa.

W1RXT, Charles F. West, Holliston, Mass.

W2ASB, Thomas A. Garretson, Perth Amboy, N. J.

W42BSQ, Frank P. Bivona, Brooklyn, N. Y.

K2DKW, Elwood W. Szabo, Fonda and Vernon,
N. Y.

W2GIF, John W. Post, Elmira, N. Y.

W2GUW, Henry Denton Sayer, Middletown, N. Y.

K2GVN, Thomas H. Thompson, Chenango Bridge,
N. Y.

W2OUS, Eric Leavens, Red Bank, N. J.

W2VM, Cyril N. Hoyer, Princeton, N. J.

W3ARG, Harry B. Walton jr., Willow Grove, Pa.

W3VN, Bertram C. Felsburg, Hazleton, Pa.

K4MRA, George C. Dixon jr., Arlington, Va.

W5AFE, Sidney L. Ross, Rayne, La.

W5DGV, William E. Maddox, New Orleans, La.

W5KTK, George G. Ingram, New Orleans, La.

W5MJT, James E. Berry, Houston, Texas

W5TAF, George M. Brumby, Houston, Texas

K6CXD, James C. Nelson, Escalon, Calif.

W6RZJ, Heinz W. Schaedler, Burbank, Calif.

W6SDB, Thomas Virgil Bottoms, Fresno, Calif.

ex-W7BEE, Clifford L. Tice, Everett, Wash.

K7IMC, Carl C. Lindeberg, Miles City and Silver
Gate, Mont.

W8AWF, Joseph D. Anderson, Wloughby, Ohio

W8CNA, Garfield Hitchens, Detroit, Mich.

W8ENP, Lawrence A. Hopp, St. Clairsville, Ohio

W8FTT, Dr. Thomas Sage, Grosse Pointe, Mich.

W8YFO, Charles C. Kenney, Findlay, Ohio

W9GNR, Hiram M. Gutridge, Crown Point, Ind.

W0ADB, Leland W. Milligan sr., Pulaski, Iowa

W0DJ, Col. William A. Beasley, Topeka, Kan., and
Washington, D. C.

W0JDB, Hazel E. Baker (Mrs. Louis E. Baker),
Monett, Mo.

W0NVII, Henry S. Hartzell, Potosi, Mo.

E1TS, A. V. McKiernan, Mount Merrion, Co. Dub-
lin, Ireland

Strays

John Robinson ("Jack") Binns, hero of the first sea rescue by radio, died in December, 1959, at the age of 75. Binns won fame in 1909 as a wireless operator on the *S.S. Republic* which was rammed by the *S.S. Florida* in heavy fog off Nantucket. Binns stayed in his flooded radio shack, sending CQD (the forerunner of SOS), until he contacted the Siasconsett Station. He then guided rescue ships to the sinking *Republic*. All 1600 passengers were saved before the *Republic* went to the bottom.

COMING A.R.R.L. CONVENTIONS

March 18-19 — Michigan State, Saginaw, Michigan.

May 1 — New England Division, Swampscott, Massachusetts.

July 30-31 — North Dakota State, Minot, North Dakota.



New Jersey — The second annual dinner and hamfest of the East Coast V.H.F. Society will be held in the Grand Ballroom of the Hotel Alexander Hamilton in Paterson on Sunday evening, February 21. Guest speakers, music, plenty of food. Prior tickets are necessary (none sold at the door) and the deadline is February 14. Send \$5 per person to Nick Franetovich, W2SWI, 100 Surrey Lane, River Edge, N. J.

Oklahoma — the Lawton-Fort Sill ARC will hold its annual Founder's Day hamfest on Sunday, February 14, at the National Guard Armory in Lawton. Registration begins at 9 A.M. Special advantages for those who register prior to February 10. Free coffee all day. Barbecued beef dinner at noon. Swap table. Mobile talk-in on 3860 kc. Registration fee is \$3. For pre-registration and further information, contact Lawton-Fort Sill ARC, Box 892, Lawton, Oklahoma.

Quist Quiz

Walter Perry Jr., W8ENM in Berca, Ohio, has a problem that combines electrical know-how with a bit of logic:

This particular "black box" has two terminals. When 50 volts d.c. is applied, a current of 2 amperes flows. When the box is connected to a 100-volt 60-cycle source, the current is 12 amperes and the power is 1200 watts. When the box is connected to a 151-volt 400-cycle source, the current is 10 amperes.

Draw a diagram of the circuit inside the box and label the values of all of the components.

Answer to last month's DX W1TS-up:

- | | |
|----------|--------|
| 1. Green | Burma |
| 2. Black | Niue |
| 3. White | Gambia |
| 4. Blue | Oman |
| 5. Brown | Nepal |



February, 1935

... The cover twenty-five years ago was real attractive. It showed a fellow standing on an ice-covered roof, on Mt. Washington, adjusting an antenna. There were no power lines in sight.

... John Reinartz, then WTQP, described an antenna system which permitted control of the radiation characteristic right from the shack.

... Ross Hull discussed the stabilizing of ultra-high-frequency transmitters with resonant short lines.

... W1BDH surveyed the important features of various types of antenna systems.

... A phone-c.w. contest was announced, with each c.w. station to work as many phone stations as possible, and vice versa.

... W3AQC discussed matched-impedance coupling to the zepp antenna.

... W1BD announced the Seventh International Relay Competition, which is nowadays called the DX Test.

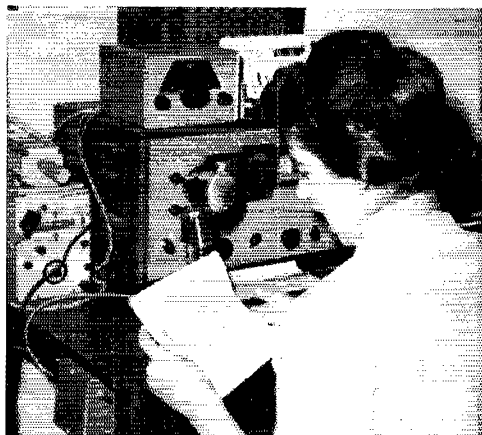
... Incidentally, it was in this issue that Harry Jenkins, W7DIZ, told the now-famous story of how he put together a transmitter and receiver from some old broadcast receiver parts and contacted amateurs on the mainland to report that his lighthouse was out of commission and that shipping should be warned.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

Who:

"I have the pleasure of sending you a photograph of an important YL ham here in Colombia," reads a letter from "How's" reporter HK5SG. "In the picture she reads a message she wrote for Colombia amateurs during an official transmission of LCRA a few weeks ago, explaining 'why' she has become a radio amateur. I suppose you would also like to know. Well, she said that during her trip to Ecuador, Peru, Chile, Argentina, Uruguay, Brazil, etc., radio amateurs were very pleased to handle traffic for her from their countries to her home in Manizales. She was impressed by this service and decided to join the fraternity. Just like that — and now she is HK6LT."



HK6LT

QST fans with a bent for escapist literature may recall a fluffy *jeu d'esprit* titled "Written in the Stars," a September 1953 flight of fancy wherein one Miss America, nee Susie Sopenwater of Knobaloosa, Arkansas, knocked off WAS on one CQ. Sooner or later truth always makes a piker of fiction; HK6LT is none other than Luz Marina Zuluaga, Miss Universe (Long Beach, 1959). And it couldn't happen to a better hobby.

You know, the more complex and "sophisticated" we make those space shots, the more trouble we have getting 'em off the ground. Scientific endeavor seems determined to collapse under its own increasing weight, and DXing is as vulnerable to this threat as any other field. Victim WIDGT testifies:

"My pickings are rather slim this month, part of the reason being that I sat around for a week waiting for the bands to open before I realized I had a dead tube in my transmit-receive switch. The troubles that progress brings!"

* 5822 West Berteau Ave., Chicago 41, Ill.

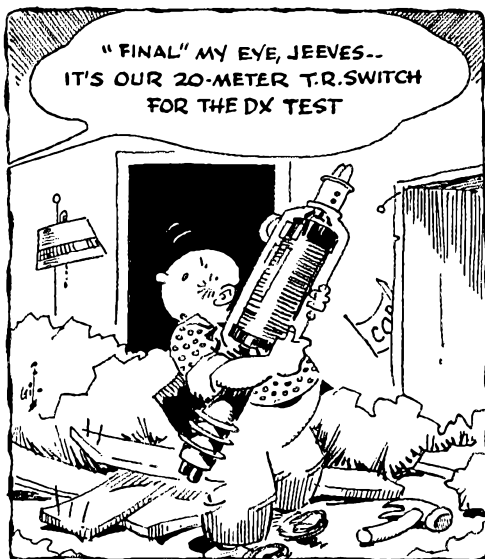
This may be laughable, but we wonder how many other DX hounds will find themselves faked out by such inanimate perversities in the ARRL Test commencing this month. What potential "sneak attenuators" lurk between *your* antenna and headphones? Piling gimmick on gimmick to improve performance we sometimes lose sight of the original simple objective: reliable conversion of r.f. signals to aural interpretation.

It's no cinch to add newfangled refinements without subtracting old-fashioned dependability, as honest rocket engineers and automobile designers will agree. We hams meter our straightforward three-tube transmitters thoroughly enough, as a rule, but we usually fail to provide sufficient built-in indicators to guard against the insidious deteriorations of sensitivity, selectivity and stability that gradually turn an elaborate communications receiver into an overdressed keying monitor.

Better consult junior's foolproof two-tube blooper to make sure that the bands are *really* dead, OM.

What:

We perpetrate this alphabetical anarchy with one ear on the syncopated strains of 20 meters and the other on the mellow muted trumpet of Mr. Jonah Jones. Jonesie is consistently solid these days but we can't say the same for poor old 20. In less time than it takes to grab another cup of coffee in the kitchen, 14 Mc. can slip *way* out. So you may have to modify your approach to fame in the League's 26th International DX Competition this month and next (participation particulars on pp. 49-52 of last month's *QST*). Here's a general idea of what to expect in the way of multipliers, a DX activity cross-check contributed by "How's" correspondents near and afar. . . :



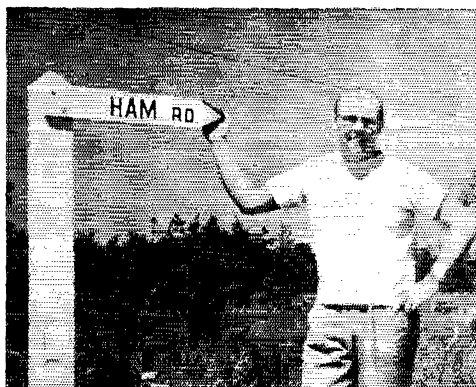
40 c.w. still is the rising star on our DX horizon. K1JFF, W1DGT, K2s DGT UBW YXC, K5JVF, W6s JQB NKE, K6s C1F KDS, W7DJU, KN800K, W9s HPI JIN WCS, K9ICG, K9HGB, HRC, ISWL and WGDXC mention such 40-meter merrymakers as CM2HF, GNs 2BK (70/10 kc.), 81DJ, GOs 2PY (3) 4 hours GMT, 5RV (6) 4, CT2AI (9), CX1FB (2) 9, EA8s CG (10) 2, CU 7, EL1A, ET2US, F2CB/FC (6), FA8s RJ RL (3) 7, GC2FNV, HK7AM, HR1VS (5) 12, JA1s ALU AN ASR, AUC RAU BGO BLN BNV BTG BTH BUN CGF CIU CMG CMY COT CVV DNI LF VX XD, JA2s AAQ AJJ AJP AQ BP MD TH, JA3s AB AEB AKT AMY AVB BCX BEK BGF BJF BLZ IL MD QY, JA4s PE VQ VR, JA5MZ, JA6s ACZ AFD AFL AFO BE SH ZB, JA7s AR 1J KE MU NI OW XF, JA8s AE CH DS EX HO JC JD LN, JA9s AP JG MI MT, KGs 1AQ 4AG (19) 0, 6NAC (35), KJ6AL, KX6CO (10) 13, LU6DBQ (3) 3, OA4s FA HY, OE6KZ, OH0NC (3), OX3RH (2) PYs 2BEZ 4AXN 7JN 7LO 7VBR (17) 9, ST2AR (10), SV0WI (9), TFs 3AB (3), 3AK 5TP, T2s CAH CMF (4) 7, UAs 1DZ 1KAG (7) 7-8, 9CM 9VB 0AG 0IK (5), 0LJ (38), UH8KAA, UJ8KAA (15), UL7LE, UM8KAB (5), UO5AA (11), UP2s AL (25), NJ (5), VKs 2HO 2ZR 3AZZ 3NH 3YD 4AS 5ZC 6WU 7ZZ, VP9s BO EB, VQs 2WW (3), 4AP (8), 4GQ, VR2DK (16) 6, VSs ICN 1FZ 9OM (10) 23, XEs 1KD 1KW 1NF (20) 7, 2KH, YS4RA (15) 8, YVs 4CI 5DE, ZC5AF (10), ZL2s AWJ IC, ZSs 1O 3HX 4UP (4) 4, 4X4s JU KK (22), 5As 2CV 3TR (10) and 9M2DW (35) 0. --- Milkewe, these 40-meter phones are knockin' 'em off between the BC bedlam: CE8AW, CO2s US (170), ZS (160), EA8CC, FA3ZA, HKs 1IS (70), 3IR, LX1s DE DU TJ, M4QAO 0, OH0NC, OY2Z, PYs 2OL 5AQ, TF5TP, UA3NB, UB5WN, UP2KNP, UR2KAE, 4X4s BO FF and 9G1BQ (s.a.b.).

80 c.w. is starting to carry its share of the DX load albeit somewhat reluctantly. W1DGT, W8YGR, OVARA and ISWL dial inspectors specify the 3.5-Mc. availability of CO2QR (3) 2, HAKSA, IT1TAI, KP4KD, OH2YV/B, PJ2AF (28) 3, SPs 6PZ 8KAF, UB5KAM, UC2KAC, XE1KD, YS4RA, YUIAS, YV5DE, about 50 Czech radiotelegraphers and a smattering of the usual variety of transoceanic items — Gs, DJ/DLS, PA0s, etc. --- ISWL reports OY7ML's sideband clicking with an occasional customer on 75 phone.

10 c.w. is regrouping for another late winter rally. W1DGT, K2s UYG YXC, WA2FNA, K5LGH, W6NKE, K6s CJF SXX, WA6DNA, K7HDB, W8YGR, K9s GDQ HLW, I1ER, VERON and WGDXC designate the desirability of GT1s ID JY, CRs 4AX (70) 20, 5AR 7IZ (12) 17, CX2BT, ET2US (3), FQ8s AF (82) 20, HA, JA1s AHS AII ANP BDF BEZ BK BKV BLN BLX BNV BUN BVA CMD CPH CSP CUD EC LF VX YL, JA2s AAT AFA CG RP XW, JA3s AG AIQ ALQ BYC EK RQ, JA4BZ, JA5IM, JA6s DC IL, JA8BP, KA2RS, KR6AM (70), LZ1KPZ, OQ5IG 17, T2CAH (65) 16, UB5GF, UP2NM, VK2AT (50), VQs 2WR 4HT, VS6BI,

VR2s AS and BC, chairborne from left to right, and VR2AP (front) blot up grid-leak drippings on the VR2BC premises where Greg regularly raises W/K/VEs on 15 phone.

(Photo via K6LAE)



EL4A (W7VCB) knows an appropriate thoroughfare when he finds one. Ken currently is making multiband DX history near Roberts Field, Liberia.

VU2RM (110), XZ2TH (70), YA1AO (160), YO3RW (20) 15, YV4CI (80) 16, ZC4AA, ZE2KL, ZS7M (77) 15, numerous ZL brethren, a few 4X4s and 7G1A of Guinea.

10 phone, opening gradually later and closing earlier as the winter waxed, enabled W1s OHA YQF ZER, W5ERY, K5LGH, W6NKE, WA6DNA, K6SXX, K7GPG, K9GDQ, UB5KAM, VE1PQ, C. Morrow, SCDXC, URDXC, VERON and WGDXC knobtwisters to log CT2AX 13, CRs 4AV 6BJ 6CA 7AG (333) 18, 7EO 7ES, CT2s AC AH 14, EA8BB, EL1K, ET2US, FA3JX (200), FB8CM, FQ8AF, GD3UB, HA8VS (394) 14, HE9LAA (350) 17, H18GA (413) 17, HP3CC, IS1DT, JAs 1BLC 1BOW 3EK 18, 6LV 7GB, KA2PC, KX6AF, LX1s A1 (445) 14, DL (447) 16, OD5s AU (400), CG, OOs 5CK (278) 18, 0KU, PJ2CA (250), PJ2AP, RAs LAB (300) 14, 1JAV 9KAR (400), BYA (700) of Tannu Tuva, RC2s ASB (400), ASL (278) 14, SRB (170), RI8ABF (350), RN1s AA (500), AAB (170), RO5s AGA (400), BDG (200), RR2RCK (359) 14, SPs 5PRG 7, 7HJ (518) 14, SV1AI, TF2WCO, UB5s LI UV, UNAT (254) 14, UP2BA (495) 15, UR2, BU (510) 14, KAA KAW (435) 11, VE3AIT/SU, VK9XN (280), VPs 2AR 6GT 6TR, VQs 2DR 2JN 2VZ 13, 3IC (200), 4DT 4RF 16, 8AV, VR2BC (43) 0, VU2s CO NR, XE3AF, XW8AC 8, YNs 1WW 4CB, YOs 2BV (490) 15, 3VI, ZC4ER, ZDs 3E (290) 21, 6FC, 2E7JS, ZLs 1KW 3OB 4KD, ZSs 3LD 7M (100) 18, 8I, 4X4s DR FR GB LC, 5A3TR and 9G1DF.

15 phone peppy produces prefixes for W1s LWV YQF, K2SFA, K5s JCC LGH, K7GPG, K9GDQ, C. Morrow, URDXC and WGDXC diggers, namely CE1AGI, CN8s, CN9CJ (161) 14, CR6AG (213) 23, EL6s C (300), D (241) 3, FB8s CD (163) 18, CO (220) 18, GP (163) 17, FK8AU (230) 4, FQ8s AF (232) 21, AW (234) 21, HP3FL, KA2BM (240) 18, KC4USB*, KG4AM*, KJ6BV (365) 7, KV4BI (312) 3, KX6s AF CR, LX1DC (221) 21, MP4s DAA BCC, OQ0PD, OX3KW (229) 0, PZ1AA, SP2KAC (163) 14, SV0WT (229) 21, TG9TS, TF3KA (235) 3, TR2FD, UA6LI (172) 66, UR2BU (212) 20, VPs 1EE 2LS 7RF 8DQ (136) 23, 8DU (245) 21, 8DW (159) 1-2, VQ2SB, VS9AE (182) 14, VU2NR (230) 19, YUs 1CM (209), 2IH (165) 14, ZB2A (221) 14, ZD1EO's new quad, ZS3s J (168) 20, RO, 4X4KQ, 9G1AA (200), 9K2AU (245) 13-14 and 9M2FX (248) 15.

15 c.w. is equally affable, encouraging W1s DGT OHA, K2s LFS SFA UTC (138/118 worked/confirmed on 21 Mc.), UYG YXC, WA2FNA, W4FFF, K4MWB, K5s JCC (170/135), LGH, W6s JQB PHF, K6s CJF JC SXX, K7s CTI GPG HDB, W8s KX YGR, W9JJN, K9s GDQ HLW ICG LIO, K9HGB (232/197) and I1ER to capture trophies like CN8s CA CJ 21, JX, CRs 4AX 5AR (30) 22, CX2BT, DU7SV, EL1K, FA8IH, FE8AH, HK0AI (35) 3-4, HS1C (64) 16, JA1s VX YL, JA2s UJ XW, JA3s AB AF (20) 22, BP CM IS UI, JAs 5FQ 6PA 7AD 8AA 9BE, K6QPG/KW6, KA2s FF (20) 22, RJ ZZ, KG1DT 23, KM6BT, KR6s GF MD, KM6BT, KV4s BO 20, CG (40) 14, KX6s BQ CO, LA2JE/p (69) 17, LZ1WD, OA4FM, OQ5s EH (51) 18, IG RH, OQ0DM, PJ2CK, SPs 2YK/mm off Ghana, 8SR, ST2AR (23) 22, T2CMF, UA8 3AN 3DU 0IJ 0KID (47) 4-5, UB5WF, UC2s AR AX (93) 5-14, UO2AN (20) 11, VE8MX, VK9s GW (50) 7, RO, VPs 2DY (10) 22, 4LA (60) 17, 8AI 8EG (50) 1 of So. Orkneys, VQs 2JM (40) 19, 2RG (74) 21, 3CF 4DT (60) 20, 4CQ (40) 19, VR3V, VS1s EB (75) 10-11, FZ, VU2MD (62) 13, XE1PJ, YVs 4CI (20) 15, 6BS (53), ZB2I (60) 7, ZEs 3JJ 8JG (70) 22, ZL3GS (55) 23, ZS7AI, 5A2CV and 7G1A (40) 23.

15 Novice nippers KNIJTL, KN8QEX (34/20), KN9SRRL, WV2HVR and WV6DNM (now Generalized) nabbed some nice numbers despite pernickety propagation: CR5AR, a batch of DJ/DLs, FQ8AF, Gs galore, HB9DX, IIAHO, JA1VX, KA2s CB HA, KC4USB, LA2SG, LU5 5DEL 8EN 8AIA, OHs 4JT 5UO, ON4s HX LB, P11s MID KMA, PJ3AD, PY3QX, SM5CO, SPs 1KHA 6FZ, TI2LA, VO2AW, VP5 2AR 7NS, WL7s DCC DEF, WP4s ARZ ATO AYQ and XE1ZB. Stick with it, lads!

20 c.w., strengthening the rearguard of our "How's" Bandwagon this month, is a fertile DX field for W1s DGT ODW OHA YQF, K1JFF, W2s ICO JBL, K2s QXG UYG, WA2FNA, K3CUI (93/82), WAFFF, K4IWB (112/95), K5s JZP (33/11), LGH LLJ (36/13), SUS, W6s JQB KG PHE UJF, K6s JCF (53/44), JC (114/80), SXX, W7s DJU LZP, K7s CTF GPG HDB (24/11), W8s KPL KX YGR, W9s CLH JIN LCG, K9s GDQ HLV (106/82), K9s HGB JPL, HK5SG, IIER, KH6DFG, UB5KAB and VE1PQ. Among the 14-Mc. code candidates they suggest are AP4M, CRs 9AH (10) 3-4, 0AC (40), CN8s BK JX, CP3CD (10) 23, CRs 4AH (50) 23, 4AX (28) 4, 5AR (43) 22, 7CD (22) 4, CT2BO (30), DM2AGH, DU5 1AJ (52) 13, 7SV, FA8BF (25), EL4A, ET2US (12), FA9UO (6) 23, FB8s CE XX, FG7s XC (5) 12, 13, XE (60), ZIV, FQ8AC (43), FQ8HO, FR7ZD, FY7YE (67), GD3UB (35) 10, HA5 5BT 7PZ (35) 16, HCs 1LE 1JU 14W (20) 23, 2IU 5CN, HKs 3TH (15) 5CR 5SG 0AI (5), MP4s BCT BCU (20) 2, TAF/MP4 (93) 14, OA4FM, ODL5X, OR4RW, OX3s AY (88) 16, RII (93) 21-1, PJ2s CK (60), CP (70), PZ1s AP AR, TFs 2WEN (30), 3AB 22, TI2CA, UA5 1KAQ 1KIA 1KUF 1OT 3DF 3FF 3NB 4HC 4HP 4KHN 4PS 9AA 9HI 4-5, 9KCC 0GF 0JB 0KAR (44) 0, 0KIA 0KID 2, 0KZA 2, 0RKC 0YC 4, UB5s en mass, UC2s AU AZ WP, UH8KAA (15) 13, UI8AP, UL7s HB JA (100) 13, KAD (2) 5, KBK (5), UO5AA (45) 5, UP2AC, UO2KAI (72) 16, VE6AEE/SU, VK9s GW XK, VK6s CC RH, VP5 2AR 4LA 4WD (26) 23 of Tobago, 4WI 8AI 8EE (15) 1, VQs 2IE (52) 5, 2JG (30) 16, 2JM 2W 3CF (70), 2, 4AP 4HT (10), 6LQ 22-23, VRs 1B 2DA 2DK 3V (6) 2, 3W, VSs 1FZ (40) 23, 4BA 4FC 5JA 9AZ 9OC (80), 9OM, VU2s AC (40) JA, JG (60), MD RM (62) 13, XE1s AAI UU, XW9SG (see "Whence"), XZ2s AD (11) 12, BB TH (10) 17-21, YA1AO (85) 17, YUIAG, YV4CI, ZBs 1FA (45) 2N, ZC5AF, ZDs 2GUP (80), 7SA (55), ZM6AB (80) 5, ZP5LS (40) 19, ZSs 3AC 6IF/8, 4X4WF (25) 16, 7G1A (40-60) 19-22, 8J1AA (80) 5 of Japan's antarctic interests, 9M2s CV and GA (73) 23.

20 phone's infinite variety of accents attracts W1YQF, K1JFF, K2QXG, K5SUS, K7GPG, W8KPL, VE1PQ (152/119 via voice), C. Morrow, SCDXC, VERON, WGDXC and WVDXC cosmopolites because of the workability of AP2BH (105) 13, BV1USC* (309) 15, CE2LE, CN8EF (260), CRs 6AK 6CZ (150), 7CS (133) 15, 9AH* (304) 15, DU5 1SA (178) 13, 7SV* 7, EL3A, ET2US* (310) 0, FA8BE (230), F5ZRT* (306) 2, GC3LXK* (310) 17, HA5 5KDQ* (318) 18, 8WS* (309) 16, HCLJU (250) 9,

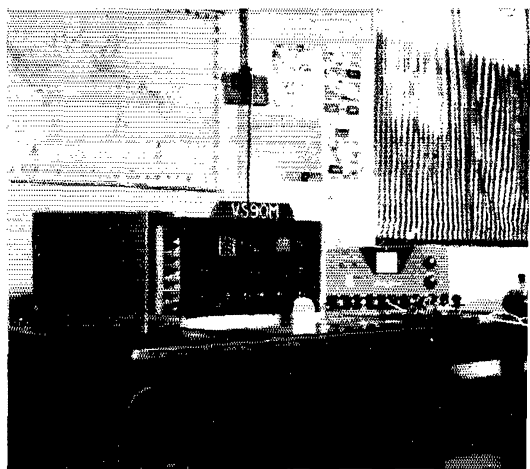
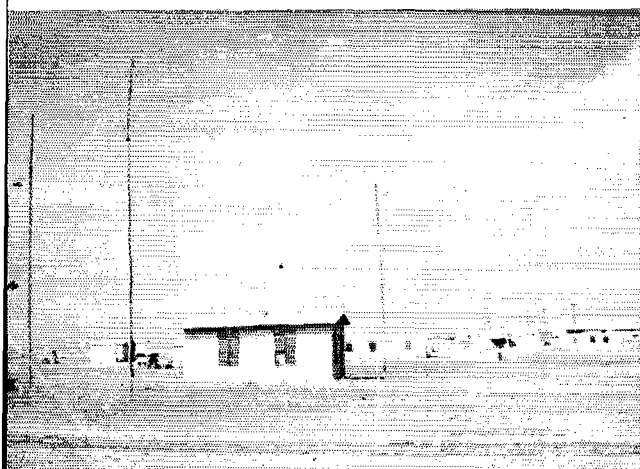
HHs 3DL* (310), 9GR* (335) 14, HI8GA* (310) 18, HPILO* (313) 12, HZ1s AB* (321) 15, TA* (307) 14-15, I5GN* (322) 21, IS1OA (221), KA2s NA (210) 13, YL* (303), KC4USN, KCs 1AQ (300), 4AA (280) 13, KV4AA* (298), KX6BT (295), LA3SG/p* (310) 14, LU5 9ZF* (312), 9ZL, MP4s BBW* (300) 15, BCC (110) 16, BCR* (311) 19, DAA* (310) 15, QAD* (299) 16, QAO* (315) 16, TAE* (310) 3, OHNC* (315) 16, OQ5IE* (309) 21, OYs 5S (150), 7ML* (306) 21, PZ1AX* (309) 5, SUINIS* (303) 15-16, SVs 1AA (140), 0WB* (317) 18, 0WV* (316) 22, 0WV (150), UA1DZ* 8, UF6s AB (145) 21, DC* (322) 19, UL7JA, UN1AH (140), VE9NA (150), VKOs CC* 4, HA* (317) 20, VP5 2AR (195) 0, 5RS* (310) 2, VQs 4ERR* 16, 5FS* (310) 15, 6LQ* (325) 0, VSs 6AZ* (305) 16, 9AIF* 19, VU2s ET 13, KV (146) 16, MD* (315) 17, NR 12, XW9SG, YUIAD* (303) 16, ZC4s GT (150), JB 22, ZD6NJ (112) 15, ZEs 3JA/ZD6* (316) 15, 6JA* (316) 19, ZK2AB (302) 4, ZSs 2MI (120) 19 of Marion isle, 3ES (330) 22, 4X4s AS* CX* DK* IX* off the high edge, 7G1A* (305) 22, 9G1BQ* (312), 9K2s AM* (299) 16, AZ (300), 9M2DB* (305) 16 and the pioneering Voice of Nepal, 9N1GW* (320) 3. Oh, as usual, asterisks (*) indicate single-sideband stalwarts in this and preceding phone paragraphs.

160 c.w. will be kept under surveillance by the more serious ARRL DX Tester in the weeks ahead, and the Transatlantic Tests of W1RB & Co. concentrate on the 7th and 21st of this month (see details in December's "How's"). Stew. OVARA and ISWL learn that DL1FF, G1s 3MRW 6TK, GM6SR, GW3s ALE DHY KSQ, ODSLX's 450-watter, OK1s GG KIO and other Czechs, VP5 3AD 3RB 9EP, ZL3RB and 5A2CV are among 1.8-Mc. possibilities. There will be the usual surprise "sleppers," of course! . . . Now let's grab another serving of joe, flapjack to the hip side of jumpin' Jonah's horn, and check developments on the QSL/QTH front. . .

Where:

Asia — "At present I act as QSL bureau for the Aden area," writes VS9AHM. "I am having considerable difficulty with this task, for no one here seems to have tried the 'agency angle' before. However, I have managed to trace the majority of stations at this locality and have attended the postmaster general's list accordingly. Had a letter from a W the other day saying he had made five VS9 QSOs but had never received a card. This is a sad state of affairs but, with everybody's cooperation, I hope to help sort things out. I can also forward cards to VS9s MA MIB MI OC and OM and will be glad to answer queries about DX in this area." Mac confirms that VS9s AAH ABJ AF AS AT and AV have departed Aden. . . . W6BSY strives mightily to clear up VS9OM's Oman logs for W/K/VE contacts. "U. S./Canadiana needing cards can contact me as I will have complete logs for these QSOs. Self-addressed stamped envelopes will be appreciated. Foreign operators can write Brian direct [see list] with IRCs." . . . Regarding still another VS9 area, K2QXG has acquired VS9MB's log for the 1959 ARRL DX Test and will oblige qualified petitioners who provide QSO data and s.a.s.e. . . . "I am no longer QSL manager for VS1GL," declares W6FAF. "I have begged, pleaded, cajoled and asked him to send me his log to no avail. So here I am with a drawerful of QSLs for him from Statesiders but no log with which to fulfill my offer. All future cards for VS1GL should go direct." This sad

VS9OM, believed to be the first amateur officially licensed in the Sultanate of Oman, now returns to England from this layout at the RAF base on Masira island. Club station VS9OC is expected to continue active in an effort to fill Brian's large DX shoes. (Photo via W6BSY)



sequence is not unique, but each fresh episode of this type always makes us wonder, wonder HL9KJ (W8NYG) writes KH6BXU: "The spirit of ham radio includes QSLing, so I always send mine when asked for one. Because surface mail takes so long I use air mail exclusively — some postage bill! There are a lot of pirates on the air over here and we are busily cleaning them up. Even my own call has been bootlegged." Noting that XZ2TH is an ardent stamp collector, W8KX says you'll make a big hit with that OM if you plaster your XZ2TH-bound mail with a fiatful of fresh commemoratives. And QSL penny-pinchers scarcely pays in the case of Burma. XZ2TH tells W7LZF that surface mail from our side may be 75 days in transit.

Africa — Ex-CN8HA (W4FOV) tells W1DF he lost the QSL records for his final months of operation at Kenitra but he does retain the station logs. Those interested may contact W4FOV at the address to follow K6CJF commends CN2BK for fast return QSL in reply to an air mail card accompanied by IRC. W2CTN now aids Joe's paste-board campaign, too ZD1EO admits to an immense backlog of QSL chores but K2UTC finds Ted determined to liquidate this state as soon as practicable. ZD1EO is scheduled to terminate his Sierra Leone operations next month in favor of Britain leave.

Oceania — More ex-PK (N.E.I.) tips courtesy VERON'S newy *DXpress*: PK1YV, J. F. Verschuyt, Zuiderbeekweg 20, Coesterbeek (Gld), Holland; PK2AA-SAA, F. Heyer, Hilversum, Holland; PK3LE, E. L. Evers, Pa0LEV, Prof. Th. Kohstammstraat 2, Utrecht, Holland; PK3MR, M. le Cotey, Alfredstraat 353, Kingston, Ont., Canada; PK3PH (now VE3CDM); PK3SJ, L. Th. E. de Sevren Jaquet, Endhofaan 2, Utrecht, Holland; PK3SP, S. A. Pleynaer, Joh. Vermeerstraat 5, Maarsse, Holland; PK3WH, Hartman, c/o Villa Wood Hostel, P. O. Leighton Field, N.S.W., Australia; PK4OH, 1133 E. Las Palmaritas St., Phoenix, Arizona; and PK6XG, W. Willemsse, 116, Scotland Rd., S. Orange, N. J. According to VERON files, ex-PKs 1WW and 6XA are deceased QSL repercussions from W5PQA's projected Tokelau tour were to be parried by W7PHO's good offices, s.a.s.e. desired W4JA/KH6 provides the KC6PE address to follow, adding: "Mail is rather slow out there, only one plane each week. I don't know whether they have QSLs at this writing but I promise all valid cards will be answered. The minute your December issue hit the streets mail started pouring in here for KC6PE!" After April 1, 1960, QSLs for KX6CS should go to his W8CFL address.

Europe — Hams who parlay DX pursuit with philately and a productive combination this is, are advised by W8KX concerning cancellations from the Second Belgian Antarctic Expedition: Three envelopes are required, the outer addressed to Roger Schoonlaan, OR4RW, c/o Belgian Consulate, Cape Town, C.P., So. Afr. The "middle" envelope, which should be addressed to Radio OR4RW, Belgian Antarctic Expedition, will be forwarded by the consulate. The inner envelope should be self-addressed and will be stamped and canceled at the base with OR4RW's QSL inserted. The two inner envelopes should not be sealed, of course, and the self-addressed job must contain appropriate Belgian postage or three International Reply Coupons. "Time of reply return will be determined by ice conditions around the base," concludes Walt, W8KX also comments, "SM15DO surprised me with a 'Statistiek-stamped' QSL. He works on Scandinavian Airlines and makes frequent trips to the U. S. and Canada as far inland as Winnipeg, having the opportunity of checking DX conditions on both sides of the pond." "For the past year I've been handling stamped self-addressed envelope

Word from the REF of France tells of *The French Contest* scheduled to begin c.w. activity February 27, 1960, at 1300 GMT through the 28th at 2100 GMT. The phone contest is to be held from April 9, 1960, at 1300 GMT through 2100 GMT on the 10th. Exchange consists of six-digit exchange on c.w. (five-digit on phone) of the RST report and QSO number. Your first contact on c.w. might be 579001. This is an opportunity to mop up countries for the DUF award, and French Provinces for the DPF award. This no-multiplier contest counts three points per contact. Rush your logs immediately at the conclusion of each contest to: REF, B. P. 42-01, Paris RP, France.

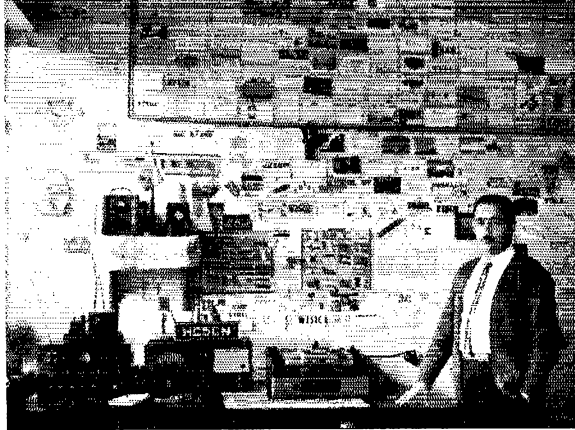
requests for CT2BO and OY7ML QSLs but the boys tend to become lax in sending s.a.s.e.," observes W6NJU. Omission of such return transportation results in reply via bureau F7FD (ex-W4VE-W5MY-KA9AA-KR6AA-etc.) indicates through W1KE that incoming QSLs are often late squeezing through channels. "Sorry for any delays — I answer all cards as received." LA4KG/min pens, "In your September column I am listed with an address c/o our Italian agents. We have now finished our Congo-Italy runs, so please specify [the address following]." W7QCU/4 discloses: "I've just received a package of QSLs for DL4FE and DL4FEE. I held DL4FE myself during 1958 and 1959 but the cards are for earlier holders." Claimants may write L. G. Heasted, 1252 Brookwood Dr., Winston-Salem, N. C., to clear Lyle's file "LA5AD/p will QSL in the spring when the first ship arrives," learns W6KG. W7LZF confirms that LA2TD/p will clear up his confirmatory chores upon return to Norway. No incoming mail for LA2TD/p till May, states the West Gulf DX Club organ.

Hereabouts — W1VG relays antarctic ham data from K1NAP: "There are four stations now active so far as Americans and K1NAP are concerned. They are KC4s USB USH USN and USV and they handle all their own QSLs. K1NAP is merely a receiving or mail center to be used when, during the long winter night, mail cannot be forwarded to the ice. The first plane to arrive carries all cards collected during their winter (our summer). We at K1NAP cannot satisfy amateurs who have not received cards, for we do not have the logs and cannot confirm contacts made with KC4s. K1NAP has a couple of thousand cards to be sent to KC4s USA USA and USW but confirmation is not available at the present time. These stations have not been manned by Americans for almost a year. KC4USA (Little America V) has been abandoned and is in process of being torn down and all material used as salvage. KC4s USK and USW are manned, but not by Americans. I still get cards for KC4s USA and USK for contacts made in 1959, an impossibility. I have recently received a package of cards for such stations as KC4s BR US KSO and VG calls which have no connection with Deep Freeze and K1NAP. At this time there is a 'transition' period going on at the ice; new crews are going in to relieve the old, we will soon have a whole new team of operators, and there will be a 'slow' period while they are getting their schedules set up, etc. I personally know all the licensed operators going down there this time and I hope that this



GB2SM, demonstration station at the Science Museum, London, receives DX contest impetus from (standing, from left) s.w.l. Gordon, G3BIA, G3IIE, s.w.l. Ken and Chas., G4ZA and G3KGM; (seated) G5CS, G3JUL and G3NPA. It's an eye-catching layout—that dangling baffle appears to have caught one.

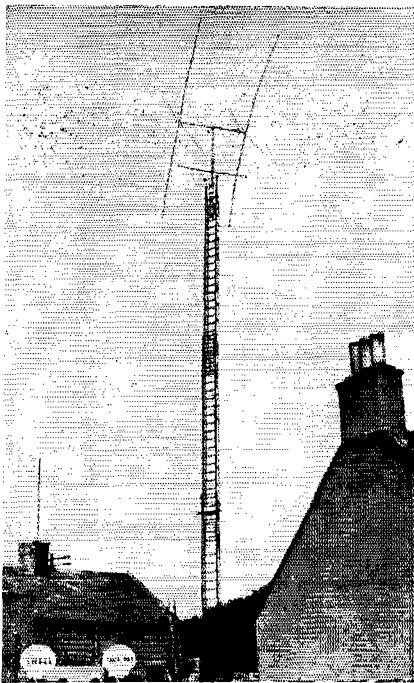
HC5CN operates a widely worked 40-watter and Windom at Cuenca, receiving with an S-40A. Say, there's nothing quite as photogenic as a QSL-decorated ham shack, is there? [Have your old QSLs, Boss—I'll take HK6LT.—Jeeves] (Photo via W8KX)



will be the best year yet. I wish there were some way that I could personally thank all amateurs for the work they have done for those in the antarctic. I have been in charge of K1NAP for over two years and am still amazed at the number of new contacts made each year. Thanks to all for a really wonderful job! The writer of these lines, K1JFJ, reciprocally rates the gratitude of all DX chasers whose KC4-bound QSLs have been expedited by K1NAP & Co. W6KG hears that VE8GC/8 will QSL direct from Alert but wants his cards to arrive via bureau YV5AEW, whose correct (we hope) QTH follows, recently spotted his address in a publication with the last numeral of his post office box number missing. The next time he saw himself listed, two digits were omitted from the box number. "I'm afraid that by the end of the year there will be no figures at all left in my box number. Please take note of my full and proper QTH." KØHGB figures that there would be much more DX activity in countries with sparse ham populations if more ambitious W/K/VE brethren would offer to help ward off ensuing QSL onslaughts WØDVN's QSL Bureau Return Envelope Service offers to keep your ARRL QSL Manager stocked with proper s.a.s.e. for your convenience. Check with Bill for details on the deal. K5LGH leads another cheer for the QSL-agency performances of Ws 2CTN and 5ADZ Brother Fabian of YN4CB advises W6NKE that IRCs are not convertible at Bluefield, although U.S. currency will defray postage costs okay. And now let's get organized specifically and alphabetically:

AP4M (via RSGB)
 CE2LE, P.O. Box 761, Santiago, Chile
 ex-CN8HA, Cmdr. G. E. Olson, USN, W4FOV, MCAAS, Beaufort, So. Car.
 CP3CN, Box 474, Oruro, Bolivia
 DL4AS, M. E. Hinks, 807th TacConSq, Box 122, APO 12, New York, N. Y.
 ex-DL4FE-DL4FEE (see text preceding)
 DL7CH, G. Holldorf, Martin Reuter Strasse 21, Berlin-Hermsdorf 1, Germany
 DU1AJ, Jose Aleli, 1018 Padre Leoncio St., Manila, P. I.
 EA8BB, T. de Armas Alonso, P.O. Box 215, Tenerife, Canary Islands
 ex-EL2Q (to EL8F)
 EL6C, V. Zeverino, Raymond Concrete Pile Co., Roberts Field, Liberia
 EL8F, c/o Bishop's House, Mourovia, Liberia
 ET2US, MARS & Amateur Radio Club, Kagnew Stn., APO 843, New York, N. Y.
 F7GT, G. E. Trent, Det. 2, 485th Comm. Sqdn., APO 55, New York, N. Y.
 FE8AN, P.O. Box 986, Douala, Camerouns
 FG7ZW (via VP4LC)
 FQ8AE, P.O. Box 467, Brazzaville, Republic du Congo
 ex-G2AH, H. K. Bourne, VE3CXW/W4, c/o United Kingdom Scientific Mission, 1907 K St. NW, Washington, D. C.
 G3NUY, S. Almond, 265 Longley Ln., Gatley, Cheshire, England
 G3NVA, F. Humphries, 78 Frank Bernard Rd., Olton, Birmingham, England
 HC1MK, Al. Kohls, P.O. Box 2327, Quito, Ecuador
 HC5CN, C. Nieto, P.O. Box 21-A, Cuenca, Ecuador
 HC8JU-9JU/mm (to HC1JU)
 HK6LT (via LCRA)
 HKØAI (via W9WHM)
 HP1LO, L. O'Meally, P.O. Box 4864, Panama, R.P.
 IS1TDW, via Carrara 10, Cagliari, Sardinia
 KC6JA, J. Anson, Koror Island, Palau, W. Carolines, P.T.T.
 KC6PE, Ponape, Zone 8, E. Carolines, P.T.T.
 KG4AB, Box 19, Navy 115, FPO, New York, N. Y.
 KG4AG, Box 41, Navy 115, FPO, New York, N. Y.
 KG4AM, Box 32, Navy 115, FPO, New York, N. Y.
 KX6CR, 1960th AACs Sqdn., Navy 824, FPO, San Francisco, Calif.
 KX6CS (via KX6AF; see text preceding)
 KV4CG, Box 618, Christiansted, St. Croix, V. I.
 LA4KG/mm, A. Antonsen, MT Tobias U. Borthen, Nedre Vollgt. 1, Oslo, Norway (or to LA4KG)
 MP4BCR/mm (via RSGB)

MP4TAF/MP (via RSGB)
 ex-OA1C (to K8MPM)
 OA4IZ (via RCP)
 OY7ML (via W6NJU)
 PX1BO, APAS Radio Club, 20 Pl. Vendome, Paris (Ler.), France
 SUIMS (via W6QNA)
 SVØVW/Rhodes, USCGC Courier, WAGR-410, FPO, New York, N. Y.
 TG9TI, Rod Tormo S., Apartado 418, Guatemala City, Guatemala
 VE8GC/VE8 (via VE8JW)
 VK9JG, J. Georgiades, P. O. Box 55, Rabaul, T.N.G.
 VK9XN, c/o ISWL, 86 Barrenger Rd., London N. 10, England
 VP4WI (to W4ORB)
 ex-VP5CC-VQ4SGC (to VS9AZ)
 VP7BB, C. Mowery, Navy 106, FPO, New York, N. Y.
 VP7NT, San Salvador Island, Bahamas, via Patrick AFB, Fla.
 VP8DU, Box 102, Port Stanley, Falkland Islands
 VP8EP (via G3JAF or RSGB)
 VP9ET, USN Fac., Navy 138, FPO, New York, N. Y.
 VQ2DR, P. O. Box 65, Mufulira, No. Rhodesia
 VQ2JG, P. O. Box 152, Ft. Jameson, No. Rhodesia
 VR2DR, R. Sims, c/o RNZAF, Suva, Fiji Islands
 VR2DS, P. E. Corner, c/o Civil Aviation, Nadi Airport, Fiji Islands
 VR2FRC, Fiji Radio Club, Box 184, Suva, Fiji Islands
 VR3W, BFPO 170, Christmas Island
 VS4JT, via W. Knight, K6GMA, 13811 McMains St., Garden Grove, Calif.
 ex-VS9AAH, A. Heeley, 26 Manor Rd., Streetley, Staffs., England
 VS9s AD ADH AE AIR AJW AL AMF ANS ARB ARF AS AZ AZA (direct or via VS9AHM)
 VS9AHM, Sgt. H. Mackie, Sgts Mess, RAF Khormaksar, BFPO 69, Aden
 ex-VS9OM-VS9AS, Brian A. Smith, 4 Shalimar Rd., Acton, London W. 3, England (or via W6BSY)
 W5BVW/VO1, (G. Miles, Box 87, 641st AC&W Sqdn., APO 677, New York, N. Y.
 W7JJM/VO1, S. Leluan, 640th AC&W Sqdn., APO 864, New York, N. Y.
 W7WOK/VO2 (via VO2US)
 WA2HUU/VO1, CG Box 49, Navy 103, FPO, New York, N. Y.
 XW9SG, Silvestre T. Gallarde, rue Sethathirath, Quartier wat Simueng, Vientiane, Laos
 XZ2AD, U Hla Oung, Box 1290, Rangoon, Burma
 YS4RA, F. D. King, General Delivery, S.M.I.U., Dallas, Texas
 YV4AR, A. Romero Lizarraga, Apartado 225, Valencia, Venezuela
 YV5AEW, Oscar Alvarez de Lemos, P. O. Box 10496, Sabana Grande, Caracas, Venezuela
 ex-ZA2ACB (to DM2ACB)
 ZD2RJQ, R. Osborne, Birnin Kebbi, Sokoto Prov., No. Nigeria
 ZD6FC, F. Clark, Box 434, Limbe, Nyasaland
 ZD7SA (via W9FJY)
 ZE3JG, 4 Lefevre Ave., Westgate, Bulawayo, So. Rhodesia
 ZM6AB, c/o Faleolo Airport, Private Bag, Western Samoa
 ZSINI, V. Nilson, 2 Normandy Mansions, Ave. Marseilles, Sea Point, Cape Town, C.P. So. Africa
 ZS3X, P. O. Box 85, Windhoek, Southwest Africa
 ZS5RD/7, P. Lamont, 29 Oxford House, 77 Gillespie St., Durban, Natal, So. Africa
 9G1DI, P. O. Box 1981, Kumasi, Ghana
 9K2AU, P. O. Box 1092, Kuwait, Persian Gulf
 9M2GM, c/o R. Gray, 7 Roseberry St., Christchurch, N.Z.
 9N1GW, c/o Ace Radio Club, 6038 28th Ave. SE, Washington 23, D. C.



GM3BQA suggests this application for any stray fire-truck extension ladders you may have lying around the shack. "Only one set of guys is used, and in windy weather the quad descends for safety. It is quite possible to climb up to the beam but all work normally is done with sections closed. A one-third-h.p. a.c. motor and winch, controlled from the shack, lowers the boom from its maximum height of 75 feet to a minimum of 34 feet in four and one-half minutes. The rotor, mounted in the top ladder section, drives a seven-foot length of two-inch alloy mast." Slip a fire truck under this arrangement and you have an ideal mobile outfit for Sunday DX on the freeway.

The gracious cooperation of W1s BDI DF DGT ODW UED YQF, K1LWV, W2s ICO JBL JWK, K2s QXG SFA UTC, W4s FFF JA/KH6, K4MWB, K5s JVF JZP LLJ, W6s BSY KG P1F, K6JC, W8s KPL KX, W9s C1H J1N, K9HLW, K0HGB, KH6s AHZ BXU, VE1QP, VR2BC, C. Morrow, Hamfesters Radio Club, International Radio Listeners League, International Short Wave League, Japan DX Radio Club, Newark News Radio Club, Ohio Valley Amateur Radio Association, Southern California DX Club, Universal Radio DX Club, VERON of Holland, West Gulf DX Club, Willamette Valley DX Club and WIA of Australia made the preceding directory possible. Whenever you encounter such postal information of potential interest to the DX frat pray pass the word along.

Whence:

Oceania — ZM6AB assures W6PHF he will attempt to keep his 4-125A and dipole available around 14,080 kc., 0500 GMT, for some time to come. . . . Fiji facts thanks to VR2BC and Fiji Radio Club's lively *Splatter*: VR2s AC and AZ leave the islands, the latter bearing phone DXCC credentials as a memento. FRC demonstrated h.f. communication at the recent Fiji Hibiscus Festival, overcoming no few vexations en route. . . . KX6CX tells K6CJF that applications for the Kwajalein club certifications have nosedived since KX6s CM CN and CW closed down. Bill collected sheepskin No. 54. . . . W8KPL and others eagerly awaited consummation of January Tokelau tantalizations by W5PQA, VR2DA & Co., an undertaking well calculated to kick off the 1960 DXpeditionary season with a bang. Bearing separate rigs for the purpose, W5PQA intended phone work, VR2DA c.w. . . . Pacific dispatches via WGDXC and VERON: VK6DL (ex-VR3B) whose employer stocks Willis Island with personnel, knows of no current VK4s available there. VK4IC was active a few years ago (check those QSL files and logs!) and VK2AGH men-

tions a VK4DS activation coming up. Willis, you know, is a brand new ARRL DXCC Countries List entity. . . . KC6PE's favorite haunt appears to be 28,600-29,750 kc. around 1800-2000 GMT, Eastern Carolines, that is.

Asta — VU2RG, formerly AP2N, writes W9FKC: "I have not been operating lately for one reason or another, and it is likely that I will be QRT for a bit longer as we are moving house. What complicates this is that I am supposed to go on leave to England early in the year. What with shifting, fixing up home in the new premises again and going on leave for four to five months, there is not going to be much time for hamming. However, we should be back well before the end of 1960 and then we'll be able to get down to filling in that DXCC list." Norman tells of the sudden unfortunate passing of VU2SX, Fr. Conessa of St. Xavier's school, Bombay, a leading light in India amateur radio and one of the steadiest VU2 c.w. hands on the bands.

From W8KPL: "An air mail letter from XW9SG states he is a Filipino working for the Laotian government and probably will be there a year. He runs 500 watts to a BC-610 on c.w., 250 watts on phone." . . . "Unless the Turkish authorities revise their opinion of amateur radio, my DX wings will be clipped for the next twelve months," writes WIARR, departing thither. Bob's mailing QTH: A/2c R. Hill, jr., TUSLOG Det, 3-2, APO 329, New York, N. Y.

K2QXG, QSL aide for VS9MB, reports that recent receipts of QSLs indicate a new surge of Maldives activity and probable VS9MB participation in the ARRL DX Test at hand. . . . Over Aden way, VS9AIIIM believes that VS9AD is preparing for renewed DX action. Mac adds that *Callbooks* of not too ancient vintage are in great demand around Khormakkar. . . . "There is the possibility of a new call sign being issued here in another month or so," writes HL9KJ (W8NYG) to KH6BXU, meaning another club activation *à la* HL9TA. . . . K6CJF conversed with 131 different JA colleagues in a three-month span. . . .

UB5KAB mentions 14-Mc. c.w. activity by UA0YC in Kyzyl, Tannu Tuva, and understands that UA0s YA and YB also will become workable there. RA0YAA is said to represent the area on 10 phone, no English. . . . Club diggings from the Near and Far East thanks to WGDXC and VERON: The a.s.b. of 9N1GW is frequently workable on 14,300-14,320 kc. at 0130-0600 and 1230-1600 GMT. He's K4KMX and anticipates a two- or three-year stay in Nepal with a Pacemaker, Courier and 3-el. spinner. Stand-op Fred hopes to sign 9N1PV for a spell, and others should follow. . . . There are JA1ACB/JA Marcus Island possibilities in the DX winds. . . . OD5LJ meditates MAY chances for a Yemen sortie. . . . U76DC, UT8AB and UJ8IC reportedly entertain single-sideband notions. . . . MP4TAF lurks as high as 14,345 kc., 1400-1700 GMT. . . . K6GJL, formerly KA0LJ, satisfies Iwo-hunters with week-end sideband splurges near 14,290 kc. where KX6BT also hangs out. . . . 9N1GW is expected to be operating c.w. from Nepal with W1CJ at the key. Operations for the c.w. gang are expected to begin sometime after the first of February.

Africa — ST2AR, who rates the DX medal of honor for profuse Sudan dispensations, pens K3CUI: "Have been out of Khartoum quite a bit late; afraid that I do not seem to find enough time to report into QST as often as I would like. Yes, I still need Nevada for my W4S plus K1H6. Wish you guys would stop adding states! Still have my ancient ex-USN HRO without crystal filter but I use a crystal converter in front for 21 Mc. and I'm making another for 14 Mc. I made the second detector into a 'product' job as I've had a lot of recent c.w.-s.s.b. QSOs on 15 meters. Hope to receive a sideband rig through W4IMP and possibly a Hy-Gain three-band rotary via W7PHO. Wonder if the HRO will be able to cope with the resultant pile-up! I could never guess it, but in contests my prefix does seem to help a little." Eric revises an old saw that "getting out is 90 per cent operator"; how about, "130-per-cent prefix"?

K2UTC volunteers African items of interest: CN8FT tells of tightening licensing authorizations over his way. . . . EL5A may be signing a new call after a move to a location near Monrovia. . . . ZS3X, after an eight-year abstinence, is back in the DX swim with a DX-100B, triband antarcic and NC-303. . . . ZS1AB speaks of a 14-mhz antarctic Queen Maud Land expedition now under way, ham call unspecified. . . . SP6AAT aroused K4MWB's curiosity with mention of one ETE3CE who claims to be ex-W9ZQF in Ethiopia. . . . Africa notes via VERON and WGDXC: FB8GP now assists FB8CD in dispensing Comoros favors, 21,210 kc. around 1800 GMT with 200 potent watts of a.m. . . . ZS5RD/7 suffered an arm injury in returning to Natal, an accident that slowed his QSO/QSL activities considerably. Peter hopes to become ZS7P shortly.

Europe — Moscow's Central Radio Club, in a letter to W1DGL of ARRL Hq., confirms that this year's Russian DX contest will take place from 2100, May 7th, to 2100 on the 8th. Details in good time. . . . Ex-G2AH now signs VE3CXW/W4 near Washington, D. C., a development that would have been unheard of just a few short years ago. . . . W2JWK writes, "SP6FZ informs me that a Polish DX group has been organized and is officially known as the SP DX Club. It aims to promote DX activities and amateur

(Continued on page 146)



Correspondence From Members-

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

OOPS . . .

Editor, *QST*:

Obviously the artist who dubbed in the antenna for the December cover is not a ham. A cardinal rule has been broken; i.e., a lead-in or transmission line should never cross over or under power drops.

The scene is cozy and conducive of rare DX — if the poor guy's nerves can stand the thought of momentary electrocution.

— C. W. Mechan, K5DXU

707 Sheridan Road
Evanston, Illinois

Editor, *QST*:

Love New England winter pix but — 1. That end-fed antenna open feeder needs a second insulator at tree. 2. Switch to Safety: get those feeders from over(?) 240 and phone drops. 3. Is *this* L. E. Rapp's residence? 4. Were I dubbing the antenna on an 8 x 10 before sending it to the engraver, I'd use a sense of perspective; neither would I allow this upward blown feeder on a calm day.

— Temple Nietzer, W9FLD

Old Comer's Road
Chatham, Mass.

Editor, *QST*:

Whatever happened to "Switch to Safety," and what character is responsible for passing the cover photo? Perhaps this is intended to highlight a horrible example; if so, I would say it's quite horrible enough!

Should that Zepp ever let go in a storm, there would be plenty of soup in that antenna!

— Bill Fishback, W1IKU

43 Alexine Avenue
East Rockaway, N. Y.

Editor, *QST*:

. . . With due regard for artistic license, the flagrant flouting of safety rules depicted in the picture can and may lead to the adoption of practices which *QST*, as the mouthpiece for ARRL, should condemn and discourage at every turn.

We old-timers broke into the game in an age when some components couldn't be bought. We learned respect for voltages the hard way, by dealing with bread-board layouts, bulky and balky parts, inadequate insulation, etc. Today's commercial equipment is so well protected that the user would have difficulty in reaching a hot lead. Actually, about the only thing a young squirt has to do today is put up an antenna — and you drape one over the power lines!

Please, in the name of Hiram Percy Maxim, guard against any repetition, or you can (and may) lose a League member — the hard way.

— Robert M. Forster, W2DVG
Arlington 7, Va.

Editor, *QST*:

My wife remarked that probably the reason why the car was outside the garage enduring the rigors of the winter was that the garage was so full of radio junk there wasn't any room. After 32 years with me, I couldn't put up much of an argument. . . .

— Ed Redington, W4ZM

THANKS

I.T.U., Palais Wilson
Geneva, Switzerland

Editor, *QST*:

We feel that due acknowledgment should be made through your columns, to the President, General Manager and staff at Geneva, for the invitations to, and the sub-

sequent dinner at, the Hotel de Rhone on the occasion of the visit of Mr. Dosland to the I.T.U. Conference.

The gathering again demonstrated that amateur radio provides a common ground for social contact despite different languages and national outlooks. The many new friendships made at the conference and at the dinner must result in an improved understanding of international relationships.

All thanks and every good wish to the President, his lady, and members of ARRL.

— D. A. Duthie, ZL2ASK
P. Hewlett, ZL1MW
C. C. Langdale, ZL2CH
D. L. Vaughan, ZL2VA

ROGUE'S GALLERY

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

Editor, *QST*:

I have been reading *QST* for a good many years, but this is the first time I have really read an article which hit the nail on the head as much as "It Seems to Us" in the December issue.

To my way of thinking, these "creepy characters" are breaking the law just as much as a drunk driver wobbling all over the road or the guy continually running red lights or cutting you off at a turn. These drivers usually lose their licenses and get a stiff fine. I see no reason why the same can't be done with these "jerks" who think they are getting away with something!

. . . Rather than add to the list, I say let's do something about eliminating these guys entirely! After a fair warning has been issued, the next stage should be license suspension for at least 3 months. Sure, I know, there aren't enough FCC monitors to go around to nab all, but what is stopping you from letting the guy know? To my way of thinking, an OO should be drafted just like an auxiliary policeman and his findings should be forwarded to the FCC.

— Louis A. Gerbert, W8NOH

Spotswood
New Jersey

Editor, *QST*:

. . . I have been reluctant to send any letters to *QST* that were not of a constructive nature for fear of being labeled a complainer, but I share your dislike for High Power Harry, Squatter Squagg, Moneybags Mike, Helpful Hal, etc. You overlooked dozens more such as the youngsters who feel compelled to say "I am only 8 years old"; "— only 15 years old." What's with this age routine? Do they expect a medal, or perhaps a multiplier in a contest? Then we have the ham who yells "Hello Test — 1-2-3-4." I suppose there are many things to tune up on a 2-meter Gonset!

But ham radio is still a great game, despite the characters.

— Phil Spillane, W2IZY

3121 Lee Street
Dallas 5, Texas

Editor, *QST*:

Your editorial in December *QST* is well put. However, you refer to the rogues as comprising "only one or two percent of the ham population." This seems to be a matter of grave concern. If the scoundrels are in such strong percentage, our very hobby and fraternity is in danger. Now I will acknowledge in gentlemanly fashion that there are a few of the "slightly" out-of-bounds fellows who are real nice chaps, but that is another story for another rainy day. My contention is that the percentages tell of trouble to come.

In this highly-organized social order of ours, we are enjoying the best prosperity our fraternity has ever known. More hams, more rigs, more fine signals, more nets, more emer-

(Continued on page 148)



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, WIDGL, Ass't. Comm. Mgr., C. W.

ROBERT L. WHITE, WIWPO, DXCC Awards
LILLIAN M. SALTER, WIZJE, Administrative Aide
ELLEN WHITE, WIYYM, Ass't. Comm. Mgr., Phone

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Amateur Operator License Suspended for Exceeding One Kw. and Hindering Station Inspection. FCC's Public Notice, Report 609, states the action by the Commission suspending the operator license of Homer H. Biedebach (W6GFE) Pasadena, California "for equipment and operation violation of the amateur rules and Communications Act."

FCC ordered (Oct. 22, 1959) that the Advanced Class Amateur Radio Operator License (W6GFE) of Homer H. Biedebach, Pasadena, California, BE SUSPENDED for six months under the authority contained in Sec. 303 (m) (1) (A) of the Communications Act, *it appearing that the licensee on Feb. 22, 1958, operated W6BXL with power input in excess of one kilowatt, in willful violation of Sec. 12.131 of part 12 of FCC Rules; and it further appearing that said licensee . . . changed the controls of this station to reduce the grid drive, under circumstances such as to impede and interfere with an inspection of W6BXL by FCC, in willful violation of Sec. 303 (n) of the Communications Act.* This six month suspension was effective from November 18, 1959.

DX Contest Again Marked by License Suspension by FCC for Super Power. In April *QST* these very columns cited FCC's Operator License suspension of a contestant for his violation of the FCC power limits during the 1958 ARRL DX Competition. We're sorry, for the reputation of amateurs in general, that these things happen. It also now appears that the '59 contest will net us more violations. Here is the news from the FCC on the most recent suspension for excess power. May all and sundry live *within* the legal power limits this year. Unsporting contestants invariably win the poor opinion of fellow amateurs. Power extroverts may, as usual, expect surveillance and action by FCC.

The Commission on Sept. 30, 1959, after review of the examiner's findings and the significant facts, took action to affirm its suspension for six months, beginning Oct. 15, 1959 of the Advanced Class Amateur Operator License (W6BXL) of Charles A. Bailey, Jr., of Los Angeles, Calif., for his violation of the FCC rules. The record of a fact-finding hearing held in Los Angeles in the fall of 1958 on the W6BXL matter was reopened in January 1959 to receive additional data from this licensee, including a letter from W6GFE to

FCC, and further proposed findings of fact and conclusions of law for consideration. A 15-page FCC report summarizes the extensive testimony pertinent to Docket No. 12552.

The hearing had been granted by FCC (1) to determine whether licensee committed the violation set forth in the Order of Suspension; and (2) to determine if the facts or circumstances would warrant any change in FCC's Order. The following information is briefed from FCC's report released on the case. On Feb. 22, 1958, during the annual DX Test period, three FCC engineers of its inspection staff, traveling in two radio-equipped cars, and with portable transmitter-receiver equipment to facilitate communication between all three, made an inspection of several amateur stations in the Los Angeles area. One Engineer parked at a point where he could observe the position of the rotary beam and after initial monitoring of the transmissions, compared subsequent field strength readings, while in this case the other Engineers visited and inspected W6BXL. It was requested on visiting the station that test transmissions be made without disturbing any adjustments on the transmitter. Voltage and current to the final amplifier were carefully measured by FCC, followed by further transmitting tests with the power supply in a 'low' and then a 'high' position. On the first test it was found that the S meter used as a point of reference had not returned to the initially observed readings . . . falling short perhaps by as much as 10 to 12 db. The power input and grid drive were noted and recorded in a number of tests. FCC later had its instruments independently checked by UCLA. This gave an indicated low and high power for W6BXL as 504 and 1444 watts. Neither W6BXL, nor Mr. Biedebach, W6GFE, who had been operating at the time of the FCC inspection, satisfactorily explained the observed excess power and indicated field strength to the FCC Engineers.

W6BXL indicated that he had tuned his transmitter to 950 watts input power on the morning of Feb. 22, the value being chosen to permit about 300 kc. frequency change and still keep in the power limits without retuning the 28 Mc. final. The low grid excitation noted on first review of the station adjustments gave rise to continued questions in the testimony. The interpretation to be placed on this became evident, however, after a notarized letter addressed to FCC by W6GFE was received in evidence. This made it clear that (1) he (W6GFE) did reduce the grid drive to the final amplifier causing it to lose efficiency as well as decrease plate milliamperes; and (2) that he did not at any time touch the high-low switch referred to in the proceedings.

The FCC account includes some fifteen numbered conclusions relative to the Docket as well as giving more details of the testimony than our space here permits. Three of the applicable statements afford the best summary:

(1) That the evidence of record establishes a prima-facie case . . . that W6BXL was being operated with power in excess of 1000 watts in violation of Sec. 12.131.

(12) That the controls were changed or tampered with between the time the members of the FCC inspection team first presented themselves at W6BXL, and the time the test transmissions were sent and that this was done for the purpose of interfering with the proper inspection of W6BXL.

(15) That no fact was presented in the proceeding which would warrant a reduction of the period of time of suspension of this Advanced Class Amateur Radio Operator license.

... Mr. Bailey must accept full responsibility for the conduct of the man who was operating his station with his consent. The record establishes that a clever bit of chicanery was attempted by Mr. Biedebach without the prior knowledge and consent of Mr. Bailey. If this chicanery had been carried on by the licensee of the station, or with his prior knowledge or consent, such conduct would have warranted the most severe sanctions which can be imposed by the Commission."

Hints for Novice C.W. Operation. The Etna Radio Club's "Oscillator" recently tabulated a condensed list of useful radio operational points in its bulletin. It has been some time since we had a concise check list along this line for presentation. In order to improve results for the newcomer and encourage each new ham to operate with confidence, we pass along the following data condensed from this source and dedicated to helping put your best foot forward in meeting other amateurs on the air:

1. Do not send faster than you can receive.
2. Look over the band *before* you call CQ; if you hear someone near your frequency, call him. This will help to cut down QRM.
3. If you call CQ, do not make this a *long* call. (After three or four CQs and a couple of identifying signs, *listen*. Repeat this procedure if you get no answer.) If you get an answer, go right into your QSO after a two-by-two call. (Your man *knows* those call letters, or he would not have called you.)
4. Until you can use a bug properly, do not put it on the air. (For keying practice use a local oscillator; do not louse up the band.)
5. Use *established* abbreviations, not your own.
6. Omit foolish signing with the shave and a hair cut, six bits routine; such only marks you as a first class lid, as well as a beginner.
7. If you hear "CQ Vermont" and are in any other state, you have no business answering; if your state was wanted it would have been called.
8. If a QSO is turned back to you and has not been copied solid, do *not* send "R"; to do this and ask for a repeat makes you look foolish.
9. Novices are *not* allowed to use v.f.o. FCC cites for violations and even makes license suspensions for ignoring its Rules; don't take a chance.
10. Avoid giving the other fellow a signal report until after you see how the signal holds up; answers to a CQ may rate 599, but then drop to 359 due to interference or fading.
11. *Make sure* you crystal matches the band you are going to work when changing bands; if not, you may be *out* of the part of the band you are allowed to operate in, and invite a citation from FCC.

Volusia County (Fla.) Civil Defense put on a display and field test of communications equipment at the Daytona International Speedway in November. W4IEU is shown here at one of the four operating positions set up in tents; all positions used emergency power.

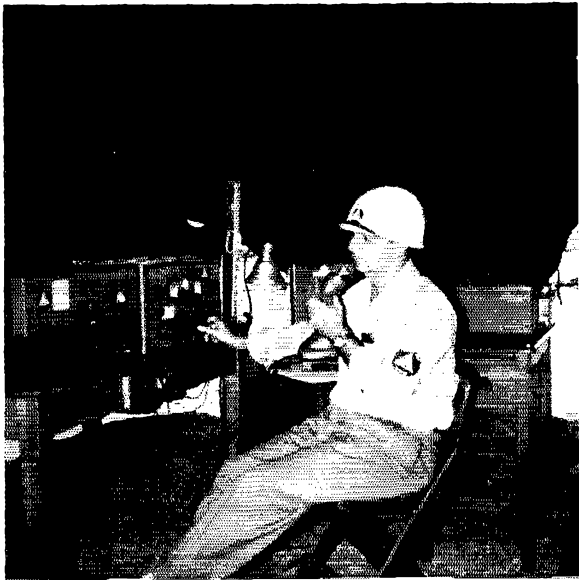
12. Investigate, eliminate and reduce harmonics! Get a local to listen on a general coverage receiver for any possible harmonic of your crystal frequencies, or for radiation on the lower frequency, if you double etc. (*Only* when satisfied that antenna couplers or other technical means have reduced such improper radiation to insignificant values should you go on the air.)

In addition to the above pointers we suggest that each newcomer review the procedures for the Novice which have been presented in two articles by W6DTY. His practical advice is well worth your study and emulation. The reprints of "Your Novice Accent" (Nov. '56 *QST*) are available on request from ARRL. Also see the useful and generally used abbreviations listed in his "Hpe CU Agn on C.W., OBI!" (August '59 *QST*).

Novice Round-Up, DX Test and FMT. As you receive this issue of *QST* the annual 15-day station test especially for *all Novice operators* will just be starting. CQ NR is the general call. Just start a list of the QSOs-with-Novices *Jan. 31-Feb. 15* inclusive. Use page 6 of *QST* to check off ARRL sections as you work them. Mark or number each station in the worked list representing such a new section worked. Send in a worked list in the form the full *QST* announcement gives. Only Novices are eligible for certificates, although it is a get-acquainted party for everybody. It is surprising how many Novices can be worked, even adding just a few a day. Try it!

ARRL's *26th DX Competition* which opens Feb. 5-7 (phone) and Feb. 19-21 (c.w.) is aimed at providing both a complete short term contest for section leadership and a chance to look for additional countries for your DXCC list either for those building to the 100-level for the first time, or wishing to add a few for the next 10-level endorsement sticker. See the full announcement in *last month's QST*. A few operational hints for stateside stations: (1) Use *short* calls interspersed with listening periods for best results. (2) Use the abbreviation for your state or province that was given in the announcement to minimize need for any repeats. (3) Follow closely any DX-given suggestions for working *up ten*, or *down seven*, etc. kcs.

One of the periodic FREQUENCY MEASURING TESTS is announced elsewhere in these columns.



One purpose is to help all amateurs check up on their personal ability and degree of precision in knowing their own and others' frequencies, under practical operational conditions. Four to six weeks after each run, when the extensive computations have been completed, we send individual reports on the results. A second purpose in FMTs is to permit those Official Observers holding SCM-appointments in frequency-measuring categories to complete one of the two-required-per-year qualification-holding checkups of measurement capability.

How and When to Abbreviate. *Operating an Amateur Radio Station* lists over one hundred of the more common abbreviations used by amateurs in c.w. work. But for accuracy words are best spelled out, even in operator conversations. There is no hard and fast rule possible in determining whether a word should be abbreviated. Our practices evolve from experience and each operator must think for himself.

Most abbreviations of words are not arbitrarily set up but bear resemblance to the parent expression. Common ways to abbreviate are (1) to use first and last letters only, such as "wd" for would or "nw" for now; (2) to use consonants only, as "ltr" for letter or "recd" for received; (3) phonetic spelling constitutes a third method, as "nite" for night, or "gud" for good; (4) one additional method is to use the first letter of a word and substitute "x" for all the other letters as "wx" for weather.

We must caution every amateur *not* to abbreviate unnecessarily when working a new operator or one of uncertain experience. It is improper to abbreviate words in the text of regular messages. Some customary abbreviations, GBA for give better address, UNDL for undelivered and the like, have a place in service messages. But as for others, we should bear in mind that those who receive messages are not all experts at abbreviating. No fad for shortening words even in conversations should take the place of clarity which makes for rapid and good contacts. *In a message* one should use concise well chosen words and spell them out, since this avoids waste of time and untangling garbles or unnecessarily requesting repeats. In summary, abbreviations serve an excellent purpose to make radio rag-chews by c.w. snappy; as a rule they have no place in radiograms, except in service messages. Our booklet list of abbreviations should help Novices. However, spelled out words, and sentences using the *fewest* words to get your thought across are a "must" in radiograms and will often prove best to make radio conversation through QRM. For systematic abbreviation when required, use the four principles here explained, and our listed miscellaneous abbreviations from *Operating an Amateur Radio Station*.

Our Novice Helps. All newcomers who are starting to memorize code and prepare for the Novice exam are cordially invited to ask ARRL for our (1) W1AW transmission schedule, including times of code-practice and (2) The

Reference Guide, a tabulation of references, information on the availability of code records, including the phonetic-list of code characters.

Radio clubs that have groups under instruction should indicate to us with their requests the number of local prospective amateurs to whom they would like to distribute such information, so that we can send several copies at a time to the club, for distribution.

For most students the best reward on "graduation" is to acquire the FCC ticket itself. We do have a club-award type certificate for club code proficiency certifications. This is adaptable to code-receiving or code-transmitting (hamfests), contests or club programs for newcomers. Somewhat like the ARRL Headquarters code proficiency certifications based on submitting W1AW or W6OWP copy, these are entirely for local administration with certificate language adaptable to the kind of test the club supervises. ARRL's only requirement is that any club using the certificates make a form report to ARRL representing the issue of such a club certification. (A specimen of such certificate form will be sent on request to clubs contemplating hamfest or special sending or receiving code-contests.)

To Put CP-Standing on Your QSLs. We find it interesting, as station QSL cards are received to note if the fellow we have worked is RCC, what ARRL Appointments he holds, his WAS or DXCC standing and CP, if indicated. More frequently of late we note that cards carry the Code Proficiency rating of the sender. To have essential data to prove awards ("QSL Cards" Oct. '50 QST, page 21) is important. But the operator and fraternal notes are also interesting and important to us.

A wider practice of amateurs putting their CP-rating on the QSL enables the operator to have proper credit for his progress. The item can be printed on with a figure or as CP—, so as one works to higher brackets the figure can be shown. What better way to inspire progress by others, too. Bill, W1SAD puts his awards and Appointments down alphabetically, including CP, but others set it off by itself. Walt Downes, W3UVD commenting on operating, also urges this point:

"Would like to suggest for those who like to send fast, or on a bug, to make sure their spacing and timing is correct. Clipping dashes or running characters together makes copy difficult. The ARRL CP program is of great aid to those who follow through. After winning the certification, one should have his QSLs show this CP35 to show that the operator is tops in this CP field. At any point above one's minimum license requirement, he should have pride and indicate his certification on his QSLs." — F. E. H.

BRIEF

We have just received a copy of OQDM's latest revision of their Advisory Bulletin 122. This bulletin contains the complete RACES regulations and a RACES Communications Plan Check List to assist in making application for RACES authorizations. We recommend it as "must" reading for all amateur groups contemplating RACES organization. It is available from your state e.d. office. Be sure you get the revision of Oct. 1, 1959; the revision of Apr. 16, 1957, has been rescinded and superseded.



Contact with the general public is a very important part of AREC organization. From time to time we receive requests for publicity material on the AREC and the general subject of amateur emergency communications to be presented to a lay audience, for presentation on radio, television, newspapers or before fraternal or civic groups such as Rotary, Lions, Kiwanis and the like.

At the present time, our Public Relations Department has no material designed for this specific purpose. We do have a sample speech and radio talk on the general subject of amateur radio which of course makes mention of the amateur's emergency communications potential, and if requests for something specific on emergency work continue to be received, no doubt something along this line will be prepared. Most of our material on emergency communication at present is slanted to amateur consumption and is not particularly useful before non-amateurs.

The best kind of public presentation, however, is one with a very strong local slant, and that is something we cannot help you with. Most of the people you are talking to are interested only incidentally in the national picture; but when it comes to the details of the amateur setup right in their home town, they sit up and listen. This is something close to home, something that concerns them individually as well as collectively. *This* is what they want to listen to.

Obviously, the person to make such a presentation is one who knows both the local and the overall situation from A to Z and who can skillfully tie in one with the other. As an example in point, we have just received a copy of a talk presented by WØRRN, South Dakota SCM, before a civic group on this subject—a talk we felt was very well done because it put emphasis on the local and statewide situation, where the emphasis belongs. Tony started out with an introduction of himself, then briefly covered the situation at state level. After that, he dwelt almost exclusively with the local level, relating incidents, giving examples, mentioning names with which his audience was bound to be familiar, outlining troubles without indulging in any petulant griping, and winding up with some general information on amateur capabilities—this latter a skillful combination of both our potentialities and limitations, without over-emphasis on either. Having thus aroused the interest of the audience, he invited questions, and got them, rounding out what was undoubtedly a most informative evening for all.

You couldn't use Tony's talk, unless you are speaking in Sioux Falls. Neither could anyone else. Each such talk is a local proposition, and the best way to devise it is to get our sample speech, study and modify it for introductory methods and wording, then amplify the emergency communications section of it in terms of your local situation, plus material from our *Emergency Communications Manual*, the Operating Booklet and this column *reworded so that it can be understood by anyone*. If you throw in a lot of amateur terminology without explanation, the snores of your audience will soon drown out the sound of your voice. Talk clearly and distinctly. Don't mumble. Tell of some amusing incidents that have happened. Look at your audience; it's always a good idea to pick out an individual in the back of the room, near the center, and talk directly to him. Always find someone who looks interested and sympathetic and tell him your story just as you would if you two were in the room alone. Unless you are a practiced and experienced speech-reader, don't read your talk; have some notes of the subjects you want to cover, so you don't forget anything.

The most important part of any talk is its preparation. This is particularly critical for a person who doesn't do much public speaking. You might feel silly doing it, but it helps a great deal to practice aloud beforehand. If possible, put yourself on tape, then play it back for self criticism; but don't be too hard on yourself. In most cases, you'll be your own worst critic.

Yes, public relations is important, and none of us should pass up an opportunity to "sell" amateur services in public, if such opportunity arises. You don't have to be an experienced speaker; all you need to know is your subject thoroughly and to be sincere.

A.R.R.L. ACTIVITIES CALENDAR

Feb. 3: CP Qualifying Run — W6OWP
 Feb. 5-7: DX Competition (phone)
 Feb. 9: Frequency Measuring Test
 Feb. 15: CP Qualifying Run — W1AW
 Feb. 19-21: DX Competition (c.w.)
 Mar. 3: CP Qualifying Run — W6OWP
 Mar. 4-6: DX Competition (phone)
 Mar. 15: CP Qualifying Run — W1AW
 Mar. 18-20: DX Competition (c.w.)
 Apr. 6: CP Qualifying Run — W6OWP
 Apr. 9-10: CD Party (c.w.)
 Apr. 16-17: CD Party (phone)
 Apr. 20: CP Qualifying Run — W1AW
 May 5: CP Qualifying Run — W6OWP
 May 19: CP Qualifying Run — W1AW
 June 1: CP Qualifying Run — W6OWP
 June 11-12: V.H.F. QSO Party
 June 17: CP Qualifying Run — W1AW
 June 25-26: Field Day

OTHER ACTIVITIES

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

Jan. 30-31: VE1 Contest, New Brunswick Amateur Radio Assn. (p. 146, last month.)

Feb. 12-14: Anniversary RTTY Contest, RTTY Society of Southern Illinois (p. 88, this issue).

Feb. 27-28: The French Contest (c.w.), REF (p. 76).

Feb. 27-28: YL-OM Phone Contest, YLRL (p. 68, this issue).

Mar. 12-13: YL-OM C.W. Contest, YLRL (p. 68, this issue).

Apr. 9-10: The French Contest (phone), REF (p. 76).

Apr. 23-24: New Hampshire QSO Party (future issue).

May 7-8: Russian DX Contest, Central Radio Club (future issue).

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 The McHenry County (Ill.) AREC group dispensed with the SET because of a real live workout on Oct. 8 when a tornado roared through McHenry, Ill. All telephones being out of commission, mobile units were stationed at various strategic locations while others operated at key points throughout the city. Most of the amateurs who participated were members of the Southern Wisconsin and Northern Illinois (SWANI) Radio Club, under EC W9KMN. Within half an hour of the first call, amateurs were converging on McHenry from all over the area. W7FQZ in Tucson, Ariz., kept the net frequency clear. Amateurs participating: 49s HEJ OBY KXH SBD NZ YUN TPA DUB, K9s DZF CCO ESQ HOL QCY.

— — — — —
 Upon the arrival of very violent wind and thunder storms on May 10, 1959, the Hawkeye Emergency Net, covering Polk County, Iowa, was called into action by Asst. EC KØCLS on 29,600 kc. Many telephone and power lines were knocked out by the storm, but the net functioned successfully from 1530 until the storm cleared at 1730. Weather reports were transmitted by the 15 stations in the net and broadcast over radio station KSO in Des Moines. KØCLS acted as NCS and the following stations participated in the storm reporting: KØs KGR/mobile, MIDZ/mobile, PCG, GXP, LUX, LVJ, RIIS, PSW, QCL, MTB, OZE, LUP; W7s NXD and ZZM.

— — — — —
 A tornado hit Monmouth, Ill., at 1645 on Sept. 26, 1959. The Warren County RACES Net went into action on 50,550 kc. By 1830 a number of mobiles had worked into the damaged area and liaison was established with all organizations needing communications. Communications outside the area were handled by K9TNX on emergency power. Operators came from all over the area, including some from Iowa, to assist. The following deserve special mention:

K0s BDC DZH JIT, W9s DUC NBF OJK SYF SXI.—
W90JK.

Torrential rains throughout Oklahoma the latter part of September and early October caused considerable flood damage in a number of places, resulting in much AREC activity. The largest of the floods was in the Tulsa area where the Arkansas River went considerably above flood stage, and on Oct. 2 local c.d. authorities asked for mobile and fixed amateur stations for relaying hourly river readings from north of Tulsa to the U. S. River Forecast Service in the city. W5OPQ was designated as the fixed station and K5KUX/mobile was sent to the Bird Creek Station but was unable to reach it because of high water; so he took to a boat with a 2-meter Communicator and small AC generator and made his reports from Bird Creek all day Oct. 3 and 4. W5QPJ was set up at c.d. headquarters and maintained contact with mobile W58 DFQ NS and K58 DVF-DVE stationed along the river west of the Sand Springs area. K5OOV furnished information from the Bixby area. By the morning of October 4, a major flood appeared to be in progress. K5HDO/mobile was dispatched to handle communications for the Corps of Engineers' officer put in charge. Other mobiles were dispatched to sand dumps, the levees, bases of operations, and other strategic communications locations. Amateur radio handled practically all communications, including that conducted for the Corps of Engineers, the Salvation Army, Red Cross, Auxiliary Police, Highway Police and city police until Oct. 6, after the river had crested and began slowly to recede. Among those active in this extensive operation were K5KTW, EC for Tulsa County; W5NDE, radio officer; W5JJR, emergency chairman of the Oil Capital Mobile Club, and W5ZBI, club president. All civic and other groups served expressed their greatest appreciation for the efficient communications services performed by the amateurs. All who took part deserve the greatest praise, and SCM W5DRZ hopes nobody has been left out of the following list of notables (asterisks for those who were active for more than 24 hours in this operation): K58 DVF GQX* EGR EUQ GLZ GSD HDO* KTW* QVR* IRD IWK* KUX* LRU* IYS JYT KOJ JCM JZV OIC JOC KGP OUV, W58 DCE* DFQ* EMF FWV* IWL* JJR* JNG* KY* NS NDF* OOM OPQ* QNP TVG* ZBD ZBL* UCII VDN* ZBI* OOF.

In early December an extremely heavy downpour of rain which continued for several days caused sixteen slides on the transisthmian highway in the Panama Canal Zone, causing a wreck on the Panama railroad and interrupting communications beyond that point. The level of Gatun Lake rose dangerously, disrupting traffic through the canal. In order to keep a close check on the lake level, lacking regular communications facilities, the c.d. communications service was pressed into action. KZ5KJ and KZ5RV set up the system at Balboa Heights while KZ5CD and KZ5BG manned the station at Coco Solo, transmitting reports every 15 minutes on 40 meters. The network was kept in operation for seven hours, the first time the c.d. system was used for other than test purposes.

The annual parade of Old Spanish Days Fiesta on Aug. 13, 1959, was coordinated again this year by the Santa Barbara Area (Calif.) AREC. Sixteen stations on ten and two meters were on the air along the parade route and in the formation area. In addition to coordinating the movement of the 228 equestrian and vehicular entries on the parade, the net dispatched an ambulance to aid a lady thrown from her horse and assisted the police with a lost child.—K6DXW, EC Santa Barbara, Calif.

The Cuyahoga County (Ohio) AREC undertook a major traffic control project and a golf tournament project in one package on Aug. 8-9, 1959. A total of 46 individual amateurs operating 27 mobiles, three portables, and six hand-carried units participated. Ten meters was used to control traffic in cooperation with the State Police, two local police departments, park police, c.d. auxiliary police, parking attendants and other officials. Six meters was used on the golf course for transmitting scoreboard information and special information to the gallery at the 18th hole. On the final day, 639 scores were handled for two scoreboards from 71 different players — with no errors! EC W8AEU includes a list of 13 incidents that were handled by the AREC during the tournament,

and we're sorry we can't detail them here because they show just how busy these boys were and how much was accomplished by them. Police calls, relief calls, food and water calls, reports of traffic jams, accidents, lost children, lost cars, stalled and mired cars, traffic flow, weather and a host of other details were all handled by the group in stride and with the highest efficiency. Another exemplary job by the highly active Cuyahoga County AREC group.

Four amateur radio clubs combined facilities to supply communications assistance for a big parade in Titusville, Pa., celebrating the 100th anniversary of the first oil-well drilling. The parade took place on Aug. 29, 1959. The Radio Amateurs of Corry, the Warren County Emergency Radio Assn., the Fort Venango Mike and Key Club, and the Crawford County Amateur Radio Assn. mobilized 21 operators for the project. A fixed unit (W3LKC) was set up on the front steps of the high school for control. Other units were established at spectator parking lots and assembly points. W3ETG operated another unit in the lead vehicle, W3FMY and W3VXV ran a fixed station at Red Cross headquarters, and a mobile unit was stationed with each ambulance and each Red Cross unit. W3AGD was net control station for six hours of practically continuous operation. One of the circuits that reduced a great deal of confusion was to a mobile unit at the assembly point for marching units coming from out of town, enabling them to be routed promptly and accurately. Two of the amateur mobile units also carried p.a. systems.—W3UDG.

Members of the Amateur Radio Caravan Club of New Mexico and other amateurs assisted New Mexico State Police on highway patrol during the Labor Day week end, Sept. 5-8-7, 1959. Mobiles performed both still and roving duties, each carrying a member of the sheriff's auxiliary. Major roads north, east, south, and west of Albuquerque were covered. Reports of serious violations were radioed ahead to road block sites and to stations working mobile liaison with state cars. Seven fixed station operators provided 130 man-hours of operation and 18 mobiles totaled 266 man hours. Perfect harmony existed among the state police, the sheriff's department and the amateur mobile group.—K6GOJ.

Amateurs assisted with communications during the Jim Long Memorial Trophy Air Race on Sept. 5, 1959 by setting up communications between La Verne and El Centro, Calif., and Phoenix, Ariz. Vital information was handled regarding pilots and planes, making it possible to keep accurate tabs on all individuals connected with the race. In one instance, the link assisted in finding a lost aircraft which was overdue for nearly six hours. The network, consisting of thirteen amateurs, was set up by the Tri-County Amateur Radio Assn. of Pomona, Calif. K6DQA, our reporter, says that the cooperation of casual amateurs on the 7293 operating frequency was superb.

During the week end of Sept. 11-12, 1959, the Fairfax County (Va.) AREC group staged its first fall activity. Three 6-meter stations were set up in downtown Vienna and a NCS was established about two miles from town. Each portable station originated messages for transmission to the net control station, about 100 each. Thirteen operators took part.

Twenty-one SECs reported October activities in behalf of 9035 AREC members. This is a considerable drop from last month as well as a decrease in number of reports from the same month last year (but an increase in number of AREC members represented). Two new sections, Maine and Northern New Jersey, appear in the 1959 "reported" list, making a total of 42 sections heard from last year up to and including October. The following other sections reported for October: S. Texas, NYC-LI, W. N. Y., Minn., Wash., Mich., Kans., Wyo., N. Mex., Nevada, Colo., Ala., W. Mass., E. Fla., E. Pa., Santa Clara Valley, E. Bay, San Joaquin Valley, W. Va., Ore., S. Dak., Okla., Wis., Ont.

The following sections have not been heard from so far in 1959: S. N. J., W. Pa., Ill., Ark., La., Miss., Ky., Ohio, E. N. Y., Iowa, Conn., E. Mass., N. H., Alaska, Idaho, Hawaii, San Francisco, Sacramento Valley, S. C., Va., W. Fla., West Indies, C. Z., Los Angeles, Ariz., San Diego, Que., Alta., Manitoba, Sask. *Hv, OMS!*

RACES News

On Sept. 8, 1959, the Iowa state radio officer was asked to set up some RACES communications facilities to assist in getting news through from remote locations as Soviet Premier Khrushchev and his party moved through the Coon Rapids area of Iowa. The required facilities were provided using three fixed stations and three mobiles, after all personnel had been cleared by State Department officials. News, available to all press agencies, flowed solid for three and a half hours, everything working 100%.

Amateurs did the operating and signing, but reporters spoke directly to reporters, relieving the amateur operators from the responsibility for making errors.

On Sept. 28, 1959, Burlington County (N. J.) radio officer W2WKI was requested to set up operations at the county control station and sent the mobile control center to Mt. Gretna, about twenty miles away. Purpose: supply communications for operations concerned with the extermination of mosquitoes suspected of bearing sleeping-sickness virus. The RACES radio link to the county control center was to maintain contact with fire apparatus being used.

Within four hours of the initial alert, 22 amateurs and 3 RACES operators were in action. While ten men were on their way to New Gretna in the mobile control center carrying 2- and 6-meter equipment and a 35-k.v.a. generator, K2YEL set up a 24-hour schedule of operators for NCS duty. After several fruitless attempts to establish communication on 2 meters, a 6-meter beam was raised on the

collapsible 70-foot tower and contact was established. Heavy rains curtailed extensive operation of mosquito-fighting procedures and operator personnel returned home to remain on standby. — W2WKI.

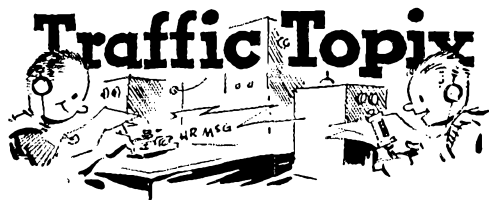
Norfolk County (Va.) Radio Officer W4SVG reports that 22 amateurs participated in a surprise c.d. alert at 1830 EST on Dec. 7. The communications center was completely activated and operational within 20 minutes after the alert was called — pretty fast work!

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.v. — 3535, 7050, 14,060; phone — 3765, 14,160, 28,250 kc.



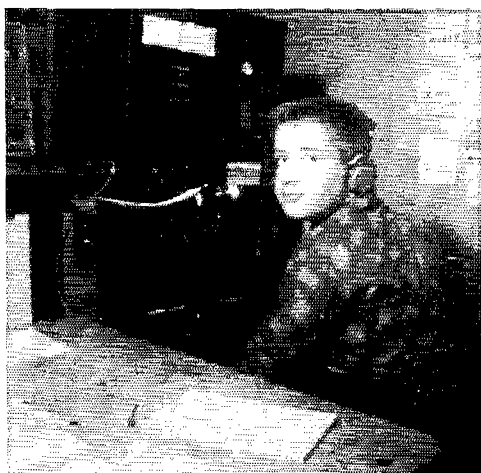
As we write this, we are in the middle of the Christmas traffic rush. This year, with a special project in mind, we have been doing quite a bit of listening to phone and c.w. traffic nets. Perhaps we are over-critical, but we find many things wrong with the way traffic is being handled. More things wrong, in fact, than right. At any rate, vast improvements are possible in our traffic-handling practices.

This column has, in the past, examined a great many of these faults and set down ways in which they might be corrected. That's one of the troubles — too much of this has been in the past. Newer traffic men haven't read it, and many of the older traffic men have chosen to ignore it. We don't want to keep on repeating the same old lines in this column and in our bulletins; yet if we simply give references to past editorializing on traffic subjects, this is far less effective than repetition because the references, even if available, will not be looked up. So we have cast about for a better way of keeping traffic-handling principles before the traffic-handling fraternity.

As most of you know, the League sponsors a Training Aids Program which carries a listing of visual and other aids designed principally to assist affiliated clubs in their meeting programs while at the same time enabling them to be educational in one way or another. These aids are limited and the demand for them greatly exceeds the present supply, so this is not necessarily a plug; it is simply a preamble, a foreword if you will, to another "great idea." Why can't we set up a number of tape recordings illustrating good and bad points about traffic handling and net procedures and make them available to clubs through our Training Aids Program? With this possibility in mind, we have been doing considerable listening, tape recorder poised. Some of you fellows in the traffic nets have been taped. You never know, now, when something you say or do on a traffic net may be thrown back at you in the form of a tape as a horrible example of traffic handling or network procedure.

So far, the proposed program is embryonic. Generally speaking, tapes are not yet available (not at this writing, anyway) for distribution, so don't start asking for them.

One thing we have done, as an experiment, is to record three levels of NTS nets on tape just as they came over the air. Sessions of the New Jersey Net, First Region Net and Eastern Area Net were so recorded. These were played back through a mixer and re-recorded, with a microphone included in the circuit for vocal comments as we went along. The nets were strictly at random and did not know they were being taped, and they were far from exemplary. This was what we wanted, because we wanted to comment on both good and bad parts of the procedure, which we did. The result was an hour of NTS net recordings, with vocal comments by yours truly, which are intended to be educational and, although not ideal for the purpose, we think succeed



K1GRP, shown here, exemplifies the capabilities of the younger teen-agers when it comes to traffic handling. Ed is a regular when it comes to making the BPL list.

to some extent in accomplishing this objective. We're trying them out on a few "dogs" now.

Trouble is, we can't get the whole picture through our own receiver. We need recordings of typical nets from all over the country. Our outlook on the matter is not regional, but our receiver doesn't know this, and refuses to receive signals from the far reaches with enough strength for effective recording. We need some help from you fellows in the field — especially you fellows who own tape recorders, and especially those situated in the midwest, deep south, southwest and far west where our receiver won't reach. Make recordings of your nets, both phone and c.w., and send them in. We'll review them, re-record any parts we want to use, and return them. Eventually, we may be able to produce a few finished tapes to offer through the Training Aids Program,

depending largely on how much time we are able to devote to the project.

Your comments also will be appreciated. What do you think of the idea? Do you think the prospect of being taped will keep the boys and gals on their toes, or keep them off the nets altogether? Can we be sued for defamation of character if we point to someone as a bad example? Must we offer a Public Service Award to anyone given as a good example? What are some other angles? Let us know your thoughts.

—♦♦♦—

Net Reports. Hudson Traffic Net reports 161 messages cleared in 30 sessions with 176 check-ins. Early Bird Transcon Net handled 765 messages in 30 sessions. Eastern Area Slow Net had 30 sessions, 135 check-ins and handled 41 messages. Eastern States Net reports 29 sessions with total QNT of 318, traffic 410 in thirteen hours and fifteen minutes of operation. The First Call Area of Transcontinental Phone Net conducted 30 sessions and handled 1635 messages. Mike Farad Emergency and Traffic Net reports 21 sessions, 371 messages handled by 343 check-ins. North Texas-Oklahoma Net had 30 sessions, 388 messages, 856 check-ins. These net reports are listed approximately in the order in which received.

—♦♦♦—

You probably all know by now that we have a new South American country with which we can handle third party traffic: Venezuela (YV). That brings the total to 11: Others are Canada (VE), Chile (CE), Costa Rica (CI), Cuba (CM/CO), Ecuador (EC), Liberia (RL), Mexico (XE), Nicaragua (YN), Panama (HP) and Peru (OA). Let's not be handling traffic with other countries by amateur radio.

—♦♦♦—

National Traffic System. Our turnover of managers in NTS is fairly rapid, and this is to be expected. Managing an NTS net is not an easy job. It is demanding both in time and patience. It requires tact, diplomacy, and in most cases more than a modicum of on-the-air activity. So when an NTS manager has hung on for more than a couple of years he deserves some sort of credit.

As we've said before, we don't go in too much for individual honors in NTS; we're a team, and if honors are involved, they are organizational rather than individual. But organizations are led by individuals; individuals who perform not one great, outstanding act meriting a bust or a statue in a museum, but who perform constantly, year in and year out, doing what they know best how to do and most enjoy doing, without giving any thought to how wonderful they are. If we must have individual heroes, NTS can supply more than its share of these from among its organizers and leaders. But these are not heroes in the traditional sense. They are just workhorses, for the most part unsensational, unspetacular, and largely for that reason unsung, if not unknown.

Our experience indicates that often the leaders at one end of the country don't know who those at the other end are. In an organization in which the efforts of all determine the success of the efforts of each, this is terrible. We don't particularly want to heap honors on any one person, but we'd like at least to have each of you know what the others look like and what their snacks look like.

So how about a few snapshots of your NTS traffic men to run in this column? We like best snaps of amateurs at their operating positions operating, looking as though they are intent on it. We can't guarantee to accept all photos; we have to leave ourselves some editorial prerogatives. But let's have some pictures of the NTS gang, eh? November reports:

Net	Sessions	Traffic	Rate	Average	Representation (%)
6AN	29	1203	.774	41.5	96.5
CAN	30	1266	.828	34.9	100.0
IRN	60	837	.404	13.9	69.3
2RN	60	475	.393	7.9	93.0
3RN	60	584	.374	9.7	94.4
4RN	56	780	.383	13.9	73.4
RN5	60	1362	.820	22.8	95.7
RN6	57	1210	.442	21.2	92.3
RN7	59	711	.278	12.1	54.0
SRN	57	358	.211	6.3	93.6
9RN	52	1280	.734	24.6	75.5
TEN	60	962	.663	16.0	79.7
ECN	19	74	.173	3.8	84.2

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for November Traffic:

Call	Qrta.	Recd.	Rel.	Vel.	Total
W3CUL	306	3312	2501	692	6811
K2UTV	457	1874	1734	137	4202
W2KIB	423	1683	1204	724	4034
W0LGG	379	722	700	37	1838
W0LCX	52	781	701	80	1614
W0SCA	28	757	745	3	1533
W0DYG	53	724	679	36	1472
W0BDR	139	712	582	27	1460
W07BA	17	696	687	9	1409
K1BCS	17	504	434	58	1153
W6GYH	108	530	460	9	1107
W8LPH	10	530	475	51	1066
K5WSP	50	464	464	50	1028
W9PTT	18	471	228	229	946
W6GOY	221	142	343	82	838
W9NZZ	237	320	1	317	875
K6BPI	31	418	365	53	867
W4PL	11	198	324	20	853
W3IV8	107	371	343	23	844
K4QFS	231	295	294	1	821
K4OLG	197	134	134	134	808
K1MMQ	216	310	274	7	807
W9IDA	8	407	388	4	807
W1PEX	16	400	384	6	806
W6EOT	17	360	361	12	780
W18MB	63	344	316	25	738
W6WFP	3	361	359	22	725
W9DO	335	21	26	330	712
K2S8X	74	220	279	22	695
W7BDU	2	347	338	6	693
W0BHI	7	537	329	8	681
W3VR	61	297	290	7	655
K1GRP	66	277	250	77	638
K1FDP	66	248	286	28	628
K9AIR	158	146	298	16	618
W7DZX	7	308	273	22	610
K9DAC	24	285	277	8	594
K48JL	100	254	209	16	579
W1YBH	10	298	41	225	574
W9ZYK	23	261	212	70	566
W9DGA	430	69	7	54	560
W7ZB	10	273	241	24	548
W0KQD	103	236	206	3	548
W9MM	47	247	241	6	541
W8NUL	7	256	243	6	512
K4URR	107	214	155	32	508
W98AA	60	230	203	15	508
K0KBD	29	265	200	10	504
W1EAG	6	256	211	29	502
Late Reports:					
K9AIR (Oct.)	6	769	676	62	1513
W4PL (Oct.)	15	634	439	9	1097
W9ZYK (Oct.)	18	330	223	98	669
W1AWA (Oct.)	7	281	270	4	562
W48RK (Oct.)	10	268	261	6	535

More-Than-One-Operator Stations

Call	Qrta.	Recd.	Rel.	Vel.	Total
W6YDK	769	353	303	50	1475
W6IAB	182	278	277	21	758
W0PT8	83	260	179	31	553

BPL for 100 or more originations-plus-activities:

W48RI	386	K9L7J	143	W3TN	108
K3WBL	141	W4BFO	140	W3IHN	104
K5RYS	206	K7BKH	137	W0KJZ	104
K4CNY	194	W7AVN/5	136	VE2WT	104
K6GMU/6	168	K3DFK	135	W2RUF	101
K9PLF	158	W8DAE	127	W52HN	100
K4VCO	156	W3KUN	119	Late Report:	
K4OED	153	K1H8	117	K5EYS	163
W6USY	145	W4QDY	116	(Oct.)	

More-Than-One-Operator Stations

K4WCZ	148	K0FDX	115	W1AW	101
		W5AC	114		

BPL medallions (see Aug. 1954 QST, p. 64) have been awarded to the following amateurs since last month's listing: K4AVU, K4PIA, W7DZX, VE2WT.

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

TWN.....	30	500	446	16.7	78.0 ¹
Sections ²	1306	10433		8 0	
TCC Eastern.....	45 ³	118			
TCC Pacific.....	109 ³	1383			
Summary.....	1995	23536	CAN	11.0	CAN
Record.....	1573	21396	931	12.6	100.0
Late Reports:					
8RN (Oct.).....	57	301	196	5.3	91.2
TCC East. (Oct.)	54 ³	175			
TCC East. (Sep.)	59 ³	220			

¹ Region net representation based on one session per night. Others are based on two sessions per night.

² Section nets reporting: WSN (Wash.); CN & CPN (Conn.); GSN (Ga.); BUN (Utah); NJN (N. J.); MDDS (Md.-Del.-D. C.); S. Dak. 40 Phone, S. Dak. 75 Phone & S. Dak. CW; NEB (Nebr.); VN, VFN & VSN (Va.); SCN (Calif.); Fla. CW, TPTN, GSSN, FAITN & FPTN (Fla.); Iowa 75 Phone; EMN & FM2N (Mass.); AENT, AEN-O, AENB & AENP (Ala.); TLCN (Iowa); MSPN Noon, MSPN Evening, MSN, MJN & KMG (Minn.); WIN & WSSN (Wis.); QKS (Kans.); QAIN (Mich.); SCN (S. C.); Tenn. CW; MKPN & KYN (Ky.); INN & CEPN (Pa.).

³ TCC functions performed, not counted as net sessions.

The increasing number of section nets reporting their monthly data causes the records to continue to fall. A few section nets have inquired as to the form of their report. These reports can be made on form CD-125, available from ARRL, or just report your number of sessions and traffic total by radio or mail. Only NTS section nets should report direct to ARRL (in addition to your SCM). Others report to the SCM only.

EAN manager W8SCW is taking steps to bolster this very important NTS clearing house. W9DO says it will take time for the boys to get used to not handling Tenn. traffic on CAN. The 8RN second session is working out fine (look at that traffic total) except for the three northern sections, which aren't making the late session very often. All 2RN NCSs had their reports in the hands of the net manager (W2PHX) by the first of the month; K2SSX gets the award as the "most valuable player." Credit for the improvement of WPA on 3RN belongs largely to W3KUN and K3G1LL. W5GY will be the new manager of RN5. RN6 certificates have been issued to K6SXX, K6ZYZ, K7CWV and W4G-DAU; manager K6HLR is moving. VE7JQ has earned his RN7 certificate; the net is having trouble with poor conditions. K4ZAL, W9NQW, W9CCO and W9QFQ have received their 9RN certificates. VE4SL is helping represent Manitoba and W0s SDN and QKP are representing N. Dak. on TEN to improve the representation. Good VE1 coverage on ECN now, thanks to the efforts of VE3BZB. TWN is now on two sessions per night, at 1800 and 2000 MIST; K0EDH is doing a fine job as the new manager.

Transcontinental Corps. The fortunes of Eastern Area TCC have been lagging for some time, partly because of difficulty in recruiting stations with the required signal power and partly because W3WG cannot devote the necessary time to the project. Boyd now wishes to resign, so the dragnet is out. Boyd has promised to remain active. November reports:

Area	Functions	% Successful	Traffic	Out-of-Net Traffic
Eastern.....	15	93.3	1302	118
Pacific.....	109	94.5	2571	1383
Summary.....	154	94.2	3873	1501

The TCC roster: Eastern Area (W3WG, Director) — W1AW, W1NJM, W1SMU, K2SSX, W3COK, W3WG, W9DO, W9DYG, K9DAC. Pacific Area (W6EOT, Director) — K6s OJV YBV HLR LVR GH), W7s EOT WPF IZG HC, K7CWV, W7s GMC ZB BDU, K0s EDH EDK, W7s ANA KQD. Only one vacancy in the TCC-Pacific roster; this takes a bit of doing!

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 Feb. 15 at 2130 Eastern Standard Time. Identical texts

will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Feb. 3 at 2100 PST on 3500 and 7129 kc.

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.

Code-practice transmissions are made from W1AW each evening at 2130 EST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text sometimes is reversed. To improve your list, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date	Subject of Practice Text from December QST
Feb. 2:	<i>It Seems to Us</i> , p. 9
Feb. 8:	<i>Trans-equatorial Propagation</i> . . . p. 11
Feb. 11:	<i>A Foolproof S Meter</i> , p. 18
Feb. 16:	<i>A Step-Type R.F. Attenuator</i> , p. 20
Feb. 19:	<i>A Two-Meter Converter</i> . . . p. 23
Feb. 25:	<i>Choosing a Transmission Line</i> , p. 42

HIGH CLAIMED SCORES 1959 A.R.R.L. SWEEPSTAKES

Follows the high claimed scores for the 1959 Sweepstakes. Included are those claimed c.w. scores over 150,000 points, and those claimed phone scores over 100,000. Should your log entry have qualified and is not listed below, drop a card to ARRL so that the difficulty may be ascertained. QST will carry the full Sweepstakes report as soon as checking is completed.

C.W.

W9IOP.....	249,386	W7KEV.....	184,333
K5ESW.....	246,284	K6QHC.....	184,325
W0VXO.....	240,535	W6UTV.....	181,760
W4KFC.....	238,710	K5LZO.....	180,000
K2DGT.....	232,869	W1MIF.....	180,000
W3JNQ.....	232,688	W2DMJ.....	175,500
W3EIS.....	224,840	W8QHW.....	174,060
K4LPW.....	221,829	W9LNQ.....	171,000
W4YHD.....	219,035	W1OGU.....	170,188
W4DQS.....	216,901	W9ZAB.....	170,090
W6ZVQ.....	211,153	W3MSR.....	170,090
W9YFV.....	210,605	W3FYS.....	168,265
W4RQR.....	210,139	W2AYJ.....	168,264
W5YDC.....	209,875	W9NPC.....	167,170
W9RQM.....	209,328	W3WJD.....	165,163
W3ALB.....	207,503	W6RWL.....	163,870
W7HMJ.....	205,312	W8IBX.....	163,794
W7YGN.....	201,845	W20IB.....	162,750
W8CDP.....	200,750	W9FVT.....	162,720
K4GSU.....	200,020	W9RCJ.....	162,270
W3MFW.....	197,282	W5MCT.....	161,352
W3GAU.....	196,096	K9SLO.....	160,600
W9IRH.....	194,580	W6TTE.....	160,600
W9WNV.....	191,534	W3IYE.....	160,064
K2MVK.....	191,443	W42BEX.....	156,585
K6SXA.....	190,176	W6A1H/VE3.....	154,851
W3GHL.....	188,796	W6NWL.....	151,415
W6KG.....	186,515	W3KFF.....	150,745
W4JAT.....	185,237	K6GLC.....	150,563

PHONE

K5MDX.....	212,868	W7CAF.....	139,194
W6LNW.....	201,480	W5KC.....	137,211
K0RNZ.....	176,577	W3ZKH.....	132,276
W6YQ.....	171,145	W4FGH.....	129,582
W7BSW.....	158,412	W6JVA.....	124,063
K4IEK.....	157,863	W0PRZ.....	123,051
K4KXX.....	156,493	W8AJW.....	122,256
W6MILY.....	154,614	K8BIT.....	112,608
W1EOR.....	144,540	K2LXL.....	108,468
W5JWL.....	140,097	K9BGL.....	108,009
W5INL.....	139,613	W7UWT.....	100,774

¹ Multiple-operator station.



MEET THE SCMs

Adrian V. Rea, W5DRZ, was issued his first license in 1954, although he had been interested in amateur radio for over thirty years.

Upon taking office as SCM of Oklahoma, he relinquished his Phone Activities Manager's post but still maintains his Official Phone Station appointment. An active traffic man, he has made the Brass Pounders League numerous times and has earned a BPL Medallion. He is an NCS of traffic nets and Army MARS, and has handled traffic during fire, flood, snow storms and other emergencies. SCM Rea is a member of both the Shawnee Amateur Radio Club and the Aeronautical Center Amateur Radio Club.

W5DRZ's transmitters include a Heathkit DX-100, Command transmitters on 80 and 40 meters, and a Surplus T-23 on 2 meters. Receivers are an NC-125, an R-45/ARR-79 Surplus, and an RA1E-152 converter. Antennas are an all-band dipole (inverted V) with tuner, an 8JK on 20, and a beam on 2 meters. A 2000-watt portable gasoline generator is on hand for emergency use.

Being a Methodist minister, he is known affectionately on the air throughout the Southwest as "Preacher." Among his hobbies are stamp-collecting and photography; he enjoys baseball and occasionally does some fishing and golfing.

ELECTION RESULTS

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

Rhode Island	John E. Johnson, K1AAV	Oct. 12, 1959
Manitoba	M. S. Watson, VE4JY	Dec. 10, 1959
Maryland-Delaware-		
District of Columbia	Thomas B. Hedges, W3RKE	Dec. 10, 1959
Saskatchewan	Harold Horn, VE5HR	Dec. 10, 1959
Virginia	Robert L. Follmar, W4QDY	Feb. 11, 1960

In the Alabama Section of the Southeastern Division, Mr. William D. Dotherow, K4AOZ, and Mr. Leighton W. Steele, III, K4JDA, were nominated. Mr. Dotherow received 155 votes and Mr. Steele received 138 votes. Mr. Dotherow's term of office began Dec. 14, 1959.

ELECTION NOTICE

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

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

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

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

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

Oklahoma SCM, W5DRZ

petition may be found invalid by reasons of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

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

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

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

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

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

— F. E. Handy, Communications Manager

Section	Closing Date	SCM	Term Ends
Yukon *	Feb. 10, 1960	W. R. Williamson	Mar. 17, 1949
West Indies	Feb. 10, 1960	William Werner	Aug. 10, 1958
Quebec *	Feb. 10, 1960	C. W. Skarstedt	Dec. 15, 1959
Eastern			
New York	Feb. 10, 1960	George W. Tracy	Feb. 10, 1960
Maritime *	Feb. 10, 1960	D. E. Weeks	Feb. 15, 1960
Arizona	Feb. 10, 1960	Cameron A. Allen	Apr. 15, 1960
Tennessee	Feb. 10, 1960	R. W. Ingraham	Apr. 15, 1960
Washington	Feb. 10, 1960	Robert W. Thurston	Apr. 30, 1960
Alberta *	Feb. 10, 1960	Gordon W. Hollingshead	May 1, 1960
Santa			
Barbara	Mar. 10, 1960	Robert A. Hemke	May 9, 1960
Louisiana	Mar. 10, 1960	Thomas J. Morgavi	May 31, 1960
Alaska	Mar. 10, 1960	Eugene N. Berato	Resigned
Ontario *	Apr. 11, 1960	Richard W. Roberts	June 15, 1960
Eastern Mas-			
sachusetts	Apr. 11, 1960	Frank L. Baker, jr.	June 15, 1960

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

RTTY CONTEST NOTES

The RTTY Society of Southern California announces sponsorship of the 7th Anniversary RTTY SS Contest. This is to start at 6:00 p.m. EST February 12 and end at 3:00 a.m. EST February 14. Stations will exchange message preambles consisting of message number, originating station's call, check or RST report of two or three numbers, ARRL Section of originator, local time (0000-2400 preferred), date, and band used. Score one point for a message sent and received for entirely by RTTY, and one point for a message received and acknowledged by RTTY. For final score, multiply the total message points by the number worked in different ARRL Sections. (Refer to page 6 of this QST for listing.) Two stations may make additional exchanges on different bands for added contact points, but the section multiplier does not increase when the same section is reworked on another band. Each foreign country counted by ARRL for DXCC credit is treated also as a new section for RTTY multiplier credit. Logs showing the full tabulation of preamble-exchanges and claimed score should be mailed to Merrill L. Swan, W6ABE, 372 Warren Way, Arcadia, California.

FREQUENCY MEASURING TEST FEBRUARY 9

ARRL invites every amateur to try his hand at frequency measuring when W1AW transmits signals for this purpose starting at 9:30 p.m. EST (6:30 p.m. PST) Tuesday, February 9. The signals will consist of dashes interspersed with station identification. These will follow a general message sent to help listeners to locate the signals before the measurement transmission starts. The approximate frequencies used will be 3539, 7053 and 14,088 kc. About 4½ minutes will be allowed for measuring each frequency, with long dashes for measurement starting about 9:36 p.m. It is suggested that frequencies be measured in the order listed. Transmission will be found within 5 or 10 kc. of the suggested frequencies.

At 12:30 a.m. EST, February 10 (9:30 p.m. PST, February 9), W1AW will transmit a second series of signals for the Frequency Measuring Test. Approximate frequencies will be 3519, 7053 and 14,104 kc.

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

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

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

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

DX CENTURY CLUB AWARDS

HONOR ROLL

W6AM.....296	W9NDA.....291	W3RXX.....289
ZL2GX.....296	W6CUB.....291	W8BKP.....288
W1FH.....295	ZL1HY.....291	W4DMD.....288
W8HGW.....295	W1MFE.....291	W4DQH.....288
W3GHD.....295	W3JNN.....291	C63AG.....288
PY2CK.....293	G2PLT.....291	W4TAM.....287
W2HUG.....293	W7AMX.....291	W1CLX.....287
W6EYN.....293	W3RTT.....290	W8UAB.....287
W6SYG.....293	W5ASG.....290	W8NNV.....287
KV4AA.....292	W9YFV.....290	W8KIA.....287
W8JIN.....292	W6ADP.....290	W9KOK.....287
W4BPD.....292	W6EBG.....290	W6MCK.....286
W8BRA.....292	W3CIV.....289	W5ADZ.....286
W2AGW.....292	W7GHW.....289	G4CP.....286
G3AAM.....292	W9RBI.....289	W6T8.....286
W6DZZ.....292	W3RBS.....289	

Radiotelephone

PY2CK.....293	W1FH.....284	W8KML.....280
VQ4RR.....287	W8HGW.....284	ZL1HY.....280
W8GJ.....286	W3JNN.....283	W6AM.....280
W8BF.....285	W9RBI.....283	W8PQQ.....279
ZS6BW.....285	W6YY.....281	4X4DK.....277

From November 1, to December 1, 1959 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

W3LE.....128	W1EAF.....103	K5ESW.....100
ZS2HI.....128	LZ1UR.....102	A5KET.....100
W6HHL.....124	K2CMN.....101	K6PHD.....100
OE8AL.....119	W3HWE.....101	K9KFS.....100
SP8HU.....117	W4RRK.....101	K0HCD.....100
KR6AK.....107	W8BGE.....101	K0HWB.....100
W7LNG.....106	W7JWE.....101	K3BD.....100
G5PT.....106	W8QHW.....101	H8RW.....100
K9PFX.....105	G2DCG.....101	JZHA.....100
ZL1HA.....105	K3ANW.....101	SM5BFR.....100
V81FZ.....104	K5DCC.....100	SP1J.....100
K4LRA.....103		ZB2L.....100

Radiotelephone

K4CTU.....173	L3BU.....107	Z8IRV.....102
W3LE.....122	DJ3CN.....106	W4NWT.....101
V82TU.....121	OV7AT.....104	W4NWT.....101
K2ZFH.....117	W2VAP.....103	W1AF.....100
W0AII/VE3.....108	ZL1IE.....103	K4YUX.....100
	F9YN.....102	W8RWZ.....100
	ZL1HA.....102	

Endorsements

W6NTR.....280	W4VYP.....240	W6ORH.....214
W8JHI.....280	LA3DH.....240	W9JPF.....212
K6EVR.....270	W8MF.....234	W3BQA.....211
W6QNA.....270	W6UQQ.....231	W3NOH.....211
W4LYV.....270	K5LIA.....230	W8UMR.....211
K2OEA.....260	W9RKP.....230	W4NYN.....210
W8TXL.....260	W6LN.....229	K9AGB.....210
W8CPN.....260	W38OH.....222	V63PK.....210
W6UJ.....254	W6KUT.....221	K5AIZ.....206
W8RTT.....253	G6VT.....221	K9CLO.....205
W2X.....250	FY1DH.....221	W6CG.....202
W6IRD.....250	K2LVR.....220	YV5FK.....202
G3AAE.....250	V63AU.....220	Z14BO.....202
W4AZK.....248	W5RDL.....217	K2QXG.....201
W1ICP.....242	K4EHA.....216	K6RWO.....201

D16YK.....201	W2GBX.....161	EA8BC.....134
W3GRS.....200	W3IPO.....161	W1EYX.....133
W3RPG.....200	W0LPA.....161	W1JLN.....133
K6KIL.....200	W3RWB.....160	K8DYX.....133
W6DMA.....200	W4WDI.....160	W9GFC.....131
W6RFE.....200	W4GZG.....160	VE8RH.....131
JA6AO.....200	W6VX.....160	W1YRO.....130
OH2LA.....200	W1HGT.....158	K2KZU.....130
ZS1OU.....200	K48XO.....156	W6PFB.....130
W8HCY.....199	E43GF.....155	W7BTH.....130
JA7AD.....198	W2KLR.....153	W0GTU.....130
W4BTE.....194	K6CTV.....153	W8RPH.....129
K4DRO.....191	W6PHN.....153	UO5AA.....129
EA2CB.....191	V65GF.....152	K9GFK.....125
W9LTR.....190	K2LGN.....151	K9RGL.....124
W2PTD.....184	G3HIW.....151	W7LVR.....123
JA6AK.....184	K0QXF.....150	SM6RS.....123
W2AXR.....181	K8SHJ.....150	Z86AWW.....123
W2RGV.....181	W7VDM.....150	SP9DT.....122
W3CEB.....181	W91JU.....150	W8ETU.....121
W1WAI.....180	W9LSV.....150	K8GHG.....121
W2TP.....180	W0SLB.....150	K0PFE.....121
W3ARK.....180	K4PRK.....150	W1UQP.....120
W1PTD.....176	K6JZY.....146	W2BOP.....120
W0DEL.....174	K6W0Q.....145	W2BWC.....120
W4EFX.....173	K9HHD.....145	W2CVZ.....120
W6EWH.....173	W3ZBF.....144	K4TFI.....120
G4FYT.....173	W8AAL.....144	K2HIY.....116
W4HZZ.....171	W1GSC.....143	K2FGC.....113
W2BAC.....170	W3CP.....140	V61WL.....112
W2JVZ.....170	W4TK.....140	W2HWA.....111
W4ZMC.....170	W5CPW.....140	W2UN8.....110
W8TTN.....170	W7CMO.....140	W3AHC.....110
D1LIZ.....166	CFLNT.....140	W6MDK.....110
W4BEY.....164	G3KZI.....140	W9TFD.....110
W1UUF.....162	W7QCP.....139	W9WVJ.....110
W4BFR.....162	W6IUG.....137	V67KK.....110
W1UMC.....161	W42CC.....135	GC3AAE.....110
	K6OYD.....134	

Radiotelephone

W4ANE.....241	ZL4BO.....167	K2GSO.....130
Z86Q.....241	W91TR.....163	W9ABA.....130
W4VDJ.....238	W1UIC.....161	K2WKG.....118
ZP5CF.....234	W1RAN.....160	W5DA.....110
VE3AIU.....212	W2RGV.....155	W7TGG.....110
W6OBH.....210	K4EHA.....155	W8VQG.....110
CX2AX.....210	W9ZSZ.....150	JA6AK.....127
K6LAS.....201	W8SNI.....149	V65JV.....125
W6EYV.....191	V65GN.....145	K9BKW.....124
K6EVR.....186	W7VDM.....142	VE8TU.....122
W2BYP.....181	K4SXO.....141	K9KYK.....121
W0GEK.....179	F98H.....136	W7LVR.....121
W5JRF.....173	CR6AU.....135	W9Y8Q.....120
G3AAF.....171	W2GBC.....130	SM3AZI.....120
W4FPX.....170		W2CVZ.....110

U.S.-Canada Area and Continental Leaders

W0ELA.....281	V6EDIF.....250	VE7ZM.....280
K1H6J.....259	VE4XO.....180	VERAW.....195
K17PL.....231	VE5JV.....190	W0LDX.....220
VE2WV.....262	VE6NX.....256	Z86AWW.....285
		4X4DK.....284

Radiotelephone

W2BXA.....267	K17AFR.....190	VE8RU.....178
W4DQH.....264	VE1DR.....137	VE6NX.....152
W58QP.....251	VE2WV.....202	VE8TF.....152
W7PHO.....268	VE3KF.....224	VE7ZM.....253
KH6OR.....254	VE3QA.....224	G2PLT.....264
	VE4RP.....102	

• 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: DUL RM; AXA, PAM; TEJ. New appointments: HZZ as OO, HRD as OES, K3BHU as OPS. The new EC for Lackawanna County is DXE. CUL added another s.s.b. rig to help handle the extra traffic load over the holidays. The PFN, via IVS, has a direct 6-meter hookup with Washington, D. C. HNK got his CP-25 sticker. K3DFK made BPL on originations. NE has half-kw. troubles but held it together long enough to work the SS Contest. CUK and ZRQ added eleven new Novices to Schuylkill County. The Lehigh Valley ARC held its annual club banquet in January with EWN in charge. OY has filled the gap in the EPA Net for the Lancaster Area. PDJ is a "week-end" traffic man because of working skeds. K3CMM is teaching a code class in the Pottsville Area. EAN made all but five sections in the SS using an automatic "CQ-sender." The electronic key wore out for JNQ during the SS Contest. GYP has 104 counties credited and uses a 20/15-meter quad antenna. K3BHX is back on the air with a new Apache. K3HAQ, a student at Villanova University, is working his share of DX on 15 meters. HZZ has a new Viking II and his dad is KN3JFQ. YLL didn't make his usual SS goal because of sky-wire trouble. The Mt. Airy V.H.F. Society has awarded plaques to the club's high scorers in the January V.H.F. SS. New officers of the Pocono Amateur Radio Klub are K3ALL, pres.; K3GCI, vice-pres.; AGP, treas.; K3BSK, secy. KMM and UCY are operating on A-4 facsimile. MDO is teaching theory and code to Novices for the General Class exams. KN3JGV is sporting a new HQ-170 receiver. K3DOR is now General Class. Both PAM TEJ and RAM AXA are looking for an interested operator in the Scranton/Wilkes-Barre Area to QNI the PFN and EPA Nets. DUL, our SEC, reports that when he accepted the appointment in June there were 124 AREC members. The membership as of November is 490, an increase of 366. The section should be proud of this interest and increase in emergency-minded operators. Many clubs have their own emergency or traffic nets. Is it registered at Headquarters? A card or radiogram will forward the proper forms for registration. Traffic: W3CUL 6811, IVS 844, VR 655, HNK 310, MEW 136, K3DFK 135, W3KMD 128, PKE 94, AXA 92, HLU 67, NF 53, BEU 51, ZRQ 40, ALD 30, ANS 29, TEJ 29, ZLP 26, BFF 24, MAV 24, BPZ 20, BUR 19, OY 18, AMC 8, PDJ 6, K3ANU 4, CMN 4, DUI 4, NQB 4, EAN 3, JNQ 3, ADE 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3RKE—Asst. SCM Delaware: P. R. DeCourcelle, 310QZ. SEC: PKC. The MDD Section C.W. Net meets on 3650 kc. Mon. through Sat. at 1915 EST; the MEPN (Phone) Net on 3820 kc. Mon., Wed. and Fri. at 1800 and Sat. and Sun. at 1300 EST. Slow-speed nets: MDDDS, on 3650 kc. Mon. and Thurs. at 2030 EST. The MSN meets on 3670 kc. Mon. through Fri. at 1845 EST. New appointments: FCP, LUL, K3JTE and JNG as OOs; K3GBV as OES. *Maryland Report:* AHQ keeps up his usual high OO activity in spite of a trip to the hospital. OVE gave a pep talk on PG County AREC activity to the Greenbelt ARA. 4EXM/3 is retiring after 20 years of active service in the USAF and will have more time for traffic nets. ZAQ leads Baltimore OO activity with a solid report. K3GZK keeps plenty of traffic moving in the MSN. GJD reports by radio and is busy as a Baltimore outlet for MDD. OSF turned in a nice OO report from Baltimore. OYX is rejuvenating AREC activity in the Hagerstown Area and is busy with a club bulletin. The Antietam RA elected EHA, pres.; LII, vice-

pres.; K3HRM, secy.; and DRK, act. mgr. TN made BPL for the third month in a row and gave an interesting talk on traffic matters to the U. of Md. ARC. UE is keeping the 3RN jumping and prods the boys into action. ZNW turned in a nice traffic count. K5OEA/3 recommends his XYL as OPS. MSR is busy in contests, v.h.f. work and F.M.T. MCG has taken over as MDD manager while PZW finishes his new home. LUL is recuperating from a major operation. KHA keeps GQF on the air at Johns Hopkins, where he is a student. JZY has his triband rotary up and going nicely. JWN, ZGN, YTW and YVQ kept ZGN on during the SS from the top of South Mountain near Hagerstown and made a Field Day out of the expedition. PVRC turned in some top-flight activity during the SS again this year. IWJ is active on MCW on 2 meters. K3GBV is making a good start as OES. CXX is active in the MDD, MDDDS and 3RN from Baltimore and provides a good outlet there. COK checks in from Morningside. K3CIO is moving to Long Island to get a WA2 call. The PVRC will miss you, Al! CDG checks in for the Carroll County AREC Net. BUD is busy with MDDDS and taxiing his teen-age daughters. *District of Columbia Report:* ECP is the newly-elected Division Vice-Director. K3VBJ originates plenty of traffic from Walter Reed Hospital and makes BPL. BYB received his 1st phone ticket. PQ continues his solid activity in MDD. K3ANA is moving to a new QTH in Maryland. EOY is active in the WAIRC. Washington RC's Christmas Party was a great success. CN went mobile but couldn't keep away from traffic net activity. *Delaware Report:* HKS renewed his ORS appointment and is back in MDD. EEB now has 181 confirmed for DXCC and is Delaware's most active OO. K3GKF talked to the Delaware ARC on Radioisotope Instrumentation. It sounds interesting and some of the other clubs might like to hear it. EKO is busy OObing and DXing on 40 meters. How about more club bulletins from the 68 active radio clubs in the section? Traffic: (Nov.) W3UE 404, K3WBJ 291, W3PQ 189, K5OEA/3 180, W3TN 125, K3BYB 95, W3COK 66, K3ANA 52, W3EKO 51, K3CJD 44, W3BUD 40, K3CXX 30, W3ZNV 35, FCP 33, EOY 29, IWJ 20, CN 18, BKE 17, JWN 14, CDG 12, K3GZK 12, W3EEB 11, W4EXM/3 4, W3JME 2, KHA 2, HKS 1. (Oct.) K3BYB 122, GJD 80, W3EKO 40, JWN 5, JZY 4.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. RMs: W2BZJ, W2HDW and W2ZL. The Levittown (N. J.) Radio Amateur Club has elected K2TQM, pres.; W42IVJ, vice-pres.; K2MOV, treas.; and K2YBN, secy. K2LEM is RACES Communications Officer for Hightstown Boro. K2CPR's DX totals are now 251/247, also 4-band WAC and DXCC has been confirmed. W2RG, Camden Co. RACES Officer, reports 221 licenses in the RACES program. W2BEL, Audubon, is keeping in Greenland skeds. W2ZL, N.J. Phone Net Mgr., reports 30 sessions, attendance 587 and traffic 113 for November. The Southern Counties ARA *Newsletters* are received regularly from the club's president and editor, K2HBA. The club is equipping a trailer for emergency communication. K2BWR is heard on 160 meters. K2HOD is Acting Editor for SJRA's monthly publication, *Harmonics*. W2LXB was the Club's Christmas Party chairman. Your SCM visited the Gloucester Co. Radio Club in November. K2JJC and K2JGU attended a MARS meeting at Ft. Monmouth. The Burlington Co. Radio Club elected K2MOV, as president. K2YIB, Riverside, received Certificate No. 1 of the V.H.F. Century Club. Stan also is SJRA's V.H.F. Contest chairman. W42AXP is a regular on the Teen-Age Phone Net, 3835 kc. at 1600. Twenty-five NJN members and friends attended the club's annual meeting in New Brunswick. W2RG was QNI top man in the NJN, with W2CIVW runner-up. NJN boasts a roster of 56. All organizations are urged to report their new officers to your SCM for recognition and publication. Fifteen Form #1 reports were received. Keep up the good work. No reports were received from Mercer, Salem or Cumberland Counties. Traffic: K2DEI 188, W2RG 129, W2YRW 114, W2ZL 41, K2OWM 39, W2BZJ 38, W42AXP 23, W2BEL 16, K2SOX 14, W2SXV 13, W2TLO 12, K2JJC 4, K2CPR 3.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—RMs: W2RUF and W2ZRC. PAMs: W2PVI and W2LXE (v.h.f.). NYS C.W. meets on 3615

(Continued on page 102)

SECOND CONVERSION OSCILLATOR IN THE MODELS SX-100 and SX-101 RECEIVERS

A NUMBER of inquiries have been received concerning the function of the second conversion oscillator in the SX-100 and SX-101 series receivers.

A TWIN triode type 12AT7 tube is employed and each section is crystal controlled to provide maximum oscillator stability.

THE response control switches the second conversion oscillator to operate at the required frequency for reception of CW, SSB, and AM signals. In the lower sideband positions the 1600 kc crystal is used, and in the upper sideband positions the 1700 kc crystal oscillator is switched into the circuit.

ASSUME that the signal being received is modulated at 1 kc. With the response control set in the lower sideband position, the 1600 kc signal from the second conversion oscillator is heterodyned with the incoming signal at the first intermediate frequency of 1650 kc to produce three new frequencies: the carrier at 50 kc, the lower sideband at 51 kc, and the upper sideband at 49 kc. The lower sideband then falls within the I.F. pass band and the upper sideband falls outside of the pass band. Thus, the lower sideband is accepted and the upper sideband is rejected.

WHEN the response control is set in the upper sideband position, the 1700 kc signal from the second conversion oscillator is heterodyned with the incoming signal. In the frequency conversion process the carrier still remains at 50 kc, but now the upper sideband appears at 51 kc and the lower sideband appears at 49 kc. The upper sideband is thus accepted and the lower sideband is rejected.

IN the Model SX-100, and SX-101 receiver prior to the SX-101A, the 1700 kc crystal oscillator is employed not only for upper sideband reception, but also for the "treble-cut" and "normal" positions. In the "normal" position, the audio response is essentially flat at the low and mid frequencies and slightly attenuated at the high frequencies. The response in the "treble-cut" position is essentially the same except that the high frequencies are attenuated considerably more than in the "normal" position.

THE response switch in the new SX-101A receiver is now calibrated with provisions for upper and lower sideband reception on AM, together with upper and lower sideband selection for SSB-CW operation.

UNDER crowded band conditions the sideband which is most affected by other interfering signals can be rejected, thereby aiding in the elimination of QRM. When receiving an AM or CW signal, it is possible to change sidebands during the course of reception in order to offset changing QRM conditions which may be due to adjacent signals disappearing and reappearing within the band.

THE features that we have described are only a few of the many that have been engineered into your Hallicrafters receiver to provide the utmost in communications receiver performance.

See you in Miami January 30-31 at the Tropical Hamboree. Jim Ricks, W9TO, will be with us to talk about our new electronic keyer.

A. R. DAMBRAUSKAS, W9GXH

Bevel Ballerian Jr. W. J. Hoelzen W9AC for hallicrafters



"RANGER" TRANSMITTER/EXCITER

This popular, superbly engineered transmitter also serves as an RF/ audio exciter for high power equipment. 75 watts CW or 65 watts phone input. Built-in VFO or crystal control—instant bandswitching 160 through 10. 6146 final amplifier. Wide range pi-network coupling system will match antenna loads from 50 to 500 ohms—tunes out large amounts of reactance. Timed sequence keying. TVI suppressed. With tubes, less crystals.

Cat. No.	Amateur Net
240-161-1. .Kit.	\$229.50
240-161-2. .Wired and tested...	\$329.50

No matter what you expect from a transmitter...

"VALIANT" TRANSMITTER

Here's effective power, wide flexibility, and many unique operating features combined in a compact desk-top transmitter! 275 watts input CW and SSB (P. E. P. with auxiliary SSB exciter) and 200 watts phone. Bandswitching 160 through 10. Built-in VFO or crystal control. Final amplifier utilizes three 6146 tubes in parallel—wide range pi-network output. With tubes, less crystals.

Cat. No.	Amateur Net
240-104-1. .Kit.	\$349.50
240-104-2. .Wired and tested...	\$439.50



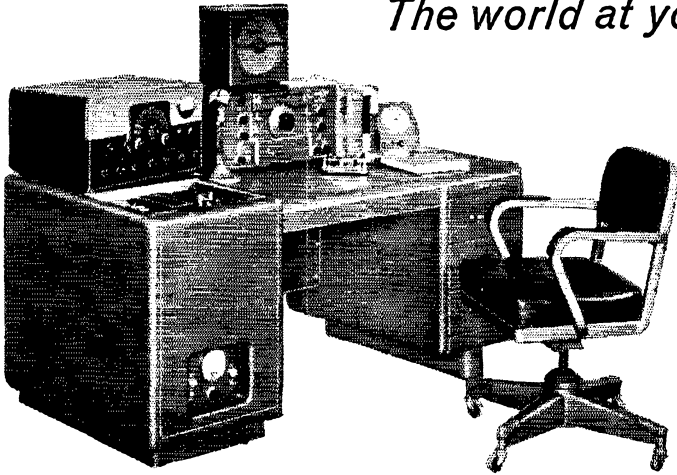
"FIVE HUNDRED" TRANSMITTER

More than one-half kilowatt of power plus outstanding operating convenience! 600 watts CW input . . . 500 watts phone and SSB (P.E.P. with auxiliary SSB exciter)—instant bandswitching 80 through 10 meters! All exciter stages ganged to VFO tuning. High gain push-to-talk audio system. Built-in VFO or crystal control—VFO is temperature compensated, highly stable. Wide range pi-network output. Low level audio clipping—effectively TVI suppressed. With tubes, less crystals.

Cat. No.	Amateur Net
240-500-1. .Kit.	\$749.50
240-500-2. .Wired.....	\$949.50



The world at your finger tips!



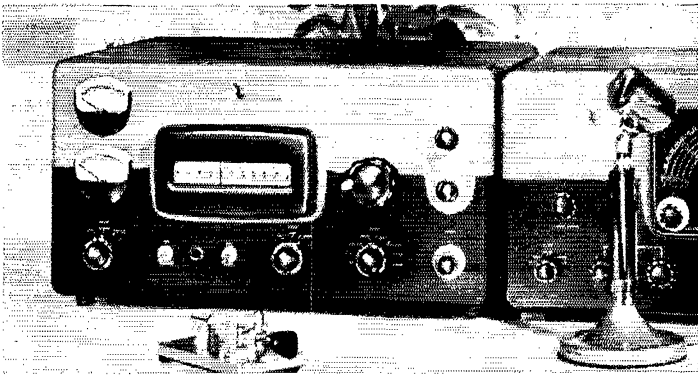
VIKING "KILOWATT" AMPLIFIER

This exciting unit is the only power amplifier available which will deliver full 2000 watts SSB* input, and 1000 watt CW and plate modulated AM! Class C final amplifier operation provides plate circuit efficiencies in excess of 70%. Continuous coverage 3.5 to 30 mcs. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB.

Cat. No. **Amateur Net**
240-1000... Wired and Tested . \$1595.00
251-101-1... Matching desk top, back and 3 drawer pedestal, FOB Corry, Pa. . \$132.00

*The FCC permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions, this results in peak envelope power inputs of 2000 watts or more, depending upon individual voice characteristics.

you'll get more with a **VIKING!**

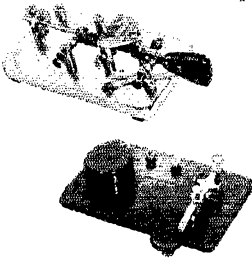


"THUNDERBOLT" AMPLIFIER

Here's real power and peak performance in a compact, completely self-contained desk top package. Rated at a solid 2000 watts P.E.P.* input SSB; 1000 watts CW; 800 watts AM linear! Continuous coverage 3.5 to 30 mcs. — instant band-switching. May be driven by the "Ranger," "Pacemaker" or other unit of comparable output. Two 4-400A tetrodes in parallel, bridge neutralized. Wide range pi-network output. With tubes.

Cat. No. **Amateur Net**
240-353-1.. Kit..... \$524.50
240-353-2.. Wired..... \$589.50

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The E. F. Johnson Company also manufactures a complete line of standard, semi-automatic, heavy duty, and high speed keys—as well as practice keys, practice sets, learner sets, and key accessories. See them at your nearest Johnson distributor.

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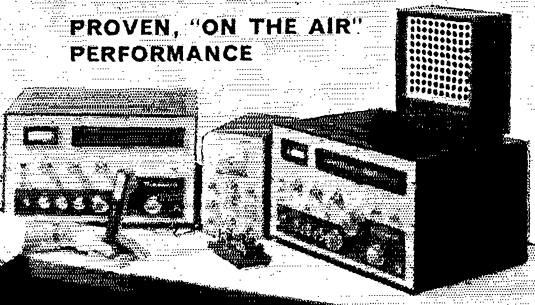
HEATHKIT

HAM GEAR



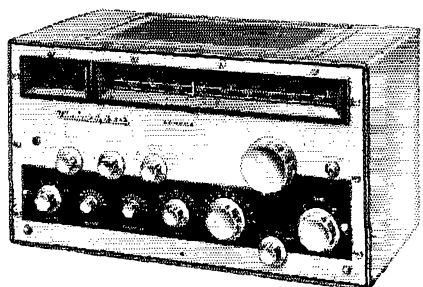
HEATHKIT HAM EQUIPMENT
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PROBLEMS AND
NEEDS.

PROVEN, "ON THE AIR"
PERFORMANCE

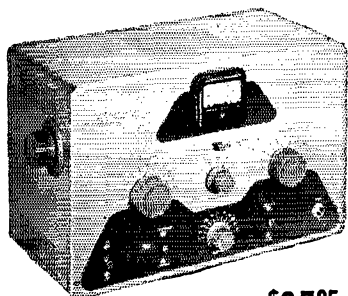


"SENECA" VHF HAM TRANSMITTER KIT

Beautifully styled and a top performer of highest quality throughout. The "Seneca" is a completely self-contained 6 and 2 meter transmitter featuring a built-in VFO for both 6 and 2 meters, and 4 switch-selected crystal positions, 2 power supplies, 5 radio frequency stages, and 2 dual-triode audio stages. Panel controls allow VFO or crystal control, phone or CW operation on both amateur bands. An auxiliary socket provides for receiver muting, remote operation of antenna relay and remote control of the transmitter such as with the Heathkit VX-1 Voice Control. Features up to 120 watts input on phone and 140 watts on CW in the 6 meter band. Ratings slightly reduced in the 2 meter band. Ideal for ham operators wishing to extend transmission into the VHF region. Shpg. Wt. 56 lbs.



HEATHKIT VHF-1 **\$159⁹⁵**




HEATHKIT DX-20 **\$35⁹⁵**

DX-20 CW TRANSMITTER KIT

Designed exclusively for CW work, the DX-20 provides the novice as well as the advanced-class CW operator with a low cost transmitter featuring high operating efficiency. Single-knob bandswitching covers 80, 40, 20, 15 and 10 meters using crystals or an external VFO. Pi network output circuit matches antenna impedances between 50 and 1,000 ohms. Employs a single 6DQ6A tube in the final amplifier stage for plate power input of 50 watts. A 6CL6 serves as the crystal oscillator. The husky power supply uses a heavy duty 5U4GB rectifier and top-quality "potted" transformer for long service life. Easy-to-read panel meter indicates final grid or plate current selected by the panel switch. Complete RF shielding to minimize TVI interference. Easy-to-build with complete instructions provided. Shpg. Wt. 19 lbs.

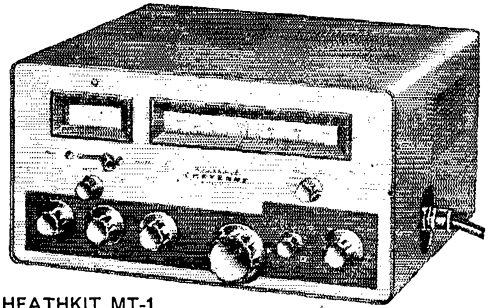
HEATH COMPANY Benton Harbor, Michigan

 a subsidiary of Daystrom, Inc.

Mobile Gear...for the Ham on the Go!

"CHEYENNE" MOBILE HAM TRANSMITTER KIT

All the fun and excitement . . . plus the convenience of mobile operation are yours in the all-new Heathkit "Cheyenne" transmitter. The neat, compact, and efficient circuitry provides you with high power capability in mobile operation, with low battery drain using carrier controlled modulation. All necessary power is supplied by the model MP-1 described below. Covers 80, 40, 20, 15 and 10 meters with up to 90 watts input on phone. Features built-in VFO, modulator, 4 RF stages, with a 6146 final amplifier and pi network (coaxial) output coupling. High quality components are used for long service life and reliable operation, along with rugged chassis construction to withstand mobile vibrations and shock. Thoughtful circuit layout provides for ease of assembly with complete instructions and detailed pictorial diagrams to insure success. A spotting switch is also provided. A specially designed ceramic microphone is included to insure effective modulation with plenty of "punch". Plan now to enjoy the fun of mobile operation by building this superb transmitter. Shpg. Wt. 19 lbs.



HEATHKIT MT-1
\$99⁹⁵



"COMANCHE" MOBILE HAM RECEIVER KIT

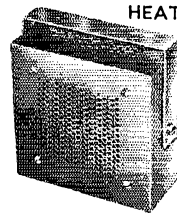
Everything you could ask for in modern design mobile gear is provided in the "Comanche" . . . handsome styling, rugged construction, top quality components . . . and, best of all, a price you can afford. The "Comanche" is an 8-tube super-heterodyne ham band receiver operating AM, CW and SSB on the 80, 40, 20, 15 and 10 meter amateur bands. A 3 mc crystal lattice-type IF filter permits the receiver to use single conversion without image interference, and at the same time creates a steep sided 3 kc flat top IF bandpass characteristic comparable to mechanical type filters. The neat, compact and easy-to-assemble circuitry features outstanding sensitivity, stability and selectivity on all bands. Circuit includes an RF stage, converter, 2 IF stages, 2 detectors, noise limiter, 2 audio stages and a voltage regulator. Sensitivity is better than 1 microvolt on all bands and signal-to-noise ratio is better than 10 db down at 1 microvolt input. One of the finest investments you can make in mobile gear. Shpg. Wt. 19 lbs.



HEATHKIT MR-1
\$119⁹⁵

MOBILE SPEAKER KIT

A matching companion speaker for the "Comanche" mobile receiver. Housed in a rugged steel case with brackets provided for easy installation on fire wall or under dashboard, etc. Uses 5 PM speaker with 8 ohm voice coil. Measures 5" H. x 5" W. x 2 1/2" D. Shpg. Wt. 4 lbs.

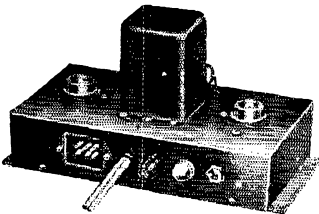


HEATHKIT AK-7
\$5⁹⁵



HEATHKIT AK-6
\$4⁹⁵

HEATHKIT MP-1
\$44⁹⁵



MOBILE POWER SUPPLY KIT

This heavy duty transistor power supply furnishes all the power required to operate both the MT-1 Transmitter and MR-1 Receiver. It features two 2N442 transistors in a 400 cycle switching circuit, supplying a full 120 watts of DC power. Under intermittent operation it will deliver up to 150 watts. Kit contains everything required for complete installation, including 12' of heavy battery cable, tap-in studs for battery posts, power plug and 15' of connecting cable. Chassis size is 9 1/16" L. x 4 3/4" W. x 2" H. Operates from 12-14 volt battery source. Circuit convenience provided by self-contained relay which allows push-to-talk mobile operation. Shpg. Wt. 8 lbs.

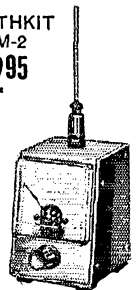
MOBILE BASE MOUNT KIT

The AK-6 Base Mount is designed to hold both transmitter and receiver conveniently at driver's side. Universal mounting bracket has adjustable legs to fit most automobiles. Shpg. Wt. 5 lbs.

POWER METER KIT

This handy unit picks up energy from your mobile antenna and indicates when your transmitter is tuned for maximum output. A variable sensitivity control is provided. Features a strong magnet on a swivel-mount for holding it on a car dashboard or other suitable spot. Has its own antenna or may be connected to existing antenna. Sensitive 200 ua meter. Shpg. Wt. 2 lbs.

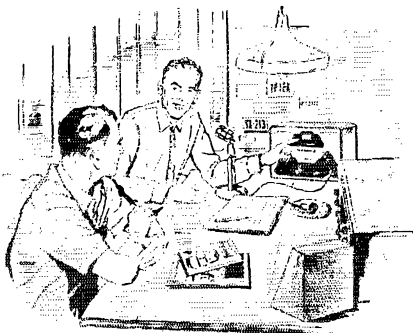
HEATHKIT
PM-2
\$12⁹⁵





HEATHKIT

COMPANION UNITS



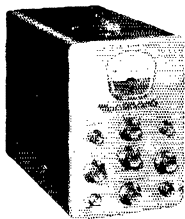
HEATHKIT TX-1 **\$234⁹⁵**

"APACHE" HAM TRANSMITTER KIT

The many features and modern styling of the "Apache" will provide you with just about everything you could ask for in transmitting facilities. Emphasizing high quality the "Apache" operates with a 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, built-in switch selected circuitry provides for single-sideband transmission using the SB-10 External adapter. The newly designed, compact and stable VFO provides low drift frequency control necessary for SSB transmission. A slide rule type illuminated rotating VFO dial with full gear drive vernier provides ample bandspread and precise frequency settings. The bandswitch allows quick selection of the amateur bands on 80, 40, 20, 15 and 10 meters. This unit also has adjustable low-level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation. The final amplifier is completely shielded for TVI protection and neutralized for greater stability. A cooling fan is also provided. The formed one-piece cabinet with convenient access hatch provides accessibility to tubes and crystal sockets. Die-cast aluminum knobs and control panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. A "spotting" push button enables the operator to "zero beat" an incoming frequency without putting the transmitter on the air. Equip your ham shack now for top transmitting enjoyment with this outstanding unit. Shpg. Wt. 110 lbs. Shipped motor freight unless otherwise specified.

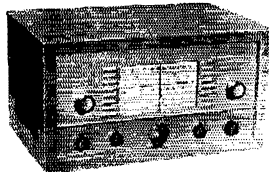
HEATHKIT SB-10 SINGLE SIDEBAND ADAPTER KIT

\$89⁹⁵



Designed as a compatible plug-in adapter unit for the TX-1 "Apache" transmitter, this unit lets you operate on SSB at a minimum of cost, yet does not affect the normal AM and CW functions of the transmitter. By making a few simple circuit modifications, the DX-100 and DX-100-B transmitters can be used, utilizing all existing RF circuitry. Extremely easy to operate and tune, the adapter employs the phasing method for generating a single-sideband signal, thus allowing operation entirely on fundamental frequencies. The critical audio phase shift network is supplied completely preassembled and wired in a sealed plug-in unit. Produces either a USB, LSB or DSB signal, with or without carrier insertion. Covers 80, 40, 20, 15 and 10 meter bands. An easy-to-read panel meter indicates power output to aid in tuning. A built-in electronic voice control with anti-trip circuit is also provided. 10 watts PEP output. Unwanted sideband suppression is in excess of 30 db and carrier suppression is in excess of 40 db. An EL84/6BQ5 tube is used for linear RF output. Shpg. Wt. 12 lbs.

MODIFICATION KIT: Modifies DX-100 and DX-100-B for use with the SB-10 Adapter. Model MK-1. Shpg. Wt. 1 lb. **\$8.95**.



HEATHKIT AR-3

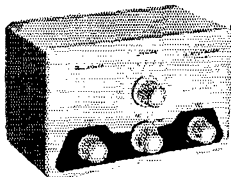
\$29⁹⁵

(less cabinet)

ALL-BAND RECEIVER KIT

A fine receiver for the beginning ham or short wave listener, designed for high circuit efficiency and easy construction. Covers 550 kc to 30 mc in four bands clearly marked on a slide-rule dial. Transformer operated power supply. Features include: bandswitch, bandspread tuning, phone-standby-CW switch, phone jack, antenna trimmer, noise eliminator, RF gain control and AF control. Shpg. Wt. 12 lbs.

CABINET: Opt. extra. No. 91-15A. Shpg. Wt. 5 lbs. **\$4.95**.



HEATHKIT QF-1

\$9⁹⁵

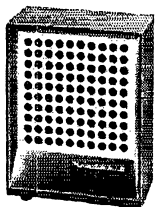
"Q" MULTIPLIER KIT

Useful on crowded phone and CW bands, this kit adds selectivity and signal rejection to your receiver. Use it with any AM receiver having an IF frequency between 450 and 460 kc that is not AC-DC type. Provides an effective "Q" of approximately 4,000 for extremely sharp "peak" or "null". The QF-1 is powered from the receiver with which it is used. Shpg. Wt. 3 lbs.

OF DISTINCTIVE QUALITY

ACCESSORY SPEAKER KIT

Handsomely designed and color styled to match the "Mohawk" receiver this heavy duty 8" speaker with 4.7 ounce magnet provides excellent tone quality. Housed in attractive 3/8" plywood cabinet with perforated metal grille. Speaker impedance is 8 ohms. Shpg. Wt. 7 lbs.



HEATHKIT AK-5
\$995



HEATHKIT RX-1 \$274⁹⁵

"MOHAWK" HAM RECEIVER KIT

Styled to match the "Apache" transmitter the "Mohawk" ham band receiver provides all the functions required for clear, rock-steady reception. Designed especially for ham band operation this 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc and covers all the amateur frequencies from 160 through 10 meters on 7 bands with an extra band calibrated to cover 6 and 2 meters using a converter. Specially designed for single sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled wired and aligned front end coil bandswitch assembly assures ease of construction and top performance of the finished unit. Other features include 5 selectivity positions from 5 kc to 500 CPS, bridge T-notch filter for excellent heterodyne rejection, and a built-in 100 kc crystal calibrator. The set provides a 10 db signal-to-noise ratio at less than 1 microvolt input. Each ham band is separately calibrated on a rotating slide rule dial to provide clear frequency settings with more than ample bandwidth. Front panel features S-meter, separate RF, IF and AF gain controls, T-notch tuning, T-notch depth, ANL, AVC, BFO, Bandswitch tuning, antenna trimmer, calibrate set, calibrate on, CW-SSB-AM, receive-standby, upper-lower sideband, selectivity, phone jack and illuminated gear driven vernier slide rule tuning dial. Attractively styled with die-cast aluminum control knobs and escutcheons. No external alignment equipment is required for precise calibration of the "Mohawk". All adjustments are easily accomplished using the unique method described in the manual. An outstanding buy in a communications receiver. Shpg. Wt. 66 lbs. Shipped motor freight unless otherwise specified.



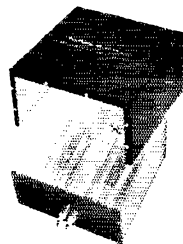
HEATHKIT AM-2
\$1595

REFLECTED POWER METER KIT

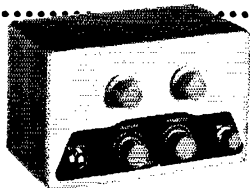
The AM-2 measures forward and reflected power or standing wave ratio. Handles a peak power of well over 1 kilowatt of energy and covers 160 through 6 meters. Input and output impedance provided for 50 or 75 ohm lines. No external power required for operation. Use it also to match impedances between exciters or RF sources and grounded grid amplifiers. Shpg. Wt. 3 lbs.

BALUN COIL KIT

Match unbalanced coaxial lines, found on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance with this handy transmitter accessory. Capable of handling power input up to 200 watts, the B-1 may be used with transmitters and receivers covering 80 through 10 meters. No adjustment required. Shpg. Wt. 4 lbs.



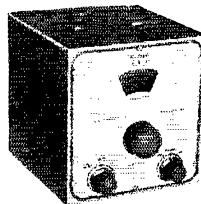
HEATHKIT B-1
\$895



HEATHKIT VX-1
\$2395

ELECTRONIC VOICE CONTROL KIT

Eliminate hand switching with this convenient kit. Switch from receiver to transmitter by merely talking into your microphone. Sensitivity controls allow adjustment to all conditions. Power supply is built in and terminal strip on the rear of the chassis accommodates receiver and speaker connections and also a 117 volt antenna relay. Shpg. Wt. 5 lbs.

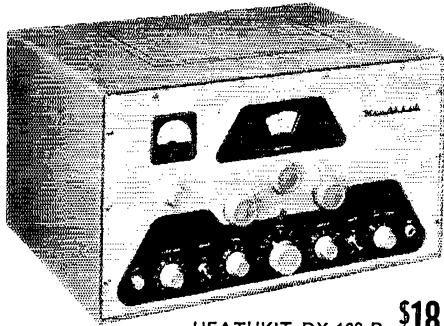


HEATHKIT VF-1
\$1950

VFO KIT

Far below the cost of crystals to obtain the same frequency coverage this variable frequency oscillator covers 160, 80, 40, 20, 15 and 10 meters with three basic oscillator frequencies. Providing better than 10 volt average RF output on fundamentals, the VF-1 is capable of driving the most modern transmitters. Requires only 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a. Illuminated dial reads direct. Shpg. Wt. 7 lbs. (

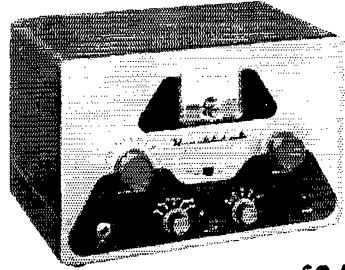
Save 1/2 or more...with Heathkits



HEATHKIT DX-100-B **\$189⁵⁰**

DX-100-B PHONE AND CW TRANSMITTER KIT

A long standing favorite in the Heathkit line, the DX-100-B combines modern styling and circuit ingenuity to bring you an exceptionally fine transmitter at an economical price. Panel controls allow VFO or crystal control, phone or CW operation on all amateur bands up to 30 mc. The rugged one-piece formed cabinet features a convenient top-access hatch for changing crystals and making other adjustments. The chassis is punched to accept sideband adapter modifications. Featured are a built-in VFO, modulator, and power supply, complete shielding to minimize TVI, and a pi network output coupling to match impedances from 50 to 72 ohms. RF output is in excess of 100 watts on phone and 120 watts on CW. Band coverage is from 160 through 10 meters. For operating convenience single-knob bandswitching and illuminated VFO dial on meter face are provided. A pair of 6146 tubes in parallel are employed in the output stage modulated by a pair of 1625's. Shpg. Wt. 107 lbs. Shipped motor freight unless otherwise specified.

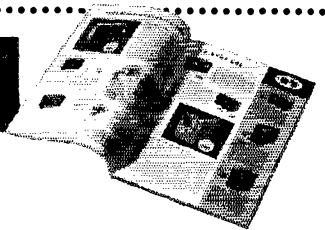


HEATHKIT DX-40 **\$64⁹⁵**

DX-40 PHONE AND CW TRANSMITTER KIT

An outstanding buy in its power class the DX-40 provides both phone and CW operation on 80, 40, 20, 15 and 10 meters. A single 6146 tube is used in the final amplifier stage to provide full 75 watt plate power input on CW or controlled carrier modulation peaks up to 60 watts for phone operation. Modulator and power supplies are built in and single-knob bandswitching is combined with the pi network output circuit for complete operating convenience. Features a D'Arsonval movement panel meter. A line filter and liberal shielding provides for high stability and minimum TVI. Provision is made for three crystals easily accessible through a "trap door" in the back of the cabinet. A 4-position switch selects any of the three crystals or jack for external VFO. Power for the VFO is available on the rear apron of the chassis. Easy-to-follow step-by-step instructions let assembly proceed smoothly from start to finish even for an individual who has never built electronic equipment before. Shpg. Wt. 25 lbs.


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NAME _____

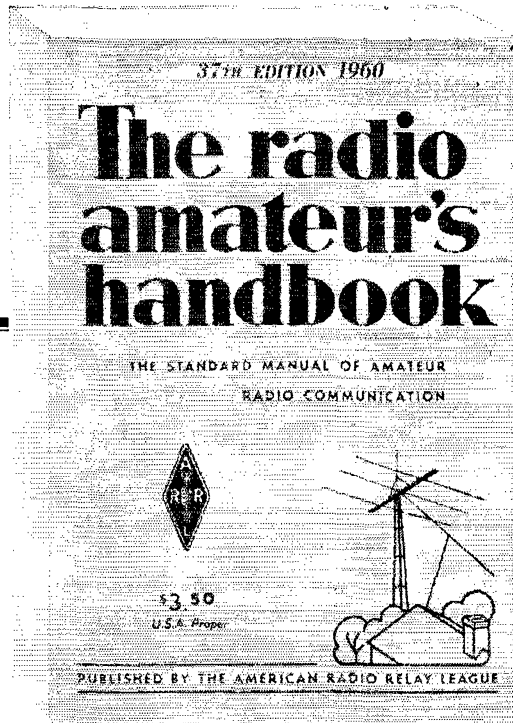
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CITY _____ ZONE _____ STATE _____

QUANTITY	KIT NAME	MODEL NO.	PRICE

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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 antennal

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-TI2TG)

List of 105 countries/stations worked with 65 watts and a V-80 vertical

BV1US	KG4AI	VK3YL
CE3DZ	KG6FAE	VK9XK
ZL5AA	KH6IJ	VK9AT
CO2WWD	KL7BUZ	VK0CJ
CN2BK	KM6AX	VP2KFA
CN8FB	KP4ACF	VP2AY
CR9AH	KP6AL	VP2DW
CT1CB	KR6BF	VP2MX
CX2FD	KS4AZ	VP2LU
DL1FF	KV4AA	VP2SW
DU7SV	KW6CA	VP5CP
EA1FD	KX6AF	VP5BH
EI4N	KZ5CS	VP6TR
FBVQ	LA3SG	VP7NM
FB8ZZ	LU2DFC	LU1ZS
FG7XE	LZ1KSP	VP9BK
FK8AL	OA4AU	VR2DA
FM7WT	OE9EJ	VR3B
FO8AD	OH2TM	VS1HC
G3DOG	OK1FF	VS2DW
G8CDO	ON4AY	VS6LN
G13WUI	KG1AX	XE1PJ
G3GJB	OZ2KK	XW8AI
GW3LJN	PA0FAB	YN1JW
HA5KBP	PJ5AA	YU3FS
HC4IM	PJ2ME	YV5HL
HC8LUX	PY2EW	ZC5AL
HE9LAC	PY0NE	ZE1JV
HP1LO	SM5AQB	ZK1BS
II1MV	SP6BY	KH6MG/ZK1
JATANG	TI2LA	ZK2AD
JZ0HA	UA1AU	ZL1ABZ
W1AW	UA0KKB	ZL3JA
KB6BJ	UQ2AB	ZM6AS
KC4AF	VE8OJ	ZS1OU



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- If K6INI can do it, so can you.
- Absolutely no guying needed.
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- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph wind-storms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- 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.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. **ONLY \$16.95.**

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A product that is consistently advertised in *QST* month after month, year after year, has to be good. Over 10,000 GOTHAM antennas have been purchased by *QST* readers. Even the "price-is-no-object" customers choose GOTHAM antennas on the basis of performance and value. Select your needs from this list of 50 antennas:

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TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

- | | | |
|-----------------------|--------------------------|---------|
| 6-10 TWO BANDER..... | <input type="checkbox"/> | \$29.95 |
| 10-15 TWO BANDER..... | <input type="checkbox"/> | 34.95 |
| 10-20 TWO BANDER..... | <input type="checkbox"/> | 36.95 |
| 15-20 TWO BANDER..... | <input type="checkbox"/> | 38.95 |

TRIBANDER

Do not confuse these full-size Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

- | | | | |
|----------------------------------|---------|-----------------------------------|---------|
| <input type="checkbox"/> 6-10-15 | \$39.95 | <input type="checkbox"/> 10-15-20 | \$49.95 |
|----------------------------------|---------|-----------------------------------|---------|

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

- | | | | |
|---|------|--------------------------------|-------|
| <input type="checkbox"/> Deluxe 6-Element | 9.95 | <input type="checkbox"/> 12-El | 16.95 |
|---|------|--------------------------------|-------|

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

- | | | | |
|--|-------|----------------------------------|-------|
| <input type="checkbox"/> Std. 3-El Gamma match | 12.95 | <input type="checkbox"/> T match | 14.95 |
| <input type="checkbox"/> Deluxe 3-El Gamma match | 21.95 | <input type="checkbox"/> T match | 24.95 |
| <input type="checkbox"/> Std. 4-El Gamma match | 16.95 | <input type="checkbox"/> T match | 19.95 |
| <input type="checkbox"/> Deluxe 4-El Gamma match | 25.95 | <input type="checkbox"/> T match | 28.95 |

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30-50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

- | | | | |
|--|-------|----------------------------------|-------|
| <input type="checkbox"/> Std. 2-El Gamma match | 11.95 | <input type="checkbox"/> T match | 14.95 |
| <input type="checkbox"/> Deluxe 2-El Gamma match | 18.95 | <input type="checkbox"/> T match | 21.95 |
| <input type="checkbox"/> Std. 3-El Gamma match | 16.95 | <input type="checkbox"/> T match | 18.95 |
| <input type="checkbox"/> Deluxe 3-El Gamma match | 22.95 | <input type="checkbox"/> T match | 25.95 |
| <input type="checkbox"/> Std. 4-El Gamma match | 21.95 | <input type="checkbox"/> T match | 24.95 |
| <input type="checkbox"/> Deluxe 4-El Gamma match | 27.95 | <input type="checkbox"/> T match | 30.95 |

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Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

- | | |
|---|---------|
| <input type="checkbox"/> Beam #R6 (6 Meters, 4-El)... | \$38.95 |
| <input type="checkbox"/> Beam #R10 (10 Meters, 4-El)... | 40.95 |
| <input type="checkbox"/> Beam #R15 (15 Meters, 3-El)... | 49.95 |



15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

- | | | | |
|--|-------|----------------------------------|-------|
| <input type="checkbox"/> Std. 2-El Gamma match | 19.95 | <input type="checkbox"/> T match | 22.95 |
| <input type="checkbox"/> Deluxe 2-El Gamma match | 29.95 | <input type="checkbox"/> T match | 32.95 |
| <input type="checkbox"/> Std. 3-El Gamma match | 26.95 | <input type="checkbox"/> T match | 29.95 |
| <input type="checkbox"/> Deluxe 3-El Gamma match | 36.95 | <input type="checkbox"/> T match | 39.95 |

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

- | | | | |
|--|-------|----------------------------------|-------|
| <input type="checkbox"/> Std. 2-El Gamma match | 21.95 | <input type="checkbox"/> T match | 24.95 |
| <input type="checkbox"/> Deluxe 2-El Gamma match | 31.95 | <input type="checkbox"/> T match | 34.95 |
| <input type="checkbox"/> Std. 3-El Gamma match | 34.95 | <input type="checkbox"/> T match | 37.95 |
| <input type="checkbox"/> Deluxe 3-El Gamma match | 46.95 | <input type="checkbox"/> T match | 49.95 |

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

ALL-BAND VERTICAL ANTENNAS

- | | | |
|--------------------------|---|---------|
| <input type="checkbox"/> | V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE NOVICE WHO OPERATES 40 AND 15..... | \$14.95 |
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- | | |
|--------------------------|--|
| <input type="checkbox"/> | 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 |
|--------------------------|--|

- | | |
|--------------------------|---|
| <input type="checkbox"/> | 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 |
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Station Activities

(Continued from page 80)

kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3509.5 and 3993 kc. at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, IPN on 3980 kc. at 1600. Appointments: WV2ILF and K2QWD as OESs. Endorsements: K2IYP as OPS, K2MES/5 as ORS, W2GBX, our SEC, has moved to W5-Land. Bruce has done a fine job and for the first time we have an EC for each one of the 44 counties in the W.N.Y. section. I regret to announce that W2OS and W2HYP have joined Silent Keys. ECEN elected K2GBY net mgr., K2QDT asst. mgr. and W2VRG secv. K2ICK has added a new HQ-160 to his shack. W2UTH/FRL has taken over as editor of *The Smoke Signal*, publication of the Squaw Island ARC. K2UZS now operates a h.c. station at R.P.I. W2EMW worked VS6AE with 25 watts and no beam. W2COB has a new HQ-160. W2RQF is building a reflected power meter. K2EQE will use a Wonderbar on 10 meters. K2JXF has erected a 403-ft. long wire for "top brand" use and he reports it works into W6-Land FB. Alfred U. expects to have a DX-100 and an SX-71 in its club station by now. The RARA announces that the 1960 hamfest will be held May 14 at Doud Post. K2EQK is chairman and W2ICE program chairman. Congratulations to the Ogdensburg ARC on affiliation with ARRL. The SWNYVHFA announces a certificate will be awarded to any non-club member who works 6 members or any member who works 10 members. K2CHB designed CP. W2SB put out a fine flyer announcing the N. Chautauqua ARC auction. WA2DAC is now Asst. EC for Clinton County for 50 Mc. He has organized the Champlain Valley 6-Meter Emergency Net, which ran a fine "downed plane crash drill" for the S.E.T. with 12 stations on 2 meters and relay via 6 meters. How are your clubs' emergency plans? Are you ready to serve as an efficient organization in case the need arises? K2MEF reports the first meeting of the Tioga ARC in Nov. was attended by 24. K2SSX and W2LUF made the BPL Traffic (Nov.) K2SSX 695, W2E2B 303, WA2CIG 302, W2RUF 278, K2IYP 191, W2TPV 144, K2JBX 123, W2OE 117, K2QJF 101, K2AOQ 83, W2FEF 83, K2GQU 80, K2IMK 48, K2UZI 45, K2BBJ 42, K2RWV 40, WA2ALO 34, K2JXF 29, W2QQK 19, K2OFU 18, W2RQF 18, WA2BTH 17, W2COB 17, W2BKC 15, K2EQB 13, K2EE 11, W2ZDL 10, WA2DAC 8, W2ISJ 7, K2MIY 3. (Oct.) K2GWN 28, K2MEF 17.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RAIs: GEG, NUG and KUN. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. The PFN meets Mon. through Fri. at 1800 EST on 3850 kc. K3GYD recently got his General Class ticket. The winners in the Penna. QSO Party sponsored by the Etna RC are as follows: Penna. (1) DQG (2) YOZ (3) K3ANU (4) EYF (5) GYI; Overseas (1) VE3AJU (2) VE3DDU (3) VE2LL; Out-of-State (1) ITS (2) K6OBF (3) K9HHA (4) WA2EBR (5) K4BAI and 8BZX, a tie. The McKean RC elected OCR, pres.; K2SPD, vice-pres.; GOE, secy.-treas. Up Erie way: The RAE is starting a c.w. net; KNQ is home from the hospital; the RAE's c.d. alert turned into Operation Snowbound; ADN has been discharged from the hospital. OCR is now mobile. ZFA is going on 220 Mc. The Horseshoe RC reports via *Hamateur News*: The club members operated as a group in the recent Sweepstakes; LIV and MBB worked hard in trying to get the club control center on in the recent Operation Alert; the Huntingdon County ARC has acquired land for its new home. Congratulations to KUN on making BPL. K3GHH visited Pittsburgh hams over the holidays. K3HPS and K3HPT, brothers, are on 10-meter phone. KBZ has a new HQ-170C. LMM, after more than ten years of EC work for the City of Pittsburgh, recently sent in his resignation. He has done a wonderful job and we know that he needs a rest. The Steel City ARC reports via *KiloWatt Harmonics*: The club station has a new rig on 6 meters; SVJ is back home from the Army; ZPZ has joined the Army; KPI now has 229 confirmed. The Etna RC reports via *Oscillator*: New officers are OVM, pres.; EDK, vice-pres.; DMK, treas.; TAS, act. mgr.; KSI and NSQ, directors. K3DKD now has a Thunderbolt. K3BBO and NSJ are back on 6 meters. The WPA Traffic Net still is in need of traffic outlets around Pittsburgh. If interested, contact KUN, Route Manager, Rich Valley Road, Emporium, Pa. We would like to thank the secretaries of the many radio clubs in the area who faithfully send us copies of their bulletins. We invite the members to drop us a line on their activities. Traffic: W3KUN 425, K3-GHH 208, W3UHN 197, WRE 56, LSS 20, KNQ 16, NUG 14, CA 5, K3COT 4.

(Continued on page 108)

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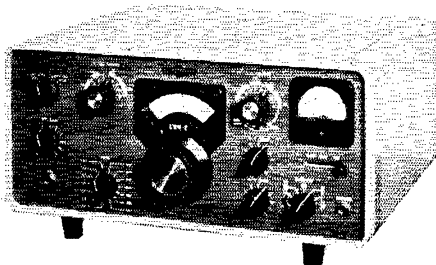
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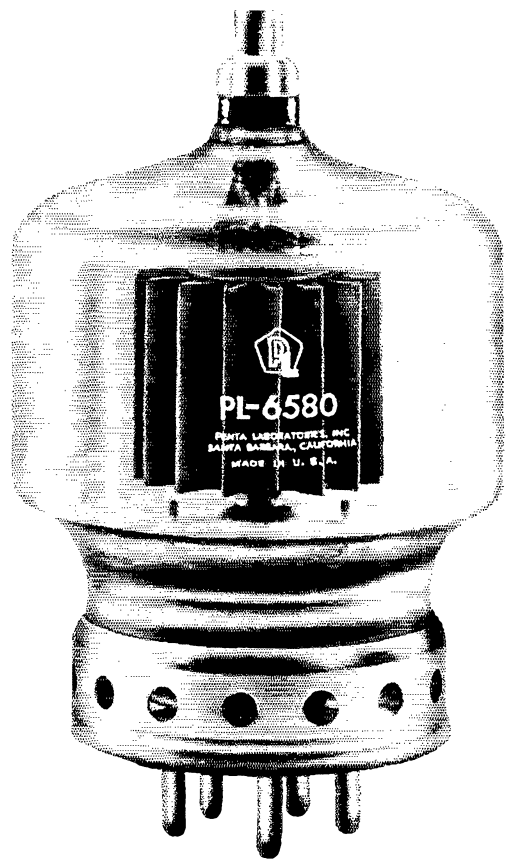


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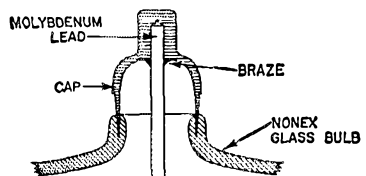
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RME in announcing the new 6900 states without equivocation that this receiver performance is unmatched by anything near its price class. The 6900 is engineered to give optimum service for all modes of amateur communications — not merely one. Engineered under the supervision of Russ Planck, W9RGH, the 6900 has as many advanced pioneering features as its extraordinary namesake, the world famous RME69, which was the first band-switching communications

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CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: PSP, RM; PCQ, PAM; RYU, EC Cook County: HPG. Section net: 1LN, 3515 kc. Mon. through Sat. at 1900 CST. FWT has joined the ranks of the Amateur Extra Class. K9ECN reports that a state-wide 2-meter net is being organized into local emergency nets so that the entire State will be covered in case of emergency. K9COB has appointed K9MHJ as Assistant EC of Moultrie County. Several Chicago 6-meter mobiles assisted during the fire resulting from an airplane crash at Midway Airport killing ten Nov. 24. K9OCU has added a new D-104 to his shack. PTD has gone v.h.t. and has sold all his l.t. gear. TZN spent many hours in the SS Contest and rolled in a high score. KN9QMJ has the DX bug and reports many new contacts. Amateur activity has picked up in the Quincy Area with GSK, QFH, VTD, FAU and YGP conducting code and theory classes to train new hams. The new MARS gang there has turned in some fine reports. UFL, former chaplain of St. John's Hospital in Springfield, has been transferred to St. Joseph's Parish as pastor near the Quincy Area. JUV has piled up his 242 DX contacts. IMN has notified this column of a Worked All State Capitals award. Contact him for details. K9LXK is now working SS and CD Parties with a new exciter on all bands. K9KNNM is knocking off the DX on 15 meters with his new Valiant and three-element beam. JIN has a new jr. operator. GD received his 235 sticker for DXCC. SKR received a gold nugget attached to his QSL from KL7AMS. ESD and KMN are now holders of the WAZ Award. The executive committee of the ARRL has approved the application of the Peotone High School Amateur Radio Club as an official affiliated club. K9AMD received her QSL from H2JT in the form of a pair of ruffia shoes. K9DYP was a contributing editor in the November issue of *Electronics Illustrated*. CNT's new QTH will be in W1-Land. K9MLI wrote and illustrated an article about amateur radio and its large network of stations in the latest issue of *Partners*. JIN, IGH, K9CCL, IFA, K9KIM, K9KYF, PBU, REC, K9HEA, HPG and TZN participated in the recent Frequency Measuring Test. K9MHF and K9KKL have gone s.s.b. with new Hallcrafters HT-37s and have given the a.m. signals to the "non-believers," as they call them. Many of the radio amateur clubs turned out to demonstrate their talents on Civil Defense Day Dec. 7 in cooperation with civil defense officials. The newest net announced is the No Name Net (an XYL net) with K9IVG as net control. It meets on Tue. and Fri. at 0800 on 7250 kc. K9QYW reports that the North Central Phone Net handled 164 messages during November. Traffic: (Nov.) W9IDA 807, DO 712, K9AIR 618, W9USR 422, K9PLF 374, W9SPS 101, K9GSR 90, IVG 85, W9JXV 80, K9JSV 72, W9MAK 72, SXL 71, K9QYV 51, ISP 21, LKX 21, LXX 18, W9TZN 16, LGH 15, K9OAD 12, GDQ 7, W9PRN 6, PNY 4, SKR 4, NIU 3, K9IDB 2, W9JUN 2, K9MLI 2. (Oct.) K9AIR 1513, CIL 5.

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SNQ. PAMs: BDG, BKJ, MEK and UKX. RMs: DGA, JOZ, TT and VAY. Net skeds (all CST): 1FN (A.M.) 0800 daily and 1730 M-F on 3910 kc.; ISN (s.s.b.) daily on 3920 kc.; QIN 1900 daily and RPN 0700 Sun. on 3656 kc. and QIN (training) 1800 M-F-F on 3745 kc. New appointments: K9CJE as EC for Newton County, JIP as EC for Hamilton County and RTH is OBS. New officers of the Tri-State Amateur Radio Society: K9JQN, pres.; MVX, vice-pres.; BKQ, secy.; K9PNJ, treas. The Michiana Amateur Radio Club entertained 190 at its 10th Annual Banquet Nov. 21. K9JTO has a new Gouset Tribander. IGH has put up a 162-ft. tower. SNQ has a new Mohawk on the air. Ditto for K9IJJ, plus an Apache. YSK is attending Rose Polytechnic Institute. K9C9Y is building a high-power rig for 6 meters. DZS is new on 6 meters with a G-50. The theme for the 10-day amateur radio display sponsored by the Indianapolis Radio Club at the State Fair Grounds was "Small World." The booth attracted thousands of visitors and hundreds of potential hams. HVR has returned to the air after being inactive for several years. MC operated portable on 6 meters from the Hobby Show using a G-50 and a halo. S.s.b. fellows held their second annual dinner Nov. 14. PAK has a new SX-101 Mark III. Those making BPL: DGA, MM, NZZ, TT and ZYK. November net report: BDG reports 413 total for IPN; ISB total was 77, as reported by MEK; VAY reports QIN traffic at 736 and RPN totaled 521, as reported by TT. Traffic: (Nov.) W9TTF 946, NZZ 875, ZVX 566, DGA 500, MM 541, VAY 418, K9AYI 313, W9FJR 286, BKJ 193, K9HMC 138, W9SWD 129, FTAI 111, MEK 97, K9IXD 97, W9GJS 82, BDG 76, K9BSU 75, LBD 54, W9RTH 50, K9PTS 44, W9TGH 41, ZPP

41, NTI 40, K9JKK 32, PDE 31, GGB 23, LZJ 23, W9CLY 27, RVM 27, SNQ 26, KN9TCG 26, K9RMIQ 25, W9BUQ 23, QYQ 22, CC 20, EJW 19, IMU 18, UQP 17, VNV 17, VYX 15, K9MAF 12, W9ENU 10, OCG 10, RDP 8, HUF 8, GG 8, K9MWC 6, W9FWH 4, NTR 4, AB 3, YVS 3, SFU 2, UXK 1. (Oct.) W9ZYK 669, K9RMO 38, LBD 28, PDE 24, AUN 19, W9DZC 19, K9GGB 14, W9VQP 1.

WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH, PAMs: NRP, GFL and K9IQO. RMs: SAA and K9ELT. BEN certificates went to K9THR and LXD. BPL certificates were earned by DVG, SAA and K9DAC. New officers of the La Crosse Club are K9HFL, pres.; K9CUT, vice-pres.; GGY, secy.; and K9HVL, treas. NLJ's DXCC accomplishment rated a picture and quarter-page write-up in his local paper. K9PDJ completed his 50-state WAS. The Green Bay Mike & Key Club celebrated its 20th anniversary of ARRL affiliation on Oct. 21. IKY is chasing DX with a new Thunderbolt and a Telrex beam on 20 meters. The Fond du Lac Club has undertaken the project of reactivating the Wisconsin Council of Radio Clubs and, with the assistance of the Badger V.H.F. Club of Milwaukee, is making plans for the first meeting of the old officers and the election of new officers at the coming Wausau Hamfest in May. OBS K9LCA has a new Apache transmitter. The 3rd Annual Banquet of the Fond du Lac Club was attended by over 170 people and will be made a yearly event. PDX made contact with all 73 ARRL sections in the last SS. MRAC mobiles furnished perfect communication for the Marquette U. Homecoming Parade. NQW has a new null, a vertical antenna and a shack phone to make his traffic-pushing easier. K9OPF thanks GTJ for the 20-ft. tower and APU for the three-element 10-meter beam they gave him. Five QOs sent out 42 notices during November. OTL and YOM have completed 21 years of weekly skeds, the war years excluded. Marquette U. Amateurs elected K9UEI, pres.; K8PFO, secy.; NOR, treas.; and K9LXJ, station manager. Traffic: (Nov.) W9DYG 1472, K9DAC 594, W9SAA 508, CXY 473, K9-DTK 394, W9IDD 151, K9QYQ 94, ELT 53, PDJ 41, W9OTL 40, VHP 38, NRP 37, K9QJA 31, W9MIWQ 29, K9TKR 29, W9IKY 26, K9JIG/9 26, W9CCO 24, K9GSC 21, W9KQB 21, K9DOI 19, W9VJH 15, VIK 10, CBE 9, K9LWY 9, IQO 8, W9YT 8, K9OPF 2. (Oct.) W9OTL 34, GIL 5.

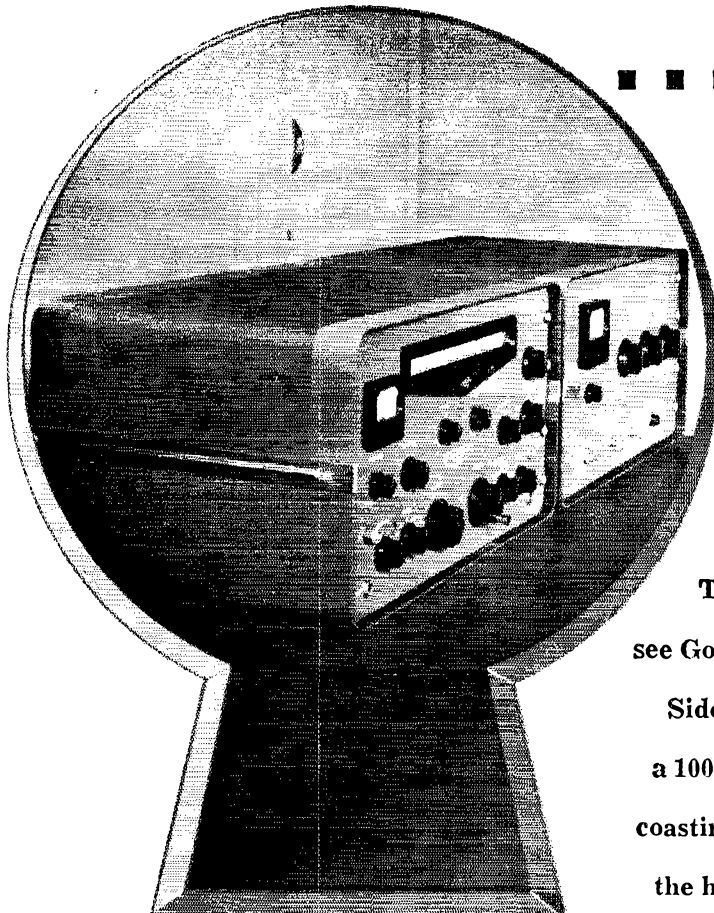
DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold Wengel, W0HVA—SEC: K0JLW. RM: RTZ. PAM: K0KJR. The Minot Amateur Radio Association met Nov. 12 with 26 members present. The MARS secretary reports that HDD and JWJ are operating s.s.b. using Collins equipment. JWL, on a.m., has worked 130 countries using about 200 watts. The Central Dakota Radio Association is taking first-aid training under the leadership of Les Potter. A new ham and radio club member in Bismarck is KN6WLS. K0GRM has his 2nd-class commercial phone license. The monthly meeting of the Young Citizens' League was held at the home of K0TYX Nov. 13. Ray demonstrated radio operation and discussed the role of amateurs in emergencies and civil defense. A 25-minute contact was made with K8POU. The N.D. C.W. Net reports 12 sessions, 86 check-ins and 12 pieces of traffic. Traffic: K0TTP 60, W0BIT 54, K0GRM 27, TYV 26, GII 18, ADI 17, JLU 16, PVM 13, W0DNJ 12, K0MPH 11, W0KTB 10, K0PJI 9, FVM 9, W0YCL 8, K0LAB 7, W0CAF 7, K0DHF 6, MHR 6, PVG 6, KJR 5, OLM 5, RUF 5, RMS 4, AJW 1.

SOUTH DAKOTA—SCM, J. W. Sikorski, W0RRN—SEC: SCT. Five activities reports were received for November. YQC and family have moved into their new home Frank lost no time getting up an antenna and returning to the net. In addition to being on the air, K0EWJ, Beresford, is now in it—taking flying lessons. OLP, formerly of Yankton, is stationed at Alameda, Calif. YVF, Redfield, has a new HQ-170 and a 10-meter beam on a 40-ft. tower. K0RRB, also of Redfield, put his beam on a 60-footer. SCT reports the following newly-appointed ECs: ZVV, YMB, K0CRD, K0LOW and K0LKH. SIF sent in his EC certificate for endorsement. New call: KN0ULH, at Bear Creek Indian Day School. Traffic: W0SCT 421, ZWL 278, K0BMO 188, W0DVB 127, K0AIE 54, W0NEO 42, K0KLR 29, W0CTZ 27, RWX 19, DIY 17, K0SEL 14, LXX 12, W0WBW 8, K0QPK 6, W0DUR 5, K0LKH 5, W0FJZ 4, YVF 4, EQY 2, K0LJL 2, W0OXU 2, PLW 2, K0CWJ 1, W0NNX 1, K0RQY 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, W0KJZ—Asst. SCM: Rollin O. Hall, 0LST. SEC: TUS. PAMs:

(Continued on page 108)



...A 1000 WATT PEEK...

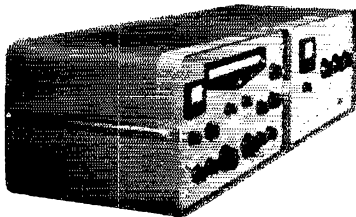
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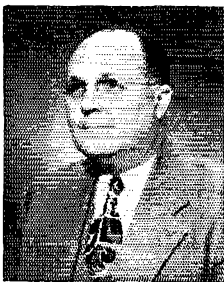


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QVR, TCK and TUS. RMs: RIQ and KØIZD. The MRC voted to hold the Division Convention in the fall of 1960. New MRC officers are KØUWC, pres.; PRT, vice-pres.; KØBIT, treas.; GLU, secy.; SFU and RGR, directors. SEC TUS attended the SPRC and Hennepin Mobile Club meetings. New officers of the Rochester Radio Club are KØEVV, pres.; KØSSB, vice-pres.; KØSAZ, secy.; KNØSND, treas. The SPRC elected ORA and KØMVB as Board members. OPX and LST received their Traffickers 1000. Ex-5DEW, the XYL of ARRL President TSN, is now KØWKS. TUS and KJZ made BPL KØRCF keys a new Ranger. LPX's Gonset Six converter was stolen and was recovered in pieces via an ad in the SPRC's *Ground Wave*. Ex-BOL, now 7ZEW of Seattle, visited in the Twin Cities. Cokato's newest ham is KNØWYO. KØMGT rebuilt his rig with a 6146 in the final and grid-block keying. During the past year Asst. SCM LST made 23 of the 24 FMT measurements. EC KØOIW replaced 17 parts in his Valiant and put up a cubical quad for 10 meters. KØQLM received ORS and TEN certificates. EC KØIKU states that Windom's emergency plan includes a semi-van communications vehicle and two generators, 13 KVA and 12½ KVA, the latter to be mounted in the van. KØRMK demonstrated ham radio at Mankato State College. DZZ put up a Gonset 20-meter beam. KØAUA is in the Navy stationed in Florida. KØEGE, MNY and BEI are newly-appointed ECs. Because of inactivity PHY and EYH were cancelled as ECs. TWG, VOA and KØCRB renewed their EC appointments. KØMAH and BUO were first and second in the I.O. Guessing Party. Most sincerely I thank retiring PAMs QVR and TCK for a job well done on the 3820 nets. Traffic: WØTUS 553, KJZ 307, KØQLM 162, WØOMC 106, RIQ 106, LEN 102, KLG 96, KØIZD 70, WØOPX 70, WMA 60, BUO 59, KØMAH 55, WØKFN 54, KØØHK 51, SNG 51, WØQVR 50, UMX 45, KØEPT 40, WØDQL 39, PET 39, LST 36, KØIDY 32, JYJ 32, WØISJ 31, OJG 30, IRD 28, ALY 26, TCK 26, RCF 25, Iku 24, MNY 23, KYK 22, LWK 22, QXY 21, PMI 20, RGP 20, TWG 19, NYM 18, RQJ 18, ØET 16, KØQRI 16, SNC 16, GIW 15, WØTHY 15, KØBFS 14, WØØJK 14, QVQ 11, KØRHN 11, WØDYC 10, MXC 10, KØMGT 9, OIW 9, QVF 9, OBP 6, UPA 4, WØFGP 3.

DELTA DIVISION

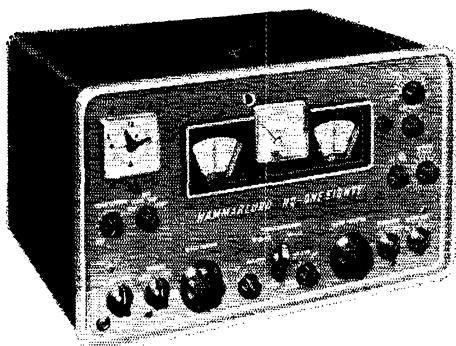
ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR, PAM: DYL, RAM: K5TYW. We are glad to have 9PHR with us. Sam has just returned from duty with the Air Force in Germany and presently is operating the MARS station at the Blytheville Air Base. VQD has purchased a plane and is in the air now as well as on the air. The 2nd District RACES has started net operation on 3995 kc. each Sun. at 0800. The MICARA recently held its annual election. Officers are as follows: K5SMV, pres.; KMK, vice-pres.; AIWU, secy.; KQD, treas.; NTS, act. mgr. YHT has been in the conversion business again, having recently converted his favorite YL into his XYL. Our best wishes, Fred. The club station at the U. of Ark., YM, is back on the air. Recently-elected officers are: K5IPB, pres.; KIB, vice-pres.; GOE, treas.; IEQ, secy.; ILX, sponsor. K5GXR is back on the air with a new Glohe Champ. We were very glad to hear BYJ during his short visit from college. Traffic: K5IFS 116, TXW 95, W5RYM 44, K5MES 26, W5DYL 14, BYJ 12, K5CTR 12, ZVE 12, W5TJH 4, ZZY 4, K5ABE 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Our new Director, 4RRV, is looking forward to hearing from us in the Louisiana section and will be glad to attend meetings, hamfests or any activity which will help him carry on his job. For those who are looking for a new award, Award Mgr. 3IMN will issue a certificate of "Worked all State Capitols." Drop him a line for details. The La. Tech Radio Club of Ruston elected K5GFN, pres.; ZBC, vice-pres.; K5VMC, secy.-treas., K5BWZ pub. The club's station, IGT, runs 500 watts to a pair of 813s on 75, 40 and 20 meters. The members would like to hear from other Louisiana college radio clubs. Address K5BWZ, Box 653 T.S., Ruston, La. USN recently started its 9th year of transmitting Official Bulletins and sends at 15 w.p.m. Mon. through Fri. at 12:30 p.m. CST and Fri., Sat. and Sun. at 7:30 p.m. CST on 7100 kc. After the station is moved to its new quarters, the skeds will be expanded to include more transmissions and at lower speeds. SPZ is in charge. K5WKZ and K5VUD are active on 15 meters with a new Valiant and an HQ-145. Looks like K5LKC and K5SFB are going into some frequency-measuring activity. CEZ just missed making the BPL. Listed in Silent Keys are AFE, DGV, and KTK. WYN, NC for the Delta 75 Net, is playing around with s.s.b. How many guys voted for GDY, who was striving for that voting-machine custodian job? WNSWSR started a Novice emergency net which meets on 7190 kc. at 9 p.m.

(Continued on page 110)

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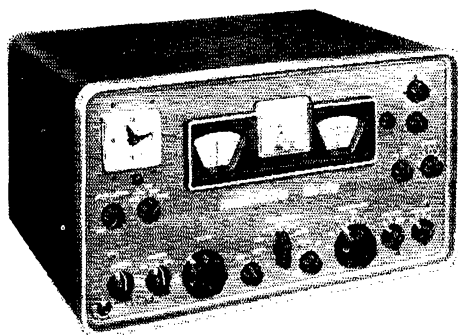
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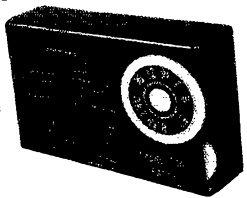
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TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4EJN. RM: FX. PAMs: UOT and PAH. Congratulations to RRV in his new post as Director and thanks for his service as SEC. Welcome to K4EJN, Jellico, who has accepted appointment as SEC. ECs can find Jud on the c.w. and the phone nets. Thanks to UOT, PAH and FX for net reports and to K4KYL for his OES report. WBK reports from Memphis as OBS that YANG is a freshman in Vanderbilt. SGI has renewed his OO appointment. Congratulations to EIN editor and the c.w. net on a fine bulletin. Traffic: (Nov.) W4PL 858, K4CNY 329, W4CXY 255, OGG 229, VJ 211, EIN 65, PQP 64, UIO 39, K4AMC 38, W4PPP 37, UVP 22, K4OUK 21, W4UVL 19, PAH 15, K4KYL 8, W4RRV 8, JVM 7, SGI 6, DFR 4. (Oct.) W4PL 1097, TYV 5, SZI 2, VTS 2.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—SEC: BAZ, RM: K4CSIL. PAMs: K4HCK and SZB. S.S.B. PAM: AMY. V.H.F. PAM: K4LOA. C.d. station ABK, at Louisville, is originating c.d. and Red Cross traffic going all over the state every Monday. We are striving for complete coverage on our section nets, particularly on this night. Make a special effort to have your location covered on Mondays. We are demonstrating to public officials our ability as well as training ourselves. The Louisville AREC group, under the direction of BAZ, furnished communication to the Shamrock Athletic Club during its Annual Cross Country Race on Thanksgiving morning at Bellarmine College. BAZ, HNF, IZF, URG, K4GFN and QXQ, all operating mobile on 6 and 2 meters, participated. More 9RN and KYN-KPN liaison stations are needed. Contact the RM and PAMs for your assignment. The new station at Ft. Knox, K5HZC/4, is a big help to our section nets. K4PGH has Bowling Green covered on KYN. K4BPY worked HC1JW November 1 on 6 meters. K4SPJ is now on all hands. ELG is working 6 and 2 meters from Louisville. K4DFZ has a MARS license. HTD is busy with his engineering course at U.L. ADH reports good s.w.r. with an Omega match on a four-element 50-Mc. beam. OO reports were received from SZL, EJA, K4IFB and K4BUB. KJP and SZB had perfect attendance on MKPN during November. Union College at Barboursville has a new club station. Traffic: K4CSH 190, W4ZDB 167, BAZ 159, SUD 111, K4PGH 70, HCK 51, W4CDA 45, SZB 42, K4CC 33, DFZ 25, W4HOJ 24, K5HZC/4 24, K4QHZ 20, W4JBC 19, YYI 19, K4LMS 16, W4NUQ 14, SYE 14, HTD 12, KJP 12, K4PTM 10, MPV 10, LOA 7, KIS 6, LSB 6, W4SZL 6, ELG 4, K4WBG 4, W4ADH 3, K4VDO 3, SPJ 2, W4VJV 2, K4BPY 1, IFB 1, W4WVU 1.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: YAN. RMs: SCW, OCC, F.W.Q. PAMs: AQA, NOH (v.h.f.). EC appointment went to ELR; ORS to NOH. SCW, SJF; OPS to FSZ; OBS (s.s.b.) to UOQ; OES to K8AEM. NUL makes the RPL. OO EMD turned in 96 "citations," 87 being 2nd harmonic, and 82 being Novices! The Holland ARC's new officers are DYI, pres.; K4CV, vice-pres.; K8EMV, secy.; K8HNB, treas.; GCW, programs. As are most clubs they are going for guest speakers. Local interest there on 2 meters is high. The Genesee County (Flint) RC's new officers are QLX, pres.; K8GOW, HRL and VXM, vice-pres.; VGG, secy.; K8JXR, treas. The club station, ACW, has a new HQ-170. The Saginaw Valley ARA plans a convention with a Wouff-Hong ceremony and provided communications for a Sports Car Rally. The St. Clair Valley ARC (Sarnia-Port Huron) reports 300 to 400 at the Ontario Convention, plus an interesting report on ol' VBE. YAN and NOH report on the 5th Annual V.H.F. Conference at West. Mich. University, Kalamazoo. More than 120 v.h.f. hams from Michigan, Ohio, Indiana, Illinois and Wisconsin attended, with talks and a demonstration on "V.H.F. Antennas," "Easy 20 Mc.," "Miniature and Printed Circuits" and "Micro Construction." The Calhoun Area RC had a nice talk by YIL on "Semi-conductors and Transistors." All inactive Michigan ECs will be dropped. Turn in your monthly report to YAN. Good reporters: PDP, MM, UOQ and K8CIS. The Grand Rapids ARA plans a banquet for April 9. TOX presents a good plan for AREC for Barry County. K8AEM reports the S. Mich 6-Meter Traffic Net ties in with the Indiana, Michigan, and Ohio 6-Meter Nets Mon. through Fri. on 50.7 and 50.85 Mc. BFF now has No. 26A for RTTY. K8KMQ handled deer-hunter traffic to home. ZEB is working QMN and MARS. TBP hears a Spanish/Latin b.c. station on 3663 kc. Adrian ARC officers are K8K, pres.; VJT, vice-pres.; K8EOP, secy.; K8OVV, treas. K8-CKD's new bride is learning the code. IZS transferred

(Continued on page 112)

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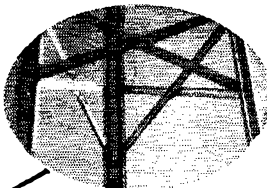
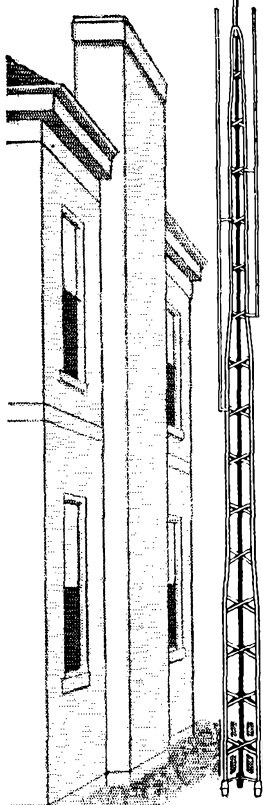
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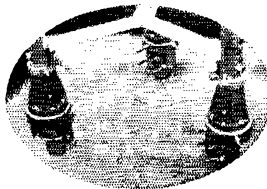
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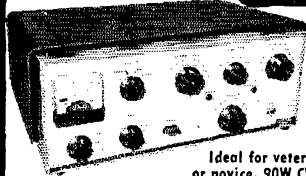
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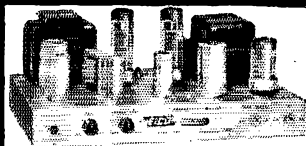


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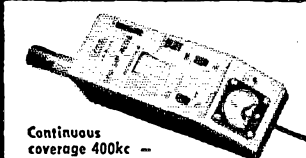
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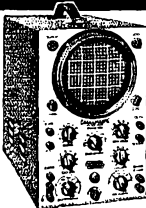
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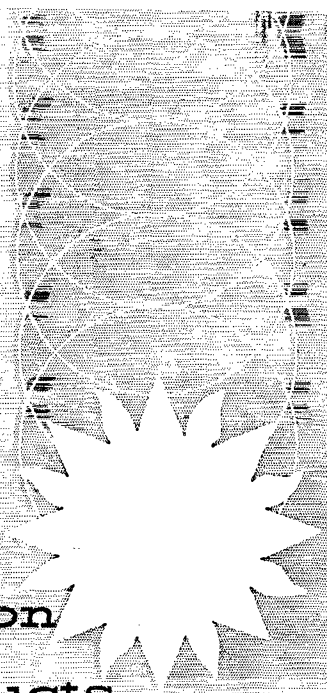
back to KL7-Land. New OO applications will not be acted on until after two frequency checks have been submitted. MGQ and MMB have a new son. Traffic: (Nov.) W8NUL 512, OCC 235, QOQ 217, FWQ 199, FX 94, YAN 93, RTN 68, NOH 64, K8GJD 57, W8JKX 50, K8EXE 43, KMQ 43, W8OCU 36, K8KVV 33, NAW 30, W8ILP 29, AHV 23, ZHB 27, ELW 23, SCW 23, K8ABW 22, W8TBP 22, K8AEM 19, W8AUD 18, IHN 18, HKT 15, QIX 14, SWG 14, EU 13, EGI 10, K8LOT 10, KVM 9, W8TUC 8, K8LPV 8, CKD 5, W8FDO 4, K8MIC 4, W8WXO 3, DSE 2, K8KCO 2, W8PXA 2.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE, SEC: UPB, RMs: DAE and VTP, PAMs: HZJ, WYS and K8BGD, VYU is in Italy with the Navy. PMJ received his Extra Class license. SWB is stationed and operating at Navy station NSS. The Seneca RC had a potluck dinner on Thanksgiving and held an auction. A new certificate, "Worked All State Capitols" (WASC), has come to my attention. Send QSLs of contacts made after January 1, 1955, and a dollar to H. L. German, W3IMN, 129 N. 30th St., Camp Hill, Pa. EEQ has a new Globe Champion. New appointees are KFC as OO, AEB as ORS, and K8HGD as PAM. Columbus ARA's 1960 officers are K8IXY, pres.; VOW, vice-pres.; GKQ, secy.; HOL, treas.; THX, BCK and DWP, trustees. The club's *Carascope* reports that Dr. Howe gave an antenna demonstration, a code and theory class will be started, the club's v.h.f. group heard K8HO talk on parametric amplifiers. VOW has a new harmonic. UPB is the new Great Lakes Division Director. We all thank SPF for directing our interests these past many years. A bulletin was received from the Fort Hamilton ARA, which states that Doc Davin passed on. Springfield ARA's Q-5 tells us that 1960 officers are KJT, pres.; K8LGC, vice-pres.; K8DEO, secy.; DCJ, treas.; and K8KIG, editor, that the club received and displayed the Ohio Council ARC's 1958 Sweepstakes trophy. OG presented a talk on "Introduction of Side Band," EQN's son, K8KSB, is at Port Monmouth taking a 32-week radio course. K8IFV attended the ARL National Convention in Texas. Toledo's *Ham Share Group* names K8HYE as it's Ham of the Month and states that the Toledo RC held its annual family get-together, lightning hit K8DRW's shack but he is back on the air, OQR is now WA6ING, K8OFV is now on 6-meter mobile and the mobile club held a transmitter hunt. The Canton ARC's 1960 officers are OJV, pres.; LDR, vice-pres.; OYV, secy.-treas.; and DNC, IEM, TJJ and K8LPD, board of directors. The new treasurer of the Piqua RC is K8DSP, K8EJN has a new Tribander. Kent State University RC elected JHD pres.; K8EKG, vice-pres.; and K8OHS, secy.-treas. as its 1960 officers. K8GRA is the club station. VDA took upon himself a wife. The St. Lawrence Seaway Net opens on 2 meters with SUT, GGH, ARF, QAY, NWC, K8s: CJS, JLA, KFY, LCW, LFX, LLY, NYB and K8NPNB enrolled. Its purpose is to study the phenomenal effect of weather conditions on 2-meter communication, handle traffic, ragchew and to tie in with other 2-meter nets. The BN prayers seem to have been answered with the Cincinnati outlet being filled. Guess I am a dreamer, but wouldn't it be ideal if the phone and c.w. nets would coordinate their traffic, with a station in each net nightly going into one of the other nets to give and take traffic for parts of Ohio where the other one doesn't have coverage. The Buckeye Net has coverage into Cleveland, Painesville, Youngstown, Akron, Canton, Mansfield, Findlay, Toledo, Newark, Columbus, Piqua, Dayton and Cincinnati. Phone nets, let us know your coverage so we can help each other out in handling traffic in Ohio. Traffic: W8UPH 1066, DAE 410, ZYU 313, BZX 93, K8GWK 85, W8QLJ 85, CMX 68, K8HVT 58, DHJ 29, IDH 28, W8IBX 23, K8HKU 22, W8WVS 22, YGR 20, K8JZZ 18, W8AL 17, WE 15, K8MHO 10, W8OUU 9, PZS 9, BEW 7, K8EEG 6, HEI 6, W8PMJ 6, CFE 5, LGR 5, BLS 4, FFK 4, K8IPA 4, HSU 3, HDO 2, W8LMB 2, LT 2, K8EJL 1. (Oct.) K8GWK 78, W8PMJ 16, PBX 8.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC, RM: W2PHX, PAMs: W2JGG and W2NOC. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; IPN on 3980 kc. at 1530; ESS on 3590 kc. at 1800; ENY (emerg.) on 20,490 (Thurs.) and 145.35 Mc. (Fri.) at 2100; MIT (Novice) on 3716 kc. Sat. at 1300. Appointments: W2SZ as OPS and OES. We welcome the Center Radio Club of Glenham as an affiliated member club. WA2EBP is secretary. WA2AKK finished the home-made 50-Mc. rig after much debugging. After 6 months in Greenland K2EIU is back with an Apache and an SX-101. K2CBA, of R.P.L., is back on the air after an appendectomy.

(Continued on page 114)



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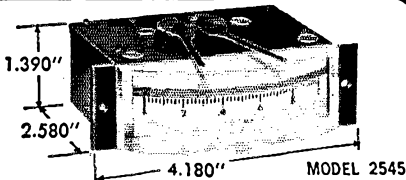
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The cartoonist for the *ESS-SED Newsletter* (R.P.T.) is K2LCF. WA2BDC is the call of the Schenectady Air National Guard. Operators include W2ANB, WA2FLA and W2VFOZ. We are sorry to announce the passing of W2CEC. K2KRP is editor of the Ellenville Club bulletin. He is ably assisted by W2MSQ, K2OCH and K2ZDA. Congrats to W2QYN on a new arrival. K2ZY0 is building commercial transistorized gear. In the newly-married column is WA2ABU. W2GTB and K2LKI are new Asst. ECs in Schenectady County. W2IR is a life member of the Schenectady Club. Ulster Co. amateurs extend sympathy to W2BTV on death of his XYL. W2VVP and his XYL won prizes at the ARRL Northeastern Convention. Having sold his DX-100. W2DVZ has 250 watts on 2 meters. It's nice to have W2DRV back from Germany. K2YZI is back on the traffic nets after curing his rig troubles. K2YJL reports 6 states and VE2 on 160 meters with 13 watts. W2BM has a new BC-191; WA2BKK a new DX-20. Heard on 80 meters from Florida was W2HH/4. Congrats to our BPLers: K2ZTV. Traffic: K2UTV 4202, K2MBU 132, K2YTD 116, K2EFU 106, W2PHX 65, K2OZT 61, W2ATA 48, K2LKI 46, WA2ALO 34, K2HNW 27, K2BIO 23, K2YZI 15, K2EUI 6, W2DRD 6, WA2AKK 2.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannels. W2TUK—SEC: W2ADO. RM: W2VDT. PAM: W2UGF. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. nightly at 1930 EST and Sat. and Sun. at 1915 EST. NYC-LPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST. NYC-LI AREC, 3908 kc. Sun. at 1730 EST. V.H.F. Traffic Net, 145.8 M. Tue., Wed., Thurs. at 2000 EST. It is my pleasure to announce the formation of the Hudson Amateur Radio Council with more than 20 clubs represented at the election meeting. HARC's officers are: W2TUK, pres.; W2ESZ and K2EAF, vice-pres.; W2XVY, secy.; W2YGM, treas. and W2IN, W2JHL, W2KW, W2RGP, K2GZ and K2SN, directors. All clubs in this section are urged to become members of this Council for the unity of amateur radio endeavor in the Hudson Division. W2KEB is our one and only BPL winner this month. Congratulations, Georgie, on extending your line record. The EASN reports excellent activity with several NLI members reporting in on 3748 kc. at 1800. K2PTS has been trying 160 meters. It is my unpleasant duty to report W2GQP as a new member of Silent Keys. Joe was active as the EC for the Five Towns Area and worked diligently for the AREC/RACES program. K2OPT is now mobile with the Conestoga Twins. K2MFQ is majoring in math at school. W2GTE is active in the Red Cross Net with K2UZG as operator. WA2CSE is using a linear amplifier on the V.H.F. Traffic Net. K2IUT added another continent from his powerful 9-watt mobile with a VQ4 contact. K2JHW is trying his first at traffic on EASN. Equipment for 220 Mc. is under construction at K2OFD and K2RHD. W2DXH is looking for states on 15 meters with his Globe Chief 90 and SX-99. W2HQL has passed the 250 mark for DXCC and now has a 130-country sticker for phone only. Joe added an HT-33A to his HT-32. W2JGU almost scored 10 times his '58 SS score with 80,000 points in 1959. K2DGT and his antenna farm accounted for 1275 contacts in the SS. K2DZA completed a transistorized 0-meter transceiver. W2OKU and W2LDC are active as Asst. ECs in the King's County 2-Meter AREC. A 6-Meter Mobile QSO Party sponsored by the I. I. 6-Meter Emergency Net will take place Sun., Mar. 20. The object is to contact as many mobiles of the net as possible. Certificates will be awarded to the highest scoring Tech. and General Class licensees plus those confirming 15 mobiles. K2SLP is enjoying his new HQ-145. K2SNM joined the married ranks. K2UQT has snagged 65 countries with his DX-35 and HQ-140X. WA2AQJ is working on 420-Mc. gear. WA2ECG has a new SX-101—ditto W2ZAL. A new "Worked All State Capitals" award has been announced. Contact W3IMN with your cards. K2EUY is now Asst. EC for Staten Island. Officers of the Massapequa HSRG: K2TEU, are WA2CWW, pres.; W4ZLG, vice-pres.; WA2CZG, secy.; and WA2CAW, act. mgr. The station is active with 75 watts into a Telrex Tribander with an HQ-110 receiver. Please check your appointments for renewal. Traffic: (Nov.) W2KEB 4034, W2EW 125, W2WFF 103, K2YQK 85, W2VDT 59, W2GP 42, W2DUS 35, K2PTS 35, W2UGF 29, K2QBW 28, K2GCE 26, K2JVB 24, W2JBQ 18, WA2BST 17, W2TUK 17, W2UAL 16, K2IRS 14, K2UZG 14, WA2CSE 12, K2AAW 10, K2PEV 9, K2RWB 9, W2PF 8, K2UAG 8, WA2HEU 7, K2CNIJ 6, WA2DXH 6, W2AEE 5, K2IUT 5, K2QOP 5, W2HJ 3, K2JHW 3, K2PIL 3, K2RHD 3, W2FNG 2, W2LDC 2, K2AZT 2, K2DEM 2, K2GKT 2, WA2IQH 2, K2TPU 2, W2DSC 1, W2SAP 1, K2MEM 1, K2ZLE 1. (Oct.) WA2CSE 12, K2QOP 4, W2DXH 3, K2AAW 1. (Sept.) WA2CSE 7.

NORTHERN NEW JERSEY—SCM, Edward Hart, jr., W2ZVW—SEC: W2CWW. RMs: W2ADE and W2RXL. PAMs: K2KVR, W2REH and K2SLG. NJN held

(Continued on page 116)

5

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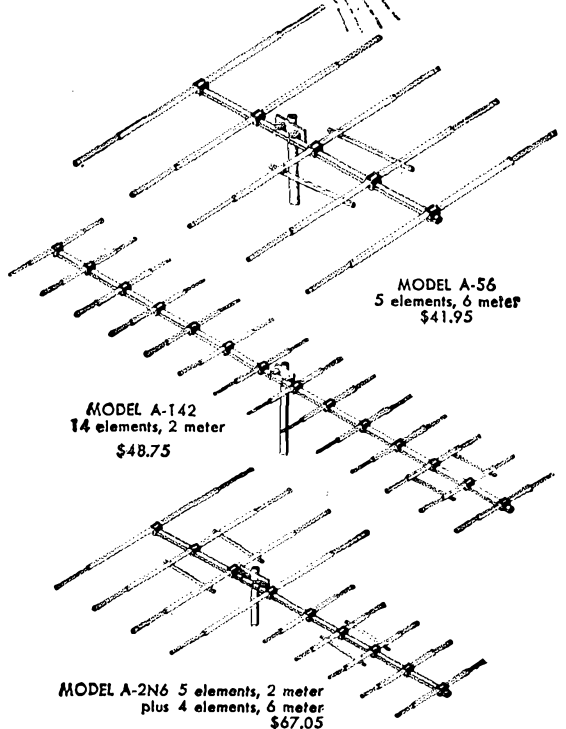


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30 sessions and handled 408 messages. NJPN also held 30 sessions and handled 113. NJ6-2 had 11 sessions and handled 18. W2TKZ finally got everything working at the same time and snagged CR5AR. K2VAB has homework listed as his major activity! K2ZHK spends lots of time on the Eastern Area Slow Net. K2CBG changes the final tubes in the transmitter like they were 6L6s. K2PTI lost his antenna during the SS. You want to know about R'TTY? Ask K2GIF. WA2COO has a new 175-ft. long wire antenna. K2JTU is building a 10-meter beam. W2NIY is working mostly on 40 meters. K2AGJ has trouble with rig break-down. W2BSC, Stevens, Hoboken, has started a message center for the staff and students with WA2CFF as manager. W2NKD is working DX on 40 meters, using a new HQ-170. W2CQB says s.s.b. is taking a big chunk of his time. K2UCY was appointed assistant to the director for c.d. in Belleville. The Northern New Jersey Radio Assn. elected W2DZA, pres.; W2NTY, vice-pres.; W2SCP, treas.; K2PIA, secy. Traffic: (Nov.) WA2APY 249, W2RNL 181, K2GIF 172, WA2COO 155, K2ZHK 142, K2UCY 116, W2VW 115, W2CQB 74, W2RZO 74, W2EBG 63, K2MIF 62, K2VVL 60, W2YFGP 59, K2YBC 42, W2ADE 40, W2DRV 38, K2VNL 37, K2LWQ 33, K2EQP 31, W2CVW 24, K2CBG 20, W2CFB 19, K2JTU 17, W2ANG 14, W2BSC 14, K2QGD 14, WA2AKM 6, W2OXL 6, K2KVR 5, W2PTS 5, K2VAB 5, W2BYE 4, W2NIY 4, K2AGJ 2. (Oct.) WA2AKM 12, WA2CCF 6, K2KVR 6, K2QGD 6.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, W0BDR—The Section extends condolences on the death of Leland Milligan, W0ADB of Pulaski. SLC, Iowa SEC, reports emergency activity is picking up with new nets being formed by EEG, EC for Benton County, and K0EAA, EC for Marshall County. K0EAA reports that his 160-meter emergency net is very successful. LCX reports that NFL has rejoined TLGN, and new TLGN members are K0HGB and FCE. NGS, Iowa PAM, reports activity is picking up on the 75-Meter Phone Net. New appointments: K0GBD as ORS and K0IHC as OPS. Renewals: EEG as EC and NGS as OPS. GXQ reported to Lowry Field, Colo., for Air Force training. K0EXN is back from Nebraska. LGG and EFL have a new HT-37. LGO is now on d.s.b. KNBWRV is a new Novice in Council Bluffs. 90CW reports hearing an excellent aurora skip on 2 meters with several Iowa stations working into Ohio. The Fort Dodge Club reports increasing activity on 6 meters. VWF reports excellent progress in the development of the RACES program in Iowa. K0EAA has a 75A-2 receiver. UTD has a 2500 Traffickers certificate. BDR has a 10-meter beam. The Story County AREC group is using 2 through 80 meters for emergency drills. TCC reports personally that he expects to be more active in the near future. Traffic: W0LGG 1838, LCX 1614, SCA 1533, BDR 1460, K0MMZ 128, W0NTB 51, SLC 50, NGS 48, VWF 43, QVA 37, BTX 24, K0EAA 18, KQA 14, KTP 13, W0VQX 13, GQ 12, NYX 12, K0OTV 12, SEW 12, W0UTD 12, K0AGJ 9, JGM 7, JNK 5, W0PTL 5, K0BRE 4, GOT 4, W0JJP 4, K0KBX 4, W0HFO 3, FMZ 2, K0RTF 1.

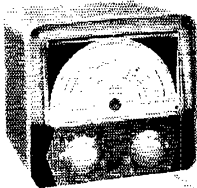
KANSAS—SCM, Raymond E. Baker, W0FNS—SEC: IFR, Asst. SEC: LOW, RM: QGG, PAM: VZM, V.H.F. PAM: HAJ. Renewals: TOI, IFR, K0BXF and IQA as ORS; IFR and K0GYA as OPSS; LIX, ETX, KXB and MXG as OBS; ETX as OES; GJG Zone 14 as EC; BYV as OO. New appointments: K0TNW as EC Zone 10. K0BXF is very busy around K. C. in the insurance game. BYV is recuperating from a little ticker trouble. K0BIX is doing a fine job issuing the QRS News Letter and Traffickers Club certificates. Our thanks to the Wichita Clubs for the fine meeting Nov. 21. K0JWS was fine as M.C. RC, now Mayor of Wichita, made an FB welcoming address. The traffic session was held by your SCM and PAM, the DX session by VBK, v.h.f. by K0EMF, MARS by DEL, emergency coordination by LNZ. Also a very fine demonstration and session of single sideband was conducted by BVQ. Our thanks to ZJY, general chairman of the meeting. K0EWN has done a splendid job of getting the Federation on its feet and we know that K0JWD will keep it rolling. New Salina Club officers: K0PKD, pres.; JAS, secy.-treas.; RDP/θ, activities; RDK, hamfest chairman. My thanks to all section members and LOs for their able assistance in 1959 and we are counting on it in 1960. Traffic: (Nov.) W0OHJ 681, BLI 428, FNS 216, K0BLX 139, W0QGG 137, K0HGI 130, W0SYZ 120, RJF 117, ABJ 93, IFR 55, VZM 51, TOL 46, UTO 44, K0TOA 36, BNF 34, KED 33, W0SAF 33, K0EFL 25, LJJ 14, W0VUI 11, K0GWN 10, W0WFD 10, STC 9, GJG 8, K0TNW 8, LHF 7, GIG 5, W0FHT 3, K0SMQ 3, QOB 1. (Oct.) K0IRL 42, GYA 34, W0FHT 16, OAG 11, K0MRI 3.

MISSOURI—SCM, C. O. Gosch, W0BUL—SEC: K0LTP, RMs: OUD and QXO. PAMs: BVL, OMIM and

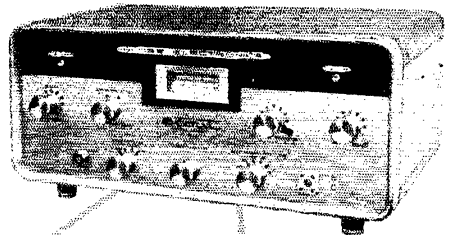
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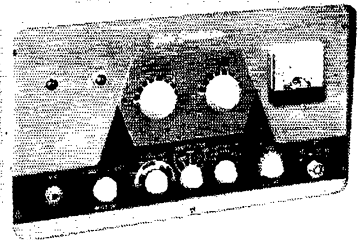


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6th EDITION

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116 West 14th Street, New York 11, N. Y.

KØKLQ. Net reports: MON (1900 CST Mon. through Sat. 3580 kc.) QNI 156; QTC 97; NCS KØQCQ 6, OUD 7, KØKBD and RTW 4, KØONK 3, ARO 1, SMN (1800 CST Sun. 3580 kc.) QNI 13; QTC 6; NCS OUD, MEN (1800 CST M-W-F. 3885 kc.) sessions 13; QNI 476; QTC 137; NCS OHC 4, OVV 3, VPQ 4, OMM 1, BUL 1. RVL reports that Lou (ex-CPI) is now K5WXT in Texas. KØBLJ is new to the section from Iowa. Ken is active in MON. OUD reports nice 1X on 80-meter c.w. KØPFF and KØBST are experimenting with flea-power (½ watt) u.h.f. rigs. KØJJC reports limited operation as he is QRL school work. KØONK had rig trouble during most of November but still managed to handle a large quantity of traffic. KØDEW reports considerable 144-Mc. activity in Pulaski County, including 25-mile contacts mobile to mobile. KØRAL has a new 55-ft. "crank-up" tower and is looking for a DXCC. RACES activity in the section is increasing, following the appointment of KØALL as State Radio Officer. The section has been transferred from Region 4 (Battle Creek) to Region 6 (Denver). Plans are underway for 80- and 40-meter section-wide c.w. nets and a 144-Mc. phone net to parallel the 3993-ke. Sunday Morning Phone Net. OVV reports considerable interest in AREC and RACES in Pulaski County. The 50.55-Mc. Weather Net in the St. Louis Area proved its efficiency during a developing tornado. Some twenty stations, plus mobiles, took an active part. OO reports were received from KØJJC and KØRAL. Appointments: KØONK as OPS, KØLGZ as OO, KØBWW as OES. Traffic: (Nov.) KØKBD 504, LTJ 468, ONK 385, WØOMM 244, MEJ 156, KØLTP 146, WØVDL 100, VPQ 82, KIK 64, OVV 58, KØQCQ 53, WØAUL 44, KØBLJ 37, WØBUL 34, ZBR 28, ARO 23, PXE 23, RTW 33, KØPFF 17, IHY 12, WØWAP 7, KØOEP 6, OJC 5, WØQMK 4, GBJ 2. (Oct.) KØPFF 57.

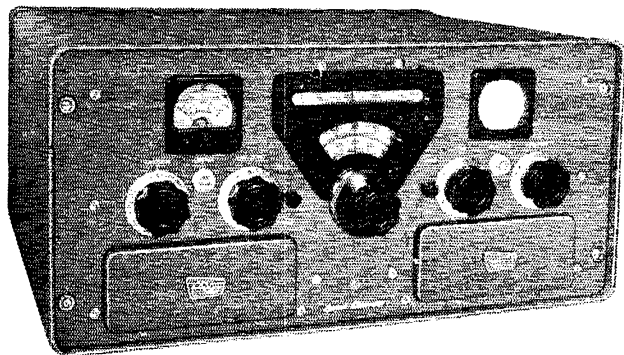
NEBRASKA—SCM, Charles E. McNeel, WØEXP—The 75-Meter Morning Phone Net, KØDGW reporting had QNI 695, QTC 147. The Western Nebraska Net, NIK NCS, reports QNI 675, QTC 490. The 75-Meter Frequency Phone Net, which meets at 1230 daily on 3983 kc., had QNI 444, QTC 36, as reported by ZOU. The NEB C.W. Net is going strong on 3525 kc. at 1900 CST. WRY and KØLXS were on the air for several days handling traffic when a storm took out all long-distance lines. KØDGF and HTA have been elected NCS and alternate for the Morning Phone Net. ZOU and KØSRV are NCS and alternate for the Noon Phone Net. We are sorry to hear that YLC, of Bassett, passed away recently. New officers of the McCook Radio Club are UKN, pres.; MJF, vice-pres.; KØUWV, secy. The Slow-Speed Net, as reported by KØQVM had QNI 57, QTC 13 in October. Traffic: WØGGP 387, NYU 227, RDN 218, ZJF 117, KØDGW 102, WØNIK 84, KØQFK 62, RRL 62, MZY 42, WØJWJ 39, KUA 36, OCU 36, ZOU 35, KØCDG 30, CYN 30, WØEGQ 28, VEA 28, KDW 24, KØDFO 23, QVM 22, ULQ 20, WØBOQ 18, KØELQ 18, MSS 18, WØTFQ 18, HTA 17, KØKJP 16, KTZ 14, TUA 14, UPA/Ø 14, WØLJO 13, RJA 12, KØBDF 10, WØVZJ 10, YFR 10, KØSCM 9, ELU 7, URR 7, LXS 5, WØATU 3, ØOP 3, AFG 2, KØPTH 2, WØQKR 2, SWG 2, URC 2, KØVPG 2.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor I. Crawford, WITYQ—AW and YBH made BPL. EJJ is active on MARS. KNIKEA and KNIKGI received Section Net certificates for their support of CVN. KYQ reports CVN handled 548 messages, including 140 on the second session, with an average attendance of 13.7. High QNI goes to OBR, REFJ and KIHWP. VRP has a new Apacite transmitter. RTI is using a Thunderbolt and an NC-303. PJD is building a 2-meter rig. OBR has a new Jeep station wagon. GUV converted a Heath Citizens Band rig to 10 meters. FHP reports CVN had 79 stations check in during 10 sessions and handled 12 messages. High QNI goes to FHP, KNIKEA and KNIKGI. RQU has a new 8- and 2-meter antenna farm. IOH has a new three-element 10-meter beam. AW made 1045 QSLs in 71 sections in the SS. CHR had a visit from KIHWP and KIJWC. The Waterbury ARC (LAS) moved to new quarters Jan. 1. PHT and JZA are hunting DX on 220 Mc. QBF is home from the hospital. KIACC and KIDHU teach dancing. YBH advises CPN met 30 times in November, handled 361 messages and had an average daily attendance of 26 stations. High QNI goes to DAV 30; YBH 29; KIAQE and TVU 28; KIBSB and KICVB 26; VQH 25. Certificates have been awarded to the following Connecticut Wireless Assn. Conn. QSO Party winners: KIHOP first, MWB second, KIDDY v.h.f. only. KNIKSH Novice. BDI finds 2 meters ideal for QSPing traffic to New Britain. LGE has antennas on 50, 144 and 220 Mc. FVV picked up some BBC TV signals. KIGHL hopes to be on 2 meters soon. CJD renewed acquaintances with two W3s he

(Continued on page 120)

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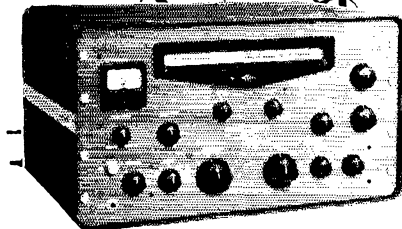
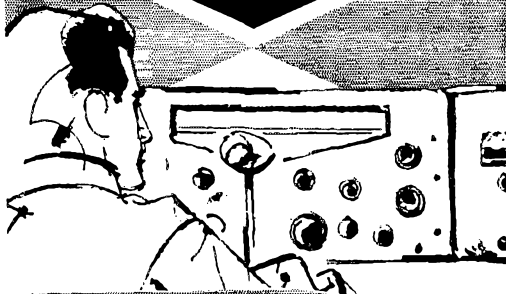
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1000 watts P.E.P. input linear uses stable, efficient grounded-grid circuitry. Has pi-network output, bandswitches 80-40-20-15-10 meter bands. Supplies for power and bias and antenna relay are built in. Linear drives by GSB-100 or other equipment supplying 60-70 watts of driving power.

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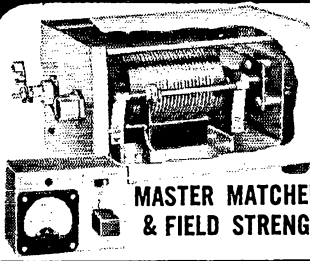
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BETTER STILL, COME IN—PLENTY OF PARKING SPACE

hadn't QSOed in 25 years. K1MLJ is on with a GSB-100 and an HQ-170. K1BHM has been elected net manager for the ESTA Net. QVF went hunting. KN1MJC has 8 states using a 616 with 15 watts. K1IJT is on 6 and 2 meters with a TBS-50C. MBY is after WAS on 15 meters using a DX-35 and an 840-B. K1CCB has a Viking II and an NC-109. The CQ RC had 62 stations check in their four sessions on 2 meters during November. TYQ had a 20-meter s.s.b. chat with VWP via CN8JF. K1CAK has a new Heath TX-1. K1CSY won the Southington ARA WAS Contest. ZZK has a 254 worked, 250 confirmed country total. GVZ has a 152/134 total. ZTQ has over 100 countries confirmed. RGB and UCA are working at Pratt and Whitney in Wallingford. GTH is back at work after a long illness. ZTQ is active on 15 meters. New appointments: K1IFJ as OO; K1HOP as OO and OBS. Appointments renewed: ADW and NLM as ORS; MDB as OPS; ADW and NLM as EC. Reports received: OES from FVV and LGE; OO from MBX. QPD and VW. Traffic: (Nov.) W1YBH 574, AW 317, OBR 312, KYQ 267, EFW 209, BDI 178, ROX 159, K1HWF 139, WINJM 128, K1AAE 125, W1YU 92, K1BHM 91, W1CHR 83, K1JAD 52, W1FHP 50, RFJ 50, TYQ 33, K1CBV 31, AQE 29, DGK 28, W1FCE 16, V1Y 14, E1H 11, BNB 7, CUH 7, QVF 6, TUW 6, K1BSB 5, HOP 5, W1MBX 4, KN1MJC 3, K1CCB 2, W1CWF 1. (Oct.) K1HAN 135, W1CHR 58, K1HOP 15.

MAINE SCM, Jeffrey I. Weinstein, W1JMN—SEC: JMN. PAM: BXL. RM: EFR. JMN's Official Bulletin frequency is 3600 kc. The Sea Gull Net meets Mon. through Sat. at 1700 on 3940 kc.; the Pine Tree Net Mon. through Fri. at 1900 on 3596 kc.; the Maine Slo-Speed Net Tue., Thurs. and Sat. at 1730 on 3726 kc. New appointments: LER, K1KFR and KSG as OOs; K1CXX as OBS; K1CJX as EC. Details on the Worked All States Capitals award may be obtained from your SCM. BPM needs only 2 more states for WAS on 20 meters. GKJ made WAS during the SS. WXI is on 2 meters. Have you joined the AREC yet? If not, get on the ball and become a member of this vital phase of amateur radio. Applications are available on request from your SCM, SEC or local EC. K1CXX has a new 2-meter 829B rig under construction. Keep your ears open for the State of Maine QSO Party coming up sometime in March. The PAVA has an active and interesting program planned for the coming year. All amateurs are welcome to attend meetings which are held every Tue. evening in the c.d. room of Portland City Hall. Your SCM would like news of club activities for use in this column. Welcome back to K1KRG, who returned recently to Maine from Greece. K1GVQ is net manager of the M55N. The two Maine c.w. nets could use more operators. Every amateur should know and use the proper procedure in c.w. traffic work. Traffic: (Nov.) K1DFM 48, W1SO 41, K1HQK 27, KSG 21, GVO 15, W1JMN 13, K1IWN 12, W1EFR 11, TKK 6, K1BQT 2, BYE 2. (Oct.) W1TKK 5, K1BZD 5.

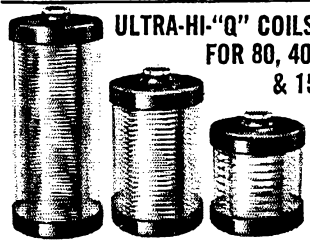
EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointments: K1GYM Winchester as EC, K1JAW as ORS, KBN as OBS, K1MMQ as OO, K1LJK as OBS and QO. ALP is the new Radio Officer for Area 2 of Mass. Civil Defense Agency. TZ is the new Radio Officer for Sector 2-D. The Eastern Mass. 2-Meter Net is now a member of N.T.S. On 75 meters: K4ZEO/1, DSW, LZB, JHU, YIB, LLY, Kis AGS, CIE and JHD. On 2 meters: EAB, UZN, EYU, KSA, MQH, YZC, PEX, EZV, LKD, K1s CWE, EK1, MPJ, GSI, HHN, GDR, DGG, HDY, KN1s KHP, JPW and MPB. We are sorry to announce the death of F1. K1KHJ, Coast Guard boat *East Wind*, left Boston on the way to the South Pole and will be on 15, 20 and 40 meters. The following took part in the Sept. F.M.T.: PLJ, AYG, WAJ, MNK, PXH, OGU, HJP and DMH. The T-9 Radio Club met at HB's QTH. K1DFD has a DX-40, an NC-200 and an SCR-522. RFN has an HQ-129X, a DX-40 and a Windom antenna. The El Ray Club had Capt. Fred Lawton, skipper of the race-winning *Columbia*, as a speaker. We all wish to thank AYN for his fine job done as R.O. for Area 2. KH6JJ, ALP, AOG and IAE attended the meeting of the Winthrop C.D. at BB's QTH. K1BBH has a TBS-50-HQ-129X on 6 meters. K1JCC is on many bands. The Framingham, Malden and Mobilier Clubs held auctions. A New England Division Convention will be held May 1, 1960 at the New Ocean House, Swampscott, Mass. AUU spoke on his 7 years in MARS at the Braintree Club. ZSS is net manager and K1s GYM and MHC are assistants for the Eastern Mass. 2-Meter Net. OFK spoke at the Waltham Club on traffic-handling. K1GVR is on Beacon Hill now. TWG, K1GYM, MHC, W1QFO, PEX, QOI, NVV and SIV had a get-together at OFK's. K1ISR has his Tech. Class license. SIV went on a motor trip. KWD is back from a trip. K1BGK is on 2 and 6 meters. KVZ is on 6 meters. GFX is building a new shack. K1GLM is in the Air Force in Texas. LMZ

(Continued on page 122)



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- Rigidly tested & engineered—found to have "Q" of 525
- Operates into a 52-ohm cable
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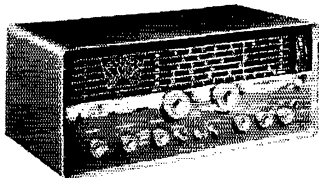
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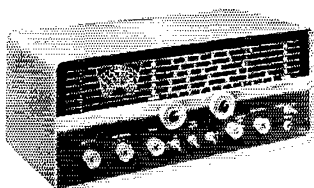
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heard HCLJW on 6 meters. INC is Comm. Officer and YQM is Radio Officer in Melrose. MFM is in Hull and on 8 meters. WEX spoke at the QRA on "Modern Weather Forecasting." The Hingham Club had quite a few out-of-town visitors at its meeting. MFAM is Chief Radio Officer for the 6-Meter Mobile Club, which had an "Operation Lost Men" when a group went to Mt. Wachusett to operate 2 meters and failed to return. It turned out the group had gone on to Connecticut. Also the club was lost to Troop 18 Boy Scouts in Quincy at the Stop & Shop Market where a station was set up and code tests given. Officers of the Northeastern Club are FJJ, pres.; HGT, vice-pres.; IRH, secy. ZE has been hospitalized. The Beverly c.d. group assisted in the search for a lost boy. TCPN officers are PEX, dir.; UEQ, alt. dir.; MDB, asst. alt. dir. and secy. KNILKP worked IJ-Land. KIQP now is in Peabody. KIMMQ, PEX, KIGRP and EMIG made BPL. All our nets need outlets in Plymouth, Bristol and Essex Counties. DPO is active on many bands. KIJAW has a knight v.f.o. active in the Hudson Traffic Net. KIMHC and IHO are working on a rig for 1296 Mc. AUQ is active again. KIGKB is the new president of the Rockport Wireless Club. ADR and KIMHC are Asst. ECs. KILLY is on 6 meters. AKN broke his right arm. KIMHM has an SX-101 and is on 75-meter phone. K8KDJ enjoyed Thanksgiving at K1HBJ's QTH. KIBYL passed the Extra Class exam. NJL has new antennas. RCQ is at a new QTH and has a Zepp up 40 feet. KIAI has an HQ-170. BVP has an HQ-100 and is on 8 meters. KILJK has a TB-600 Hornet tri-band beam. SS was given a "Citation for Meritorious Service" by the Research Station for Satellite Observation, Cambridge. K2QBW and MYK are going to M.I.T. Appointments endorsed: EGZ Harwich, INC Melrose as ECs; DWO, BYL, USA and EMIG as ORSs; DWH and USA as OOs; USA as OPS and OBS; KIAII as OBS. KIDGI broke her leg. KBN is working on a transmitter for 1215 Mc. PI is in N. H. HWK spoke at the El Ray Radio Club Traffic. (Nov.) KIMMQ 807, WIPEX 206, KIGRP 638, W1EMIG 502, AWA 448, KIDIO 233, W1EAE 233, ZSS 170, UTR 160, OFK 125, DPO 117, KIJAW 117, BYL 108, JAP 68, JCC 60, BYV 58, MHC 58, BKG 50, WICZW 44, HGN 35, AUQ 32, NVV 31, IBE 25, MSW 25, SIV 25, TWG 21, AIX 22, AOG 21, KIEJW 16, GYM 15, CMS 13, W1BGO 12, KIDNG 11, W1GEX 11, KILLY 10, W1AKN 6, KIMHM 6, WINJL 5, KIAII 4, W1RCQ 4, IXX 2, ILA 2, LJK 1, (Oct.) W1AWA 562, K1JCC 76, WISS 43, NJL 38, CZW 32, MIX 22, AUQ 1, (Sept.) WINJL 61, (Aug.) W1LGO 24.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, WIBVR—SEC: BYH, RM; DVW, PAM; DXS, V.H.F. PAM; RFU. The WAIN meets on 3560 kc. at 7 p.m. Mon. through Sat. and now boasts very good coverage. The Mass. Phone Net meets on 3870 kc. at 6 p.m. daily. WAIN had 100 per cent representation to 1RN this month, even with 1RN running a double session daily. KICPD has been appointed OBS and KIGCV ORS. The SEC received reports from only three of his ECs—BKG, DXS and HRV. EOB reports 1004 contacts in 73 sections in the SS. ZPB reports the Mt. Hermon Radio Club was very active during the SS. HRV is now back on WAIN as well as working 10-meter mobile. AGM lost his long-wire in the wind, but had a spare pulley and line on the tower. Smart boy! The Fitchburg Club enjoyed a talk on civil defense by GUL. The Berkshire County Radio Club played to a full house with an illustrated talk on Navy operations in Operation Deepfreeze, ably presented by "Father Dan," HWK. DVW submitted a very excellent report on WAIN activities with many ideas of things to come. Club equipment at Classical High School, Worcester, includes a Globe Scout 680-A with a Keith V.F.O. and an HQ-100 receiver. Operation is on 10 and 40 meters and the members would like to sked any other club between 6:30 and 8 a.m. EST. Traffic: W1DXS 257, BVR 152, DVW 126, BYH 123, KIGCV 105, W1ZPB 46, AGM 26, K1JIV 24, LBB 18, W1AMI 17, QKC 8, TAN 7, K1JDC 6, W1EOB 4, OSK 2.

NEW HAMPSHIRE—SCM, Robert H. Wright, W1RMH—RMs: K1BOS and K1IK. PAM: 1IQ, V.H.F. PAM: TA. The GSPN meets at 1900 Mon. through Sat. and at 0900 Sun., on 3842 kc. The NEN (c.w.) meets nightly at 1830 on 3885 kc. The Northeast V.H.F. Net meets daily at 1930 on 145.8 Mc. K1IK requests that more stations check into the NFN to handle traffic. Also the GSPN needs more outlets in the Manchester and Nashua Areas. PFA gave a very interesting illustrated talk at a recent meeting of the Concord Brass-pounders on his UX-pedition to P8B-Land. AIJ is working at Sprague Electric in Concord. K1MST (ex-2HDQ) is living in Plaistow. K1MID has a Model

(Continued on page 124)

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15 teletype and plans to be on RTTY shortly. Anyone interested in the new "Worked All State Capitals" certificate award should contact either your SCM or 31MN for details. Appointment: K111K as RM. Certificate renewals: AIJ and KVG as OPSs, AIJ and K1BCS as ORSs. HQ as PAM. Traffic: K1BCS 1153, FDP 628, I1K 263, C1F 84, W1RWH 37, YHF 28, EVN 17, K1CSJ 8, DKD 5, W1BYS 2.

RHODE ISLAND—SCM, John E. Johnson, K1AAV —SFC: PAZ. OBS appointees: SMU and TXL EC endorsements: LU Providence, JFF Newport, UEF Coventry, VZP Lincoln, GZA Warwick. Section Net certificates were issued to K1BBK and DUY. Worked All Rhode Island certificates were issued to 3KJ and JSS. An OO report for November was received from GR. SMU is interested in starting a Novice net and would like all Novices who are interested to contact him. K1LSM was able to operate only the last ten days of the month because of U.S. Naval commitments. TXL is using a new Viking 6N2 with great results. KN1LI now has his Tech. Class license. GBQ has completed his SB-10 and now is on s.s.b. Two certificates are issued by radio clubs in Rhode Island. Information on the Worked All Newport County certificate can be obtained from TXL or any Newport Radio Club member. Information on the WRI certificate can be obtained from SMU. Traffic: W1SMU 738, K1LSM 347, W1TXL 97, K1BBK 33, W1VBR 30, YRC 14, WED 9.

VERMONT—SCM, Harry A. Preston, jr., W1VSA—SEC: EIB, RM: K1BGC. PAM: HRG. Vermont frequencies: C.w. 3520, phone 3855, RTTY 3620 kc. Nets: C.w., Mon.-Wed.-Fri. 1830: VEPN, Sun. at 1730; VTPN, Sun. at 0900; G1MN, Mon.-Sat. at 1730, K1GCX, with an HQ-160, a DX-40 and a 40-meter dipole, has worked DX to OK1VM, G2HDR, F8AT and OE1HI on 15-meter c.w. K1G is having good luck on 2 meters considering his location. The Chittenden County AREC went into action during the Simulated Emergency Test. Three control centers were activated to serve as relay points to ARRL. The Middlebury Mike and Key Club holds meetings the first Fri. of each month. The BARC, Inc., meets every other week and on alternate Fri. and Sat. The Central Vermont Amateur Radio Club meets monthly and the schedule is announced on the Vermont nets. SPK, TFB, K1KXQ, K1KBL and HFS announce their new net meets each night at 1830 on 145.8 Mc. The name of the net is the ACES and HFS is net control. The RTTY Dinner held in Burlington had representation from Vermont, New York and Massachusetts. K1AUE has a new Valiant. K1CPC fired up his new Johnson 500. K1HKA has a new beam up. Traffic: (Oct.) W1OAK 182, VSA 121, ELL 48, K1BGC 31, W1KJG 14, VE2AZ1/1 13, K11XB 13, W1KRV 8, K1DKH 6, BOL 1, GCX 1.

NORTHWESTERN DIVISION

ALASKA—Acting SCM, Kenneth E. Koestler, KL7BZO —In the November DX Test band conditions were poor. PJ, MF and CZF worked the 20-meter band. ALZ was on 15 meters and picked up quite a few points. PJ is on s.s.b. with a new HT-37. CIA took a month's vacation going to the South 48 combining business with pleasure. AN and ZR, his wife, visited their daughter in Portland-Ore., for Christmas. There is a new award. Work all 50 Capitals of the States and receive a WASC certificate. CAH and BJO, his XYL, celebrated their 25th anniversary with open house held at the home of BEN. There were approximately 65 guests. Former SCM DZ and his XYL are enjoying their assignment in Spain, 2 meters should be getting better all the time with more KLs putting up better antennas.

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—Your SCM would like to hear more activity on LO Parties, and more check-ins on the Idaho C.D. Net Tue. at 1930 on 3997 kc. Districts 3 and 4 Morning Nets had 100 per cent check-ins twice in November. Best wishes for a speedy recovery to OCR, State Radio Officer, who was badly injured in a car accident. KN7JTM is a new ham in Pocatello. Reports of new gear: VQC, a Valiant; GGV, a Hornet Tribander; DHL, a DSB-100; VPS, an HQ-160; K7EQQ, a DX-100B. BDL/WNR is back on the air from a new home in Pocatello. YBA reports the 80-meter "hoola whoop" antenna cuts down noise FB with the transistor receiver. Idaho YLs got acquainted on 80 meters during the VL-AP. How about forming a net, girls? Q1S visited his mother, K7JIL, and sister, K7JIK, en route from California to Ohio. GFW had an eyeball QSO with ACD in Cottonwood, Ariz. K7KBU works all bands 80 through 6 meters from his kinport mountain-top QTH. FARM Net traffic—87. Traffic: W7GMC 107, K7AYU 50, W7GGV 39, VQC 35,

(Continued on page 126)

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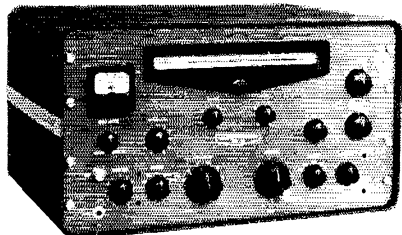
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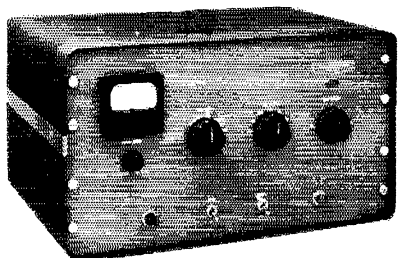


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MONTANA—SCM, Vernon L. Phillips, W7NPV/WX1 --SEC: KUH. PAM: FOI. RAJ: KGG. JPN meets M-W-F at 1800 on 3910. NISS meets T-T-Sat. at 1830 on 3530. K7MIC joined Silents Keys Nov. 9. PGF got married and will settle in Waltham, Mass., where he is stationed as a lieutenant in the Air Force. ZOH made WAZ. K7BKH made BPL for the fifth consecutive time. K7EWD made WAS. YHS got his 1st class radiotelephone license. K7HOP is a new Conditional Class license at Columbia Falls. KN7KJS is a new call at Laurel. VFY moved back to Great Falls from Rapid City, So. Dak. HTB has a new 6-element 20-meter Telrex beam on a 100-foot tower. K7AWD has a new 10-meter beam. K7CFA has a new Viking Courier. K7IUJ has a new Viking Valiant. K7DCC has a new SX-99 and an Eldico. New radio clubs are the 829 Club at Belt, the Glacier Amateur Radio Club at Columbia Falls and the Skyline Radio Club at Kalispell. YHS was reappointed Emergency Coordinator for Billings. Traffic: K7BKH 205, EWZ 172, BYC 102, DVZ 24, W7SFK 17, K7AWD 10, CTI 8, W7NPV 6, YUB 5, K7IHA 4.

OREGON—SCM, Hubert R. McNally, W7JDX—New appointments: K7EZF and K7AIS as OESs, K7AXF as ORS. WKP as OBS. Net certificates in the AREC Net have gone to W7s DTT, RXJ, CSM, WPW, DEM, GWC, FLJ, K7s DDI, DLS, ADX and CJB. The new net is coming along fine with the usual good boost from UQI, our SEC. OSN is having trouble lately with low check-ins. AJN is giving up the job as manager and will concentrate on his RM activities. How about more of you c.w. men taking the net? OEN now has a new net mgr. in FSU, of Prineville, with K7AJB as assistant. RXJ has a new RACES rig on the air at the c.d. location. K7s AIS and GFY are trying for a QSO marathon record. DEM is going c.w. on Air Force MARS. K7CNZ was working on a 2-meter rig but the antenna blew down. Old reliables ZB and BDU both made BPL again. VIL threatens c.w. work on traffic nets, so look out, gang. Portland MORESCO called out the Portland gang this month to help in the rescue of two girls lost on Larch Mountain. Those responding were RVN, JDX, DGE, RCL and WFP but rescue was made before the gang could get much traffic handled. The joint council of Portland Clubs now definitely is on the way with 1960 OARA Convention plans. Traffic: W7BDU 693, ZB 548, K7CLL 378, W7ZFH 51, AJN 35, K7CNZ 29, W7MTW 25, VIL 25, LT 20, DEM 13, WPW 11, RXJ 9, BVH 7, K7CNB 5, CSM 3.

WASHINGTON—SCM, Robert B. Thurston, W7PGY --SEC: MMQ. RAJ: AIB. PAMs: LFA and PGY. Washington nets: CBN, 3960 kc., 2000 PST; NNN, 3700 kc., 2100 PST Mon. through Sat.; WARTS, 3970 kc., 1800 PST Mon. through Sat.; WSN, 3535 kc., 1900 PST, Mon. through Fri.; EGN, 3920 kc., 1700 PST Mon. through Sat. The Spokane AREC group conducted mobile patrol activities with 18 mobiles and 1 NCS. A total of 25 amateurs from the Spokane Area participated. MMQ, of Puyallup, is our new Section Emergency Coordinator. All ECs are requested to mail their monthly reports to him. HXE participated in the YLRL Anniversary Party sessions. There is lots of 6-meter activity in the Lewiston-Clarkston Area. PKR and PSL are building 6-meter walkie-talkies. FM has a new 20-meter beam. K7CWO received his call letter license plates. LFA has his big rig back on the air. K7GYA has a new HRO and Tri-bander. YFO lost his beam in a 75-m.p.h. wind storm. The WSN had 22 sessions with 266 QNIs and 148 QTCs for October. FIX's main transmitting antenna is down because of houses being moved for the new freeway. K7GCK passed the General Class exam and has a new beam and rotor. IEU is NCS for WARTS on Sat. and received his 20-w.p.m. sticker. AIB picked up his new HQ-170 and installed it Nov. 16. UWT is working mostly on 10 meters now. K7AJT is a new OPS and OBS. BSV is a new OBS. BA renewed his OBS, OPS and ORS appointments. GIP is working JAs on 28-Mc. c.w. AREC in the Seattle Area was very active along with RACES during the flood in the lower valley. K7ABB runs 120 watts on 2 meters. IGH is using a DX-35 transmitter and an NC-98 receiver. Traffic: (Nov.) W7BA 1409, DZX 610, QLEH 447, AMC 185, KZ 112, APS 98, GIP 62, IEU 31, K7AJT 26, W7AIB 23, K7CWO 23, W7USO 22, GYF 15, LFA 10, YFO 8, K7GNA 6, W7EVW 5, IGF 2, UWT 2, FIX 1. (Oct.) W7GIP 33, JHS 4.

PACIFIC DIVISION

HAWAII—SCM, Samuel H. Lewbel, KH6AED—The new officers of the Honolulu Amateur Radio Club are AGB, pres.; DFG, vice-pres.; BWO, secy.; AUJ, treas. Len Westho, at KW6CGA, reports that duty has kept him out of traffic activity for several months. Len also reports Novice activity on Wake Island with KN8QYL, WV8IFK, and KN5YFV, so for Novice DX look to

(Continued on page 128)

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Wake. From Guam and the Marianas Amateur Radio Club, via KG6AIIH: W6DTN/MAI, aboard the SS *Golden Bear* visited the club. He is up on 21,076 kc, with RTTY and uses an HT-32 and a 51J4. K31ZT/KG8 is active on Guam. W6GALL says to listen for the Guam Novices on 21,120 kc. KG6AIM has left Guam for the States. KG6AIN is assembling a DX-100, K6MSA/KG6 is on 15-meter s.s.b. with an Eldico and KG6AII is using a new 'Hy-Gain' Tribrander. Also listen for K6MOG/KG6, a new arrival.

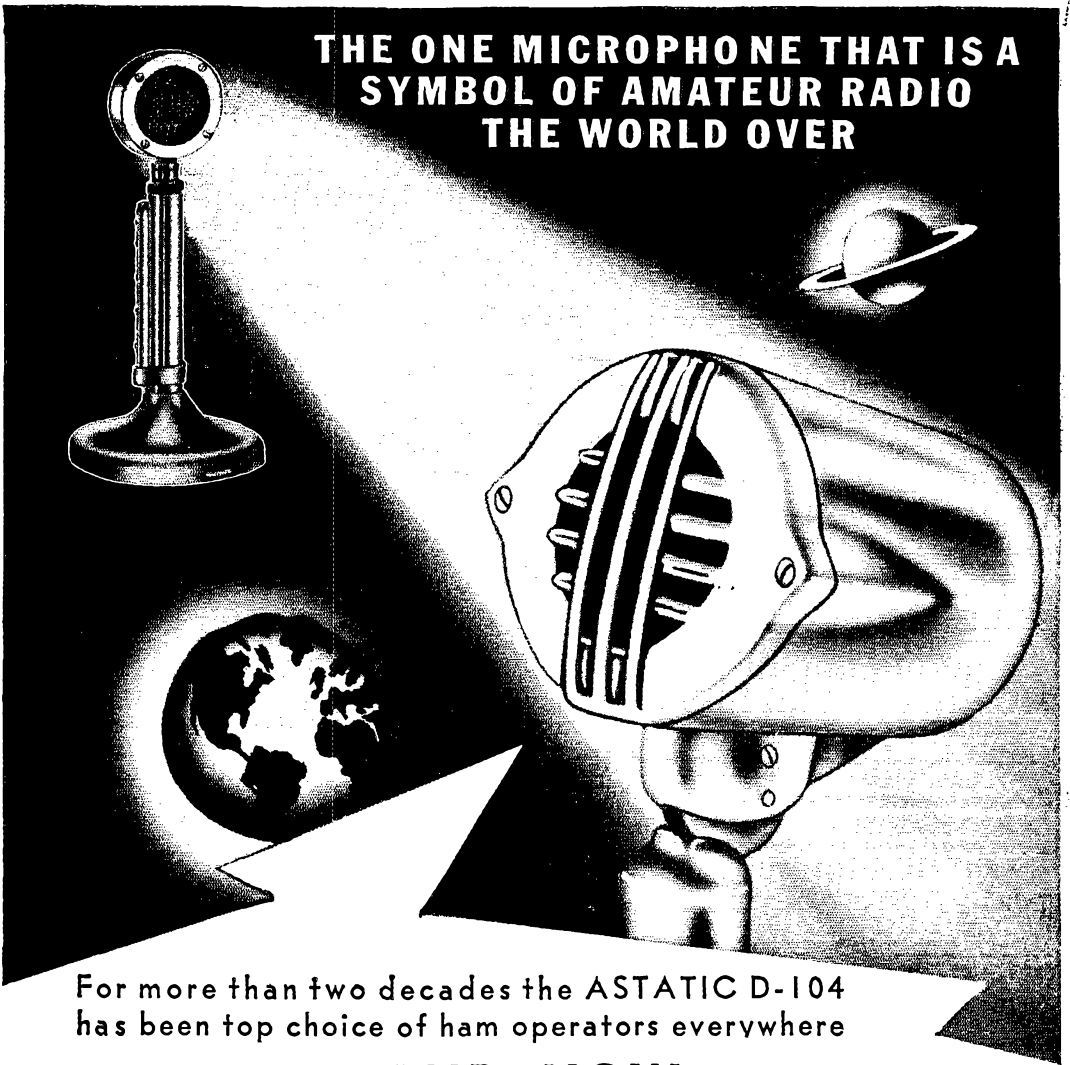
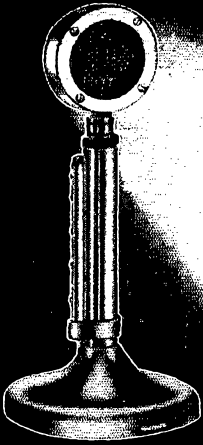
NEVADA—SCM, Charles A. Rhines, W7VIU—MAH, ANK, VJR, SDE, PC, JBR and AZF have teletype machines in readiness for the Reno 2-Meter RTTY Net. MAH is operating AFSSK and PSK on 6 and 2 meters. NRU is on 6 meters with a converted Ranger. CX is on 6 and 2 meters with new Heath gear. VJR has moved to "Communications Center" (or is it "QRM Center"?) along with ZHW, KEU, AZF, JUV and JUW. NRU is a grandpa again. K7BJR and JUN dropped the "N." 1LB has a new 10-watt 6-meter mobile. HRW is about ready for 6 meters. The Reno 2-meter repeater project has been held up for lack of space on Slide Mt. K7BPQ is working on a MARS 2-meter repeater for Angel Peak in So. Nevada. ICW has worked K61BY near Los Angeles on 220 Mc. and is looking for other 220-Mc. skeds. ADD, ICW and KJQ are on 6 meters and monitoring 50.1 Mc. in So. Nevada. 1EON is now K7JVZ. K6YAZ received Nevada Award No. 69. K7HRW finally worked his 50th state. All NARA members received a batch of QSL cards, courtesy of Harold's Club.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—The Stanford RC, in conjunction with Stanford-in-Germany, is proposing several DXpeditions in Europe in the coming year. A club station is being set up in Stuttgart, Germany, for contact with the home station, W6YX, in Stanford, Calif. New officers of the SCARS are K6MPN, presy; W6WIG, vice-pres.; K6GNL, secy.; K6JJU, treas. Speakers at the November meeting were Lt. Col. and Mrs. Lloyd Colvin talking on "Travel, DX and Amateur Radio" with color movies of their recent Caribbean trip. WA6EIC reports the Santa Clara County Emergency Net has been officially recognized by the cities of Mountain View, Sunnyvale and Los Altos as an integral part of their civil defense organization. The net operates at 1900 Mon. on both 50.50 and 146.7 Mc. W6ASH reports 12 stations on 224.1 Mc. in the Los Altos Area. K6GZ still has ham gear strewn about the garage floor of the new QTH in Belmont. WA6HRS, of Sunnyvale, is a new OBS appointee. He reports the XYL now holds Novice Class license W6GIRL. K6ZCR had her mother visiting her from Pennsylvania. K6ZCV soon will be operating from Pago Pago, American Samoa. W6OII has been relaying messages for W6WKK/7, who is temporarily in Phoenix. W6GGQ is off the air while rebuilding his exciter. W6DEF has been painting the house. Traffic: (Nov.) W6RSY 384, K6DYX 149, K6ZCR 116, W6YBV 87, W6AIT 58, W6YHM 37, W6OII 36, W6HC 26, W6RFV 20, W6DEF 17, W6PON 14, K6VQK 14, W6ASH 13, WA6HRS 2, W6ZLO 2, W6OWP 1. (Oct.) W6ZRJ 34.

EAST BAY—SCM, B. W. Southwell, W6OJW—EC: K6DQM, ECs: W6LGW, W6ZZF, K6EDN, K6JNW and K6ESZ. K6GK is getting RTTY gear perking. K6OSO made an SS score of 4935 and is rebuilding. VK2EN, VK2VC and ye SCM had an eyeball QSO when the boys from Down Under visited the VOA station. K6BJ gave an FB talk to the EBRC. The CCRC held its November meeting at the HAMS club room in San Francisco. The Mobileers had a breakfast on Hayward and held a field strength test of mobiles. WA6CNW is General Class in the Walnut Creek Area. W6LGW is on s.s.b. with a new GSB-100. The MIDARC Emergency Net frequency is 145.29 Mc. Check in on Monday evenings. W6LGW is resigning as EC effective Jan. 1, and W6EFI is taking over the reins for Eastern Contra Costa County. W6TI has a DX score of 282/280. K6LRN won the field strength test of mobiles at the Mobileers Breakfast. W6IVW is a new Novice in the Hayward Area. WA6AIF has a new 65-ft. skyhook and is readying a Telrex 6-meter beam for it. WA6BRD is converting a surplus receiver. K6AOZ is building a new 15-meter rig with 811s. WA6CSK finally worked his first out-of-State DX. W6V6JI and W6V6INC are new Novices in Hayward. K6YBS sold his DX-40. KH6DDA was a visitor at the HARC. W6FKM is out of the hospital and on the air again. W6IPY is attending transistor school. K6RDD severed a tendon in his right hand so will be on phone for a while. W6FFQ is working portable/7 in Idaho. K6SWY will be starting new Novices classes after the first of the year. The HARC worked on 3985-kc. phone and 6 meters in the AREC-S.E.T. K6QKD is heard working DX with his DX-100 and new beam. K6EMR/7, at Lake Tahoe, worked W6KMO/6, 200 miles away. Let's have your reports in the mail to ve old SCM on the first of

(Continued on page 130)

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each month. Remember this is your column; I only write it. I can ad lib, but there is a limit. Traffic: K6GK 300, K6ZY 181, K6OSO 88.

SAN FRANCISCO—SCM, Leonard R. Gerald, K6ANP—Asst. SCM: Jeri Bey, W6QMO. RM: K6PQG. PAM: W6PZE. ECs: K6EKC Fortuna, W6OPL San Rafael, W6WJF San Francisco. OO: W6GQA Class I, K6OHJ Class III. OBS: W6GGC. ORSs: K6PQG, W6GGC, W6QMO, W6OPL, W6QY. OPSs: W6PZE, W6GGC, K6OHJ. The San Francisco Radio Club is making plans to charter a bus for an outing to Reno. Contratulations to W6WB on winning the DX C.W. Contest for the San Francisco section. K6QJB now checks in regularly on NCTN. W6PZE is doing a good job on NCTN. We welcome W6MLXJ back to the San Francisco section. Art has been doing a good job as Bulletin Station for the NCARTS. His XYL, Eleanore, comes to the section with her brand-new call, WA6JGR. Happy to have you, Art and Eleanore. W6GB reports that he worked a San Diego station who was using an all-transistor transmitter running 72 milliwatts on 20 meters. RST was 559. The 6-meter hunt was won by W6FZN and the 10-meter hunt by W6KFS. While operating the DX C.W. contest in November, stations heard were W6ERS, W6LTX and W6CQK. K6KZF is EC for the Mission Trail Net. Congratulations to K6PQG in passing her tests in the State Mental Hospital. W6GQY is doing his usual terrific job on the RN6, RN7. PAN and TXN Nets. K6TWJ and K6TWS are a father-and son team checking in regularly to the American Legion Net. Traffic: (Nov.) W6GQY 888. W6QMO 85, K6PQG 62, (Oct.) W6PZE 42.

SACRAMENTO VALLEY—SCM, Jon J. O'Brien, W6GDO—Asst. SCM: William van de Kamp, W6CRV. SEC: K6IKV. RM: W6CMA. PAMs: W6ESZ and W6PIV. New appointment: W6CEI as ORS. The SARC had a very nice Christmas dinner at the Chuck Wagon. W6JN and W6PIV each won 2-meter beams and K6PWA a 10-meter vertical. The McClellan Club (MARS) also had a very nice party, held at the new NCO Club at the base. K6SXX worked 100 Oregon stations to earn the OCC. A new YL in McCloud is W6PFC, W6OJB, in Orangevale, has regular skeets with W6NTV in Turlock on 432 Mc. The GEARS has a record membership of 41 paid members. W6SYX has completed an electronic organ kit. From the GEARS *Ham Gazette* we read: "Assemblyman James Holmes, W6REK, of Santa Barbara, introduced a bill in the State Legis. that is now Sect. 5005 of the Calif. Motor Vehicle Code and provides that additional fees for special license plates issued to amateur radio licensees shall be paid at the time the plates are issued or ownership of the vehicle is changed, rather than annually. This amendment was effective Sept. 18, 1959." Your traffic and station activity reports are invited and encouraged. Please note: My new address is 6608—5th Street, Rio Linda. Traffic: K6SXX 210, K6YLT 124, W6OJB 3.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The New officers of the Fresno Amateur Radio club are W6QON, pres.; K6PPI, vice-pres.; K6BGK, treas.; and W6KOK, secy. W6HYZ is going s.s.b. W6ONK got himself a Hornet Triband beam and an HRO-50 receiver. W6JUK is on 75 meters. W6KUT is now located in the Los Angeles Area. WA6BXD is working on an Apache transmitter. WA6CZU and K6AUA have their Technician Class licenses. W6BAN is the new editor of *SKIP*. The Fresno Radio 2-meter repeater should be on the air at the time of this writing. K6GOX has a new converter for 6 meters and is waiting for openings. W6FXV is on 75 meters with a home-built s.s.b. exciter while waiting for his 100V exciter. WA6DAU is running an SB-10 on 75 meters. W6NAS is thinking about s.s.b. K6RAU has a GSB-100 on 75 meters. The Fresno Radio Club helped out with communications for the Motorcycle Club with good results on 2, 6 and 75 meters. W6JXY has an Elmac installed in his car for 75 meters. K6LRZ is giving up s.s.b. W6NKZ is learning about Cadillac radios and OZA rectifiers. The tentative date for the Fresno Radio Hamfest is May 21, 1960. I will report further developments as they unfold. I would like the secretaries of the radio clubs in the San Joaquin Valley section to send me a list of their respective new officers; also the time of their club meetings. Traffic: K6ROU 43.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: DRC. V.H.F. PAM: ACY. We need an RM. BAW reports that he is a member of eleven nets. This, I believe, is a record. If anyone can beat this, let me know. The biggest need in the State today is more amateurs operating on nets (even one net). The phone nets on 75, 6 and 2 meters are doing OK, but we need outlets in many places. Our shortcomings are c.w.

(Continued on page 132)

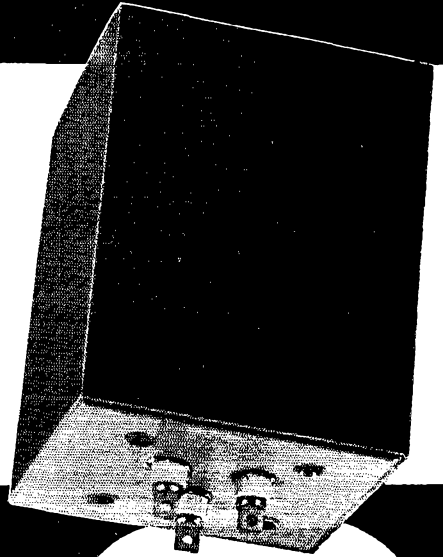
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operators who will stick in there and really operate. The S.S.B. Net is growing faster than any net at present. Fellows, like it or not it surely does make for fast communications. Tune these boys in some evening and listen. Lots of fellows are joining in. K4KUT, of the Shelly Club, reports much activity in the Club's RACES program. A truck has been purchased and at the moment the members are preparing to mount a complete c.d. station aboard. They seem to have good coverage in the county on 2 meters. Forsythe, Catawba, Lincoln, Gilford and Burke, along with Nash-Edgecombe, Craven and Gaston, seem to have the situation well in hand on 2 meters. CVU reports that Madison is revamping its c.d. and will be on 2 meters. Buncombe seems to work out OK on its 10-meter frequency. Glad to hear that GOB is back at home. W4TMO had a heart attack and is in the hospital. If you have neglected the traffic portion of your hobby I urge you to give it a try. We have the nets, we just need your support. Traffic: K4YEP 7.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—K4PJL reports S.E.T. traffic of 1978 messages with 112 stations participating. November traffic on the 3930 kc. Phone Net was 267, with 804 stations checking in; the S.S.B. Net on 3915 kc., 83 messages and 431 stations; the C.W. Net on 3795 kc. 786 traffic and 319 stations. Among the new members of the SCN is KNI. The objectives of the C.W. Net as set forth in Nov. SCN News are most commendable and noteworthy. K4MYR is moving to Columbia. K4SSQ has earned his SPARC code certificate. K4PIA is a new OBS as well as net manager. K4OCU is NCS, for Fri. night on the Phone Net. New officers of the DX ARC of Camden are K4GGP, pres.; K4YOE, vice-pres.; K4J4PT, secy.-treas. PPH has completed moving into his de luxe "Studio A" with full permission of his XYL. The S.S.B. Net of S.C. met at the Jefferson Hotel for luncheon Dec. 6. AKC, K4PIA and HJK made the BPL. The Rock Hill Area has reactivated its 2-Meter C.D. Net on Tue. at 1900 with UMW at the helm. All clubs electing officers for the new year are asked to please send the roster to the SCM. Traffic: W4AKC 193, K4PIA 185, WCZ 180, AVU 100, W4FPH 82, K4LNJ 71, BVX 42, W4PED 42, CHD 20, K4KCO 19, W4CXO 18, K4GAT 16, MBN 16, IIE 12, W4YIW 6.

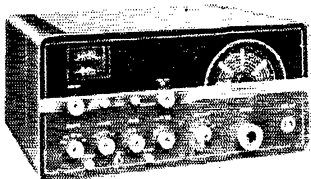
VIRGINIA—SCM, John Carl Morgan, W4KX—SEC K4MJZ reports considerable leadwork among the ECs. Those inactive were cancelled as of Jan. 1. The same applies to other appointees. My final term as SCM ends Feb. 11, and I plan to pass on only known active appointees to my successor. To the overwhelming majority who have reported regularly, thanks. K4QER has taken over as publisher of *Va. Ham*, and you've probably received her first opus ere now. SVG, Norfolk County RO, reports 25 amateurs participated in the c.d. drill on Dec. 7. IHN racked up all 73 sections in 78 QSOs in the SS. The Harrisonburg Club tutened its treasury with a show at the Armory. BGP predicts VFN traffic will exceed 5000 for '59. Technician K4AJL, QIX's XYL, who handles a respectable amount of traffic on v.h.f., is boning for the General Class exam with an eye to the h.f. traffic nets. K4QIX reports a new Washington Area traffic net burgeoning. Ex-G2AH finally got on the air from Falls Church as VE3CXW/W4. Harry is with the U.K. scientific mission in Washington. W4GZR and DMS are keeping K4VAG warm at Warrenton. Welcome to newcomers KN4YPI, in Winchester; LPI, Front Royal; and LPS, Norfolk. K4HIA, moved to McLean, and K4ADD flew south to Florida and is looking for Virginians on 10 and 15 meters. QBA, from MCS Quantico, visited the SCML. Traffic: (Nov.) K4QES 821, W4QDY 457, SHJ 456, K4QIX 421, SGQ 148, AJL 115, AET 114, QER 109, JKK 89, W4DVT 68, OOL 68, BZE 65, BGP 59, YVG 58, K4MJZ 47, GFR 31, W4KX 31, K4WAG 30, W4PRO 25, K4IIP 24, MIXF 15, W4ZM 14, W3MGL/4 13, W4ATQ 13, OVW 13, BHD 12, K4SSA 12, W4LK 10, AAD 6, BYZ 5, K4HIA 5, JRE 4, W4JUJ 4, (Oct.) K4MJZ 100, JRE 51, KNP 47, W4BZE 32, JUJ 13, BRF 8.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—SEC: HZA. PAM: K8BIT. RMs: GBF, K8HID, PBO and VYR. WVN: C.w., 3570 kc.; phone 3800 kc. K8HTS is the new EC for Fayette County. MARA officers are PZT, pres.; GAD, vice-pres.; JM, secy.-treas.; DPT, act. mgr. K8ELH has a new 813 phone rig. ETF operated the Ranger from the bedroom while recovering from an operation. TVO is now a Class 1 OO. The Mountaineer Phone Net meets Mon. through Fri. on 50,250 kc. K8JLF and FNI have reduced their traffic totals because of school. K8HUX is NCS for the Tygart Valley EC Net. K8OLY, secy. of the Greenbrier Radio Club, has a new receiver. DJP and K8DZU operated 20-meter s.s.b. while in Florida. K8CNB, QWE and PBJ are active on 160 meters. BKI has a new thirteen-element beam for 2 meters. HLX made WAC on 15 meters (c.w. and phone) with a Ranger and Beam. The

(Continued on page 134)

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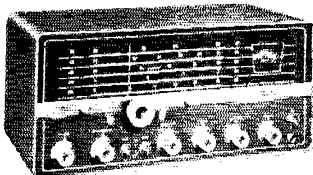
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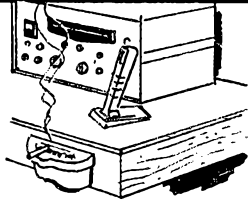
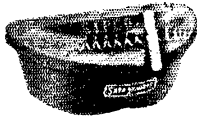
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ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Carl L. Smith, W0BWJ—SEC: NIT. PAMs: CXW and JLR. RMs: WME and K0EDK. ORSs: KQD and K0DCC. EC appointments went to DWE, FPT and PVN. Traffic nets: HNN at 1200 on 7240 kc. daily except Sun.; CEPN at 0800 on 3890 Sun. only; CCW at 2000 on 3655 Mon. through Fri. HNN was the most active net with an average QNI 19. QTC 21. K0EDH is now manager of TWN. Thanks to all who participated on Field Day. Final scores show OUI/Ø led Ø zone and IA/Ø and QMH/Ø were third and tenth for two- and four-transmitter classes, respectively. SS activity was good and results of the challenge will be eagerly awaited. ULZ is custodian of the Pikes Peak RAA station in the Red Cross Bldg. OUI, the club station of the DRC, has added an Apache, thanks to the Red Cross. The DU Club reports new operators, QGO, WLP, WRN, ZEXP and 5BNO are helping ONY. OTY, FVD and REQ to keep the transmitter at ANA warm. The Lamar Club has been reactivated with YCD, pres.; TMM, vice-pres.; and JEX, secy. More operators are needed for the section emergency roster. All who are normally available during daytime periods for emergency operation duty should contact the SEC or SCM for details. KQD and K0EDX made the BPL. Traffic: W0KQD 548, K0DTK 379, EDII 329, EDK 280, W0WME 206, K0RTI 189, DCW 146, FDY 144, W0BWJ 66, ENA 59, K0SHG 51, TMM 47, EVG 43, W0YQ 42, K0RQF 24, W0CBI 14, K0LCZ 9, W0AGU 5, K0PNO 4, W0SIN 2.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, 70CX. SEC: FSC. RM: JBV. V.H.F. PAM: SP. OPS: BYR. BBN has resigned his post as PAM because of conflicts. JAP has been appointed as EC of Davis County to replace LBO, who moved to California. HIO will be off the air until his receiver is returned from the factory. QWH finally got his 40-meter beam up. 3MDI has moved to Utah and is living in Clearfield. K7VMI, a recent OES appointee, is looking for information on the 703A tube. The Beehive Utah Net (BUN) is now operating on a daily basis and is handling quite a bit of traffic. K7s GGS, DWA, GYT, GOG and DVT have earned net certificates on BUN. FSC conducted a code class on 160 meters and had about 30 listeners over the State. Traffic: W7OCX 308, K7HIO 19, W7QWH 14.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAM: ZU. V.H.F. PAM: FFB. RM: ZIIN. The NMEPN meets Sun. at 0730 on 3838 kc., Tue. and Thurs. at 1800 on 3838 kc. The Breakfast Club meets Mon. through Sat. at 0700 on 3838 kc. The NMBP meets Mon., Wed. and Fri. at 2000 on 3570 kc. The TWN meets daily on 3570 kc. at 1900. The AREC Net meets Tue. through Sat. on 3838 kc. at 2000. The EC Net meets Sun. at 1900 on 3980. Please support your nets. I want to take this opportunity to thank all official appointment stations for working so hard and giving me so much help and cooperation while I was SCM. I have enjoyed it very much. A special note to all ECs: Please try to report every month to the SEC so he will have something to report to the SCM. In the past few months some of the ECs have been a little lax. I wish a lot of luck to the next SCM and hope whoever it might be will get as much pleasure out of the office as I have. The Churavan Club furnished communications for the Sports Car Rally in Santa Fe. Traffic: (Nov.) K5WSP 1028, W5ZHN 321, W7AVN/5 221, K5GOJ 133, 1PK 105, LMJ 42, W5VC 22, K5DAA 14, DAB 13, W0OME/5 13, K5IQL 5, W5KWR 5, CIN 2, PDO 2, ZU 2. (Sept.) K5IPK 68, W5BQC 5.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: CQL. The Pony Express Net meets Sun. at 0830 MST on 3920 kc., the Wyoming Jackalope Net Mon. through Fri. at 1200 MST on 7255 kc. for traffic. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. Wyoming had a very good turn-out in the Sweepstakes. BHH is very busy with the YO and TWN Nets. The lums are receiving their car license plates with call letters. AXG, 81 years old and the oldest ham in Wyoming, has taken a trip back to Chicago. Shirley, K7IVK, turned in a good score of 70,000 in the YL Contest. IDO, Betty, is on the mend. DTD moved to Sheridan. PVN got a new receiver, BFL, working for FAA in Sheridan, has gone to Oklahoma for three months' schooling. K7GDW is acting as EC for him. The Casper Club

(Continued on page 180)

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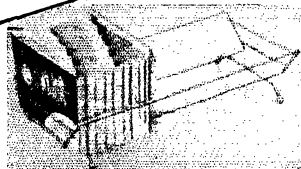
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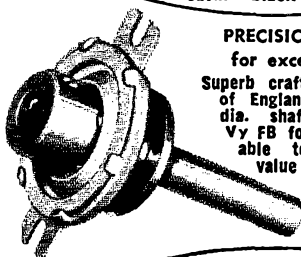
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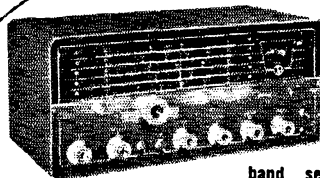


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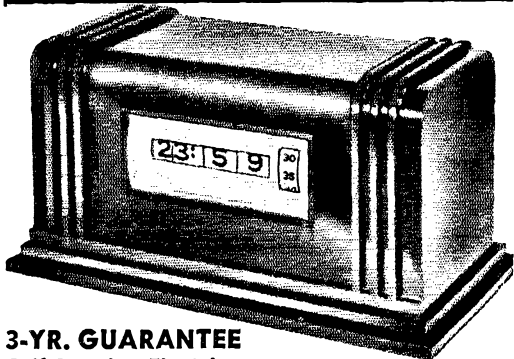
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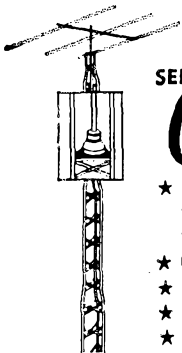
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conducts theory and code class every Tue. evening with 15 students. The Sheridan and Cheyenne Clubs are active. AMU and his XYL celebrated their Golden Wedding Anniversary Dec. 20. Traffic: W7BHH 76, DXV 40, NAW 7, AAU 4, BKI 3, K7IDU 2, HEA 1.

SOUTHEASTERN DIVISION

ALABAMA—Acting SCM, Harvell V. Tilley, K4PHH—SEC: WJX. PAMs: K4BTO and PHH. RM: RLG. Congratulations to K4ZXX on receiving ORS appointment and to KLA, who is on 6 meters from Athens, on receiving his Conditional Class license. K4AOZ finally changed the mobile rig to the new car with "no space to spare." K4EEX hopes to have a phone rig soon. The Muscle Shoals Amateur Radio Club held a Christmas Party. GYT has a Globe Scout and GYW has a new Gonset SB exciter. A dog chewed BTN's coax. We welcome K4RJM, from Piedmont, to AENB. Total traffic for AENB in Nov. was 185, average 5.9. The Southern Belle Net invites all YLs to join them Thurs. at 0730 on 3920 kc. for a nice round table and ragchew. Selma stations stood in readiness after a train wreck in South Alabama Nov. 8. Operators on stand-by were BFX, K4KQN, VAL and IFF. K4PHH wishes to express his appreciation for the fine cooperation given him during the last few months. I hope that in that short time I have conducted the duties of SCM satisfactorily. Congratulations to K4AOZ, the newly elected SCM of Alabama. We're looking forward to an even finer Alabama section under Mr. Dotherow's managerial position. Traffic: W4RLG 361, K4PFM 163, ZNX 122, RIL 106, W4KIN 87, OKQ 71, K4UEE 66, JDA 61, W4PVG 55, M1 53, K4YGS 48, W4WHW 38, K4BTO 31, PHH 30, HVN 27, HFX 24, W4YRO 24, K4AOZ 23, WCIN 20, K4SAV 19, IFF 14, RSB 12, W4UCU 11, K4TSN 8, ISZ 6, W4USM 6, K4RUA 5, AJG 1.

EASTERN FLORIDA—SCM, John F. Porter, W4KQJ—SEC: IYT. RM: K4SJM. PAM: TAB, V.L.F. PAM: RMU. The Florida Emergency Phone Net meets every Tue. at 1830 EST on 3910 kc. QFN, the All-Florida C.W. Net, is in full swing now and needs more coverage throughout the State. This Net is supported by both the Western and Eastern Florida sections. EHW is back with a new transmitter and sky wire. IOPD wants a sked on 2 meters between 1800 and 1930 EST with Miami or vicinity any night except Wed. or Fri. K4ZND has a new HQ-110. Your SCM met with the Homestead and Hollywood Clubs during November. Of interest to many is the news that our section is fourth in the nation on traffic-handling. Let's keep those reports coming in on the first of each month. In order to keep the files accurate and to visit as many clubs as possible during 1960 I would appreciate the following information: A post card or letter advising the name of each club in this section along with the officers' names and calls; also the club address and meeting time and any changes that may take place during the year. Your V.L.F. PAM, RMU, still is looking for more stations to complete the v.l.f. section-wide net on 6 meters. Drop Allen a card or radiogram advising what you have and can do. The new EC for Polk County is IOPD. K4PMA is a new ORS. We hear that IYT is looking for a new ham shack location now that this old one is running over with jr. harmonics. HJ, K4QLG and SJH made RFL. Did you all hear Bill (Old Dog Bones) give out with the Santa Claus routine on the TPTN Dec. 2? Traffic: (Nov.) K4QLG 808, SJH 579, AHA 353, W4SDR 316, EPC 258, K4BY 255, LCD 248, KDN 243, LCF 202, ODS 127, FMA 120, W4GJI 118, LMT 114, K4AHW 111, EHY 80, AZM 69, W4IYT 55, K4RNS 49, AX 43, ILB 37, COO 33, W4TAS 28, SMK 24, K4EFZ 20, W4KQJ 19, SGY 18, EHW 16, K4ZNC 16, TDT 13, ISR 8, OSQ 6, MTP 5, IWT 4, ZVF 4, (Oct.) K4SZC 32, TDT 16.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: PQW. PAM: RZF. RMs: AXJ and BYE. Perry; ACB, of Tallahassee, spoke at a meeting of the H.S. Club through the efforts of KQP. Port St. Joe: K4RZM has a portable rig for store use. MXN is assembling a Cheyenne and a Comanche. K5CJU is new in town. K4RZF reports 28 stations now are on the WFPN roll. Panama City: A large crowd attended the installation dinner of the PCARC Dec. 5. K4FQQ is building a 40-meter transistor rig and has a 10-meter mobile also. K4OID is Asst. EC for Bay County. The Bay H.S. Club has about 11 licensed members. De Funiak Springs: HQN has moved here from Virginia. Ft. Walton/Edgin AFB: WKQ ran up over 1000.000 points for his best score yet in the SS. K4UBR and K4LFR also represented W. Fla. in the SS. K4AAK expects to give nearly 20 exams at the completion of the EARS classes, Pensacola: The NAS Club has a complete Novice station set up. K4QCAC worked aero-mobile to Birmingham and back on 6 meters. The V.H.F. Club has a new 2-meter beam and a Viking 6-and 2-meter trans-

(Continued on page 188)

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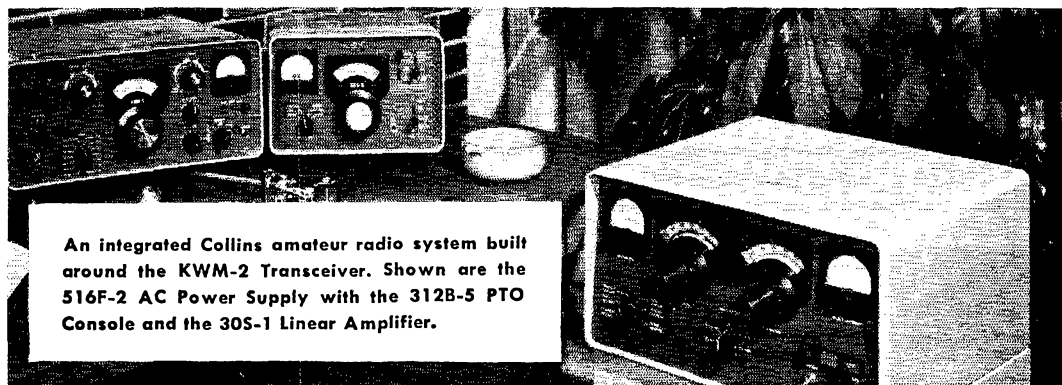
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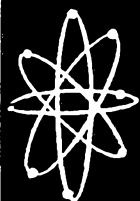
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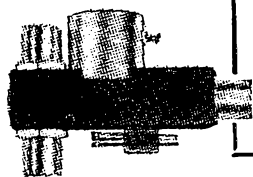
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mitter. EQR and PLI worked Ecuador on 8 meters recently. K4HYL gave an FB talk on modulation at the PARC. SRK, HIZ and others made the ham exhibit at the State Fair a success. K4DDD's XYL reports the PARC Auxiliary had an FB Mexican Dinner Party. More W. Fla. stations are needed on both the 3840- and 3650-kc. nets. Traffic: (Nov.) K4UBR 508, OJD 223, W4BVE 142, GAA 4, (Oct.) W4SRK 535, BVE 41.

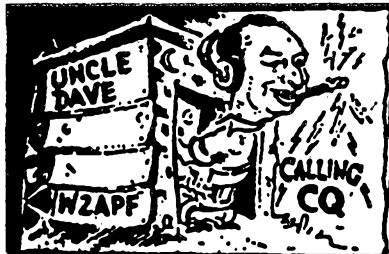
GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: PMJ. PAMs: LXE and ACH. RM: DDY. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 on Sun.; GSN Mon. through Sun. at 1900 EST on 3595 kc., DDY as NC; the 75-Meter Mobile Phone Net meets each Sun. at 1330 EST on 3995 kc., K4JTC as NC; GTAN Sat. at 1000 EST on 7290 kc.; the ATL Ten-Meter Phone Net each Sun. at 2200 EST on 29.6 Mc., KWC as NC; the GPYL Net each Thurs. on 7260 kc. at 0900 EST; the GAN on 7105 kc. at 1800 EST Mon. through Fri., K4KZP as net mgr. We Georgia hams surely were sorry to lose VO and AD, both of Rome. VO passed away Nov. 17 and AD Nov. 18. VO was EC for Floyd and Bartow Counties. K4VHC made BPL this month with a total traffic count of 328. K2VZK is a new ham in Marietta. FWH transmits Official Bulletins on 6 and 2 meters regularly. K4LEM now is studying at the U. of Ga. LNG is building a k.w. power supply for v.h.f. transmission. K4TFY is continuing construction of a high-power 50- and 220-Mc. rig. MIV and K4GCK have been fishing in Florida. DDY is doing an excellent job as NC for the Georgia State Net. The Atlanta Teen-Radio Club is increasing in membership each month. The Radio Club of Georgia Military College at Milledgeville, Ga., is now an ARRL affiliated club. Col. Schuyler surely is doing a nice job organizing this club. Traffic: W4DDY 357, K4VIC 328, EJI 289, BAI 108, MIH 103; LVE 53, VJH 52, PHA 36, W4FWH 4.

CANAL ZONE—SCM, Ralph E. Harvey—Amateur activity in the Canal Zone was quiet in November. During the emergency periods of Nov. 3 and Nov. 23, communications were all on 47 Mc. and it was not necessary to use the emergency frequency of 28.9 Mc. However, all stations were prepared in the event that they would be needed. LC reports that he made a score of 66,000 in the Phone Sweepstakes. 5RM has purchased a new Apache and is busy putting it together. AD has been called to the States because of serious illness in the family and is maintaining contact with the Canal Zone through VR and OA. KZ5AU has returned home from vacation. KZ5RR was on leave in the States. The Canal Zone Amateur Radio Association will hold its annual election the first Thurs. in January. Traffic: KZ5KQ 120, OA 79, OB 71, SW 30, AD 29, RM 26, VF 26, LL 16, JW 15, KA 12, LC 11, BS 9, WB 9, TD 8, VR 8.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. RMS: W6HHG and K6HLR. PAMs: W6BUK and W6ORS. The following stations made BPL: W6GYH, W6WPF, W6AEE0 and W6USY. Congrats, fellows! W6UFDJ came up with two new countries. New officers of the Covina High School Amateur Radio Club are K6SIV, pres.; W6GBZ, vice-pres.; W6GFE, secy.; K6ZWS, trustee. W6BES moved into a new combo den/shack! K6VWE is building a new Tri-band quad. W6AYF reports W6EOL passed the General Class exam. K6OJV is building an s.s.b. rig. K6CDW, W6CIS, K6GLC, W6HAL and W6NKR were very active in the SS! K6EA reports formation of the MGN at 0930 PST on 7125 kc. K6CLS/6 moved in from Iowa and is very active on SCN. Glad to have you, Jerry! K6OZI has GGMTH certificate No. 5. Congrats, Jack! W6AWD is working 40 meters with a home-brew 25-wattor. W6SYQ is doing fine liaison between 2 and 75 meters. K6COP has a DXCC-120 sticker! K6SIX still has a check-in record of 100 per cent. W6CK is back from an extensive trip East. W6NKR is busy rebuilding the shack, tr. switch and antenna traps! K6PLW is handling traffic with CE9AF. The SoCal Net Metro-Div. officers are W6ADJB, NCS; K6CIH, K6PZM, K6JQB and K6PQM, ANCS. The J.A. section can boast of having three of the national officers of the YLR: W6DXI, pres.; K6EXQ, secy.; K6QQD, trans. New officers of the Palisades Amateur Radio Club are K6JQH, pres.; K6CKM, vice-pres.; W6QFE, secy.; W6GAA, trans. Support your Section Nets: C.w., the Southern California Net on 3600 kc. at 1900 PST daily; phone, the SoCal Six Net on 51.0 and 50.4 Mc at 1900 PST daily. Traffic: (Nov.) W6GYH 1107, W6WPF 725, K6OZI 478, W6ACKR 411, K6LVR 306, W6AEE0 374, W6USY 350, K6CLS/6 277, W6BHG 222, K6OJV 183, W6SYQ 140, K6EA 101, K6SIX 43, W6CK 34, W6AYF 27, W6JLO 15, K6COP 10, W6ADWP 8, W6BUK 5, W6CIS 5, W6AWD 1, W6UFDJ 1, K6ZWS 1, (Oct.) K6TPL 46, W6JLO 11, W6NKR 3, K6SYG 2, W6UFDJ 2.

(Continued on page 140)



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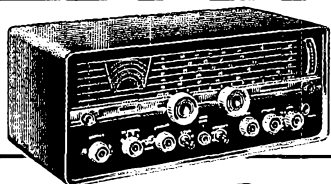
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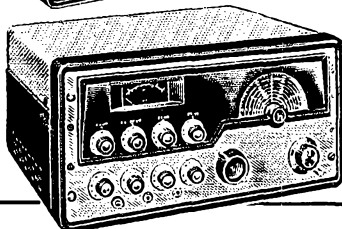
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three short-wave bands covers
1550 kc-34 mc.

FEATURES: Slide rule bandspread dial calibrated for 80, 40, 20, 15 and 10 meter amateur bands and 11 meter citizens' band. Separate bandspread tuning condenser, crystal filter, antenna trimmer, "S" Meter, one r-f, two i-f stages.

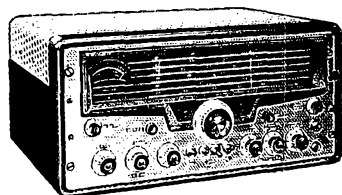
\$159.50



HALLCRAFTER MODEL HT-32-A

FEATURES: 5.0 mc. quartz crystal filter — rejection 50 db. or more. Bridged-tee side-band modulator. C.T.O. direct reading in kilocycles to less than 300 cycles from reference point. 144 watts plate input (P.E.P. two-tone). Five band output (80, 40, 20, 15, 10 meters). All modes of transmission — CW, AM, S.S.B. Unwanted sideband down 50 db. or more. Distortion products down 30 db. or more. Carrier suppression down 50 db. or more. Both sidebands transmitted on AM. Precision gear driven C.T.O. Exclusive Hallcrafters patented sideband selection. Logarithmic meter for accuracy tuning and carrier level adjustment. Ideal CW keying and break-in operation. Full voice control system built in.

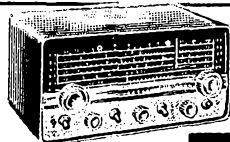
\$695.00



HALLCRAFTER MODEL SX-101-A

FEATURES: Complete coverage of six ham bands — 160, 80, 40, 20, 15, 10 meters. Large slide rule dial. Band-in-use scales individually illuminated. Illuminated S-meter. Dual scale S-meter. S-meter zero point independent of sensitivity control. S-meter functions with AVC off. Special 10 Mc position for WWV. Dual conversion. Exclusive Hallcrafters upper-lower side band selection. Second conversion oscillators quartz crystal controlled. Tee-notch filter. Full gear drive from tuning knob to gang condensers — absolute reliability. 40:1 tuning knob ratio. Built-in precision 100 kc evacuated marker crystal. Vernier pointer adjustment. Five steps of selectivity from 500 cycles to 5000 cycles. Precision temperature compensation plus Hallcrafters exclusive production heat cycling for lowest drift. Direct coupled series noise limiter for improved noise reduction.

\$399.50



HALLCRAFTER MODEL S-107

COVERAGE: Standard Broadcast from 540-1630 kc plus four short wave bands over 2.5-31 and 48-54.5 mc. Intermediate frequency; 455 kc.

\$94.95

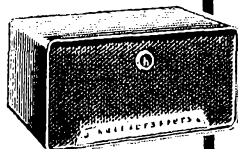


MODEL S-108

FREQUENCY COVERAGE: Broadcast band 538-1600 kc plus three S/W bands 1550 kc-34 mc.

FEATURES: Slide rule bandspread dial calibrated for 80, 40, 20, 15 and 10 meter amateur bands and 11 meter citizens' band. One r-f, two i-f and separate bandspread tuning condenser. Temperature compensated oscillator and built-in speaker.

\$129.50



HALLCRAFTER SPEAKER

MODEL R-48. Latest design uses new 5½" x 7½" elliptical assembly. Alnico V 3.16 oz. magnet has fully saturated air gap for exceptional damping, distortion-free response. Switch at rear for selection of music or voice response. Use with SX-101A, SX-100, SX-110, SX-62A, or any receiver with 3.2 ohm output. Gray steel 6¾" high x 13¼" wide x 8¼" deep cabinet. Shipping weight approximately 9 lbs.

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Type K-2 Univ. Ball Mtg., Coax.....		7.50
Type SA-1 Hwy-Duty Stainless Spring.....		7.50
Type RS-2 Comb. Ball & Spring Mtg.....		13.80
Style BXS Center-Loaded Antenna for Standard Frees., 72" S.S. Whip.....		9.00
Style BSS Same as BXS with Type SA-1 Spring Mtg.....		15.00
TS-896 96" One-Piece Stainless Whip, Centerless Ground.....		4.50
TS-884 84" Same Description as Above.....		4.50
TS-872 72" Same Description as Above.....		4.20

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GP-430 Lt.-Wgt. Alum. Ground Plane Antenna, Fully Adj. from 40-60 Mcs.....		\$30.00
GP-450 Same as Above, Adj. 20-40 Mcs.....		24.00
GP-312 Civil Defense VHF Ground Plane Ant., Efficient & Inexpensive, 108-120 Mcs.....		4.80
GP-314 Same as Above — 144 Mcs.....		4.80
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SS — 1100 Series From 12' to 35' in Hgt.		

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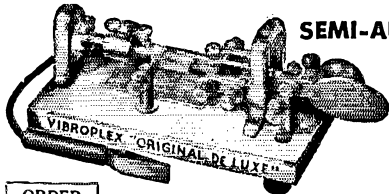
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ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: CAF, PAM CSN, 3880 kc.; FMZ, The Grand Canyon Net meets on 7210 kc. The Catalina Emergency Net had six alerts in two weeks. The fellows were so busy they had no time to drill. HVA is the new EC for the Tucson Area. We reached 44 per cent check-in on the 12th Regional Net in November. Traffic is now moving quite well both in and out of the State. CSN ties in with MTN, ALN and the 12th Regional. AMM takes APO traffic. Traffic: W7AMM 46, OIF 46, CAF 39.

SAN DIEGO—SCM, Don Stansifer, W6LRU—K6BX, in Bonita, is now a Class I Official Observer. W6CAE has a Telrex Tri-Band beam operating from his new location. K6BTO is trying to stir up more activity on 432 Mc. in the area. WA6CDD, in El Cajon, joins the ranks of traffic-handlers, and checks into the Mission Trail Net. K6RYI is now the Emergency Coordinator in Fallbrook and will be assisted by old-timer W6LKC. WA6BUX got a mini-three band beam for Christmas. Your SCM enjoyed a nice trip and meeting with the Newport Amateur Radio Society. It is a well-run live-wire club and meets twice a month. K6BIM is now in Alaska with the Coast Guard after enjoying 30 days of leave at home. The December meeting of the San Diego DX Club was held at the home of W6LRU, W6HAW, in Vista, continues to lead the north county gang in working DX on 14-Mc. c.w. More and more secondary schools in the area are organizing amateur radio clubs and equipping stations as part of their Industrial Arts program. Traffic: W6YDK 1475, K6BPI 867, W6EOT 760, W6IAB 758, K6GMU/6 470, WA6CDD 174, W6ETQ 81, WA6ATB 19.

SANTA BARBARA—SCM, Robert A. Henke, K6CVR —The Santa Barbara RC elected K6DXW, pres.; Herb Bolton, vice-pres.; K6BF, treas.; K6OLDE, secy. A radio link for the Sports Car Rally was provided by mobiles K6DXW, K6EAG, K6CVR and W6FNK covering from Santa Barbara, Solvang and Santa Maria, in that order. NKT has completed a home-brew 250-watt transmitter. K6RWP finally got his antenna in the air and has an FB signal. The Ventura County RC has started on its club station with a DX-100 transmitter. W6QWV has sold all of his station equipment and is looking for some mobile equipment to use until he moves into the new QTH. K6ARK has a new s.s.b. exciter and is having a lot of fun with it on 75 meters. Congrats to WA6IHU on the W6 call and General Class ticket. Welcome to W6RSD, W6IEQ, W6ILY, WA6GMM, K6GQG and K6TQW. Traffic: WA6BLM 193, W6NKT 70, W6FYW 5.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX. PAM: BOO. RM: K5ETX. The Wichita Falls group has organized a weather net with IFI as Net Control. This net meets each Sun. at 8:30 A.M. on 3885 kc. Listen in and help out when you can. A weather net must have large coverage to function properly. The Big Spring Radio Club is building a club house and planning a hamfest in the early Spring. The Black Water Valley ARC (Muleshoe and Ferwell Area) reports good attendance, good programs and plenty to eat at its regular meetings. OSV and K5ODQ are deer-hunting near Menard and keeping in touch with home via portable radio. WKH and K5EGB are on 40 meters at the request of Jan's mother. K5MTF, K5LAE won a beam at the TYLRUN Party. K5LHF and K5HVC are proud parents of another girl, born Nov. 21. K5ETX advises us of plans to start a second session of the NTX to take care of the Christmas rush. CenTex ARC of Waco is getting the city to renovate the e.d. building used as a club house. K5MBB is building an RTTY converter. RVI reports 262 contacts during the Oct. CD Party. NFO suggests that you listen before you put a signal on the air to be sure you are not going to interfere with a traffic net or someone trying to pass traffic. Traffic: W5UTW 304, BKH 222, GY 141, LGI 92, K5RAY 53, W5BOO 43, VEZ 30, K5ETX 26, ACD 19, W5RVT 13, K5EGB 8, W5KPB, 8 K5PXV 3.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—SEC: UYQ. PAMs: EJK, VCJ and K5DLP. RMs: VVQ and K5JGZ. W5PAA has a new Seneca for 50 and 144 Mc. New officers of the Aeronautical Club are: UYQ, pres.; K5JEA, vice-pres.; EHC, secy.-treas.; K5PBE, asst. to pres. EHC has been walking on air since working HZTAB on a.s.b. New Novices: KN5VYU, Oklahoma City; KN5YQI and YVI, Bartlesville. FLS has a new HT-37. OVI now is on phone with a new modulator. K5JEA owns a new 75A-3 and UHP a new kilowatt linear amplifier. IER, who handled traffic for Antartica, wound up with an enjoyable personal visit by one of the South Pole operators. New officers of the Enid Club are PCQ, pres.; K5QEE, vice-pres.; K5CAY, secy.-treas.

(Continued on page 176)

Here's how

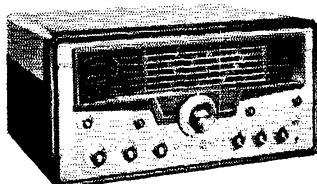
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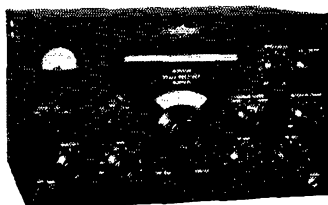
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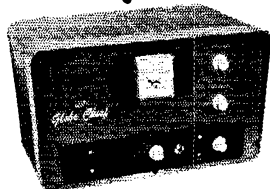
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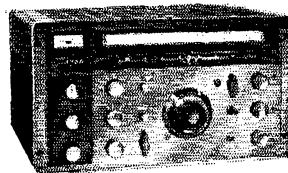
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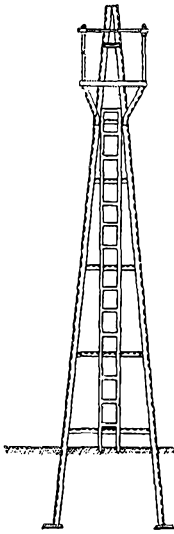
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CAY is NCS on the Interstate S.S.B. Net. Your SCM visited Muskogee and Southeastern Oklahoma amateurs in November. EJK's and VLVs XYLS sure know how to fix the fried chicken and steak, Oklahoma Ham of the Month is K5BAA for his faithfulness over many months in sending news of his area. GIQ is on the air from his old QTH after two years in Ethiopia. A tip of the SCM's hat to JXM for the fine work on the *OLZ-SSZ Bulletin*. Edmund has a new club. Traffic: W5YVQ 187, DRZ 132, K5JGZ 132, CAY 113, USA 104, ELG 79, W5JXM 54, K5OJD 43, W5CCK 31, K5OVR 30, W5KY 25, K5QEF 25, W5WDD 24, WAF 19, MFX 18, PNG 18, K5INC 16, CBA 15, W5UYQ 14, K5YGW 14, JOA 13, W5VLW 13, K5EZM 10, LYM 10, W5EHC 6, K5QZJ 3.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM,—SEC: QKF, PAM: ZPD, RM: K5BSZ. VE is now engineering radar for the U.S. Weather Bureau. He will be on 40 meters soon. ADQ has one of the most interesting collections of old-time radio gear in Southern Texas. Anyone around San Antonio should go and see it. IRJ is in the process of constructing a new rig. MIF, in spite of his years as a Marine operator, is now being heard on phone. Congratulations to DKF and XYL on their latest, a girl. K5RYS has a new station wagon equipped with an AF-67 and G66B receiver. He will be mobiling up in Yankee-Land over the holidays. Amateur radio lost one of its finest in the passing of TAF. Mac will be long remembered in Southern Texas. The v.h.f. and u.h.f. enthusiasts of Houston have formed the Port City Hibanders Club. PM's DX score now stands at 224/214. Keep after them, Jack, with the new beam. The 7200 Traffic Net had 40 sessions, 560 messages handled. ZPD is the new PAM; SMK, net manager; K5IPG assistant manager; ZPD secy. BVP is the monitoring station, to keep stations on frequency and to check modulation. Congratulations to K5RYS on making RPL for the third time and AC for the first time. K5EWW was heard mobiling around San Antonio. Traffic: (Nov.) K5RYS 399, W5AC 138, ZIN 78, ZPD 63, BHO 44, K5MXO 13, VUZ 10. (Oct.) K5RYS 241.

CANADIAN DIVISION

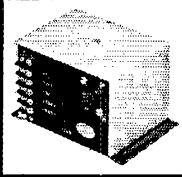
MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. D. Solomon, VE1OC, and H. C. Hillyard, VOICZ. SEC: BL. New appointments include VO1EX as OO. Congratulations and best wishes to VG and his XYL on their recent marriage. UL has resigned as vice-president of the NBARA because of ill health and WF has been chosen to take his place. Members of the NSARA hold daily code practice sessions on 3700 kc. at 2000 AST. The Maritime AREC Net now operates Sun. on 3790 kc. at 1330 AST, while the NBARA Net has been changed to 1700 AST, Sun. The NCS in both cases is BL. LT's QTH was severely damaged by fire but he saved his GPR-90! VO2AW reports that the Goose Bay Rag-Chew Net now meets on 3780 kc. Sun. at 1400. New calls at Goose include VO2AM. Officers of the SONRA are VOICZ, pres.; VO1BU, vice-pres.; VO1BJ, secy., VO1FD, treas. Friends of DQ will be pleased to hear that he is recovering from a very serious illness. (Art did an excellent job on this column for many years!) Traffic: VE1ADH 23, DB 13, BY 10, OM 6.

ONTARIO—SCM, Richard Wm. Roberts, VE3NG—Numerous VE3s are trying for the Worked Ontario Counties (30) and WAVE Awards. Try them for a winter project. VE3s are on all bands. AVS visited GG. AUU reports an FB S.E.T. in his area. VD works VE7s with an 8-ft. whip antenna indoors. SG will be back on the air soon. TL is going RTTY. DQL is on s.s.b. The Windsor ARC assisted a local car club by providing communications during a car rally. Those who assisted are as follows: CIP, EHX, DXQ, CNB, DKE, BIW, AJR, BFO, BGW, DNV, CPB and CGC. For those of you that have not already heard, the North Bay Club will NOT repeat NOT, hold a hamfest in 1960. The members are taking a hard-earned rest. DGB is moving to Rimouski, Que. London Club members are getting around to normal after the FB convention. AKQ returns to the airwaves after seven years absence. ANL is rebuilding (his house, that is). BZA is s.s.b. Our congrats to our new Assistant Canadian Director, Noel Eaton, 3CJ. AFI is on 40 meters, DBF is on 2 meters. APC has an FB signal from Fort Erie. EAO is now in Kitchener. BIV is at Bowmanville for the winter. DTO is mobiling in VE6-Land. NG has a new tower to hold up his 10- and 2-meter beams. You are again reminded to send a set of self-addressed envelopes to our QSL Manager for any cards he may hold for you. May you all have a Healthy, Happy and Prosperous 1960. Traffic: (Nov.) VE3BUR 147, BZB 111, DPO 92, NG 65, CFR 52, AOE 46, NO 38, AUU 35, PR 26, DWN 22, RN 22, KM 21, EAM 17, DH 15, EHC 14, RW 10, ELC 9, VD 9, AVS 5. (Oct.) VE3BUR 176, CFR 59.

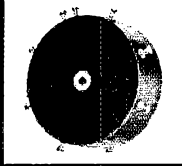
QUEBEC—SCM, C. W. Skarstedt, VE2DR—It is
(Continued on page 144)

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These small light-weight units, feature low current drain, high conversion efficiency, ruggedness and no moving parts. They provide trouble free, economical operation of communications equipment and other related devices. Ideal for use in mobile, marine, aircraft, Citizen's Band and amateur equipment.



Precision wound Toroidal Transformers. For use in construction of Transistorized Power Converters and Inverters or as a replacement part. Encapsulated for ruggedness and long life. Easy to install and wire. Designed for operation in ambient temperatures from -55° to 130° C.



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RATING	25W	60W	120W	25W
PRICE	\$32.50	\$48.50	\$57.50	\$32.50
OUTPUT Voltage Current	250V 100ma	300/150V 200ma total	500/250/-60V 200/100/10ma	115/26VAC 25W-400cy
INPUT No Load Full Load	0.5 amp 3 amp	1 amp 7 amp	1.5 amp 12 amp	0.5 amp 3 amp
REGULATION Full Load/No Load Full Load/1/2 Load	86% 92%	88% 93%	85% 91%	70% 85%
OVERALL DIMENSIONS Width Length Height	2 1/4 in. 3 3/4 in. 2 3/4 in.	3 in. 4 3/4 in. 3 3/4 in.	4 1/4 in. 5 1/4 in. 3 3/4 in.	3 3/4 in. 5 in. 3 3/4 in.

TOROIDAL TRANSFORMERS FOR 12 TO 14 VDC INPUT

MODEL	TT-25W	TT-60W	TT-120W	TIC-25W
RATING	25W	60W	120W	25W
PRICE	\$8.10	\$11.25	\$15.25	\$14.75
TRANSISTOR POWER RATING	3 amp	6 or 12 amp	12 amp	3 amp
OUTPUT Voltage Current	250V 100ma	300/150V 200ma	500/250/60V 200/100/10ma	26 & 115 VAC 400cy

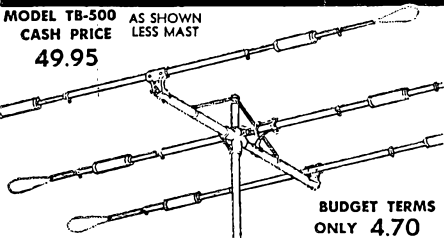


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- * HEAVY GALVANIZED STEEL BOOMS
- * CARPET-BEATER ELEMENT TIPS GREATLY INCREASE BAND WIDTH, FEATURING EXCLUSIVE RIVETLESS CONSTRUCTION; WILL NOT SHAKE LOOSE

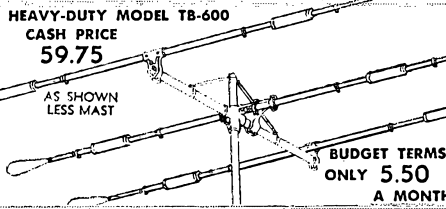
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TB-3	9 db Avg.	25 db	1.2 or less
TB-3B	8 db Avg.	25 db	Unity

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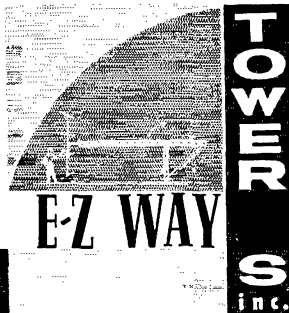
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How's DX?

(Continued from page 78)

radio in general; ARRL DXCC members throughout the world are invited to join." Drop SP7HX a request for details ... Marie of LA9NF is a YL DX candidate recommended by K9LIO ... League Assistant Secretary K1LVW received a WAC application from F3DJ whose mobile-in-motion DX score is 45 countries. F3DJ/m modulates a 6146 with Class B 6DQ6s ... F7FD, perhaps best known as former W4VE, expects to be signing W4NO back in Virginia after retiring from the service in June ... W0VBK is rather surprised to find Kansas considered a rarity but a QSL from G3CHJ goes: "Have waited thirteen years for Kansas, so I'm enclosing IRC and living in hope!" ... Further ament WAS aspects, W7POU of Salt Lake City writes, "Of fourteen European QSOs made during a recent 15-meter opening eight stated I was their 'first Utah.' Judging from QRM around town there is no paucity of stations here — perhaps Utah Sevens just aren't DX-minded." ... Continental miscellany via SCDXC, WGDXC and VERON informants: LA2TD/p, employing SM5WN/LA/p's old setup on 40, 20 and 15 meters, has 44 states and 55 countries in the log so far. ... PA0LOU comments on Holland's license classifications: (A) 12-w.p.m. code, maximized technical and regulatory knowledge, 150 watts on all ham bands; (B) essentially the same as Class A, 50-watt power limitation; and (C) a v.h.f.-type license sans code requirements, 50 watts maximum input on bands above 30 Mc. PA0LZ, by the way, is PA0LOU's contest nemesis and the pair often finish one-two in such endeavors. ... HB9TL was invited to put OE9IM's rarish installation through DX paces in mid-December. ... HE9LAA still does a booming business on 28,150 kc. near 1330 GMT when the skip is right.

South America — The tropics are all hustle and bustle these days, especially on the DXpeditionary front. The Galapagos came under attack by separate detachments under the leadership of OA4GM and HC1JU, while Malpelo island is threatened by r.f. burns courtesy HK DX adventurers and the 1959 Serrana Hank gang. A step-up in Juan Fernandez action appears imminent, and PY lads are stirring things up in the Fernando de Noronha sector. K2SFA, W9CLH and KH6AHZ helped Jeeves keep tuned in on the din ... YL-type DX hunters will find Gina of LU5DEL quite available on 15 c.w., declares K9LIO ... "I operated OA1C from 1948 to 1957 on 10 and 20 meters before returning to the States in '57," writes K8MPML. "Last November I was elected mayor of my home town of Toronto, Ohio, and would like to hear from some of the boys I used to work in Peru. I'll soon have 200 watts on 40, 20 and 10." ... W8YGR finds P12AE determined to make his WAS on the low edge of 80 c.w. ... Via WGDXC: Those troubled by VP4WD's Tobago elusiveness will appreciate the fact that Jack's receiver, a B2 service model, has only one-eighth-inch spread on 20 meters. He's often on 14,022 or 14,050 kc. from 2300 to 0300 GMT with 30 watts to a doublet, when work on Swiss Family Robinson cameras permit ... OVARA finds ex-VP6BH commercially active on SS Ore Regent, the Philadelphia-Venezuela run. W3OZA/mm operates ham bands from the same vessel ... VERON observes H113DL's new sidewinder really rocking the 14-Mc. duck pond.

Hereabouts — "During the 1960 ARRL DX Contest our Central High School Radio Club will operate W0LNI/0 in South Dakota on 14 and 21 Mc., c.w. only," notifies J. Fuhrman of the Sioux City, Iowa, gang ... Last month's juicy QSL spread courtesy NCDXC was photographed by W6PHF/FO8AW, a well deserved credit overlooked ... K1GCX offers Vermont contacts between 21,075 and 21,100 kc. on week ends between 1500 and 2100 GMT. Dick fears that being located in a fairly rare state doesn't necessarily help QSL returns ... WA2FNA puts Wantagh High School's K2LFS on DX bands from time to time, being the only General on the staff at present ... Fire took a catastrophic swipe at W4KVX, erasing Don's business and hobby facilities overnight. Suspended by the loss is W4KVX's popular periodical DX, an effective voice promoting lively interest in the long-haul sport ... W6NKE learns that YN1WW checked in a brand new HQ-170 to help accommodate his DX friends. ... TG9TI turned in his 70-watter for a 500-watt job with which he hopes to close out a stubborn WAS. Rod also would like to see the annual CRAG (Guatemala) DX test expand into the English-speaking DX world. The next such affair is set for mid-September and we shall see ... It took WA2-GWF only from July 11 to October 18, 1959, to work his first 100 countries. But Dick still needs about 80 QSLs ... W7LZF highly recommends CRPL-Jb releases for DX hounds who like to try to call their shots. They are propagational forecasts printed on post cards and disseminated weekly by National Bureau of Standards Central Radio Propagation Laboratories, Boulder Lab, Boulder, Colo. Cost? Free, man, to W/Ks ... Via W6KG: No. Calif. DX Club, Inc., now offers its California Award to

(Continued on page 148)

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BUILD YOUR LINEAR FROM AN LA-400-C KIT

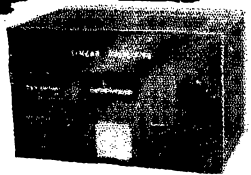


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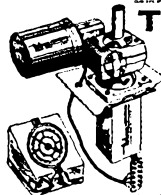
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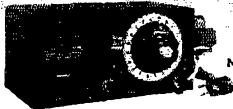
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Art Brown, W9IHZ

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non-U. S. hams who confirm QSOs with 200 California amateurs plus 20 NCDXC members, contacts to date after October, 1946. Interested parties can obtain details from the club at P. O. Box 75, Oakland, Calif. VE1PQ, battling to overcome VE1NT's call-area, phone DX supremacy, struggles to improve his 152/119 voice DX score. VE1WL also is in there pitching with 102 phone countries bagged since early September. K5JCC reports a friendly 15-meter battle royal between Fives and Ones of the younger set. K5s LGH LZQ, Pete, K1s BJB CCA CJV EPI and others join in pouncing on stray 21-Mc. overseas items K6KDS has worked all but one of California's 58 counties, needing only super-rare Modoc to clinch his WACC.

Ten Years Ago in "How's DX?" — The looming 16th ARRL International DX Competition is your February 1950 column keynote. One-sixty meters crashes DX headlines with reports of transatlantic QSOs between Gs 3PU 5JU 6BQ, GD3UB and numerous WVEs Eighty is almost out of this world, OM; EK1AO, FA8BG, LX1DX, MP4AD, TA3GVU, TG9RB, VK9RH, VP5 5BF 8AI, VR2BU, VS6BL and XZ2EM are on the low edge Forty is routine, and 14-Mc. c.w. throbs with FT3-AM, FE8AB, FM8AD, FY8AA, HS1SS, MD2PJ, MI3ZZ, ST2AM, TA3s AA AB PAS, VQ1CUR, VR4AA, YK1AC and ZD8B. Twenty phone's best are AC3SQ, CR5UP, F9QU/FM8, F9QV/Corsica, FN8AD, HE1EU, HZ1AB, MB9AD, MD4JG, PJ5CE and ZC1CL. Ten-meter mikers apply themselves for ACs 4RF 5CS, CRs 8AJ 10AA, EK1AD, ET3AE, FJ3RG, HE1SW, HL1BJ, IIAHV/MI1, LX1JW, MD7HV, MI3SC, MP4AO, MS4A, PK4DA, ST2KR, V89AH, ZC6DZ, ZD4AH, ZS6OS/Z87 and ZS8A REF announces a world-wide DX contest. TA3AA's jaunt to Chios as SV7AA resulted in 63 contacts with the U.S.A. Kerguelens activity appears in store. Jeeves's sparse scalp interests some peeved Indians, while photos of PX1A, CX6AD and several Cuban DX men conclude the course. **QST**

Correspondence

(Continued from page 79)

gency organizations, more cooperation, more of all that make up the unique hobby that is ours. Without any obedience to the "good ole days," the powers that be (FCC) have gone all out to help make ham radio what it is.

The FCC is presently acutely aware of their limitations. They have a full time job handling the affairs of commercial industry, even if all of ham radio suddenly became non-existent. Add to this fact that the Geneva conferences again show the demand of other radio services for our frequencies, and the comparatively small percentage of rogues in hamdom really takes on sinister significance. For if we as law-abiding citizens continue to allow these fellows to step where they please when they please, they will sell us down the river of no-return.

One lousy signal can spoil the band. One lousy operator can make misery out of a good time. This is a problem for internal solution. If we wait until the FCC steps in, we might all lose our heads (at least our privileges). I personally think the matter should be reviewed further, and more ideas solicited among our members.

— Dick Burt, W5QQM

27 Grayson Place
Teaneck, N. J.

Editor, QST.

You omitted the worst offender in your editorial. He is Headstrong Headquarters, old man ARRL member — a true case of the pot calling the kettle black.

Headstrong Headquarters has a rare disease known as being Contest-Crazy which has taken hold of him to the extent that he absolutely refuses to accommodate the other half of the ham population who wish to communicate without being involved. It would be so simple to set aside 25 kc. in each band which would be off limits to contestants but in his great blindness Headstrong Headquarters is able to manufacture more reasons why this is not practicable. He finds it more democratic to take over all of the frequencies for his events. He reasons that everybody who is on the air is in the contest anyway — and he is so right. Fully one-half of all the operators normally on the air during these periods have a choice — either join up or QRT.

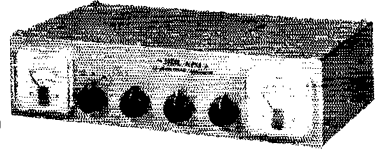
If you go to a part of the band where it appears to be momentarily quiet and try for a QSO you find Knucklehead Karl trying to force a contest contact report on you after your call of "CQ NO CONTEST" and Eager Ed is tuning

(Continued on page 160)

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B+ requires 600v @ 100ma; 350v @ 200ma (approx.)



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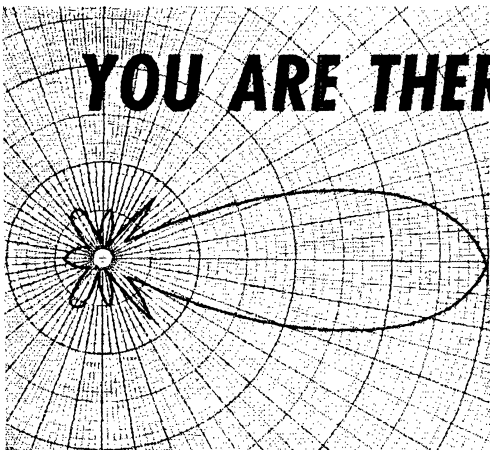
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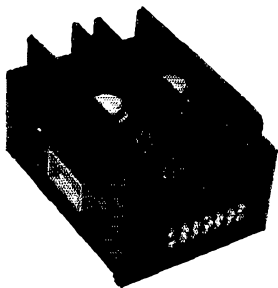
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up on the frequency to get in on the deal. There is no place to go to get away from them except off the air. . . .

While there are others who also conduct contests with the same attitude of "the public be damned," Headstrong Headquarters is the chief offender and he sets the pattern. If he will correct his mess he will have cleared up the others as well. . . . Nobody objects to contests but we do object to being forced off the air. Won't somebody please straighten out Headstrong Headquarters?

— A. C. Winter, W2ADB

HELPING HAND

11153 S. Vincennes
Chicago, Illinois

Editor, *QST*:

Unfortunately, not all of the newcomers to amateur radio are electronic geniuses. Many technical phases have to be thoroughly examined and explained before being grasped.

When an experienced amateur publishes his conversion design of command rigs, or any circuit design of a 10-80 meter band rig, he shows a great amount of ingenuity that has made ham radio what it is today. He has accomplished what all of us newcomers hope to do in the future.

Then why in the great balls of r.f. do these fellows refuse to acknowledge a simple postcard asking or inquiring about certain technical phases of their design so we too can build the darn things?

We are led to believe that brotherhood prevails in amateur radio. Although some of our questions may appear "easy-as-a-nose-on-your-face" to the experienced ham, I am very sure that they themselves had to seek answers at one time or another.

Frankly, I'm a guy that likes to be grabbed by the hand and pulled up on the ladder. After explanations, I climb up the remaining rungs myself.

— Jack Chancellor, W9SON

STINGY?

311 McNeel Road
San Antonio 1, Texas

Editor, *QST*:

Your article on the QSL Bureau in "It Seems to Us," November *QST*, is timely. . . . The exchange of QSL cards was, in the good old days, religiously practiced. But today — ha, you are lucky if you get 5 back for each 100 you send. What has happened? Has ham radio become commercialized by a bunch of professionals? Or, have the brethren become too doggonned tight?

Now maybe I am old fashioned, but I still like to exchange QSL cards and the three I have received, out of the many contacts I have made in past weeks, each gave me quite a bit of pleasure. How about all the newcomers who want WAS, WAZ, WAC, etc? How are they ever going to do it if we don't send acknowledgment of contact? Well, they aren't. You old timers who have all these and more should be a little more considerate of others who started out as we did. Remember when each contact was a real thrill and how you watched the mail for each QSL card?? Well, old timer (and some of you new timers too) others are now waiting for yours!

I am going to continue to be old-fashioned by mailing out a QSL card to each contact. I may not get many in return but if I am going to be a radio amateur, I am going to do it up first class — or I'm not going to do it at all. I don't believe a few QSL cards and a little postage is going to bankrupt me. I can, and will be happy to, forego something else.

What say, fellows? Let's return ham radio to the pleasant hobby it once was!

— George W. Miller, K5VXX

GOOD WORD

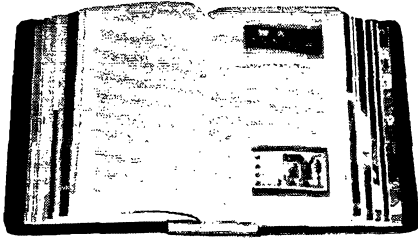
743 N. Main Street
Brockton, Mass.

Editor, *QST*:

I have read *QST* for a number of years and could not help but notice that you receive a number of brickbats as well as roses. I have noticed in "Correspondence from Members" that on controversial issues you give approximately the same space to each side of the question. There can be no squarer way to handle it.

(Continued on page 158)

QST BINDERS



Are your 1959 QSTs scattered around your shack? If so, get a QST Binder and file them away neatly for future reference. While you're at it, start the New Year right by obtaining another Binder in which to preserve those interesting 1960 issues to come.

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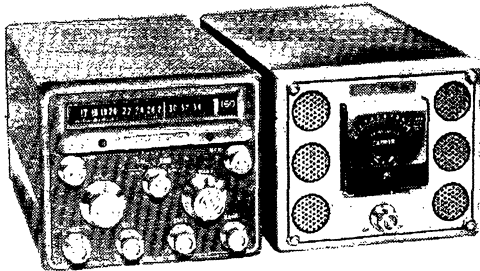
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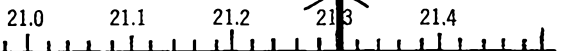
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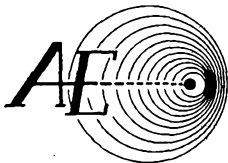
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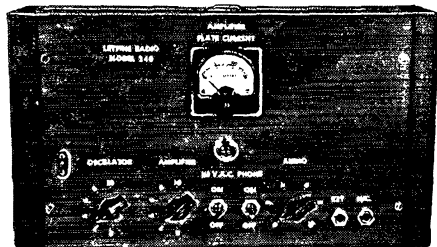
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(See page 157 for ad on the Cage)

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The articles on "how to build" equipment cover the entire field from beginner through the math bug, and through the course of time, it appears that you cover all phases of amateur radio. As to the critics of *QST* - it can only be said that no *one* magazine can completely satisfy everyone; amateur radio is too complex for a simple answer. . . .

- Albert P. Kazukonis, W1OBZ

M. M.

10419 65th Ave., North
Largo, Florida

Editor, *QST*:

Referring to the letter from Dr. George B. Bean (December *QST*, Page 196), in which he complains of interference from outboard ignition; in the second paragraph he says: "I operate 3.5 Mc. *maritime mobile* from a 14-foot aluminum boat . . ." and in the last paragraph he continues ". . . on a small lake . . . etc."

An amateur rig aboard any vessel, whether it be an ocean liner or a row-boat, is not maritime mobile unless the vessel is on the high seas. On inland waters, i.e., lakes, rivers, bays, etc., the proper designation would be simply mobile - the same as if the rig were in an automobile, truck, train, or any other vehicle capable of motivation.

- Arthur E. Hutchins, W4ISX

WRONG OUTLOOK

P. O. Box 403
Eldon, Iowa

Editor, *QST*:

After reading the letter written by KN7HOF published on page 198 of the December issue, I cannot help but feel that someone has given this fellow the wrong outlook on our hobby.

When I was a Novice, I jumped at the chance to work anyone! After all - what is the purpose of the Novice license? Isn't it to work on your code speed "under fire?" I can remember the most gratifying words (to me worth more than all of the "wall paper" in the world) coming back through the QRM and QRN on the SX-99 - "FB FIST OM SOLID COPY."

Sure it's rough to fight the QRM with 75 watts or less and a "rock," but always remember that you will take the rest of your active ham life to make all of the awards that you want to. High power and v.f.o. is not the answer.

As for the Novice bands being strictly for the Novice; that would be as bad as putting a bunch of infants together and expecting them to learn to talk. Sure you find a General here and there who forgets the courtesy angle, but as time goes on I'm sure you will find that this type of operator is by far in the minority. Most of the Generals are more than courteous on the bands.

One last thing to all Novices - develop that fist, learn good operating procedures, don't become discouraged by the QRM on the bands, and last but not least - speak highly of your fellow "hams." We are a proud, and at times helpful, bunch of human beings. Welcome to the hobby.

- Curtiss B. Curttright, K9QKF

Radio Propagation

(Continued from page 26)

Mc., ionospheric scatter and diffraction paths are the most probable types. Almost all radiation in the 300-to-1200-Mc. range is propagated by tropospheric scatter, diffraction, or line-of-sight paths. Above 1200 Mc., the path is pretty much limited to a 4/3 earth's radius line-of-sight path, although duct effects may be pronounced under suitable conditions. Raindrop diffraction becomes important at these frequencies.

It is quite apparent, now that the White Alice system has been in operation for some time, that tropospheric scatter and diffraction-path propagation are probably the most dependable long-distance communications methods. Although the

(Continued on page 164)

NEW

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AF-68 TRANSCITER

TYPE A-1 OR A-3 EMISSION

Six Amateur Bands

80 THRU 6 METERS

V.F.O. or CRYSTAL

A built-in temperature compensated V.F.O. is directly calibrated in megacycles for each band.

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A five Circuit meter switch provides illuminated meter readings.

The AF-68 can be operated from 6, 12 V. D.C. or 110 V. A.C. High voltage requirements for maximum input of 60 watts are 500 volts @ 170 M.A. and 225 volts @ 60 M.A.

Finish—Charcoal cabinet with chrome trim. Two-tone grey front panel.

PRICE

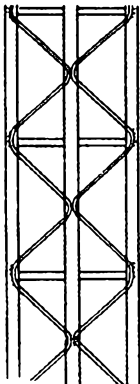
(Amateur Net)

\$20500

Including all tubes and 15 prong power connector.

Cabinet Size—13¼" Wide—6¼" High—7½" Deep
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Weight—18 lbs. (Approx.)

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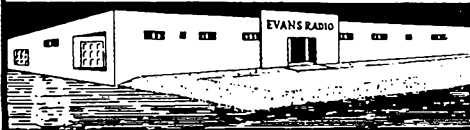
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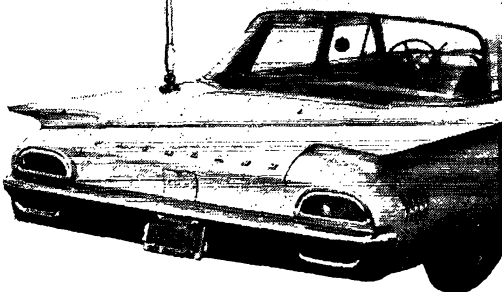
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Top, stainless-steel whip has 5-band calibration for fast band change. Whip has positive lock. Overall height of antenna with whip fully lowered, 57".

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initial expense of a commercial system is high, this technique offers a large channel capacity and, as mentioned before, extreme reliability. Judging from the research being conducted in this area by such organizations as the Bureau of Standards and Collins, the future of these propagation methods in the field of communications looks pretty bright.

In conclusion, it is the hope of the author that this brief presentation of the basic methods and principles of radio propagation will increase the reader's understanding in this important phase of his interest. The author would also take this opportunity to thank Professor R. E. Douglass of Pacific Lutheran College for his encouragement and comments, and Mr. R. M. Johnson of the Alaska Communications System for his suggestions and valuable references. **QST**

Further information on the subject of radio propagation will be found in the following references:

The Radio Amateur's Handbook (A.R.R.L.)

The A.R.R.L. Antenna Book

Villard & Peterson, "Meteor Scatter," *QST*, April, 1953.

Dyce, "More About V.H.F. Auroral Propagation," *QST*, January, 1955.

Collier, "Upper Air Conditions for Two-Meter DX," *QST*, September, 1956.

Moynahan, "V.H.F. Scatter Propagation and Amateur Radio," *QST*, March, 1956.

Bain, "V.H.F. Meteor Scatter Propagation," *QST*, April, 1957.

Craig, "Obstacle Gain Techniques for 50 Mc. and Higher," *QST*, March, 1958.

Kibler, "Transequatorial Propagation of V.H.F. Signals," *QST*, December, 1959.

HT 32 Modifications

(Continued from page 35)

this, the shield can covering these components, just behind the crystal sockets, is lifted off after removing two nuts under the chassis, and a lead is brought down from C₇₈ separate from the lead from the trap circuit. These added trimmers are mounted on a small brass bracket soldered to the front edge of the shield in the subchassis just behind the crystal sockets.

Before making the modifications, the saturation-level setting of the r.f. level control for the existing 10-meter crystal should be noted as described in the HT-32 Manual, page 9, paragraph 4-7. The trimmers for the three 10-meter crystals can then be set as described in this paragraph. With the main band switch in the 10-meter position the added switch permits immediate selection of the desired 500-kc. segment of the band.

The HT-32 has been operated almost a year with these modifications with excellent results. Interest expressed by many HT-32 owners on the air prompted writing this article to pass the details on to others. **QST**

Choosing A Transmission Line

(Continued from page 42)

necessary for practical construction; our purpose here has been to survey the field that is of special

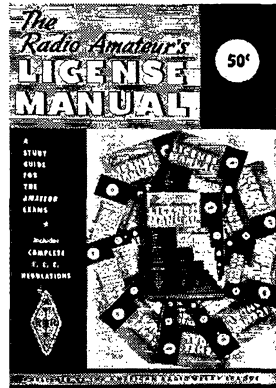
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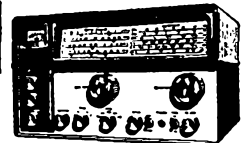
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Save on NATIONAL'S Famous NC-109

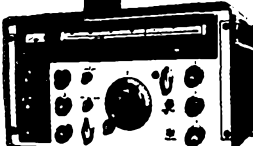
NATIONAL'S NEW NC-303

We're now offering maximum trade-in allowances for your old present gear toward National's new SSB ham receiver, the new NC-303; featuring 7 bands, optimum sensitivity and selectivity. Hams all agree it's the best feature-for-feature value in ham band only receivers.

Amateur net: \$449.



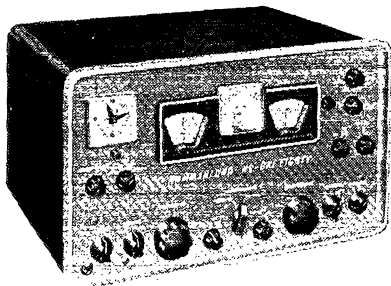
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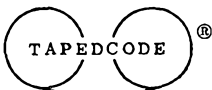
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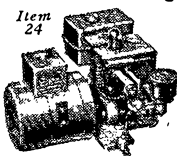
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interest to the Novice with over-all emphasis on the *relationship* between the antenna and what it is expected to do, on the one hand, and the transmission line and how it meets or does not meet the requirements, on the other. Once you decide on the type of antenna you want, give some thought to the feed system, taking into account frequency, length of line, and installation problems. The most important factor in your station's ability to "get out" will be your antenna, so don't be careless in your choice. For practical information on the various systems, it is suggested that the reader consult both the *Handbook* and the *ARRL Antenna Book*. **QST**

"Side-Band Package"

(Continued from page 43)

from the 6146 could be heard in the receiver during standby, since this stage was not completely cut off as originally wired. To cure this the control circuit was rewired as shown in the accompanying drawing (Fig. 1), so the cathode of the 6146 would be disconnected from ground during standby.

Those who wish to control the receiver and transmitter by the VOX relay alone may be interested to know that the Allied Control Company² manufactures a 5000-ohm plug-in relay of the same type and size as the P-B type 5MSLS, except that it is double-pole double-throw. It is known as the type RSHX-51 and comes with a matching socket. It is also available as a wired-in relay. The contacts are rated at 2 amperes. Using this relay it is possible to take advantage of the extra contact to disable the voice coil circuit of the speaker during transmitting, as shown in Fig. 1.

General

More than enough gain is available, and it is very easy to overdrive the amplifier if the gain control is advanced too far. It is suggested that a scope be used in conjunction with a 1000-cycle oscillator to conduct a two-tone test for determining the correct settings for the controls on all bands.

In the short time the writer has had this exciter operating, on-the-air comments have been most gratifying. Reports indicate that the pass-band characteristics are excellent, and the voice quality is more like broadcast quality than the usual s.s.b. audio sound. The v.f.o. has also been commented on as being very stable with practically no drift.

² Allied Control Company, Inc., 2 East End Ave., New York, N. Y.

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The 2nd Edition Now Also Covers
CITIZENS BAND TVI

\$1.75 in U.S.A. \$2.00 Foreign

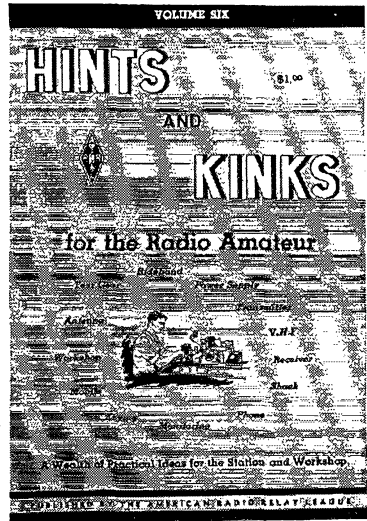
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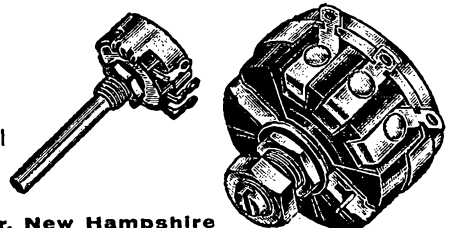
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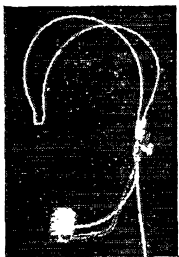


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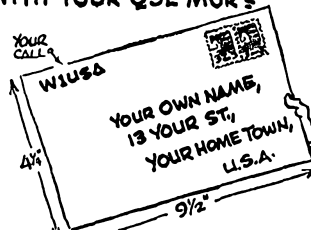
QST

A.R.R.L. QSL BUREAU

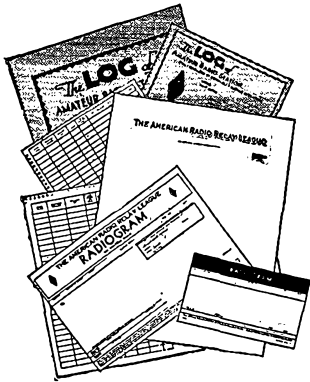
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is to facilitate delivery to amateurs in the United
States, its possessions, and Canada of those QSL
cards which arrive from amateur stations in other
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- W2, K2 — North Jersey DX Ass'n, Box 55, Arlington, N. J.
- W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.
- W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
- W5, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172, Houston 5, Texas.
- W6, K6 — San Diego DX Club, Box 16006, San Diego 16, Calif.
- W7, K7 — Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.
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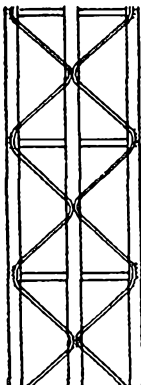
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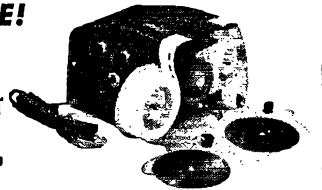
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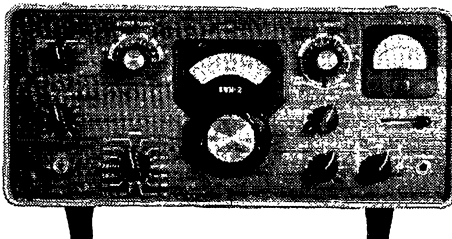
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(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (4) 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 Montic Dr., Santa Barbara, Calif.

TRANSFORMERS (3) W2EWL Special. \$3.00 postpaid, SSB, latest diagram, template, 3 xfirms, disc ceramic Emica condensers, coils L1 thru L7 for W2EWL Special (Mar. 1956 QST 10, \$10.95 postpaid. Vitale, W2EWL, Denville, N. J.

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"PIG-IN-A-POKE"? Not if you visit Ham Headquarters, USA and see and choose from the hundreds of "Like-New" bargains in the world-famous Harrison Trade-In Center. More for your money, because tremendous turnover makes lower overhead! Terms, trade. Send postcard for mouth watering photograph and price list Q-6. For the best in all new and used equipment, it pays to come to "Ham Headquarters, USA" (BCNU, 73, Bil Harrison, W2AVA, 225 Greenwich St., New York City, N. Y.)

USA DX QSL coop, Box 5938, Kansas City 11, Mo. Save time and \$ 3.00 DX QSLing. Only 3¢ per card after membership, \$2. 3 yrs. \$5.00, 10 years. QSL Bureau. Return env. serv. \$1.50 year. Free info.

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CASH For used Short-wave ham receivers, transmitters and accessories. Treger, W9IVJ, 2023 N. Harlem Ave., Chicago 35, Ill. Tel. TUxedo 9-6429.

HT-32, like new, \$500; 600L linear, like new, \$300. Made DXCC and WPX SSB in eight months with pair K2HEA/K2MGE, Lynbrook, L. 1. Tel. LY 9-2356.

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MOBILE Twins for sale. Spotless condition 10 thru 80 meters. Gonset G66B with three-way universal power supply and spkr. G77 with two-way power supply, all cables. Also Eico Model 320 Signal Generator, factory calibrated and Eico Model 425 oscilloscope, K2AUU, Murray Singer, 143 Glenview Rd., South Orange, N. J.

FOURTH Stupendous Year! Broward Amateur Radio Club's Get-together and Auction. Doors open 9 AM, lunch at noon, auctioning at 1 PM. Armory, S. W. 24th St., and 4th Ave., Lauderdale, Fla. Saturday, Feb. 13.

REWARD of twenty-five dollars (\$25.00) for information leading to or the obtaining of small control box type N C1057/ARC34. Send c.o.d. to Ted Dames, W2KUY, 64 Grand Pl. Arlington, N. J.

FOR Sale: 75A3, in perf. condx. Looks like new. 3,1 and 800 cycle filters, \$350. Lang Barbour, K5KKW, Bay City, Texas. RK65 tubes, ideal KW linear tubes. New, tested, in factory cartons. \$10 each. C. Brooner, P.O. Box 261, Morton, Ill. LEECE-NEVILLE 6 volt 100 amp. system—alternator regulator and rectifier, \$45; also 12 volt 100 amp. system, \$85. Guaranteed no-exp. police car units. Herbert A. Zimmerman, Jr., K2PAT, 115 Willow St., Brooklyn 1, N. Y. Tel. ULster 2-3472 or JAckson 2-2857.

WANTED: One Kilowatt commercially-built transmitter like Collins KW-1 or equivalent A1 T. O'Neil, Lake City, Minn.

NEW Service for amateurs. List your equipment for sale, let us know your needs. No charge to buyer, small brokerage fee to seller after transaction. W2EEJ, Herbert Greenbers, 821 Rutgers Road, Franklin Square, N. Y. IVanhoe 6-0809.

SELL: SX28 receiver with Heath Q multiplier, headset and some spare tubes Good condition. No shipping. sv. \$85. Tom Hendricks, W4IG, 1401 Huncoc Ave., Alexandria, Va.

SELL: Meissner 8C FM tuner, \$15; Hallicrafters Ultra-Linear 25W. Hi-Fi amplifier with Techmaiser pre-amplifier, \$55. W2HFM, 60 Lindgreen St., Merrick, N. Y.

SELL: DX-100 xmtr, Heath SWR meter, Dow-Key coax relay, with all instrux manuals and connectors, \$210. Art Nisson, 1652 Foothill, Santa Ana, Calif.

WANTED: Heavy duty CDR rotor code oscillator; Heath SWR bridge, sale; low pass filters B&W, \$7; Drake, \$4. F.o.b. Maple Shade, N. J. K2ZUD, 565 North Cole.

FOR Sale: GE 20A, used 2 hrs, \$150; VFO, \$38; Gonset 500W linear L.N., \$150. Cash deal. W2DTD.

SELL to locals: TCS, BC-1147A, T-23 and others. WA2CQS, IN3-7269.

FOR Sale: Selling out: Complete ham station in gud condx as follows: Hammarlund HQ100 with xtal BFO, Hammarlund HC-10, Hammarlund matching spkr, Vikings Adventurer xmtr, plate modulator with power supply, Heathkit VFO, JT-30 mike and health kit grid dip oscillator. This station cost over \$500 new but will sell all to the first \$300 cash or will sell any part to best reasonable offer. Robert L. Jolly, K4ORC, Bowling Green, Ky.

SELL: Collins 75A4 \$650; Collins 32S1 \$500; Eldico KW linear, \$325; Milten Impedance Bridge 90672 \$30; B&W grid dip meter, \$30; Central Electronics MM2 RF w/xtal \$15; KW Matchbox, \$95; Bud 66" rack, brackets, etc., \$40; E-V 600D mike, \$10; WRL space booster, \$12; Elenco compression amp, \$30; Magnecord 101 stereo record and playback, \$300; Concertone custom professional stereo recorder with pre-amplifier carrying cases, \$750. W3VDE, 1219 Yardley Rd., Morrisville, Pa.

FOR Sale 2 ea 4-400A's \$25 ea; 2 ea 4-125A's \$18 ea; 4 ea 4X150A's \$6 ea; 7" Sq brass case Simpson meters as follows: 3 ea 0-1.5 DC ma; 1 ea 0-100 DC ma; 1 ea 0-50 DC ma; 3" rd bak case Weston meters as follows: 1 ea 0-10 DC ma; 1 ea 0-25 DC ma; 1 ea 0-100 DC ua; 1 ea 0-200 DC ua; \$3 ea; 1 ea Weston 3" rd metal case VU meter \$4; Electro Voice Model 210K WSB Carbon Mike \$10; American D9AT Dynamic Micro \$10; Kellogg DB Carbon Mike desk stand w/xtal \$35; Carter Magmotor 6VDC in 250V 30 ma out \$5. W2UJPJ 6312 Pinefield Rd, Columbia, South Carolina.

MOBILE Equipment: Gonset G-66B with power supply; Elmac AF-67; Microphone, coaxial relay, \$300. W6QBF, 4421 Allott, Sherman Oaks, Calif. Tel. CRcstview 1-6521.

SELL: Hallicrafters SR-34, Six and Two-meter transceiver, 110 volt AC, 6-12 volt DC, used less than 15 hours. \$4.00. Dick Baies, K9DAX, 524 West North, Muncie, Ind.

SELL my like-new Pacemaker, \$299 or my 32V1, \$249; my 5A4, early model, in like-new condx, with 3.1 kc filter, \$439. Will accept trades, Gen. W9ERU, Box 273, R.R. 4, Rockford, Ill.

SELL: Heath AT-1 transmitter, \$19; 100 watt modulator, \$25; Bud 5 ft. enclosed rack, \$20. F.o.b. W3NQA, 201 Pioneer St., Warren, Penna.

SELL: HT-32A, \$525; SX-96 Hallicrafters \$130; Pierson K93 recv with 12 volt supply; \$250; Gonset Super Six converter, \$25. All equipment in exc. condx. W. Mahland, 30-B Meadowbrook Pl., Maplewood, N.J. Tel. South Orange 2-3138.

TEEPPE Full! Gotta move something! Central Electronics 20A, \$145; National RBL 600 Kc 110 AC \$45; xfrms, tubes, chokes, meters, condensers, etc. example: MB405L multiband tank \$6.00; 225-202-1 rotary inductor, \$5.00; turns counter, \$2.00, all unused. Send dime for a long list or, send a buck (refunded if I run out) for guaranteed bargain package of assorted parts and hardware plus list, no junk. What do you need? W2DFX, Box 234, Center Moriches, N.Y.

TELEX Beam, Monarch Tribander, model TBS-626; brand new, in factory carton, never unpacked! You get manufacturer's guarantee, 9.2 DB gain or better on 20, 15, 10, \$219. W9YBZ, George Cunningham, 814 Scenic Drive, Charleston 1, W. Va., Tel. DI 4-3233.

FOR Sale: Jackson CRO-2 5" scope, used less than 1 hour, including three probes, \$160 cash. W2CBS, Joe Tucker, 866 East 48th St., Brooklyn 3, N. Y.

SALE: Collins 32V1, in mint condx, used only 10 hrs since factory overhaul six months ago; \$285. Also HQ129X, \$135. John Minette, W7EM1, St. Edward's Seminary, Kenmore, Washington.

WANTED: SSB Slicer, in gud condx, reasonably priced. Bob, K4AQA, 1200 East Second, Tuscumbia, Ala.

QSTS: 1923 to 1958, complete. One dollar per year. Pick up deal only. Will trade. W3BKL, Ken L. Blamey, 24 Conestoga Drive, Bethel Park (Allegheny Co.), Penna.

FOR Sale: Elmac A54 mobile xmtr (modified for 15M), PE101 dynamotor, Gonset Super Six converter, antenna relay and base mount, \$125. Harvey Newman, W2ALM, 91 Fairmount Pl., Albertson, N. Y.

CALL Letters, Gold or Silver, may be applied on any surface. Set 2'-6 1/2", 3'-8 1/2". A & B Service, Box 147C, Kittery, Maine.

COLLECTORS Attention! Old tubes bought, sold, traded. Adams, W6ANN.

20A Factory wired; HQ170 receiver; homebrew QST 1625 linear SSB. All used less than 50 hours. Best offer. WA2AEV, 234 Windmere, Rochester 10, N. Y.

COLLINS KWS-1 complete in excellent condx. Spare set of 4X250B tubes included, \$1000. F.o.b. Cataipa Ridge Rd., Pittsburgh 38, Penna. W3KXU.

SELL: Sonar SRT120, 100 watt phone, \$75; Harvey-Wells TB550C AC power supply, \$65; Morrow 3BR5 converter, \$25; Presto 90 disc recorder, \$25; Dukane tape recorder, model 11A75, \$110. William Moentner, W2HUN, 90-51 54th Ave., Elmhurst 73, N. Y.

WANTED To buy: Scott Philharmonic radio or any similar model, Scott All wave radio, McMurdo Silver Masterpiece TV set, V. State mechanical and electrical condition, price, incomplete radios or lacking cabinets considered, Jack Rhodes, 1880 Juniper St., Prince George, B. C., Canada.

BC342, military equivalent of high priced Communications receiver (see conversion manual #1) \$45.00. Also Sig. Corps field-set unit BC187 rcvr-xmtr modulator and AC pwr supp. Can be battery operated 2400 to 3700 Kc, like new, in case, \$55. Also dynamotor 5D77D 12V inp., 1000V outp., \$15. C. Harris, W5VH, 31 Brooks Dr., Greenwich, Conn.

FOR Sale: CDK rotor, SM-90 modulator, Eico modulator, Hy-Gain 10 Mc. beat. You pay shipping. Make offer. K5LEH, College Heights, Arkansas.

FOR Sale: All three converters for the NC-303 rcvr, in matching accessory cabinet w/bandswitch on front panel (6, 2 and 1/4 meter converters). Original cost, \$145. Want \$75. Also Central Electronics Mod. MM-2 RF analyzer with all three adapters. Cost \$155, Want \$75. Both items brand new and unused. You pay freight. Robert Espe, K5THF, P.O. Box 3236, Arsenal, Kansas.

NATIONAL HFS rcvr for sale, general coverage 27 to 250 Mc. In excellent condx. Best offer over \$45. R. F. Sanford, K2MQM, 42 Penn Lyle Road, Princeton Junction, N. J.

SELL: Hammarlund HQ-110C with clock, \$200. W2LPC, 51 Elmira St., Hicksville, L. I., N. Y.

WANTED: Elmac AF-67 near \$75. Also want Johnson Courier amplifier near \$150. Ray Daniels, 1418 Division St., Hopkins, Minn.

PE103A, complete, excellent, \$25. J. Peter Schultz, WA2COO, 15 Crestmont Rd., West Orange, N. J.

SELL: Two 250THs, gud condx., \$30 for pr. Tom Ash, WA2BEU, Box 35, Munnsville, N. Y.

SALE: 20A-QT1-UFO linear, \$160. W2MHL, 147 Fairview, Paramus, N. J.

WANTED: Johnson Matchstick, in new condx, also 52 to 52 ohm balun coil. K6MQU, 400 Arenas, Palm Springs, Calif.

SELL Viking 500. Recently factory overhauled. In perfect condx, \$650. Reason for selling: gone higher power. W2EQS, O'Brien, 48 Prospect, Westwood, N. J.

CANADIANS! Sell or swap Hallifaciers xmtr HT-9, 150 watts, in perfect condx, like new. Also Hi-Fi Spartan console. Both top quality. Special price for cash interested in good receiver or Gonsat G66 and G77 VE2OU, P.O. Box 355 Riviere du Loup, Que. P., Canada.

FOR Sale: James Millen oscilloscope, 2 1/2" tube, \$25; RCA oscilloscope 3" tube, \$25; National SW 54 rcvr, \$25; Navy frequency meter with power supply, \$50. Write for information. W. A. Kuehl, 6647 Kenton, Lincolnwood, Ill.

WANTED: Am buying damaged, in need of repair and not in working order, all types of transmitters, receivers and testing equipment including improperly or partially wired kits. Stan, W8OKL, 2748 Meigs St., Detroit 12, Mich.

WANTED: Power supply, Vibrapack for TB-4 Navy portable transceiver. W3JLD 1602 S. 2nd St., Philadelphia 48, Penna.

THUNDERBOLT factory-wired by Johnson. In beautiful condition. 2 Kw PEP. Also power attenuator. Have bought Collins S line. Must sell. Make an offer. W2HQH, Leslie Rosenkrans, 644 Wildwood Rd., West Hempstead, N. Y. Tel. 1Vanhoe 1-1875.

SELL: Viking Ranger, not a scratch, \$180; BC-1004 Super-Pro, 0.54 to 20 Mc, with pwr supply, spkr and slicer, \$120; Thordarson choke 5-16 750 Ma., 10 Kv insulation, \$22; Kilowatt modulation transformer, \$15; rebuilt commercial grade 1/2 HP 110/220 repulsion-induction motor, \$20; 35 mm condenser enlarger, \$15. W2YCE, 612 Beacon Street, Moorestown, N. J.

FOR Sale: 40-20 meter station, c.w. fone, 160 watt, \$140. For details write WA2FML, 1205 Spring, Syracuse 8, N. Y.

FOR Sale: HQ-110 without clock, like-new condition, \$175. J. Logue, 52 Boardman Rd., Poughkeepsie, N. Y.

SELL: RME 4300, in exc. condx., \$149. Detroit area. L. W. Hobbs, Jr., K8BQD, 27665 East California, Lathrup Village, Mich.

TRADE: Johnson K.W. Thunderbolt final for 6 or 2 meter gear of equivalent value. Chas. Rice, 4183 W. Four Lakes Dr., Linden, Mich.

COMPLETE Station: HQ 110 with speaker; Scout 65B; Dow relay, xtals, Heath OF-1 Q mult.; AC-1 ant. coupler; Eico multimeter, #326; much more; \$285 takes it. WV2FWN, 165 N. 8th Ave., Highland Park, N. J.

FOR Sale: Adventurer, Heath VFO, new F/W UM-1 modulator, all 3, \$75.00. Harriarthall 6 m. xmtr with A.C. p/s, \$60; SX-99, new in July, \$120. All items, one deal, \$200. Also several general electronic items on request. Will ship. U pay express. K4JXC, 121 Maple, Oak Ridge, Tenn.

FOR Sale: DX-100, SX-99 and matching speaker, mike, Dow-Key TR, Dennis Hughes, Conrad, Iowa.

FOR Sale: KWM-1 AC/DC power supplies, mobile mount noise blander Triband heli-whip, all manuals, F.o.b. Ridge-wood, N. J. \$1050. D. H. McIntyre, W2KYH, 17 Randolph Place.

SELL: Two 6 mtr. 5 element beams, 25 ft. of masts, TR-4 rotor, 50 ft. RG-8U coax and cables. Call K2SHQ, AX 7-8121.

75A-4, No. 4222, perfect, \$575; 20A with 458 VFO, \$175. D. Andrews, 928 Sixth Ave. North, Fort Dodge, Iowa.

HARVEY-WELLS 205TS sweep generator, \$18; B&W audio frequency meter, \$40; 40 meter ARC-5 rcvr and power supply, \$9; G. V. 023 resistance decade, \$15; G. R. 200B Variac, \$5; E-V 3100 T.V. distribution amplifier, 4 outlets, \$8; Thordarson 500 watt transformer, 2400 V CT, 1800V, CT, \$8; Model 26 RTTY and table, \$65; 30 watt 400 Mc. TV transmitter, \$8, standard coil T.V. tuner, \$5.00; new 700 watt 110V AC and 12V DC gas generator, \$130; Hickok 532 mutual condenser, \$50. John Christy, 14553 Dickens St., Sherman Oaks, Calif.

32S1, #1524, \$540; 516F-2, \$95; 75S1, #1857, \$455; 312B3 speaker, \$20; all for \$1100; under 50 hours use. Unused Mosley 10-40 vertical included with total sale if picked up. W8DEA.

CLEANING out shack! Will sell individually or altogether or trade for used factory wired ham gear. Jackson VTVM Model 709 w/ probes/RCA tail calib. marker generator model WR-89A/Eico 7" scope, factory wired, model 470/Pentron tape deck and preamplifier in carrying case; model PMD/Hickok Mod. 533DM tube checker/Triplett 7" meter AC-MA, 0 to 100 Ma. R.A. scope, Mod. W088A/more equipment to numerous to mention. Send card or letter pronto. W3HNK, 26 W. Ashland Ave., Glenolden, Penna.

APACHE transmitter, \$275; SX-101 Mark III, \$295; Pan-adpater built for SX-101, \$125. W2TWK, 34 Eagle Lane, Farmingdale, N. Y.

WANTED: One pair two meter walkie-talkies. Write: WV6HXM, 1201 Tower Grove Drive, Beverly Hills, Calif. 75A4 No. 5368, \$650. WA1EN.

FOR Sale: Viking II and VFO in gud condx. Best offer over \$200. W6FJM, 5847 Livingstone, Toledo 13, Ohio.

SELL: S-85 vy gud condx, \$85. 1406 S. Drive, Mt. Pleasant, Mich.

LOOK! Selling complete station, all or nothing: Everything in top operating condition, \$1000. B&W 5100B (used 20 hrs); SX-101, matching spkr; DX-100, no modifications; HT-20; Johnson Matchbox; Jone MicroMatch and indicator; 7 Mc Com and vtvm modulator, rcvr (never used); two 4-400A six 813 tubes (new); Monitoradio rcvr, 152-164 Mc (used 10 hours); 72" enclosed cabinet rack, Vibropack; Powercon 6V battery elim; B&W low pass filters; T-R switch; Heathkit Q-multip. Dynamotor; Master Mobile ant., all-band loading coil and other items. Try and find a better deal. No time to operate. Ed Savage, K6VAR/2, 147 Ridgedest Rd., Ithaca, N. Y.

SELL: Two Heathkit Citizens Band transceivers, one VP-112 vibrator power supply, and Hy-Gain 14AV vertical antenna. One transceiver built and the rest still in kit form. Price: \$100.00. Equipment has never been used. Fred Salzman, 293 Monmouth Ave., New Milford, New Jersey.

WANTED: Old radio gear built by Grebe, complete units, cabinets, parts. Literature. W8JDV, 500 Church St., Mason, Ohio.

DYNAMOTORS, \$5 00. Box 22, Tucker, Georgia.

WANTED: Illuminated 'S' meter for HRO. Also National 1-10, any condition. Have HRO coils for disposal. VE7SV, 2412 Beacon Ave., Sidney, B. C., Canada.

FOR Sale: Collins 310 B-1 in gud condx, factory TVI suppression and retal modulator, rcvr (never used), two 4-400A efficiency. Satisfaction guaranteed or money refunded. Price: \$150. F.o.b. Durham, N. C. W4MDQ.

QST complete to date. Vols. 1-13 bound with leather backs and gold lettering, \$200. F. M. Ham, 47 Churston St., Bridgeport 5, Conn.

HAM Tickets, plastic laminated with red, green, black, white, or clear border and back. Or cut pocketbook size. State color, size, Bonus ID card or picture up to 3" x 4 1/2", total \$1.00 postpaid, four picture laminated on license, 24 hour service. Mail to Plastic Arts, 389 Caus, Imperial Beach, Calif.

FOR Sale: Globe Champ, plus a 1955 21-inch TV set. Price \$365. Both are in exc. condx. K2UBF, Charles P. MacKay, 316 Liberty St., Penn Yan, N. Y.

FOR Sale: SX-101 Mark III, in perf. condx, not a scratch! \$295. WA6IXD, 2061 Redberry Rd., Santa Ana, Calif. LI 4-0328.

FOR Sale: Collins 12 volt transistor pwr supply 516E-1 and mobile mount 351D-1 for KWM1, \$225; B&W 515B, new condx, \$165; Johnson kilowatt with desk brand new, \$1295; Central Electronics sideband slicer, Model B, \$65; APR-4 rcvr with 5000 coils, \$100; Gonsat G66, \$149; Marx rcvr and xmtr, portable-mobile complete \$475; Mobile Mount whip and 10 to 80 meter coil, \$19; Precise oscilloscope, #300, \$75.00; KWM1, #709, \$595; A.C. Supply, \$85; Eldico TFPI, \$55; Simpson Model 479 signal and sweep generator, \$195. 1500 Gogel, 1096 Laux Pl. No. Bellemore, L. I., N. Y. Tel. SUms 1-0568.

75A4 with 2 Kc, 3 Kc and 6 Kc mech. filters. No time to operate; 263 hours actual use in 2 years—equivalent to 11 days full time operation. Absolutely perfect; original carton, \$550. F.o.b. Robert Lewin, 28 Fenimore, Harrison, N. Y.

FOR Sale: One pair of Raytheon 2 meter 20-watt FM xmtr/rcvr for fixed or mobile. Complete with tubes, xtals, power supplies, cables, mike, etc. \$28.00. 1958 model automatic tube tester panel with charts, etc. \$16.00. Six meter Gonsat converter, \$9.00. V.I. ship. Henry Werner, 7831 Nor 53 Street, Milwaukee, Wisconsin.

VIKING II VFO, factory-wired, perfect condx, \$175. Interested in 40 ft. or longer tower trade or buy. H. Pully, Box 284, Elmira, N. Y.

WANT Early spark and crystal gear for personal collection. W4AA, Wayne Nelson, Concord, N. C.

GSB-100 SSB transmitter, Model 3233, new, \$439. Cash only. N. Roesch, K9CPW, 5037 Olympia, Chicago 31, Ill.

KITS W/rod tested. All brands, ham or test gear. Guaranteed. Fifty per cent kit price, plus postage. Write K9TCC, Hollis Hervey, Keosauqua, Iowa.

SX-99, matching speaker, perfect, \$120. Viking Adventurer, never used, \$40. No trades. K6PXJ, 26667 Silver Spring Dr., Rolling Hills, Calif.

JOHNSON Pacemaker, like new, \$285. Major H. Zirriacks, W5RJR, Post Signal, Ft. Sam Houston, Texas.

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 information or membership application, sample "Sidebander", to SBARA, 12 Elm St., Lynbrook, N. Y.

SELL: Hallicrafters S-77A in gud condx, \$50; Chief 90A in exc. condx, \$40. Will ship. K3HRO, RFD 4, Box 272, Elkridge, Maryland.

H-O Train set, valued at \$80.00, in like-new condx. Will trade for SX-71 in fair condition or any other gud rcvr. Bruce Simmons, 30 Balsam Crescent, New Hartford, N. Y.

SELL: Professionally wired DX-100 with coax relay, low-pass filter. Excellent condx, \$200. Like new GPR-90 rcvr spkr, \$195. Two element 1.5M Telrex Beam, \$50. Prefer local delivery. WIDHO, 9 Fairfield Ave., Darien, Conn. VALIANT, factory-wired, latest revised circuit and serial number, brand new in factory carton with warranty card. Perfect condx. 275 watts. Beautiful crisp CW timed-sequence keying, SSB, and penetrating AM with built-in audio clipping, \$379.50. Johnson Matchbox 275 watt, brand new, in factory carton with warranty card, perfect condition, \$39.50. C. Bronner, P.O. Box 261, Morton, Ill.

HIGHLY Effective review for FCC commercial phone exams. Free literature. Wallace Cook, Box 1063K, Jackson 9, Miss. CANADIANS! Two meter converter for sale: \$21.00. Ralph Diehlman, VE3BPB, Lambeth, Ont., P. Canada.

FOR Sale or Trade: Globe Chief 90 with Heising modulation, \$40; WRL Model 755 VFO, \$25; G-6 mobile rcvr with 115 and 12 volt pwr supply ex spkr, \$100; Elmac A-54 xmttr converted to all bands, \$60; PE-103 dynamotor, \$15; HRO60 rcvr with A, B, C, D. AC coils ex xtal calibrator, perf. condx, \$375. Will trade up or down. K5PMC, Box 336, McGehee, Ark.

SELL 250 watt fone/tele. commercial rig/REL PR-814 finals PR-8K \$210.00. Also, B.O.B. offer \$100. F. New Britain, Conn. takes it. Write: WIMHU, John J. Jankowski, 336 Elm St., New Britain, Conn.

275 WATT Johnson Matchbox with directional coupler and built-in indicator, never used. \$65. W4LAN, Cunningham, 19 Twelfth St., Columbus, Ga.

COLLINS 32V2 transmitter, in excellent condition, \$250. K6YNB, 1511 Ruhland, Manhattan Beach, Calif.

FOR sale: Meissner Signal Shifter, AM modulator, 2 power supplies, final, parts. Willard E. Cross, W2UNU, Mexico, N. Y.

FLORIDA Hams: Like new Collins 30K1 transmitter complete. W1ATP/4, Ted Valpey, 4353 Riverside Drive, Wilbur Daytona Beach.

SELL: SP-600 Recvr, \$250.00; Gonset G66 Recvr, 12-110 v supply, \$150.00; Elmac 54, \$50.00; Parts for BC-610. H. Hodson, 340 Dwyer Rd., Lexington, Ky. W4NCQ, New Britain, Conn. TRI-EX deluxe tower HZ334, self-supporting with tripod base, no guys required, 54 ft. high, cranks down to 20 ft. X-Sway bracing throughout, withstands heaviest winds, beams and rotor loads complete with 35 to 1, gear box and crank, only 6 months old, \$355; Gonset Triband beam mod. 3220B for 10-15-20 meters, used 3 months, \$95; Workshop heavy-duty rotor and control compass with 100 ft. of cable, \$75. Jack Rose, 349 N. Bowling Green, Los Angeles 49, Calif.

SELL: Quad ant. bracket assembly, Aug., '59 issue; Filament transformer Stancor S-62, 10VCT-10A; Merit P2944, 6.3VCT-1A; Push-Pull Amplifier Model A-131 for receiver or TV; Mike, Astatic, Model 10-C; Tubes: 2-813, 2-866ir; CW Transmitter, 75 watt; Hi-Voltage PS 1500V-200MA, A. J. Basarowski, W8JAL, 800 Charlotte N.W., Grand Rapids 4, Mich.

HAM Magazines: Write W6KJL (Tatum), 1451 Raymond Avenue, Glendale, Calif.

NATIONAL NC-109, Like New, Orig. carton, Best offer takes it. R. E. Moser, 66 Vreeland Ave., Hackensack, N. J.

WANTED: Good used heavy duty antenna rotor. State condition and best price in first air mail offer. Edgar Cole American Schools, Sukirani, APO 331, San Francisco, Calif.

SELL: Knight 10w. Hi-Fi Amplifier-Preamp.: \$15.00; Garrard Mod. 17 3-Speed turntable. New Diamond Stylus, G.E.-V.R. Cartridge; \$26.50; Heath Grid Dipper: \$15.00; Heath VTVM, like new; \$20.00; Heath R.F. Signal Generator: \$14.00; Heath Portable tube checker: \$25.00; E.M.C. Mod. 103 multimeter, leads: \$13.00; New Telecraft 6-Meter converter kit: \$24.00. Frank Sibley, 163 Buckingham St., Hartford, Conn.

HY-GAIN 8 el. 6 mtr. beam, \$17.00; Heath VTVM V7-a, \$17.00; Heath "Seneca" kit, never uncrated, \$145.00; RAO-5, in good working order, \$25.00. K6SRM, 402 4th St. East, Sonoma, California.

TECRAFT 2M Transmitter, Converter and TR switch, 2 months old in attractive cabinet with meter and power supply: \$89.00 LaBella, Gastonbury, Conn., ME-3-9243.

75A-4 with two filters; KWSV-1 with power supplies on three enclosed chassis; asking reasonable offer. WIGR, 77 Fairfield Road, Cranston, R. I.

75A-4 Late serial 5031 with speaker \$520.00; 20 meter 3 El. Telrex with rotor, coax; \$120.00; Meissner Signal Shifter: \$20.00; Deluxe Bug: \$15.00. Smitty, K4DXI, Box 724, Greensboro, N. C.

HALLICRAFTERS S-107, new, \$70.00, Heathkit VFO: \$15.00. W. H. Henry, 6844 Hickory Lane, Chattanooga, Tenn.

KH6J will be one of the many speakers at the W.N.Y. Hamfest, Rochester, May 14.

NC-98 with Heath Q-mult: \$93.00, without \$87.00; Globe Scout, 65B with operating but uncalibrated VFI: \$63.00. Sold separately, cash. College expenses must be met. K2OUA, 60 Edward St., Cohoes, N. Y.

CLEANING House; receivers, manuals, tubes, parts, etc., New list for stamp. M. Marshall, 455 Washington Ave., Dumont, N. J.

APACHE TX-1 Transmitter: \$200.00; HQ-160: \$300.00, slightly used. FOB W0MLK, 306 North Cascade, Colorado Springs, Colorado.

CANADIANS—Sacrifice 75 watt 20 meter CW xmttr, w/ps, TVI proof, clean signal, steal, only \$50.00. Ernie Crump, 64 Barrie, Galt, Ontario.

FOR Sale: 32V2 with spare final tube: \$350.00. O. Dye, W0CQF, 1011 Boland, St. Louis 17, Mo.

FOR Sale: Globe Linear LA-1, Excellent condition, factory wired, used little: \$100.00 plus shipping. K2ODN, 2 White Horse Pike, Haddon Heights, N. J.

SELL: Communicator 11, 12V with beam and mike, \$150. Chipman, W4PRM, 816 Melrose Street, Winston-Salem, N. C.

ATTENTION: CD groups and Hams! Are you tired of fighting QRM and TVI and static on the low frequency bands? Switch to the new FM band, used higher quality commercial gear, now available at low prices. Write Skyline Electronics, 6022 N. Rogers Ave., Chicago, Ill. for info.

RECONDITIONED Equipment: World Radio Laboratories—terms—trials!! New Guarantee—high frequency—Aerotron 500 \$159.00; Black Widow 2M \$159.00; Transcon 6 \$69.50; Eldico MT-2 \$119.95; Gonset 3024 \$39.00; Gonset 6M Linear \$109.00; Communicators inquire; Gonset 32V2 VFO \$54.95; SR-34AC \$295.00; 6N2 \$129.00; JOHNSON 2M VFO \$19.95; L&W 6M #50 \$39.50; Sonar MB-26 \$39.50; Tapetone XC50 \$44.50; Teacraft CC-50, \$24.50; regular ham specials—5100B \$379.00; 515B-B \$175.00; 20A \$189.00; 600L \$349.00; 32V-3 \$485.00; Elenco 77 \$369.00; SX-96 \$189.00; SX-101 \$319.00; DX-20 \$347.00; OF-47 \$7.95; Viking II \$219.00; Pacemaker \$385.00; NC-98 \$114.00; NC-183B \$309.00; NC-300 \$269.00. Leo W0GFO, Box 811, Council Bluffs, Iowa.

FOR Sale: Eldico SSB-100 good condition, \$325; Collins 32V2, in exc. condx, \$325; 75 M. mobile transmitter, complete, 300 watts input, 12V DC power supply, built to commercial standards, \$145. Richard Wilde, K6OHI, 3671 23rd St., San Francisco, Calif.

MINIFON P55 pocket recorder, case, microphone, table amplifier, battery eliminator, 160 minutes recording wire, shoulder holster, stethophones. Excellent. Costs \$482 new. Best cash offer. K2QDQ, Box 43, Bronx, N. Y.

ALL Johnson factory wired. Viking II, VFO, Matchbox, LP filter, SWR bridge. Also spare 6146. First \$200 takes all. Ed Slaga, K9BZTX, Box 361, Spring Green, Wisconsin.

SELL Collins 75A-3 w/speaker, xtal calibrator, plug-in product detector and vernier knob. Excellent working condx, like-new appearance: \$385. oseph Skutnik, Box 57, Pine Island, N. Y. Tel ALpine 8-2383.

GLOBE CHIEF \$50 F.o.b. K4MFI. 4217 N. Manhattan, Tampa, Florida.

CANADIANS! Telrex Monarch Tribander beam with modification kit and balun, \$200.00; Heathkit Seneca VHF xmttr, wired and tested, used only once, \$175.00; Gonset 2 meter Communicator III with microphone and 6 xtals, \$200.00; Hallicrafters SX-100 recvr, Mark 2, \$275.00. Martin Rosenthal, V6EMR, P.O. Box 508, Station "F", Toronto 5, Ontario, Canada.

SELL: Johnson 6N2 xmttr, \$90; National NC-300C6A Mc. converter, \$25; Centimeg 32C Mc converter, never used. Will ship. Larry Kohlman, K2BVC, 30 Beechmont Dr., New Rochelle, N. Y. Tel. NE 6-4358.

COLLINS 75A4; \$485; 75A2, \$295; 75S1, new, in sealed carton, \$470; 3 kc plug-in mechanical filter, for 75A1, \$50; HQ100, perfect, \$120. W0BNE, Box 105, Kearney, Nebraska.

GSB-100, SSB transmitter, Model 3233, new, in perf. condx. Cash: \$450. K9CJN, 5037 Olympia, Chicago \$31, Ill.

VIKING Ranger #165; HQ-140X and spkr, \$180, both for \$325, in new condx. Will ship in original cartons. Jesse Brown, 2848 Riverview Rd., Macon, Ga.

SELL: FTR 30 watt putout base station 152-162 Mcs., also 6 volt mobile unit with control cables and head, both with 148 Mc xtal and aligned on 2 mtrs, \$100. Pick up only. Also 250TH in sealed carton. ARC5 1.5 3 Mc rcvr, new, \$5. Harold Crystal, K2BYB, 14 Cody St., Fords, N. J.

SACRIFICE: Good, unmodified Harvey-Wells TBS-50D transmitter and excellent APS-50 power supply, both for \$55.00. F.o.b. Hampton, N. H. W1LFO, 322 Winnacunnet Rd.

COMPLETE Ham station: \$140.00; NC-188, DX-40 plus VFO carefully calibrated. Perfect in appearance and performance. Prefer local sale. Will be willing to ship. Bob Gibbons, W1REP, 15 Everett St., Canton, Mass.

RCVR: NC-98 w/matching spkr, Central Electronics Multiphase Q multiplier. All in excellent condx. \$125 and shipping costs. Tom Jones, K6LBZ, 629 Tenth St., West Des Moines, Iowa.

HEATH DX-40 and VF-1 both in good condition, \$75. K2PGA, 153 Cambridge Ave., Englewood, N.J. Tel. LO 8-7287.

SELL RME-152A, excellent, \$45. K0EAK.

CASH Or trade: 75A2A, 3.1 and 800 cycle filters, homebuilt companion SSB mechanical filter exciter, works as transceiver, 80, 40, 20, 15, homebrew KW linear amplifier with 3 KC pwr supply—3 element Tribander beam, W2EWL exciter with AC power supply. Will swap for boat motor and trailer or \$650 cash. Or Levin, Island Electronics, 1706 Tremont, Galveston, Texas.

FOR Sale: Globe Champion 300A, \$349.50; Globe Hi-Bander, \$17.50; Globe Scout, 680A, \$87.50; Gonset Super Six, \$25.00; Gonset G-77, \$185.00; SX-101, \$250.00; HQ-110C, \$209.95; SX-28, \$87.50; Heathkit DX-100, \$169.50; Elmac PMR-6A with 6v. pwr., \$94.50; Lyvco VFO c.w. xmttr, \$49.95; HRO-50T1, \$310.00; NC-300, \$225.00; C.E. 20A with 458 VFO, \$249.50; P.H. LA400, Linear, \$145.00; Viking Adventurer, \$45.00; Heathkit DX-20, \$26.50; NC-4350 w/6 spkr, \$195; Morrow Conelrad Monitor, \$29.00; Elmac AF-67 (new), \$159.50; Elmac PS-2V, A.C. power sup, \$35.00; NC-173, \$125.00; B&W SSB rec. adapt. (new), \$87.50; Viking mobile xmttr, \$65; Viking Challenger \$115.95. Write Art Brown, W9HIZ, Brown Electronics, Inc., 1032 Broadway, Ft. Wayne, Ind.

HT32, In excellent condx. \$475. R. Yeager, 1455 Wilson, Chicago 40, Ill.

CINCINNATI Area: Sale: Globe Chief 90 transmitter, \$30. K8CET. 3950 North Fordham, Silverton.

FOR Sale: KWM1 516F1 AC supply, 312B2 spkr console enclosing directional watt meter, \$800; 351D-1 mobile rack and 516E1 DC power supply, \$300.00. Cecil J. Melville, 1110 Dismuke, Houston, Texas.

CRYSTALS Airmailed: SSB, MARS, Commercial, Net, etc. FT-243 101%, any kilocycle 3500 to 8600 \$1.49 (10 for more 99¢), all novice 99¢, 1705 to 30,000 \$1.95. All frequencies 604 available for HC-6/U hermetic holders. Builders crystal packages: November QST "Phasing Sideband" \$9.95. November CO "Crystal Synthesizer", 31 crystals \$39.95. June 1958 QST "SSB Package" five mixer crystals, FT-243 \$9.95, hermetics \$12.95, matched filter \$6.90. If you don't see it be specific, write. Airmailing 9¢ per crystal. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

WANTED: All types receivers, transmitters, test equipment, telephone in trade for NEW Johnson, Hallicrafters, Hammarlund, National, Etc. Collins 51J-2, \$495, 51J-3 \$595, 75A-1 \$239, 75A-4 \$595. Hallicrafters SX-101 \$225, SX-101 Mk111A \$295, SX-99 \$109, SX-71 \$169. National NC-60 \$45, NC-188 \$109, NC-109 \$139. Eldico SSB 100F \$495. Teletype converters, printers etc. Write, Alltronics-Howard Co., Box 19, Boston 1, Mass. (Richmond 2-0048) Store: 60 Spring, Newport, R. I.

COLLINS 75A-4 serial 5673 used one month, \$625; also serial 2352, excellent, \$525. W8WGA, 3451 Ridge Ave., Dayton 14, Ohio.

SELL: NC-120 Navy receiver, built 1944. General coverage 55-120 Mc. 11 tubes, xtal filter, a.n.l. BFO, recently aligned \$95. bid. Rev. Phillip Essex, 278 W. Rittenhouse St., Philadelphia 34.

KWS-1, Serial 246. All factory modifications, Spare 4X250B. Will send through factory for complete check. Take receiver out airplane in trade or \$1250 cash. KØDUI, 2990, 15th Ave., Marion, Iowa, Jim Newton.

TWO Portable typewriter cases fitted for KWM-1 and AC power supply. Both for \$25.00, including small speaker. Herb Hollister, 709 Baseline, Boulder, Colo.

SACRIFICE Collins 75A4 nearly new, serial 5025 with speaker, 3.1 Kc and 500 CPS mechanical filters, \$675. Also HT-32 in perfect cond., \$525. Factory manuals and cartons with above, W. A. Sandusky, K4UWJ, 223B West Point Ave., Colleege Park, Georgia.

COLLINS 51J3 factory-checked excellent, \$595.00; 32V1 in top condition, \$265, also Deluxe Vibropex key, McElroy new ink tape recorder, Claude Sweger, WØBTX, 307 Norris Ave., McCook, Nebr.

NC303 w/matching spkr, used 6 mos., \$325; Gonset II 6M 12V-115V 4Xtal pos, w/new Saturn 6M halo, \$165; Gonset II 2 M 12V-115V 4Xtal pos, \$150; Tecraft factory-wired 20.35 Mc. 2M and 6M converters w/P1 pwr supply for NC303 "X" bands, \$80 all; Drake 1000 LP filter, \$10; Heathkit SWR bridge, new, \$15; BC312 w/AC power supply, \$55. Assorted mikes. Frank, W2AFMC, Rte. 111, Smithtown, N. Y. Tel. ANdrew 5-2358 after 6 PM.

FOR Sale: Heath Cheyenne MT-1, used only four months, in exc. condition, \$95. Or swap for Johnson Challenger in excellent cond. Please send photo. Walter Burkhard K3ESU, 92 West Main St., North East, Penna.

MOBILE rig complete AF 67 xmttr, PMR7 Rec, M-1070 AC-DC power supply, MA-3 Trapmobile antenna, racks, relays, all fittings for fixed or mobile operation. In excellent cond. W4GMN, Lebanon, Va., \$285.00.

W4OB for sale, in gud cond. Make an offer. No shipping, sry. W1FDN, 29 John Carver Rd., Reading, Mass.

COMPLETE Station: Subrac transmitter, all bands, 120 watts phone-c-w, \$110.00; Heath Model 9, 99¢; VFO \$25; Hallicrafters receiver \$40A, \$60; Hallicrafters receiver SX71, \$130. WJISK, Ed Wattman, 125 Eleventh St., Providence, R. I. Tel. JA 1-9780.

WANTED: Freq. meter surplus No. TS-174 or TS-323. For sale: Sig. Gen. Precision No. E-200-C, 88 Kc. 120 Mc. \$40.00, Robert Ireland, Pleasant Valley, N. Y.

NEV Surgical hemostats, six inch with 1 7/16 in. self-locking jaws. Finest surgical steel, rust proof, precision instrument. A virtual necessity for transistor work; locking feature gives only safe, rapid, precision, heat-conducting tool while leaving hands free for soldering, etc. Makes wiring of all types rapid, accurate and precise. By contrast, long-nose pliers begin to feel like stone-age tool. Only thirty available; one per customer. Price \$4.50, prepaid. Cash with order. Dr. C. H. Scheiffley, Mayo Clinic, Rochester, Minn.

H-W Z Match, \$69; Matchbox, \$45; TDQ 100 watt 2 meter xmttr, \$99; FR-4 freq. meter 100 Kc, 20 Mc, \$650; H-P audio oscillator, 201B, \$125; G-R #1107A interpolation oscillator, \$550; 600 ohm input line-to-grid transformers, \$1.00; 12000 ohm dpdt relays, \$2; W-E teletype bandpass filters, \$14; FRA converter \$35; NR #107 dual diversity converter, \$195; UR-A, \$75; UR-A sub assemblies for two converters and comparator, \$250. Tom Howard, 46 Mt. Vernon St., Boston 8, Mass. (Tel. Richmond 2-0916.)

75A3 with speaker and vernier knob, \$650; 32V3 with low pass filter, \$495; mint condition. Need cash. First \$1000 takes both. E. A. Winter, Oak Grove Trailer Park, New Brighton 12, Minn.

FREE 1960 Surplus Flyer, Command sets, handie-talkies, receivers, transmitters, test sets, tech manuals, code machines, receivers, transmitters, transformers, capacitors, receiving and transmitting tubes, meters. VHF-UHF sets, plugs, parts. Write today to Bill Slep Company, Drawer 178, Ellenon, Fla.

SELL: PMR-7, \$90; Heath VFO, \$12.00; Millen R9ER (10 M coil), \$10; Mallory Vibrapack 6V input 300V at 100 Ma output, \$6.00; BC455; \$5.00; 50 Kc xtal osc., \$10.00. R. Frank, WSAWN, 12280 Wilfred, Detroit, Mich.

LIMITED Supply 30 ft. cedar poles, 5" top, \$12.00 each F.o.b. Suring, Wisc. Charles R. Pendi, W9IHN, Box 73.

NC101X, late model with S meter, modernized RF, excellent HRO type bandspread, spkr, \$75; AF67 w/manual, \$120; TRITV RF section, \$100 Art Ford, W2HAE, 85 Franklin St., Northport, L. I., N. Y. Tel. AN 1-8474.

SELL: Eldico 100F, excellent, \$500.00. W4CPQ, 1351 Bolling, Norfolk, Va.

WANTED: Trades new and used. New KWS: 1, \$1250.00; KWM-2, \$1095.00; KWM-1, \$950.00; 75S, \$495.00; 75A-2, \$374.00; 75A-4 \$29.00; 32V-2, \$350.00; 32V-3, \$395.00; 100 Mc, \$129.00; HQ-129, \$149.00; HQ-145, \$269.00; HQ-160, \$379.00; HQ-170, \$359.00; Johnson Ranger, \$229.00; Johnson Mobile, \$75.00; Thunderbolt, \$589.50; Valiant, \$439.50; Johnson Citizens Messenger \$139.75; Courier, \$289.50; SX-71 \$149.00; SX-101 Mark II \$395.00; Viking II, \$199.00; SX-100, \$295.00; EX-100 \$199.00; SX-102A, \$478.00; SX-11, \$159.95; NC-98, \$99.00; NC-183D-\$309.00; NC-125, \$125.00; NC-173, \$129.50; NC-57, \$59.00; Globe CB-100-Citizens Band \$129.95; Globe King 500A, \$425.00; 90 Chief, \$39.00; 90A, \$49.95; 680, \$79.95; DSBI100, \$103.95; VFO-755, \$59.95; NC-300, \$279.00; CE Slicer, \$37.50; 100V-\$695.00; Heath DX-35, \$55.00; DX-40, \$65.00; SP Super Pro, \$199.50. Ken-Eis Radio Supply Co., 428 Central Ave., Ft. Dodge, Iowa.

SELLING Collins KWS-1 first check for \$1,095. Completely factory reconditioned last year with newest ceramic 250A's. Only on air few hours since and like new condition. Sent F.o.b. or express collect from Southbridge, W1ZD, J. M. Wells, owner.

SELL: HQ129X, in gud condx, \$115.00. QSTs 1927 to 1940. KW components. Send for list. W1CSC, H. Ballard, 151 Nott St., Wethersfield 9, Conn.

NC300, with crystal calibrator; perfect condx; prefer local sale either from Fitchburg, Mass. or address below. Will talk turkey any offer over \$200. J. Lindholm, P.O. Box 1, West Hartford, Conn. ADAMS 2-5532.

SX99, \$200. Glove Scout 65, factory-wired, \$50. Both excellent. W9ZFW, Fred Steimle, 1309 Locust, Pontiac, Ill.

WANTED: T-17 ARC-5 transmitter, 1300-2100 Kc, state condx. WØEY, Vir N. James, 1316 South Kearney, Denver 22, Colo.

COMPLETE Mobile fone station for \$100. Five bands, 10 through 80. Transmitter, Johnson Viking mobile, 65 watts, like new. Converter, Gonset Super Six, adapted for 12 volts, including B supply. Bygone Model 14-33 Triban, 400 watts 150 ma. output. W2HTD, 86 Brook Rd., Red Bank, N. J.

90 Watts for \$40. Globe Chief 90A, in gud wkg condx on all bands. K9PQG, 225 Lorraine, Glen Ellyn, Ill.

COMMUNICATOR III with 505C Ranger mike, \$220; factory wired CE gated compression amplifier, \$40; factory wired Eico #468 scope, \$80; factory wired CE MM1 RF analyzer, \$80; all are in exc. cond. Mostw 14-33 Triban, 400 watts, never used, \$70. Cannot ship. K5AOV, 125 Bassford, La Grange, Ill.

SELL: Viking II, matching VFO and Matchbox, \$200; SX99 rcvr \$85; Kuehne 40 ft. self-supporting tower, CDR rotator, less base mount, \$85; \$350 takes all; all in excellent working condx. J. P. Molis, Jr., W9FJH, Box 162, Naperville, Ill. Phone 3234.

WANTED: 75A2 or HRO-60, also TA-33JR. Must be in top condition and cheap for cash. VEAMF, Binscarth, Man. P., Canada.

VIKING Challenger transmitter, \$125 HQ-140X receiver with Heath Q-multiplier, Eico grid dip meter, \$40. All equipment in exc. condx. F.o.b. Ponca City, Okla. K5VYY, 434 So. Osage, Ponca City, Okla.

SWAP: Used 1951 Cadillac Hydramatic transmission and flywheel for mobile gear or what have you? Norman Posepanko, K9HSC/6, 7626 El Cajon Blvd., La Mesa, Calif.

SELL: HQ160 perfect, mint condx, with spkr, \$300. In original cartons. W2PLB, 314 East 52nd St., Brooklyn, N. Y.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Authorized factory service station for Collins, Hallicrafters, Hammarlund, National, Harvey-Wells. Over twenty-four year Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

SELL Neatly wired, carefully adjusted Apache and SB-10. Manuals. Kit price. Write for schedule and hear this rig operate. Want unit S-1 or 325-1. K5OMR, 94 S. Alameda, Corpus Christi, Texas.

SELL: Hallicrafters SX-71 rcvr with speaker, manual and some spare tubes. Like new condx. \$150. Heath AR-3 rcvr with cabinet, manual and Q-multiplier, in exc. condx. \$35 K9UHH, 8715 Guilford Ave., Indianapolis, Ind. Tel. VI 6-5275.

SALE: Collins 32V-2 de-TV1d, in excellent condx. With extra 4D32 thrown in. \$300. F. E. Finck, WØQCB, 2909 Beaver Ave., S.E., Cedar Rapids, Iowa.

SELL: NC-125/spkr, \$120; SX-99/spkr, \$115; Globe Scout 680, \$75; HG-80-10 vertical, \$50; SSR-5A, \$25. Ray, K9ARU, 1607 Glenwood, Joliet, Ill.

TRADE complete rig for late model used car (1954 to 1957 year) Gonset G66B rcvr with power supply and speaker, A667 Eimo xmttr, Eimo 12V pwr supply, 600D HZ mike, Bassett all-band coil, antenna & mount, cables, mounting brackets, manuals. The works—all in like new condx. M. A. Booth, P.O. Box 441, Grand Haven, Mich.

TRADE: DX-35, xtals for rifle or pistol. W5UZI, 1351 Sage Loop, Los Alamos, New Mexico.

HAMMARLUND HQ-129X, in exc. condx. Complete with QF-1 Q-multiplier and integral 100 Kc calibrator. All for \$130. Will deliver within 50 miles. Hal Scott, 134 Elliot Pl., New York 52, N. Y. Call CY 3-0292.

HEAVY DUTY 2500 Volt 40 Ma. supply, 115/230 input, quality components, \$135; Transcon H600 600 volt 120 Ma. transistorized supply, factory-wired, orig. carton, \$50; Tecraft 2-meter converter 10-14 Mc. output, \$25.00; Multi-Match modulation transformers Thoradson 21M64 300W., \$25.00; UTC S-19 30W \$7.00; Turner U-9S microphone and desk stand, \$15; Bell CM-1 microphone, \$5.00; National NPW-O dial, \$10; unused Reycor multiband antenna coils, \$10; 304TH, \$18, \$13, \$8; A4903, \$12; vart; RME435OA. M. J. Fein, 29 Wynmor Rd., Scarsdale, N. Y.

WANTED: Mobile KWM1, W90KM, Henry Kampe, 1207 Oneida St., Joliet, Ill.

WIRED Heath Comanche MR-1 receiver with A.C. pwr. supply. Has been factory aligned, checked, only \$170. Box 1234, Bristol, Conn.

FOR Sale or trade: 2500 DC 1.1 amp. supply, \$125; 2500 volt 1.1 amp. xfrmr, \$30; 500 watt modulator w/speech, \$75; freq. shift adaptor 455 Kc, \$100; above equipment new commercial. Eldico 500SSB, perfect drive, with 10A, \$280. J. Swift, 1381 Richmond Court, East Meadow, N. Y.

WANTED: L-1001-A amplifier. Sell: 32V2, \$375; 310B-3, \$160. VFO-matic, 80 thru 20, \$85. James Craigs, 172 W. Third, Peru, Ind.

KILOWATT amplifier, pair 810s, \$65; 2300 volt 1/2 amp., kilo-watt supply 866s, \$65; P.E. 103 dynamotor, \$30; Telrex 20 mtr. beam, \$95; National 125, like new condx, \$95; Gonset 3-30, \$20. WIGJF, G. A. Simonson, 35 Livingston Circle, Needham, Mass.

ATTENTION 32V3 owners! New factory-built front plate, also brand new case. Will make for new appearance of your rig. Installs in minutes. \$37.50 for both. Write for details. K5MTY, 6111 Saratoga Circle, Dallas, Texas.

CHIEF 90A, \$45; US-1 wid preamp, \$30; SX-28A, matching VFO, xtal cal, preamp, \$100; VF-1 wid pwr. supp, \$20; 12-AV vort. wid MTG kit, \$20; "G" stand, \$10. William J. Iseman, K3GHE, 2522 Brookdale Ave., Roslyn, Penna.

COLLINS 75A4. Guaranteed less than 20 hours' use. Ser. #5362, \$625.00. J. R. Jeans, 101 Green Tree Road, Clifton, N. J.

KEYBOARD Perforator and Boehme keying head wanted. W8RMH, 1910 Long Point, Pontiac, Mich.

SELL: SX99 w/O multip., \$120; Stancor ST-202A 125 watt xmtr w/push-pull 6146 modulator with separate pwr. supply, \$120; brand new SX99, in factory sealed carton. Never been turned on. \$135. Hy-Gain 6 meter 5-el. beam, \$10. Heath VFO w/pwr supp., \$25. All items shipped prepaid. K4RSH, Stony Point, N. C.

SELL: Globe Scout 680, perfect, \$75; Central Electronics O-multipier, w/cables, \$20. AnSCO Memar 35mm camera with case, Deal? Jerry Sutton, 1205 Gillespie Rd., Chattanooga 11, Tenn.

FOR Sale: HT32A transmitter, \$500 and SX-101 Mark III A receiver, \$285. Both new, in original cartons. Will ship. T. Jones, 55 Westbrook Rd., South Hadley, Mass.

SELL: DX-35, VF-1, in gud condx, \$60.00. Reason: Have Apache. R. Lons, W2HPR, DI 2-3185, Maywood, N. J. 38 Orchard Place.

WANTED. HRO5TA1, with A,B,C,D band-spread coils, National power supply and National spkr. State condx and your price. W8GMN, 5918 Salem Rd., Cincinnati, Ohio. Also want 250TL tubes, new, surplus or used. Harry S. Gantz, W8GMN.

WANTED: Thordarson plate transformer #19P68. No substitutes! W0BFB, John R. Hinesgardner, Mitchellville, Iowa.

MUST Sacrifice Collins 75A-4 Ser. #2531 with vernier dial, excellent condition: \$465. Collins 32V2 with extra tubes and Airdux, balun, \$250.00; 32RA-7 four-channel 150-watt xmtr (needs TVI suppression treatment for ham use); \$50.00; K0PUN, 3600 White Oak Road, S.E., Cedar Rapids, Iowa.

HAVE a 4 x 5 Speed Graphic Century model w/ equipment. Also an Omega D2 enlarger, with colorhead. Will trade for SSB station. What have you? Lester G. Smith, 2205 Collins Blvd., Mississippi City, Miss.

SALE: Gotham 15-meter 3-element beam, Gamma and tuning capacitor added, \$20. J. T. Morey, W2HXF, 210 Mountain Ave., Princeton, N. J.

WANTED: Bandspread coil assemblies for original National HRO. K3GJV, 3500 Harwich Lane, Kensington, Md.

GRAND Rapids, 13th Annual Hamvention, April 9, 1960 at Manger Hotel.

FOR Sale: Heath Apache, \$250; SB-10 (wired by Heath Co.), \$110; Apache and SB-10 are new and have been hardly used. Also HQ14OX in excellent shape, \$180; AM-2, \$14; mike, \$5; Hy-Gain 10-meter beam, \$25; AR-22 rotor and 100 ft. of cable, \$25; Johnson low-pass filter, \$13; Dow-Key relay \$10, also 4450 xtals \$1. All equipment is in A-1 shape. Will sell whole works for \$560 or individually at quoted prices. I'll pay for the shipping. Tom McFarland, K0OMP, Box 96, Armour, So. Dakota.

WANTED: Collins 75A2, 75A3 or 75A4. Must be clean and condx gud. Advise details in your first letter. W4CYT 7307 Axtor, Springfield, Va.

TECRAFT CC5-144 two meter converter with 14-18 Mc output \$30 postpaid. Arnold Nemmers, K0LXF, Dell Rapids, South Dakota.

COLLINS "S" Line complete with AM modulator, "Q" multiplier OM-3 oscilloscope. Like new. Ship original cartons. Lot #1290. The Parson, Box 763, Harlan, Ky.

TRADE: 1958 motor scooter "Vespa" for receiver or other gear. Will swap ART-13 for more compact xmtr. George Hussar, 196 Kolb Ave., Jackson, Miss.

FOR Sale: Complete conversion data for ART-13 transmitter. 28-page booklet with pictures and diagrams, \$1.50. Schematic 22" x 36", \$1.50. Both for \$2.50. Sam Appleton, K5MKI, Box 717, Tullia, Texas.

SELL: SX-100, new condx, in original carton, with R-46B spkr, \$195. Anthony Magistro, WA2CZJ, 1629 81st St., Brooklyn 14, N. Y.

SELL: R9'er, 3 coils, \$8; Gonset Triband converter, \$15; 15 watt Delta HiFi amp, cost \$56, sell \$30. Globe King 400B all coils, spare tubes, etc., \$55. VFO, \$300. Wanted: Globe Champion 300A, RME 4350A. H. F. Cushing, WIEUS, 16 Preston Dr., Manchester, Conn.

HEATHKIT Seneca factory-checked, new, on air for test only, \$195. Frank WA2FMC, Rte. 111, Smithtown, NY Andrew 5-2358 evenings.

LATE KW-M1 with 316F-1 A.C. supply and speaker. Excellent, \$675. J. Wecker, 18 Secatogue Lane E., West Islip, L. I., N. Y.

SMITH Corona adding machine, new condx, worth \$80, for good receiver. Walter Casteel, Clayton, Washington.



Is He?



THAT pal of yours—the one you ragchew with two or three times a week—is he a member of the American Radio Relay League? He should be; the more hams who are, and the more interest they take in their organization, the stronger the League will be. The stronger the League, the stronger all of ham radio will be, for ARRL is the recognized spokesman for amateurs in the U.S. and Canada, and the leader of organized amateur radio internationally.

AND SAY! Additional licensed amateurs residing in the same household with a full member may join the League for only \$1—without having to obtain a subscription to QST.

QST and ARRL Membership \$5
\$5.25 in Canada, \$6 elsewhere

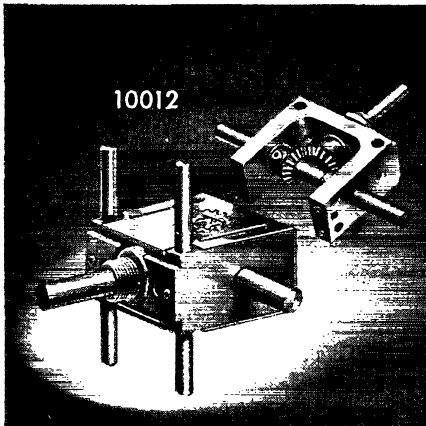
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West Hartford 7, Connecticut



Designed for



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10012

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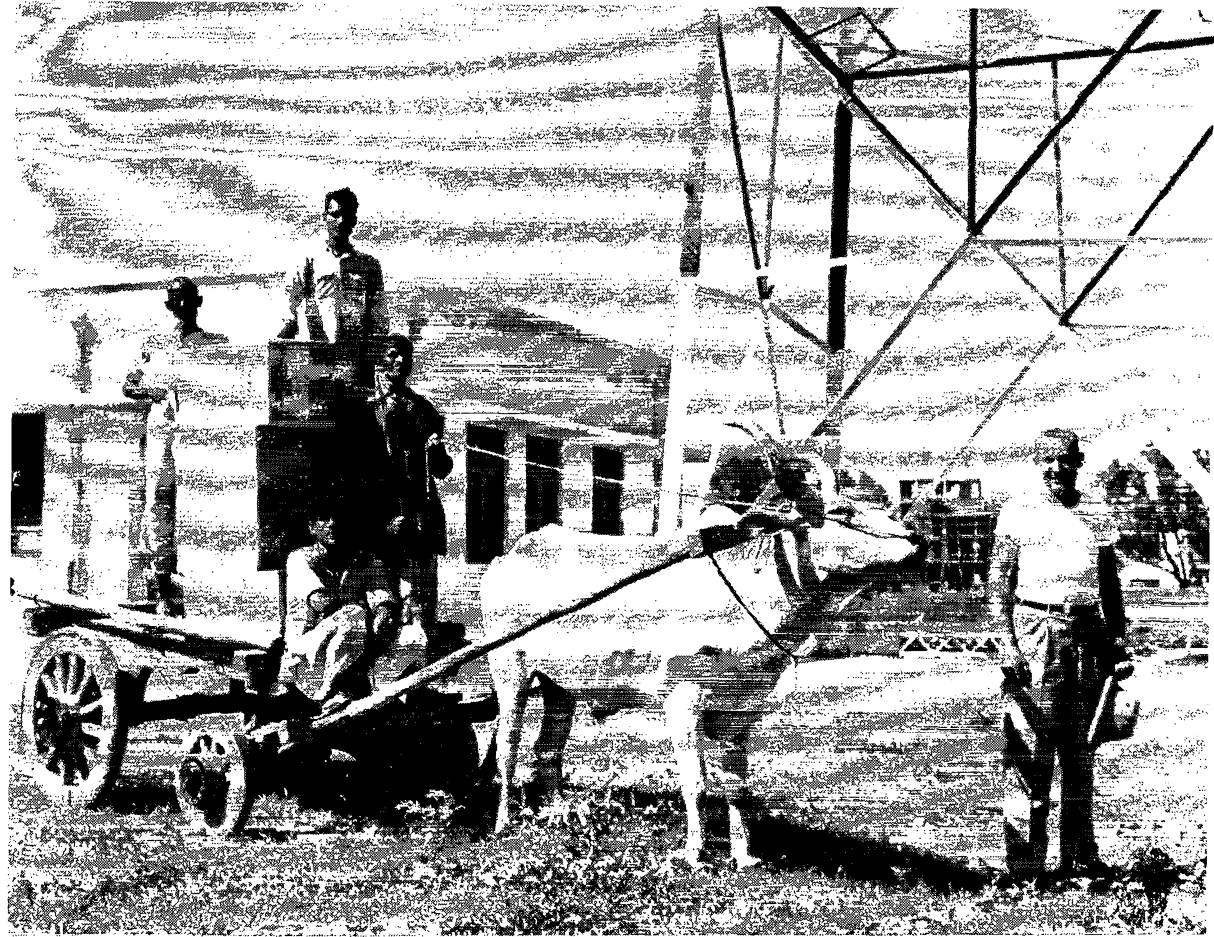
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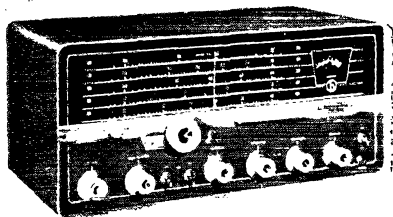


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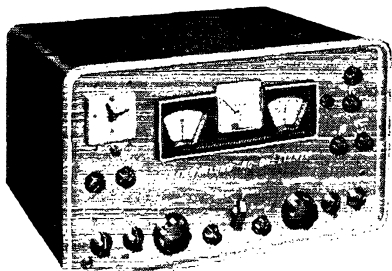
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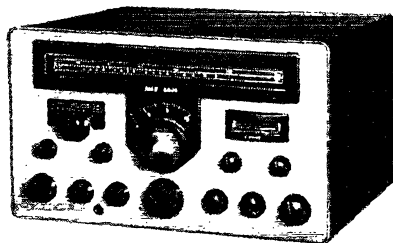
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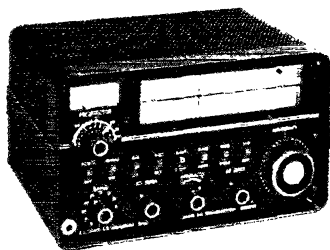
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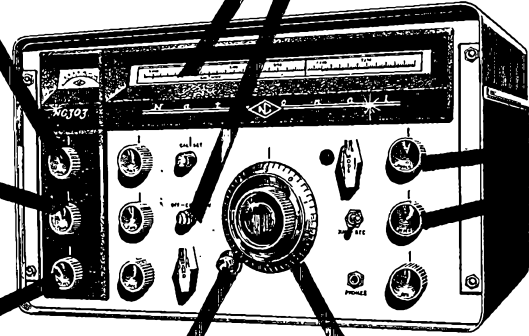
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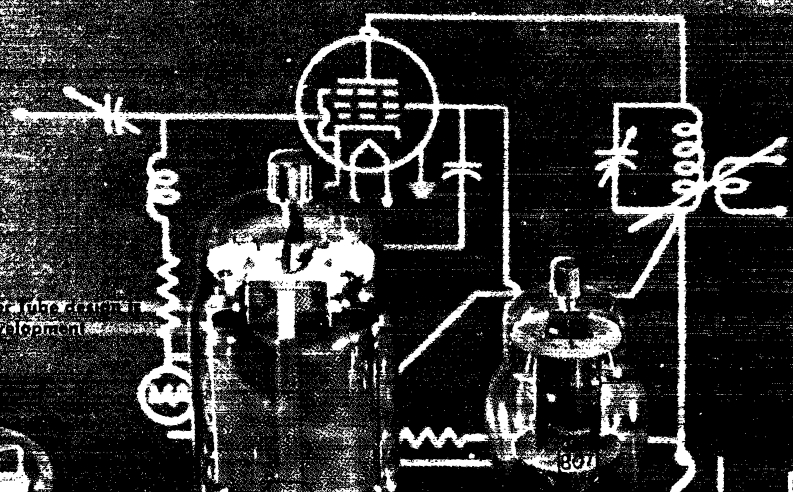
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5763	17	350	50
6146	90	750	60
7034/ 4X150A	500	2000	150
7094	500	1500	60

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