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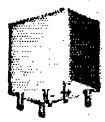

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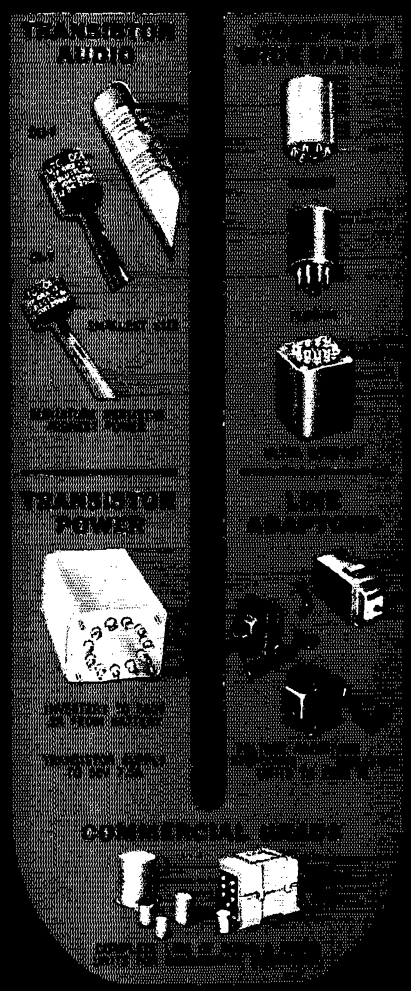

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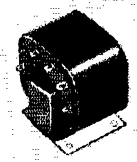

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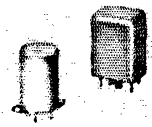

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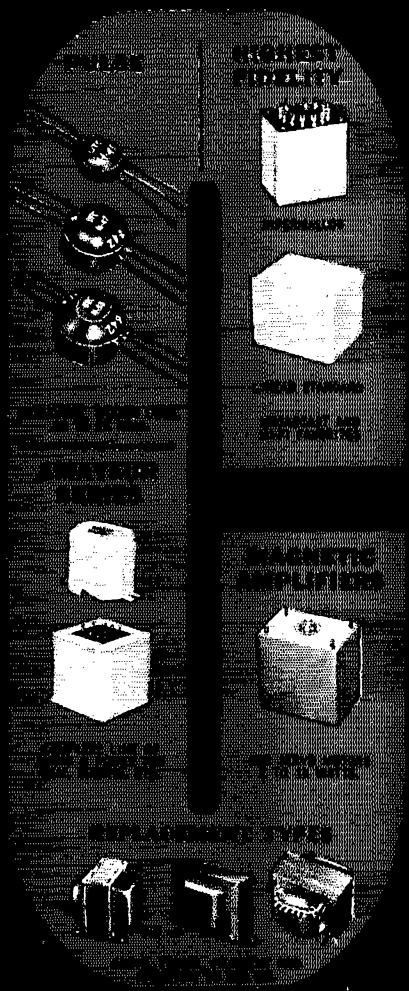

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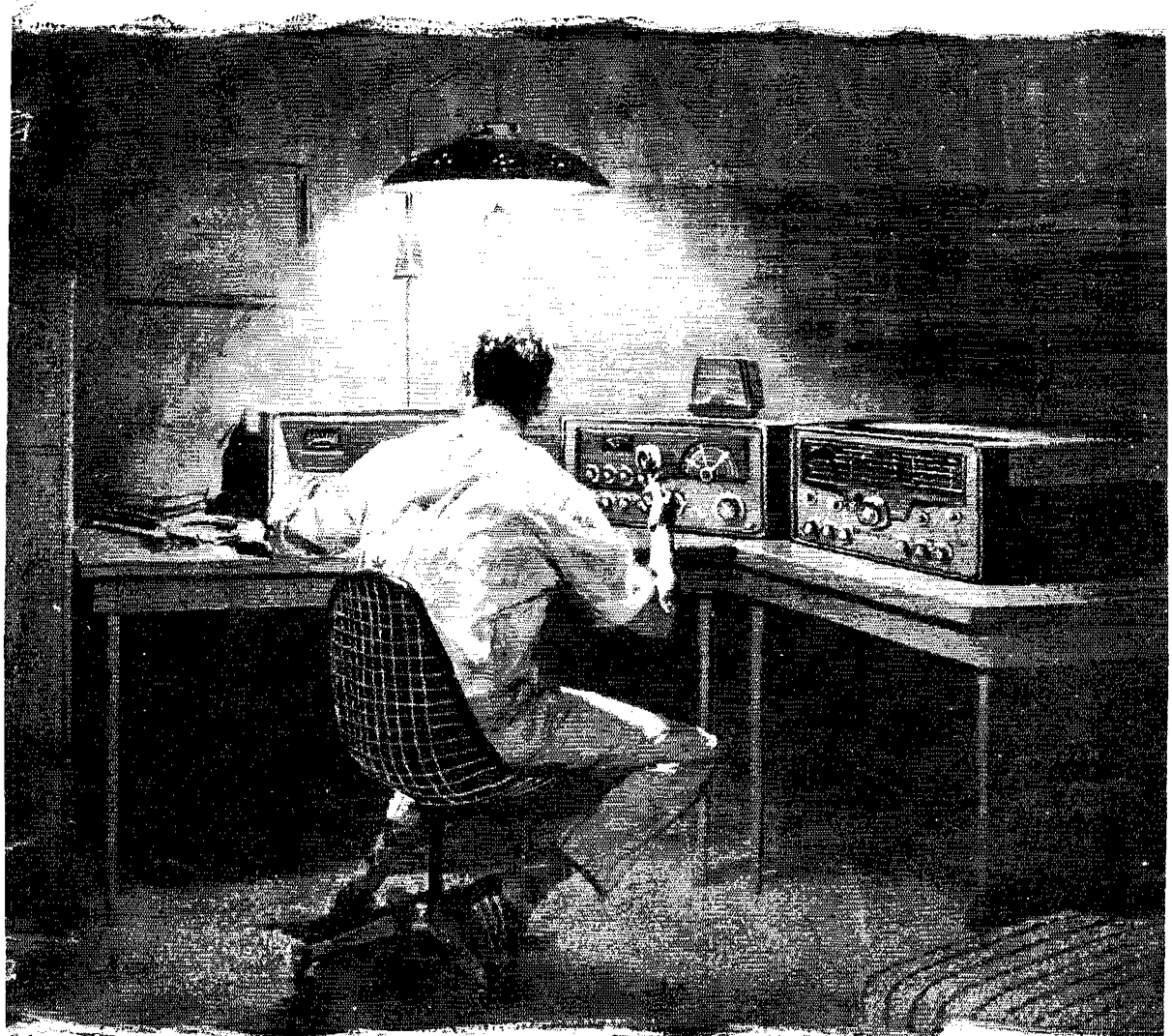

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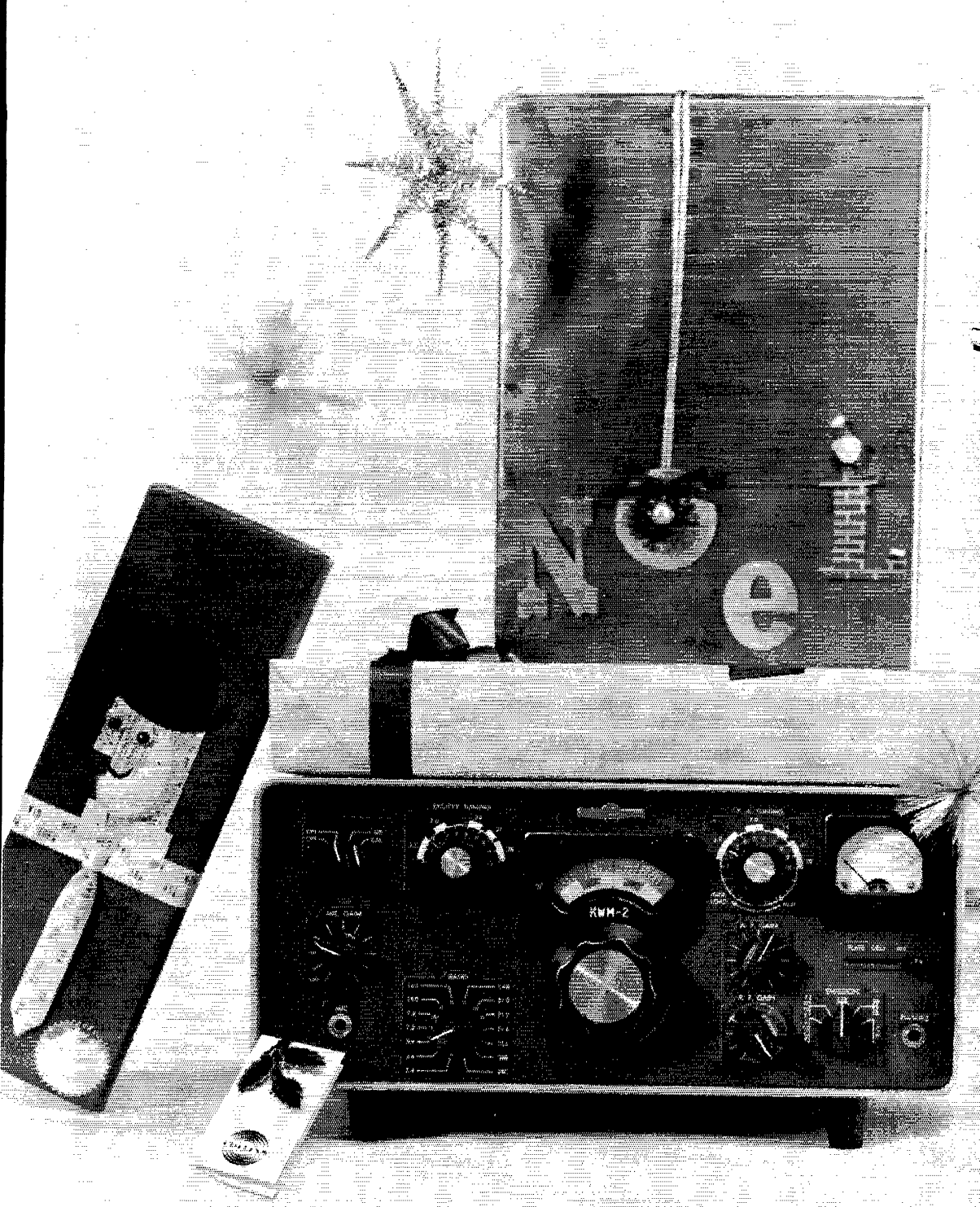

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DECEMBER 1961

VOLUME XLV • NUMBER 12

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

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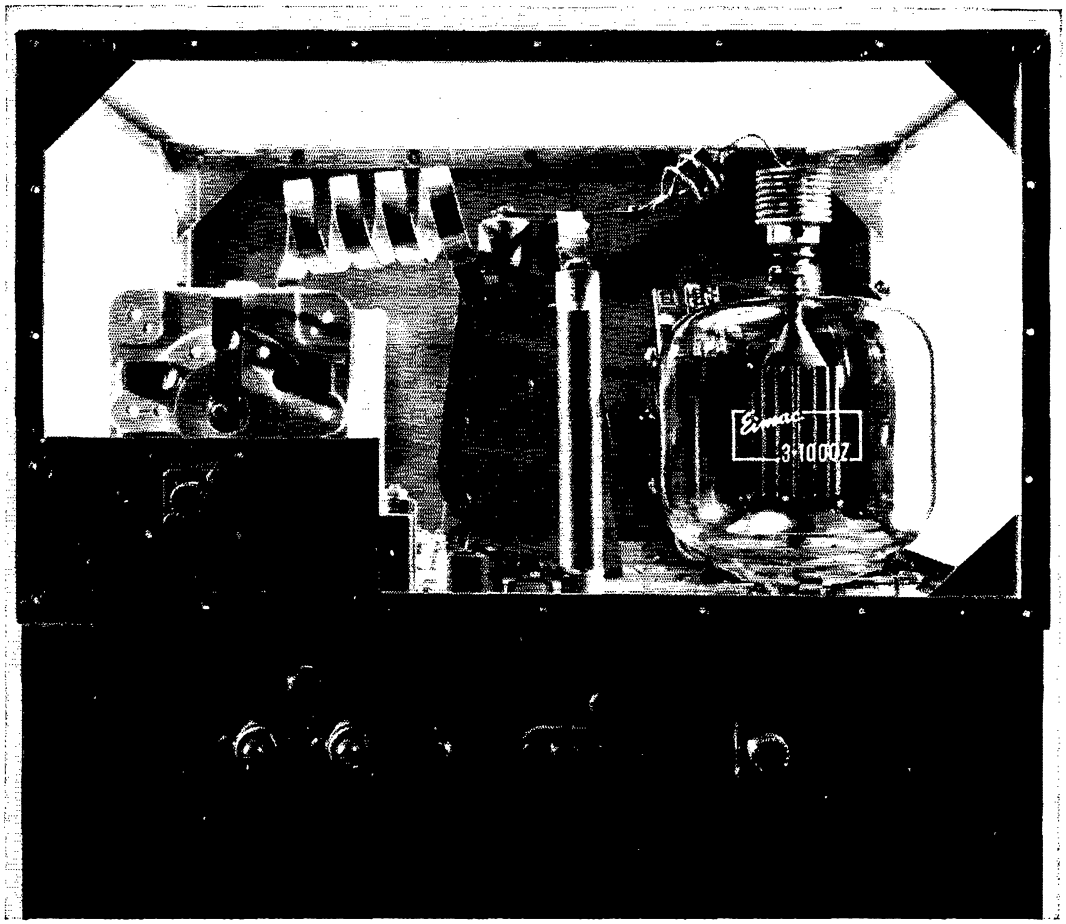

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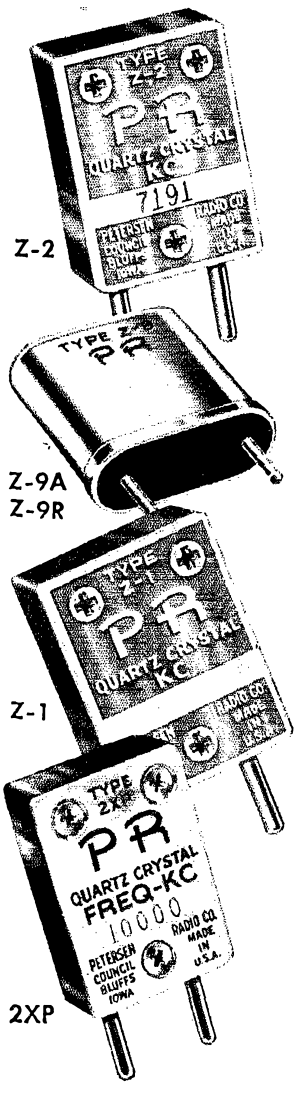

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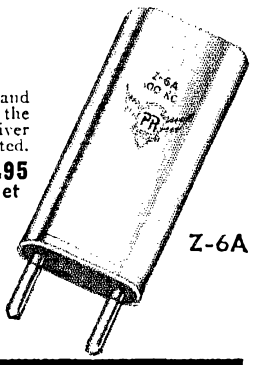

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It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors.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

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

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

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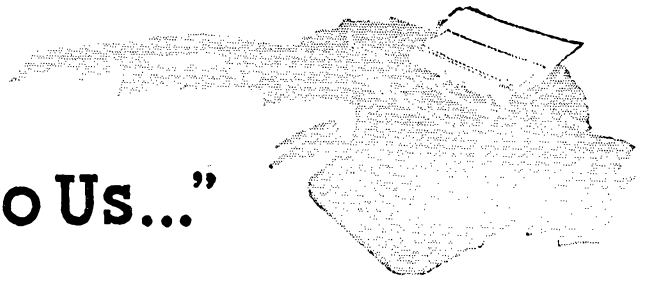


"It Seems to Us..."

MARCONI'S MIRACLE

AROUND the turn of the century there was a substantial group of young fellows whose hobby centered around various electrical experiments: they built electric motors and the wet cells to run them; they assembled static machines; they constructed backyard telegraph lines. Their interest was purely hobby, with no commercial aspect whatsoever. While many had heard vaguely of "wireless," so little information was available that very few were able to attempt this new, mysterious system of communication without wires. It was not until 1899 that the *American Electrician* published the first actual constructional information on wireless, hailed by amateurs and would-be amateurs everywhere. But progress was slow, and fraught with difficulty, and apparatus was almost impossible to obtain.

Then, just sixty years ago this month, a young Italian experimenter, only a few years out of his teens, arrived from Europe at St. John's, Newfoundland, and proceeded to set up the most advanced wireless receiving station of the time. On December 12, after several previous failures, a kite was sent aloft with 400 feet of aerial wire. At noon, Guglielmo Marconi heard a repeated trio of buzzes in his headset . . . three dots . . . the letter "S" — transmitted from his station at Poldhu on the southwest tip of England!

Marconi's miracle threw both continents into wild commotion. Older heads murmured in awe, and consulted their Bibles. But our youthful electrical experimenters saw only that here was something many times more fascinating than "electricity." With one voice they asked, "How does he do it?" — and with one purpose of mind they proceeded to find out for themselves. So this world-shaking event, if not the official birth date of amateur radio, really brought about its widespread development — and, for that matter, of all other branches of radio as well.

After Marconi's feat, wireless caught on rapidly. As a matter of fact, only two years later the art had developed so rapidly that an international wireless conference — the first in a long series — became necessary.

Marconi was not the inventor of radio; rather it was his adaptation of the inventions of others — Maxwell, Hertz, Lodge, Hughes, Branly, Loomis — into a workable system, combined with his own discoveries, that resulted in the new art of wireless communication. In a spirit so often characteristic of the amateur, this young "upstart" had first made utilitarian the various principles established and devices created by the bearded scientists of the day.

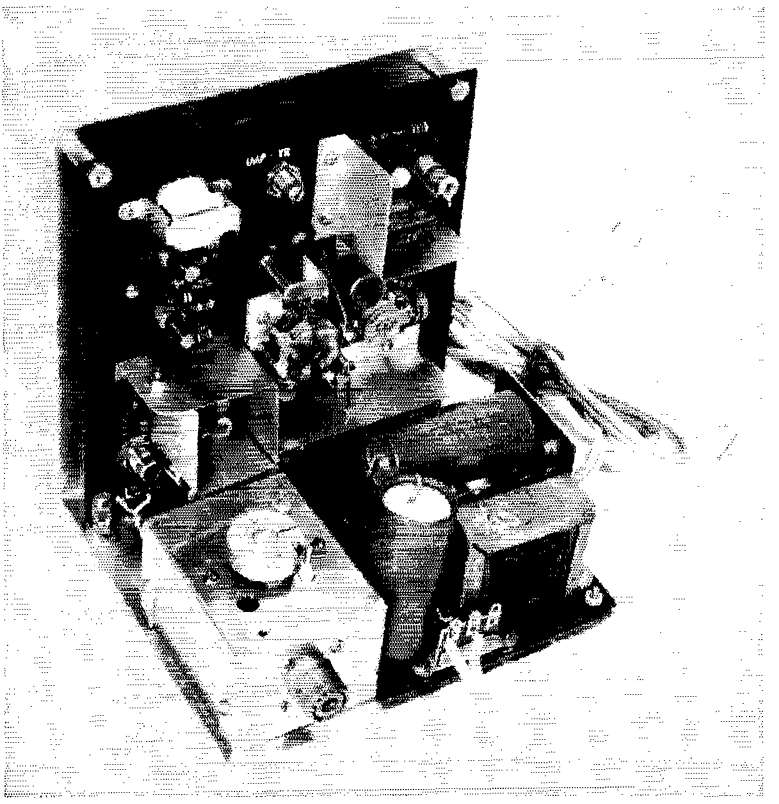
Marconi never operated as an amateur in our sense of the word, but he always maintained a warm sympathy for and identification with ham radio. Late one evening in 1933, for instance, the illustrious Senatore was touring the Chicago World's Fair, where he took special pains to visit amateur station W9USA on the grounds. The ham on duty became wide-eyed when he learned the identity of his famous visitor, who viewed all of the exhibits with interest and inspected the equipment closely. He stopped in front of one of the transmitters, and commented that it was a particularly fine piece of workmanship.

"But," said his escort, "it was only built by an amateur."

"Ah," the great Marconi replied, "but I myself am only an amateur."

—···—

With this feeling of kinship, it is not surprising that amateur groups on both sides of the Atlantic are arranging for a 60th anniversary commemoration of the first transatlantic wireless communication. The Society of Newfoundland Radio Amateurs will operate from that same historic location — Signal Hill — for 24 hours a day during the week of December 9-17. Simultaneously, the Cornish branch of the Radio Society of Great Britain will be set up on the actual site of the original Marconi transmitting station at Poldhu. Special calls, VO1MSA and GB3MSA, will be used, and special QSL cards issued. It won't be possible to duplicate the original frequency — or, in the language of the time, wavelength — since it was of the order of several thousand meters. But look for the stations on voice and c.w., 80 through 20 meters, plus 160 and 6 meters if conditions permit. QST



The Imp-TR, built in experimental fashion, is assembled on an L-shaped piece of aluminum. The power supply and the 21-Mc. linear amplifier are separate units, mounted side by side on the horizontal part of the L in this view.

The "Imp-TR"

Transistorizing the Simple S.S.B. Exciter

BY JOSEPH S. GALESKI, JR.,* W4IMP

TRANSISTORS, as well as other solid-state devices, have been greatly improved in recent years. Units are available that are capable of handling high frequencies at a reasonable power level. While some are still quite expensive, costs are dropping rapidly.

Before building an all-transistor multiband s.s.b. exciter, I felt that it would be necessary to gain experience. Twenty-one megacycles was chosen to be the output frequency of a simple filter-type exciter. If I could make it perform well on this frequency, then 10 through 80 meters in a bandswitching v.f.o. rig should not be too great an undertaking at a later date.

* 4318 Hanover Ave., Richmond 21, Va.

The Circuit

The general plan of the "Imp" exciter [1] (with the added stage of audio [2]) was followed by re-

[1] Galeski, "The 'Imp'—a 3-Tube Filter Rig," *QST*, May, 1960.

[2] Galeski, "More Beef for the 'Imp,'" *QST*, November, 1960.

The little "Imp" exciter that was first presented in May, 1960, QST, helped quite a few hams get on s.s.b. with a minimum of expense. Now W4IMP has come up with a transistorized version for the 21-Mc. band. Frankly experimental in nature, it offers some interesting ideas for those who like to do it with semiconductors instead of tubes.

placing each of the tube sections with a transistor. Interpretation of the circuit diagram is quite easy if one regards the collector as analogous to the plate of a vacuum-tube triode, the base as the grid, and the emitter as the cathode.

In Fig. 1, crystal oscillator Q_1 feeds a carrier to the balanced modulator through the link of L_1, which serves as a convenient means of coupling to the diodes. R_1 and C_1 are the carrier balance controls. If C_1 does not add to the carrier suppression obtainable from R_1 alone, it should be moved to the other side of the potentiometer. The 4700-ohm resistor from the L_2 link to chassis provides the necessary return path for the diodes.

Two stages of audio supply ample voltage to the balanced modulator. A step-down output transformer is not used because of the relatively low collector impedance of Q_3. A transformer was originally used as a matching device for a high-impedance crystal microphone, but was later abandoned in favor of the circuit shown. It worked, but generated objectionable noise. The photographs were taken before this change was made.

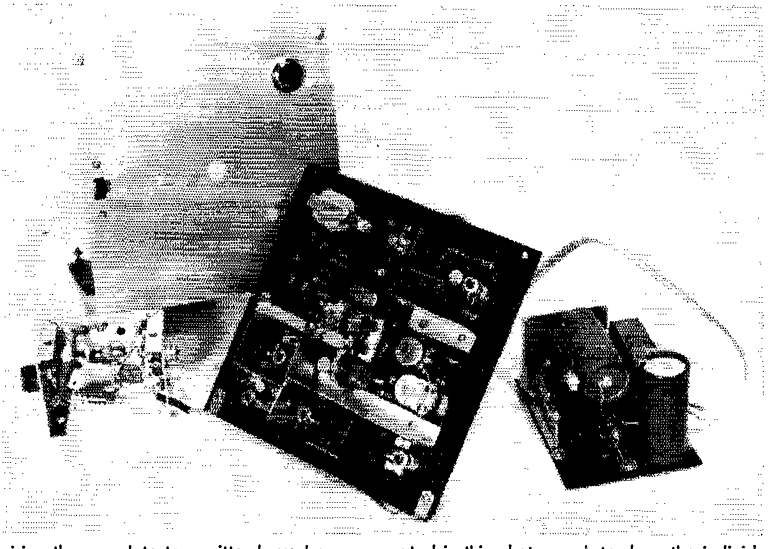
A few surplus type FT-243 crystals marked 8275 kc. were obtained for the filter. As in the original "Imp," two were selected for Y_2 and Y_4 that were a couple of hundred cycles apart in frequency. The lower was used at Y_4 as the shunt crystal. A third was ground up about 2 kc. for Y_3 and a fourth was later brought down a bit with a pencil mark for Y_1. The alignment procedure and the result to be expected were fully discussed in *QST*, May, 1960, and need not be repeated here. My methods and the resulting passband were essentially the same.

A VXO with transistors works well; however, output falls off as the crystal is pulled lower in frequency. Nevertheless, the variable feature is still to be desired. I had a 13.135-Mc. fundamental crystal on hand, and with this circuit get about 20-kc. shift. Notice that the filter frequency was chosen so that the output sum frequency is about 21,400 kc. The 10-$\mu\mu$f. capacitor, C_3, serves to prevent loading of the crystal by the transistor. Without it, the available frequency shift is much smaller. Of several high-frequency transistors, the 2N247 gave the greatest frequency coverage. W6BAF suggested that a toroid be used at L_3 for the sake of compactness, so a quarter-inch slice of a $\frac{1}{2}$-inch-diameter powdered-iron tuning slug was drilled with a $\frac{1}{4}$-inch hole to make the necessary doughnut-shaped form.

Problems that were anticipated with the simple mixer fortunately did not develop. The base of Q_5 is fed from a link on the filter coil L_4 and from the VXO through a small capacitor. I realize that the match here is not optimum, but results seem adequate. Among other possibilities, we might include replacing the r.f. choke in the VXO by a tuned circuit and feeding either the base or the emitter of the mixer from a link. The collector of Q_5 is tapped down on the tank coil, L_5, for a better impedance match.

The first r.f. amplifier, Q_6, is similar to the mixer in circuitry except that it is driven from a single r.f. source. It is interesting to note here that the r.f. voltage developed across L_6 is about 6 to 8 volts r.m.s. as measured on a v.t.v.m. This is enough to drive some of the smaller vacuum tubes.

In my opinion, the key to a successful transistorized exciter is enough power output to drive a high-power amplifier without having to resort to an intervening heat-producing vacuum-tube stage. The 2N1491, priced at about $33.00 at the start of this project, now sells for a little over $13.00. This device has a typical alpha-cutoff frequency of 250 Mc. and a free-air heat dissipation of one-half watt. This can be increased to three watts with a heat sink. Maximum collector-to-emitter voltage is 30 volts.



Sections comprising the complete transmitter have been separated in this photograph to show the individual assemblies. The "panel" is the part of the aluminum L containing the slide switch and microphone connector.

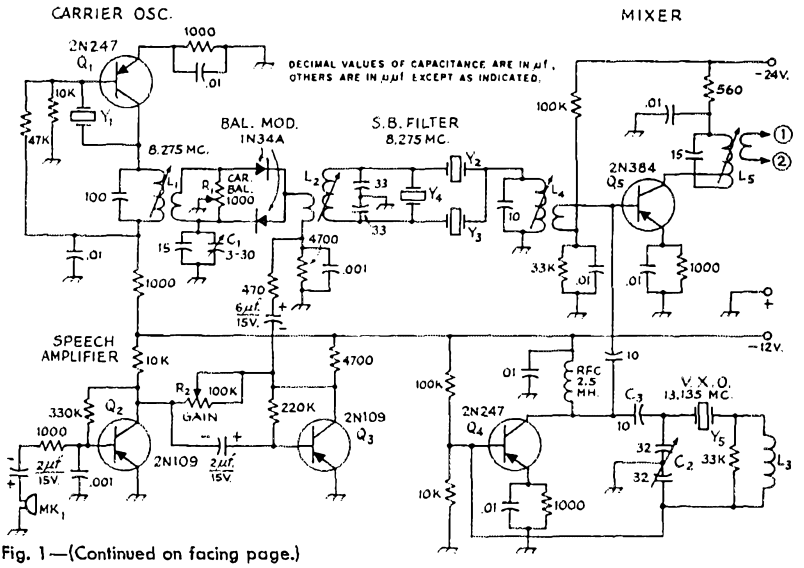


Fig. 1—(Continued on facing page.)

Several circuits were tried for the 2N1491 power amplifier. My greatest problem was parasitic oscillation. (This will sound familiar to those who have experience in building vacuum-tube s.s.b. exciters!) As usual, the simplest circuit seemed to perform the best. An output link on L_7 was abandoned in favor of a tap on the coil because stability was better.

Power Supply

To take full advantage of the 2N1491, a d.c. supply of 24 to 30 volts for the collector was necessary. Twelve volts, well filtered, was needed for the low-level stages. The available literature was searched and it was decided to use a full-wave bridge rectifier with an electronic filter.[3] A transformer with about a 20-volt secondary was needed, so a new secondary was wound on a small filament transformer. The full voltage output of the first filter capacitor in the circuit shown in Fig. 2 is used for the mixer and amplifiers. The voltage divider supplying the base of the 2N301 determines the value of the low voltage. R_4 was adjusted to give 12 volts with the entire exciter and the amplifiers connected. The effective capacitance across the 12-volt output is equal to the current gain of the transistor multiplied by the base capacitor, and this is in the order of 25,000 microfarads.[3] No hum was evident when the supply was connected to my transistorized receiver. The regulation was satisfactory and the use of zener diodes was considered to be unnecessary. Although the output voltages are not completely cut off S_1 open, the system works satisfactorily for send-receive, preventing the transmitter from "banging on" while the filter capacitors discharge. A double-pole switch breaking the -12 and -24-volt leads could be substituted.

[3] *Motorola Power Transistor Handbook*, first edition, p. 154.

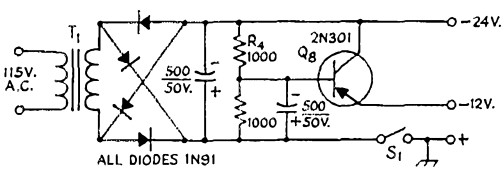


Fig. 2—Circuit of the regulated power supply. Capacitors are electrolytic; capacitances are in μf. Resistors are ½ watt.

R_4—See text.
S_1—S.p.s.t. slide switch.
T_1—Small filament transformer with secondary removed and rewound with No. 28 enam. to give 18 to 20 volts a.c.; see text.

Construction

Transistors seem to be associated with printed circuits, but printed or etched circuits are not too practical when only one of a kind is to be constructed. I liked the form and appearance of etched-circuit construction, so for no other reason I used an "unprinted" printed circuit. A 6 × 6-inch square of 1/16-inch bakelite board was obtained and the general layout determined. A mounting border was marked off all the way around, and the remainder of the board divided into nine equal squares. The original thought was to use one square for the carrier oscillator, one for the balanced modulator, two for the filter, and so on. It didn't quite work out that way, but the intention is evident from the photographs. All parts, including transistor sockets, were mounted by drilling small holes for the leads and inserting them from the top of the board. Wiring was done on the underside. As each stage progressed, thin aluminum partitions were located where it was thought they might be helpful in isolating the various stages. All partitions were connected to a common ground. Each stage was tested as soon as it had been constructed.

The power amplifier was built into a small

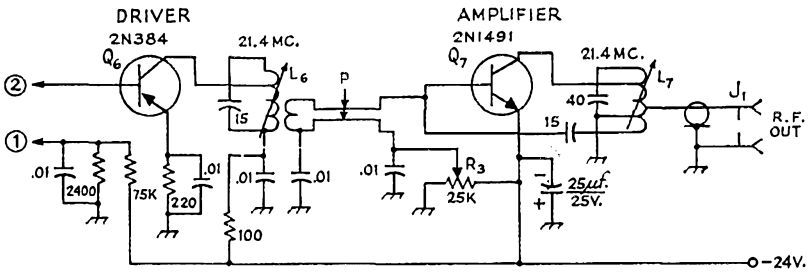
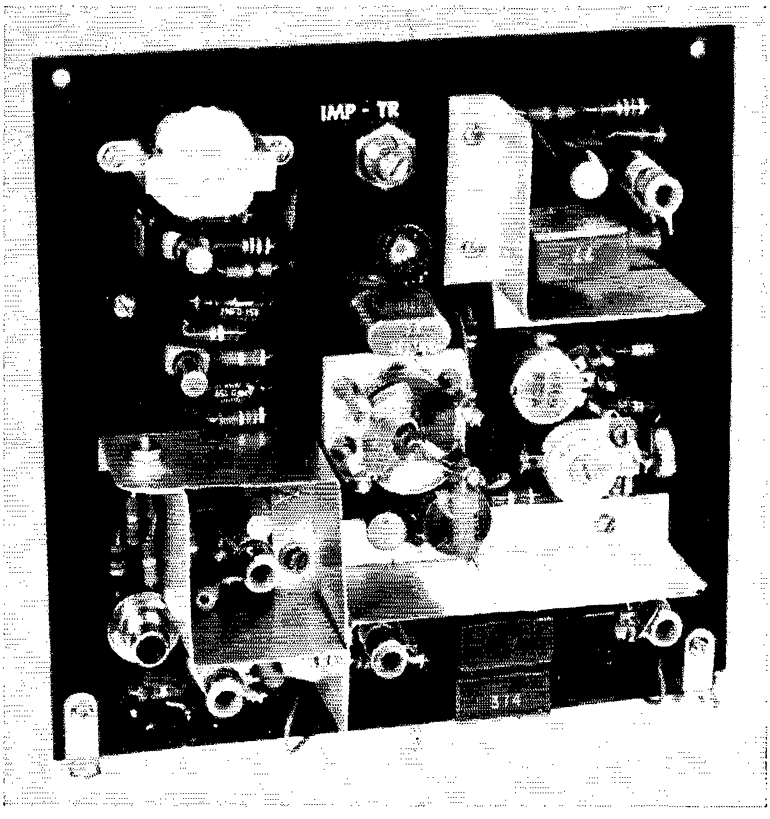


Fig. 1 (Continued)—Circuit of the Imp-TR 21-Mc. transistor s.s.b. exciter. Resistances are in ohms; fixed resistors are ½ watt. Capacitors with polarities marked are electrolytic; other fixed capacitors are ceramic. All coils except L_3 are wound on slug-tuned ceramic forms, ¼-inch diameter (CTC type PLS6/E or similar), with windings doped or lacquered. The lead from L_6 link to Q_7 is a twisted pair made from hookup wire.

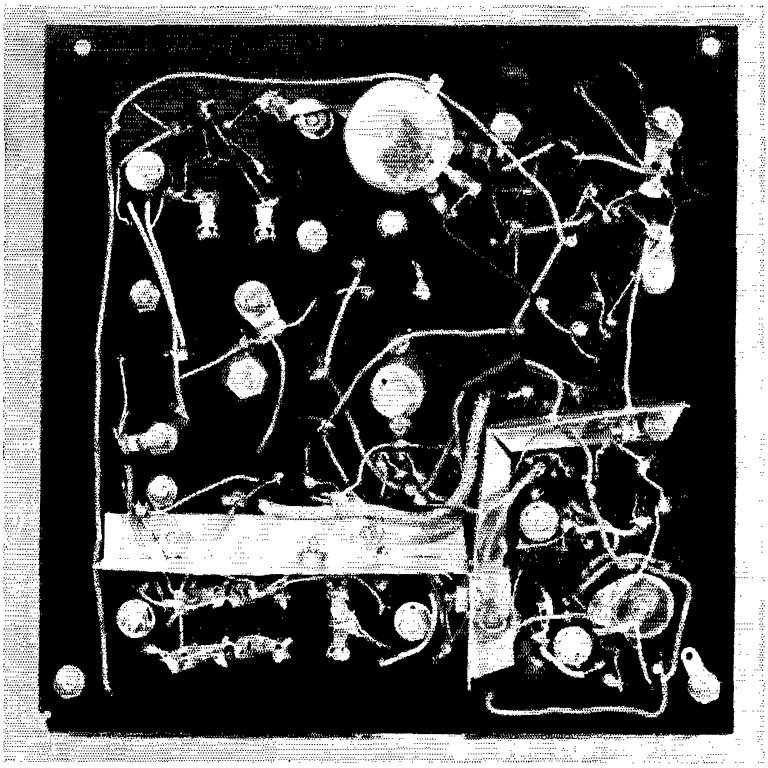
C_1—3-30-μμf. ceramic trimmer shunted with additional capacitance, if necessary, to enable balancing out carrier.
C_2—Split-stator, 32 μμf. per section, surplus. Any small unit with 25 μμf. to 50 μμf. per section may be substituted.
C_3—10μμf.; see text.
J_1—Coaxial connector, chassis mounting.
L_1—25 turns No. 28 enam., close-wound; link 7 turns. (All links wound over cold end).
L_2—40 turns No. 34 enam., close-wound; link 15 turns.
L_3—33 turns No. 28 on homemade toroid core. See text.
L_4—40 turns No. 34 enam., close-wound; link 6 turns.
L_5—24 turns No. 28 enam., close-wound; tapped 5 turns from hot end; link 4 turns.
L_6—Same as L_5 with 3-turn link.
L_7—16 turns No. 28 enam., close-wound; tapped at 4, 8, and 12 turns from hot end.
MK_1—Dynamic microphone, low impedance.
R_1—1000 ohms, linear taper, miniature (Lafayette VC-32 or similar).
R_2—0.1 megohm, audio taper, miniature.
R_3—25,000 ohms, linear taper, miniature.
Y_1—Y_4 inc.—8275-kc. crystals (surplus FT-243).
Y_5—13.135-Mc. fundamental.

Minibox and is not unusual in construction. The extra holes evident in the photographs were the result of the fact that many circuits have been tried. A heat sink was made for the 2N1491 by drilling out a piece of aluminum to fit the case and tightened by using the slot and screw arrangement which can be seen in the illustrations.

A piece of aluminum sheet 6 by 12 inches was



Close-up of the r.f. audio assembly. The audio section is at the upper left. (As explained in the text, the audio transformer in the upper-left corner is no longer used.) The mixer and driver are surrounded by the shielding at the lower left. The crystal-controlled carrier oscillator is in the upper right corner with the balanced modulator immediately below it. The sideband filter is along the lower edge. Tuning capacitor and crystal in the center are part of the VXO circuit.



The "wrong" side of the mounting board doesn't show after the transmitter is completely assembled, being held just behind the panel by short mounting pillars. Wiring is direct, with no attempt at making it pretty.

bent into an "L" shape. The exciter board was mounted vertically with the shaft of C_9 brought through the front panel. The carrier-balance control was cut off flush with the panel and slotted. The amplifier was mounted on the rear section along with the power supply that was constructed to fit the remaining space.

The power supply was mounted on a small piece of bakelite, which provided a convenient method of isolating an aluminum plate for the power transistor heat sink so that no sockets or insulating washer had to be used. Small clips were used for power-supply connections to facilitate disassembly.

Adjustment

A v.t.v.m. with an r.f. probe was used to check that the oscillators were working and that the output was of satisfactory magnitude. Don't fear that these tiny transistors will have so little output that you can't find it. Actually, 4 volts r.m.s. was measured at the collectors of Q_1 and Q_4.

The bias resistors for Q_1, Q_2, Q_3 and Q_4 are chosen to give about 1-ma. resting current. In the case of Q_1 and Q_4, a voltmeter across the emitter resistors provides an easy way to monitor the emitter current; one volt across the 1000-ohm resistor indicates 1 milliampere of current. The resting currents of the mixer, Q_5, and amplifier, Q_6, should be 1½ to 2 ma. Final-amplifier resting current is adjusted with the potentiometer, R_3, to 12 ma. Caution should be used to insure that the maximum emitter-to-base voltage rating (1 volt) is not exceeded when adjusting R_3. Be sure the control arm is at the emitter end before applying voltage to the amplifier. I strongly advise metering the 2N1491 at all times until you are sure that you have the circuit behaving itself.

Tune-up was done on the board first. The signal was located in the receiver and the carrier nulled. An audio tone of about 1500 cycles was fed to the audio input and the receiver's S meter watched for peak output while L_5 and L_6 were tuned. The amplifier was then connected to a dummy load and a similar procedure followed for it. The current kicks up a little on voice peaks, to about one-watt input, and the output is approximately ½ watt. This is not enough to "drive" my Thunderbolt, but it does make the plate meter very nervous, indicating several hundred watts input to the 4-400s.

On the Air

Quite a few contacts have been made on 21 Mc. Reports have been good as to quality and suppression. HC1AGI was able to read the exciter "barefoot." Extra contacts on my antenna change-over relay were used to activate the exciter. Since there is no warm-up time, all voltages may be removed during standby.

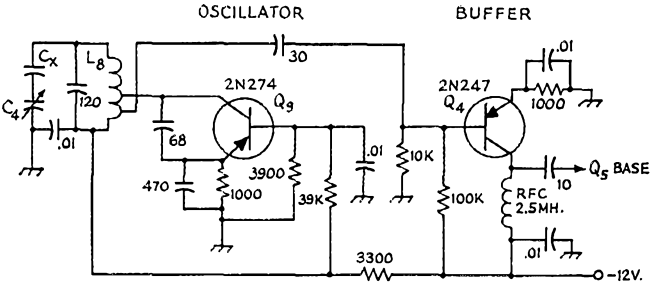


Fig. 3—The v.f.o. circuit. This substitutes for the variable crystal oscillator circuit shown in Fig. 1. Decimal values of capacitance in μf.; others are in $\mu\mu$f. Resistances are in ohms, resistors are ½ watt. Bypass capacitors (0.01 μf.) are ceramic; others are silver mica except for the 10-$\mu\mu$f. coupling capacitor (ceramic) to Q_5.

C_x—(See text) 5-$\mu\mu$f. NP0 ceramic or silver mica.

C_4—32 $\mu\mu$f. (single section of original capacitor). Any small variable can be used by properly choosing C_x.

L_8—12 turns No. 28 enam., close-wound, slug-tuned; taps at 3 and 6 turns from cold end. Form same as in Fig. 1.

A V.F.O.

I realize that few hams have a 13.135-Mc. crystal in the junk box, and that a suitable v.f.o. circuit would be needed for the all-band project. Having seen an interesting article on a stable v.f.o.,[4] I decided to adapt it to the Imp-TR.

The crystal Y_5, VXO coil L_3 with its swamping resistor, and capacitor C_3 were removed from the board. The rest of the circuit was left intact except to remove the lead between the base of Q_4 and C_2.

Coil L_8 of Fig. 3 was mounted in the location formerly held by L_3, and the transistor socket for Q_9 in place of the crystal Y_5. The remaining parts were placed as space permitted. Only a single-section variable is needed, so one half of the split-stator capacitor was used. Since 32 $\mu\mu$f. was too much capacitance for the frequency change needed, the effective capacitance was brought down by the use of 5 $\mu\mu$f. in series, C_X. With it, a 75-kc. tuning range was covered in the 180 degrees of shaft rotation. Altering C_X will change the bandspread. Unlike the VXO, the output was constant over the desired frequency range.

In operation the v.f.o. performed beautifully. Stations being worked were asked to watch for drift, but they detected none. While no actual measurements were made, I can say that stability is very adequate for s.s.b. There is a slight drift from junction heating when voltage is first applied to the oscillator. This seems to be small, occurs quickly, and no station being worked could detect it. Even this might be eliminated by permitting the v.f.o. to run continuously.

Acknowledgments and Remarks

My thanks to ZS5DN for portions of the circuitry and assistance in getting started. Mr. K. M. Aitken of RCA provided information and other help which was greatly appreciated. Experimentation is still being continued, but the all-band job is getting closer.

In general, the remarks regarding "other bands" for the tube version hold for the Imp-TR. Care should be used to prevent the carrier and mixer frequencies and their harmonics from appearing in the output. QST

[4] Stoner, "Stable Transistor V.F.O.," *Electronics World*, October, 1960.

Strays

Hams are often blamed by owners of TV sets experiencing interference when the cause is actually due to improperly shielded or otherwise defective receivers. But amateurs also suffer interference. One case involved ham reception along the Texas Gulf Coast. FCC monitoring and mobile follow-up located the origin on a remote rice farm. Here an industrial transmitter was releasing a second harmonic on an amateur frequency. The farm owner took corrective action.

—···—

When a Dallas FCC engineer visited the home of a citizens radio licensee, who was the subject of numerous complaints, he found the walls plastered with cards attesting to his efforts to get "distant" reception, which is prohibited. The licensee insisted on returning his license to the FCC engineer, stating that it had given him too much trouble and that he proposed to try for a ham ticket so that he could engage the DX type of work in which he is primarily interested.

—···—

W2ZI writes in to report that he has been active continuously for 52 years in ham radio. Can you top this?

—···—

W2OY and W3OY both live in Lancaster (New York and Pennsylvania).

—···—

Don't forget to write. Who? Your Senators. Why? Urging their support of Senate Bill 2361. When? Right now. See pages 9 and 73, October *QST*.

Qualifications for Radio Amateurs

BY PAUL AMIS,* W7RGL

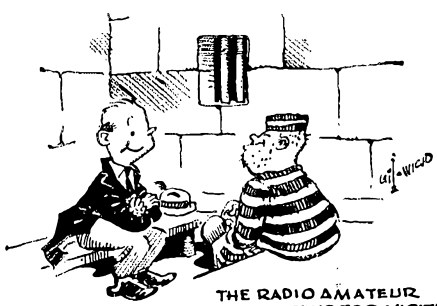
It appears that the Federal Communication Commission's requirements for becoming a full-fledged Radio Amateur fall considerably short of the necessary demands of our hobby. While it is agreed that having a slight acquaintance with electronic theory and being able to struggle through International Morse at 13 per is a proper step, there are other qualifications which, to my mind, are equally mandatory.

These additional characteristics, born of considerable mental gymnastics, are herewith displayed for general perusal and comment.

Special Characteristics for the Radio Amateur

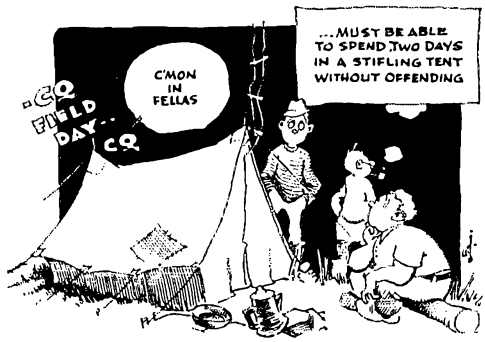
He must be a man of ambition, a round-table speaker pro tem, a before and after Hamfest bottle-goods sampler, a night owl, able to work all day, handle traffic all night, and still appear to be reasonably alive the next day. He must be able to operate from one-room apartments, hotel rooms, Yak-skin tents, suitcases, trailers, and igloos; to sleep on raw earth on Field Day, and be able to recover from double pneumonia contacted during the January v.h.f. contest in time for the February DX spasm.

He must have unlimited endurance for attending ham club meetings, ARRL Conventions, and Silent Key funerals: for contests, DX, and gab; for diplomatically soothing irate and neglected XYLs; and still find time for visiting hospitals, jails, and technical meetings to do missionary work among his s.s.b. brethren.



He must be able to maintain friendly relations with Red Cross Officers, QSL Bureau, FCC Monitors, and radio parts salesmen; be able to entertain visiting firemen, ARRL officials, and TVI complainants without suffering dementia praecox, DT's, or liver ailments from too much coffee. He must be able to inhale transformer smoke, MG exhaust fumes, dust, and backtalk, and spend two days in a stifling tent on Field Day without perspiring or acquiring BO.

* Route 1, Box 438, Poulsbo, Washington

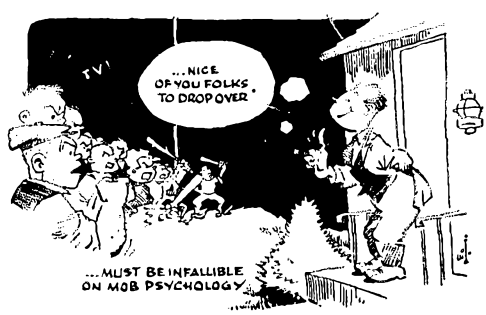


He must be a man's man, an incurable optimist, an engineering technician, a reasonably good husband, a fatherly father, a good provider, a phone man, a c.w. operator, and keep peace with his hi-fi-owning neighbors. He must have enough diplomatic skill to minimize or avoid grumblings from his boss because of talking radio or sketching schematics on company time.

He must be able to discourse on transmitters, receivers, teletype, politics, automobiles, TV antennas, sideband, and DX. He must be able to carry on complex conversations with the inevitable "learned ones" without once letting slip that, technically speaking, he may have difficulty finding his backsides with both hands. He must be able to use odometers, slide rules, bridges, tables, hand tools, pole hooks, oscilloscopes, table saws, and tourniquets. He must be a competent filing clerk, typist (two finger): read DXCC regulations, catalogs, meters, great-circle maps, the handwriting on the wall, ARRL directives, and eviction notices.

He must have an analytical mind in order to circumvent forgotten essential components in published schematics, figure personal, luxury, liquor, and sales tax; drive a mobile-modified car and be readily able to compute mileage, battery drain, doppler effect, location of radar speed traps, gas consumption per hour of QSO; estimate wear and tear on batteries, voltage regulators,

(*Continued on page 170*)



Summary of Rules—1962 ARRL DX Contest

ALL amateur radio operators throughout the world are invited to participate in the 28th ARRL International DX Competition. You may earn a certificate of performance award issued to the top phone and c.w. scorer in each country. For those DX stations that do not receive complete DX Contest rules (next month in *QST*) in time for the contest, presented here is a summary of the rules for the 1962 ARRL DX Contest.

1. DATES:

This 1962 DX Contest will be held two week ends for c.w. and two week ends for phone as follows:

PHONE: February 2–4 and March 2–4
C.W.: February 16–18 and March 16–18

S.s.b. as well as a.m. stations are invited to participate in the phone contest.

2. TIMES:

The starting time in each instance is 2400 GMT Friday and ends 2400 GMT Sunday. Phone and c.w. are separate contests.

3. OBJECT:

The rules are unchanged from last year. DX stations try to QSO as many W-K-VE-VO-KH6-KL7 stations as possible during the contest in as many different call areas possible *per band.*

4. EXCHANGES:

DX stations send RS or RST report followed by a three-digit number representing power input. For example, on c.w. you might send 579050, which means RST 579 and power input 50 watts. U. S. A.-Canada stations will send a number consisting of RS or RST report followed by the name of their state or province. This is the list of state and province abbreviations:

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

5. SCORING:

Repeat QSOs on additional bands are permitted. Your multiplier is the total call areas (not states) QSOed *on each band* (maximum of 21 *per band*). The 21 call areas are listed above. Each completed QSO counts three (3) points. For DX stations incomplete contacts count two (2) points. FINAL SCORE is the number of QSO-points times the multiplier.

6. ENTRY:

Free log forms are available on request from ARRL. You don't have to use these forms. Logs should contain calls, dates, times, bands, exchanges, and points. Sign your name to the statement: "I have observed all competition rules and regulations for my country." Send your log with summary data to:

AMERICAN RADIO RELAY LEAGUE
DX CONTEST
38 LASALLE ROAD
WEST HARTFORD 7, CONN., U. S. A.

Your entry must be postmarked by April 30, 1962 to be eligible.

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A Novel Antenna for 40 and 80 Meters

BY W. PETE CZERWINSKI,* W2JTJ

DURING a round-table discussion on the present sunspot cycle and the growing use of the lower frequencies, the author was asked for ideas on a novel approach toward designing a compact antenna that could be used for both 40 and 80 meters. Consideration of this problem led to the design shown in Fig. 1.

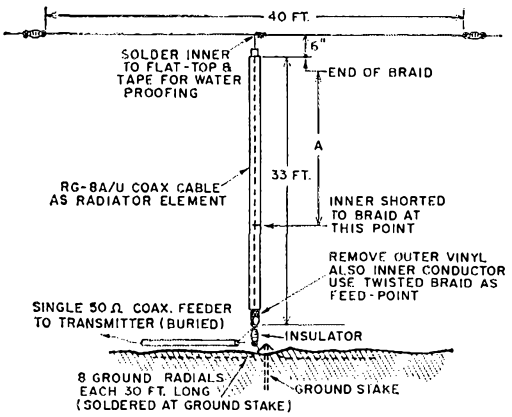


Fig. 1—Construction of the 40-80-meter antenna. Dimension *A* is an electrical quarter wavelength in the cable at the median operating frequency selected. Approximate length in feet is equal to 162 divided by the frequency in megacycles for solid-dielectric coaxial cable. Actual lengths for lowest s.w.r. found by the author were 23 feet 2 inches for 7.1 Mc. and 22 feet 10 inches for 7.2 Mc.

Essentially, the antenna is a 33-foot length of 50-ohm coaxial cable suspended vertically from a horizontal wire over a ground radial system. At the upper end of the coax cable the inner conductor is soldered to the horizontal wire as shown in Fig. 1. The braid of the coax is removed for a distance of 6 inches from the soldered connection, leaving the polyethylene insulation on the inner conductor. Tie a nylon cord from the body of the coax cable to the horizontal wire to relieve the inner conductor from having to support the weight of the cable, and tape this 6-inch gap with plastic tape for waterproofing. Insert a large needle at the selected *A* distance from the top end of the braid, thus shorting the inner conductor to the braid at this point.

Now, getting to the lower end of the coax cable, remove approximately 3 inches of vinyl, spread back the braid, and snip off the exposed polyethylene-covered inner conductor. Twist the free braid into a "rope" and fasten it to the upper eye of the base strain insulator. This is the feed point of the antenna. Wire the lower eye of the insulator to the ground stake. This lower eye is also the junction of the eight ground radials and the braid of your feeder coax.

* 202 Beechwood Drive, Shrewsbury, New Jersey.

How It Works

The antenna operates as a base-driven quarter-wave vertical on 40 meters. The r.f. current flows on the outside surface of the coax braid. At the cut edge of the top it sees a high impedance as a result of the shorted quarter-wave transformer formed by the inner surface of the braid and the inner conductor,[1] this *A* length being an electrical quarter wave in the cable. The high impedance at this point effectively decouples the flat-top wire and virtually takes it out of the picture during 40-meter operation. By adjusting the location of the needle, we can place the point of best v.s.w.r. anywhere in the band.

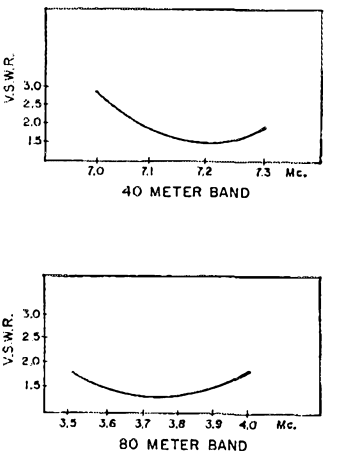


Fig. 2—S.w.r. *vs.* frequency as measured with the setup of Fig. 3.

On 80 meters the antenna operates as a top-loaded ⅛-wave vertical. The same *A* length is now much less than a quarter wavelength and is electrically equivalent to a series inductance. With this series inductance working for us, we only need 40 feet of single-wire flat-top for operation on 80 meters.

[1] Czerwinski, "Coaxial Transformer for Voltage-Fed Antennas," *QST*, June, 1961.

Adjustments

Fine adjustments for best v.s.w.r. in the 80-meter band can be made by pruning the flat-top length. By virtue of the decoupling feature, this can be done without danger of affecting the 40-meter operation.

Conversely, fine adjustments for best v.s.w.r. in the 40-meter band do not materially affect 80-meter operation.

When the "needle short" distance is decided, a more permanent connection can be made, of course.

As luck would have it, the author discovered that WA2LLQ had just erected several wooden masts for a proposed horizontal on 80 meters. He decided to abandon the horizontal and we installed this "VER-TEE"[2] antenna in his back yard. It is suggested that a wooden post be installed and taped to the lower part of the antenna so youngsters playing in the yard can't pull down the system.

[2] W2LJR suggested "VER-TEE" as a possible name for this antenna.

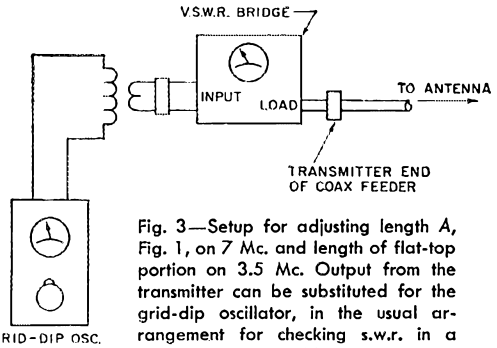


Fig. 3—Setup for adjusting length *A*, Fig. 1, on 7 Mc. and length of flat-top portion on 3.5 Mc. Output from the transmitter can be substituted for the grid-dip oscillator, in the usual arrangement for checking s.w.r. in a coaxial line.

The test setup of Fig. 3 was used for tuning up the antenna. The station receiver was used to check the frequency calibration.

WA2LLQ has operated this antenna on three bands: 80, 40 and 15 meters. His reports of on-the-air interest shown by other amateurs encouraged the preparation of this article. QST

25 Years Ago this month

December 1936

. . . The editorial was tickled pink because *QST* had come of age, being 21 years old. KBW reported that, twenty-five years ago, a complete Volume I was worth at least $30.00.

. . . Technical articles included constructional details on a 20-watt rig using phone and c.w. on five bands, a u.h.f. (14, 28, and 56 Mc.) rig with 100 watts crystal-controlled, some operating notes on the new 807 tube, a new method of coil changing for receivers, an all-band phone transmitter using beam-power tubes, the designing of a modern u.h.f. receiver, the rebuilding of a commercial condenser-type mike, and the usual collection of hints and kinks.

. . . There was a station description of W1HRX, Jim Millen, then of the National Co., and now (1961) of the James Millen Co.

. . . Of particular interest to the DX gang is that fact that the "How's DX?" column first appeared in this issue of twenty-five years ago. Conducted by W1JPE, now W1-DX, it originated a format which has been successfully followed ever since.

. . . Oh, those good old days! For less than $20 you could buy a 3-tube receiver, including power supply, that tuned from 2 to 2000 meters. QST

Strays

Complaint of a "rough noise" on broadcast reception sent Arizona FCC monitoring station engineers on a turkey hunt. The complainant accused a neighbor, an amateur operator. However, the latter's transmitter was in the repair shop. So the FCC investigators next tried an electrical plant. Here there was plenty of noise but no electrical disturbance. So the searchers moved on to another possible source — a turkey farm. There they found a loose power line connection to a large pump. The electric power company made quick repair.

Silent Keys

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

W1HM, Arthur B. Donovan, Rockland, Mass.
K1JIM, Robert G. Johnson, Mashpee, Mass.
W1VQX, Edward W. White, Peabody, Mass.
W2BT, Kurt Schoenfeld, Greenlawn, N. Y.
ex-W2EBZ, Clayton A. Cool, jr., Carlstadt, N. J.
K2PWH, Frank E. Dixon, Hempstead, N. Y.
W3AIW, Andrew A. Rhoads, Lehighton, Penn.
W3EWW, Lloyd S. Quynn, Savage, Md.
W3JPH, John P. McTigue, Philadelphia, Penn.
W4BXO, Theodore A. Bedell, Jensen Beach, Fla.
K4CWF, James R. Meacham, jr., Fulton, Ky.
W4ECK, Malcolm Bethea, sr., Birmingham, Ala.
W4OSS, Robert F. Berger, Burke, Va.
W4RKD, George Turner, Alexandria, Va.
W4TMN, Arthur Thomas, Petersburg, Fla.
K5DLO, Charles B. Free, Idabel, Okla.
W5EIH, Arvel H. Edwards, Port Allen, La.
K5GOV, Tommy R. Moore, Mineral Wells, Tex.
W5MWP, Stanley J. Schexnayder, Baton Rouge, La.
W6DTI, Gordon F. Phelps, Oakland, Calif.
WA6IND, Donald S. Swallow, San Jose, Calif.
W7LU, Wallace G. Ludgate, Portland, Ore.
KN7PIW, Byron D. Stull, Wenatchee, Wisc.
ex-W8AKN, Carl E. Suppanz, Detroit, Mich.
ex-W8CZ, Clyde B. Johnson, Charleston, W. Va.
ex-W8HBB, E. Y. Lebleu, Charleston, W. Va.
K8MXP, Daniel W. Brown, Princeton, W. Va.
W8QMU, Gunter W. Joseph, Lansing, Mich.
KN8TZV, Ralph Whitehead, Grand Rapids, Mich.
W9FQU, Marcus L. Potter, Park Ridge, Ill.
W9OVE, Kermit A. Bateman, Two Rivers, Wisc.
W9VCN, Henry J. Adams, Milwaukee, Wisc.
K0CHW, Martin Y. Diamond, Detroit Lakes, Minn.
WØPHQ, Glenn E. Greene, Newton, Iowa
KØUOX, David A. Guthrie, West Liberty, Iowa
WØVOF, Peter W. Streeter, Kansas City, Mo.
EI5G, P. T. Daly, Dublin, Ireland
KA2RL, Richard L. Davis, San Francisco, Calif.
VE3DTQ, Russell H. Davidson, Collingwood, Ont., Canada
VE3JE, Fred Swart, Brockville, Ont., Canada
ZL2ABJ, L. Gilchrist, Napier, New Zealand

15th V.H.F. Sweepstakes, Jan. 6-7

Don't Miss This Biggest V.H.F. Activity of the Year

ALL VHF'ERS, get ready for the biggest V.H.F. operating workout of the year . . . the 1962 V.H.F. Sweepstakes. This contest really makes the v.h.f. headlines every January and this time will start, as always, at 1400 (2:00 P.M.) local standard time on Saturday, January 6, 1962, and end at midnight local time Sunday, January 7. Contacts count only when the contest is in progress at both ends of the QSO.

The rules are the same as last year, so join in the fun by calling "CQ Sweepstakes" or answer such a call. Then exchange the information as shown in this announcement. Remember, that unlike the V.H.F. QSO Parties, in the Sweepstakes sections count only once no matter what band they're worked on, although you *can* work the same station again on different bands for contact points. Example: W1HDQ works W1FZJ on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only *one* section multiplier. So bandhopping will increase your score.

In scoring, the multiplier is the number of sections worked *plus ten*. Each complete exchange

Follow this log form. You may get these log forms free by writing to ARRL. This also is an example of how to score.

SUMMARY OF EXCHANGES ARRL V.H.F. SWEEPSTAKES CONTEST

STATION...W1AW..... CLASS LI:.N.S..... ARRL SECTION....CONN.....

	SENT (1 point)						RECEIVED (1 point)							
BAND Mc	NR	STN	CK-RST	Sec-tion)	EST TIME	DATE (Jan)	NR	STN	CK-RST	Section	TIME	DATE (Jan)	Nr. diff. Secs as wkd	POINTS
50	1	W1AW	59	CONN	1402	6	1	W1RJA	59	CONN	1403	6	1	2
	2		59		1404		1	W1HDQ	58	CONN	1405			2
	3		57		1410		5	W1QXX	56	EMASS	1410		2	2
	4		46		1417			K1CXX						1
144	5		58		1635	↓	21	W1RJA	58	CONN	1635	↓		2
50	6		57		1012	7	98	W3HYJ	57	EPA	1014	7	3	2
	7		56		1017		56	VE3DIR	56	ONT	1018		4	2
					1205		19	K1CXX	56	ME	1206		5	1
144	8	↓	59	↓	1608	↓	176	W1AQE	58	EMASS	1610	↓		2

(Enter below on last sheet used)
Summary: Bands used....50,....144..; Nr. QSOs..8...; Nr. diff. Sections wkd..5.....
Total Hours operation..2....; Input power.....watts; Trans. tube line-up.....
.....
Receiver..... Antenna.....
Number & names of operators having a share in above work.....
Claimed Score:..16.....contact points (maximum of 2 per QSO) X multiplier.....15.....
(number of different ARRL sections worked plus 10) = ...240.....(Total Score)

Participating for club award in the .....(name of club), of which I am a member.

I hereby state that in this contest I have not operated my transmitter outside any of the frequency bands specified on my station license, and also that the score and points set forth in the above summary are correct and true.

....
Signature Call Address

EXPLANATION OF V.H.F. SS CONTEST EXCHANGES

Send Like a Standard Msg. Preamble, the.....NR		*Call*	*CK*	*Place*	*Time*	*Date*
Exchanges	Contest numbers 1, 2, 3, etc., a new NR for each station worked	Send your own call	CK (Readability and strength or RST of station worked)	Your ARRL section	Send time of transmitting this NR	Send date of QSO
Sample	NR 1	W1AW	59	CONN	1402	JAN 6

counts two points. Here is a scoring sample. Suppose W3HYJ made 100 contacts in 17 different sections:

100 QSOs
×2 (if all SS data exchanged in both directions)
200 (QSO points)
×27 (17 sections plus 10)
5400 (claimed score)

Top scorer in each section earns a certificate. In sections of three or more Novice entries, top scorer gets a special Novice certificate. The biggest boom to activity is the club competition. You may also credit your score to your club for separate club aggregate listing (total of all club members scores) . . . with an engraved cocobolo gavel to the club with the highest total, and a certificate to each club's top scorer. Here's a good club project . . . get out your gang to help the club score. Make sure logs are clearly marked: "Participating for club award in the..... (club)."

You can get the log forms as shown in this announcement simply by writing to the ARRL Communications Dept., 38 LaSalle Road, West Hartford 7, Conn. Let us know how many you need. Logs must be postmarked by February 3 to be eligible for score listing and awards.

Rules

1) *Eligibility:* Amateur operators in any ARRL section (see page 6) operating at home, or mobile or portable *under one call* on or above 50 Mc. are invited to take part. Yukon-N.W.T. (VE8) counts as a separate section.

2) *Object:* Participants will attempt to contact as many other stations in as many ARRL sections as possible.

3) *Contest Periods:* The contest starts at 2:00 P.M. your local time, Saturday, Jan. 6, 1962, and ends at midnight, Sunday, Jan. 7, 1962. Contacts between stations in different time zones can be counted only when the contest period is in progress in both of the zones concerned.

4) *Exchanges:* Contest exchanges, including all data shown in the sample, must be transmitted and receipted for as a basis for each scored point.

5) *Scoring:* (a) Contacts count *one point* when the required exchange information has been received and acknowledged, a *second point* when exchange has been completed in both directions.

(b) Final score is obtained by multiplying total contact points by the sum of different ARRL sections worked (the number in each of which at least one SS point has been credited) plus 10.

6) *Conditions for Valid Contact Credit:* (a) Repeat contacts on other bands confirmed by completed exchanges of *up to two points per band* may be counted for *each different station* worked. (*Example:* W1HDQ works W1FZJ on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only *one* section multiplier.)

(b) Cross-band work shall not count.

(c) Portable or mobile station operation under one call, from one location only, is permitted.

(d) A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest period.

(e) Contacts with aircraft mobiles cannot be counted for section multipliers.

7) *Awards:* Entries will be classified as single- or multi-operator, a single-operator station being defined as one manned by an amateur who neither receives nor gives assistance to any person during the contest period. Certificates will be awarded in each ARRL section to the top-scoring amateur in the single-operator classification. In addition, a certificate will be awarded to the top Novice in each ARRL section where *at least three* such licensees submit valid contest logs. Multioperator work will be grouped separately in the official report of results in *QST*.

When three or more individual club members compete and submit logs naming the club with which they are identified, an ARRL certificate will be issued to the leading club member. When less than three individual logs are received there will be no club award or club mention.

A gavel with an engraved sterling-silver band will be offered the club whose secretary submits the greatest aggregate score, provided such scores are confirmed by receipt at ARRL of the *individual contest logs* from such members. Only the score of a bona fide club member, operating a station in local club territory, may be included in club entries. Claims from federations, radio club councils, or other combinations of radio clubs, will not be accepted, nor can special memberships granted for contest purposes be recognized.

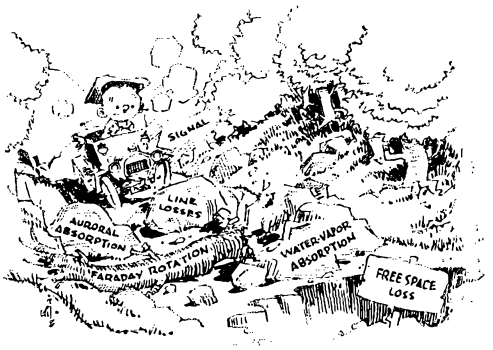
8) *Conditions of Entry:* Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

9) *Reporting:* Reports must be postmarked no later than Feb. 3, 1962, to be considered for awards. QST

FEEDBACK

If you would know whether people read Strays, just make a fairly obvious error and sit back and await the deluge. We made the necessary slip in the Stray relating to the formula for a parabola, in September *QST*, page 37. The formula given therein is correct, but so also is the formula that this Stray was supposed to have corrected. It all depends on how you define p. Both formulae, $Y^2 = 2px$ and $Y^2 = 4px$, may be found in various texts, depending on whether p is used to identify the distance from the focus to the curve, or the focus to the directrix.

Our apologies to W1TQZ, who was as right as could be in his article in April *QST*, when he used the first formula. Incidentally, he has been doing further work on the feed system, and has made minor structural changes in the reflector as the result of a year's experience with the antenna system in rough weather. He may have more for interested readers before long.



The preceding article ("Space Communication and the Amateur," November 1961 QST) showed that communication by means of some medium in outer space is essentially a signal-to-noise ratio problem. Taking it from there, the author surveys the questions of propagation vs. frequency active vs. passive satellites, antennas and tracking, and other factors that bear on getting a reliable signal back from space vehicles.

The Mechanisms of Space Communication

Propagation, Satellites, Antennas and Associated Equipment

BY RAPHAEL SOIFER,* K2QBW

Last month we discussed the all-important role of the signal-to-noise ratio in determining system performance parameters — in plain language, whether or not the thing will work. We found that the highest possible s.n.r. is always desirable, since it will make the system more reliable and versatile. From a qualitative study of the various noise forms affecting amateur space communications, we decided that it would be best to conduct such work on frequencies above 1215 Mc.

We turn now to a discussion of the second component of the signal-to-noise ratio, the received signal power. Let us see how, in a space communication system, the transmitted signal comes to arrive at the r.f. amplifier input of the receiver. In our generalized system, the signal generated by the transmitter is attenuated by the transmission line, concentrated (that is, from a system standpoint, amplified) by the transmitting antenna, partially absorbed in the atmosphere, rotated in polarization in the ionosphere, attenuated all along by free-space path loss, relayed by the relay point in space, rotated once more in its return through the ionosphere, absorbed some more in the atmosphere, amplified by the receiving antenna, and attenuated by the receiving transmission line. Sort of makes you happy you aren't a signal, doesn't it?

Without specializing for the moment, let us see how we can exploit the foregoing obstacle course to our best advantage — namely, to squeeze the most signal power out of the system and thus raise the s.n.r.

Line Losses

First to come to mind are the two line losses. There are various measures we can employ to reduce these. For one thing, we can use properly-matched sources and loads to insure that the s.w.r. on the line is essentially unity. For another, we can keep the transmission line as short as possible, because line loss increases with line length. Third, we can use line with the lowest possible loss per unit length. This rules out the popular flexible coaxial cables. For the frequencies with which we are concerning ourselves waveguides are practical, though expensive.

The theory behind transmission line loss per unit length is beyond the scope of this discussion — except to make the blanket statement that all means should be explored by the amateur to reduce his line losses. Material on microwave (and u.h.f.) power transmission is plentiful in most libraries, and should be read by anyone planning serious work in space communication.

Faraday Rotation

Next to come to mind are the two wave rotations. These are perhaps easier to eliminate than to explain. Briefly, it has been found that when an electromagnetic wave passes through a highly ionized medium — such as the ionosphere — in the presence of a magnetic field — such as that of the earth — its polarization rotates. With conventional linearly polarized antennas, this results in a cross-polarization loss similar to that observed when a vertical is used in working a station equipped with a horizontal beam.

There turns out to be a rather sneaky way of eliminating "Faraday rotation" loss, as it is known. If one transmits a signal in which the polarization is continuously rotating, and designs a receiving antenna to accept such a rotating wave without loss, then any rotation induced in transit will have no effect whatever. Such a wave is called "circularly-polarized." One way to generate and receive one is to use the helix type of antenna. This is in fact standard procedure in many industrial space-communication and radar tracking projects, and could be adopted by amateurs with little difficulty.

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

An interesting feature of a circularly-polarized wave is that when it is reflected, as from the moon or a satellite, its sense of rotation — that is, whether it is rotating clockwise or counterclockwise — is inverted. This means that for *passive* communication systems, the receiving helix must have a left-hand winding if the transmitting helix has a right-hand winding, or vice versa. Screwy, aren't they?

The Atmosphere

Atmospheric absorption, which accounts for two more terms in the total path loss, affects mainly the higher end of the radio spectrum. Such losses as affect the amateur service occur in the ionosphere from auroral absorption, and in the troposphere from water-vapor and oxygen-line absorption.

The same auroral ionization clouds which greet v.h.f. men with thoughts of DX bring no cheer to us, for we are trying to get signals *through* them, while they persist in absorbing and reflecting. Although their effect is serious at v.h.f. and lower u.h.f., by 1215 Mc. the clouds are relatively transparent and cause little difficulty.

Tropospheric absorption, on the other hand, increases sharply beyond 10 Gc. (1 Gc. = 1000 Mc.), and is a serious problem in this frequency range. For example, our amateur band 21-22 Gc. comes right at the peak of the water-vapor absorption curve, making it one of limited usefulness for space work when compared with the next lower decade of frequency. Absorption continues at a high level throughout the "above 30 Gc." range. This absorption effect causes us to place an upper limit on our optimum range of frequencies suitable for amateur space communications at 10.5 Gc., just before the sharp rise in water-vapor attenuation. The five amateur bands in our optimum range of 1.215 to 10.5 Gc. contain a total spectrum of some 1210 megacycles, which should be adequate for years to come.

Incidentally, the reader is warned that there is a tendency among engineers to refer to transmission line and atmospheric signal losses as a form of noise. The reasoning behind this is simple: Inasmuch as the s.n.r. alone determines performance parameters, we can treat a given amount of signal attenuation and consequent s.n.r. reduction as if the reduction were caused by the introduction of an equivalent amount of noise. This equivalent noise is expressed as an equivalent noise power, or sometimes as an equivalent noise temperature (remember kTB!) Although we will continue to treat them as signal attenuations, the reader will undoubtedly see these equivalent noises in his further reading, and as long as he recognizes these shifts in nomenclature for what they are, he should encounter no trouble.

Wave Spreading

Free-space loss is next on our agenda. This is derived from the law that the power intercepted per unit area from an electromagnetic wave propagating from a point source varies as the inverse square of the distance from the source. In our case, one can show that the received signal power actually varies roughly as the inverse fourth power of the altitude of the relay point.[1]

All right, the man says, keep the relaying point low, and this loss will be minimized. This is fine, except for the following catch: We recall that microwave signals propagate in straight lines; therefore, we have to have a line-of-sight path from both stations on the ground to the relay point in space. If the two stations are moved farther and farther apart, the altitude of the relay point must be increased, because of the curvature of the earth, so it can continue to "see" both stations. This increased altitude, while resulting in increased range, must also result in increased free-space loss. Thus, one can easily show that range, too, is a function of the system s.n.r. The higher the s.n.r. designed into the system to start with, the farther the relay point can be pulled away from the earth before the s.n.r. dips below the required minimum.

There is another catch as well: The ground station not only must "see" the relay point, it must "see" it at an elevation angle sufficiently high so that waves can be propagated to it with a minimum of effects caused by low radiation angles.[2] This, of course, puts a further limitation on the range of the system here on earth.

Antenna Gain

This leaves the antenna gains and the relaying operation itself. The desirability of a high s.n.r. makes it imperative that the transmitting and receiving antenna gains be as high as possible. Since it is easier to obtain antenna gain at higher frequencies than at lower ones, the choice of a high operating frequency would be wise. This, too, supports the 1215-Mc. bottom figure of our optimum range.

In this optimum frequency range, the parabolic dish reflector reigns supreme as the highest-gain antenna obtainable. The larger the dish, the higher the gain. These dishes are, in general, at least ten wavelengths in diameter. Obviously, the more wavelengths across, the higher the antenna gain.

One factor is curious, though. Intercepted power is measured in watts per square meter, so the more square meters we have doing the intercepting, the more watts we will collect. Thus, although antenna gain is dependent on diameter in wavelengths, the receiving capture area depends on diameter in feet. Although a given dish will yield 6 db. more gain when the frequency is

[1] As we will say later, it actually varies inversely as the product of the squares of the satellite range from each station. This may be visualized as follows: Station A transmits a signal, decreasing in power as $1/R^2$ until it reaches the relay point. But in order for the signal to get to the receiver, it must again decrease as $1/R^2$ from the relay point back to the receiver. Mathematical approximation leads to the result that received power varies roughly as the inverse fourth power of the relay point altitude.

[2] This minimum radiation angle is totally dependent upon the terrain surrounding each station. Considering the typical horizon profile at an amateur station, an angle of seven to ten degrees should be adequate to secure clearance.

doubled, one must double the actual area of the dish to double its capture area.

Incidentally, there is nothing to prevent us from using a helical driving element at the focal point of the parabola, thus meeting our Faraday-rotation problem.

Parabolic dishes produce an extremely narrow beam of radiation. Indeed, this is true of any high-gain antenna. This brings up a nasty question: Suppose the beam is not perfectly aimed at the relay point? If so, the effective antenna gain will be far lower than the gain which would result if the aiming were perfect. This raises the important subject of tracking, which we will defer until a little later.

The Relay

We now come to the crucial relaying operation, which is in a sense the reason for this entire business. This may take the passive form of a reflection, as in moon bounce, Echo I, and satellite scatter. Alternatively, it may take the active form of an actual retransmission of the received signal in flight, such as SCORE, Courier, and some of the proposed OSCAR systems.

In the first group, the relay point simply acts as a mirror to reflect the signals back to earth. The only special losses incurred here are in reflectivity, or the percentage of the signal striking the surface which actually is reflected, and edge diffraction. In the case of a spherical object, edge diffraction becomes important only when the wavelength of the transmitted signal is comparable, within an order of magnitude, with the diameter of the reflecting body.

An approximate equation for received signal power from this type of relay, neglecting Faraday rotation and atmospheric absorption, is

$$P_r = \frac{G_t G_r \lambda^2 P_t}{(4\pi)^3 R_1^2 R_2^2 G_L} Cs$$

where: G_t = Gain of transmitting antenna.
G_r = Gain of receiving antenna.
λ = Wavelength.
R_1 = Slant range of satellite to transmitting station.
R_2 = Slant range of satellite to receiving station.
G_L = Factor to include effect of transmission-line losses.
C = Reflectivity of relay point.
s = Cross-sectional reflecting area of relay point.
P_t = Power transmitted (measured final-amplifier output).

When all quantities are expressed in correct units and converted to logarithmic form, this equation will yield a corresponding equation in decibels. The three passive systems considered below are the same except for the factors C and s. These vary with the specific system used.

Passive Reflectors

Because of the special nature of the material used in man-made passive reflectors, the reflectivity C is essentially unity. For satellites such as the Echo series, it is actually 98 per cent at 4 Gc. (4000 Mc.). The effective cross-sectional area s varies with the particular satellite in use. For a spherical satellite, it is given by πr^2. In the case of Echo I, s equals 925 square meters.

The reflector does not have to be spherical. For example, in the case of a flat reflector, the area s is

$$\frac{4\pi A^2}{\lambda^2}$$

where A is the area of the plate. The large increase over the sphere results because a flat plate is extremely directional in its reflective qualities. Thus at 3 Gc. a 200-foot-diameter circular plate would actually exhibit 70-db. gain over Echo I in the same orbit, providing the plate were always turned precisely toward the earth. Its main deficiency, however, is the extreme range limitation incurred by so directional a reflector. As a consequence of the coplanar and equal-angle reflection laws, signals reaching such a flat reflector from a station on Earth would return to Earth concentrated over a relatively small geographical area. The location of this area would be totally beyond the control of the operators, but would depend on the location and orientation of the flat plate. Spherical reflectors, with their omnidirectional patterns, do not share this difficulty.

Orbital Scatter

A system which has been proposed recently, though not precisely passive reflection, may well be discussed here. It has been shown that a large number of randomly oriented half-wave dipoles will produce an effective scattering cross-section of quite large proportions. For example, ten billion of these dipoles within the intersecting volume produced by the beam patterns of the ground stations would give 43-db. gain at 3 Gc. over Echo I, assuming that the dipoles were at equivalent altitude, and of ten microns diameter.[3] Their effective area Cs would then be about twenty million square meters. If enough of these dipoles can be put into orbit to assure a band of uniform "dipole density" surrounding the entire earth, we could then do away with tracking so long as we aim at the band. A related system of "orbital scatter" is currently being investigated at the M.I.T. Lincoln Laboratory.

Moon Bounce

This is really a special case of passive reflection. The reflectivity of the moon is about seven per cent at 440 Mc.[4] Since the decibel is a logarithmic unit, the error introduced will be small indeed if we carry this figure up into at least the lower part of our optimum range. Inasmuch as the diameter of the moon is 2162 statute miles, the effective Cs it presents is about 670 billion square meters. Using these figures in

[3] I am indebted to F. E. Bond, C. R. Cahn and H. F. Meyer, all of Thompson Ramo Wooldridge, Los Angeles, for the quantitative figures used in this section, and to W1OUN for the reflectivity figure in the following section.

[4] For additional information, see Dyce, "The Appearance of the Moon at Radio Frequencies," *QST*, May, 1961.

our equation, it can be shown that moon bounce actually produces stronger received signals, for the same equipment, than does Echo I.

Satellite Scatter

We know beyond reasonable doubt that earth satellites are among the causes of signal-strength enhancements, and hence among potential supporters of communication, in the 21-, 28-, and 50-Mc. bands. In fact, such communication has already been conducted.[5] However, it must be admitted that we as yet do not entirely understand its mechanism.

Returning signals usually possess characteristics suggesting that they have been reflected incoherently, hence the name "satellite scatter." The *effective* cross-sectional area A_s in our reflection formula has, for satellite scatter, been found to be dependent upon many factors, including some unknowns. Several experimental determinations of this quantity have been made,[6] with the result that we now know typical values to run in the order of a square kilometer at 21 Mc., and to decrease rather sharply with increasing frequency. This rather high value has led many to speculate that it may be due to sporadic interaction between the satellite and the ionized layers through which it passes. A number of investigators have come up with theories about the nature of this interaction, but we do not as yet have sufficient data to discriminate between them. Nevertheless, amateurs are proceeding at full steam on an empirical basis, with considerable success.[7]

The fact that the frequencies on which satellite scatter work is conducted differ widely from our optimum range should not be of too great concern, since what we have here is a case of compensating variables. While it is true that noise levels and antenna problems at 20–50 Mc. exert a downward influence on the s.n.r., the frequency-dependent effective area associated with satellite scatter pulls the s.n.r. far enough in the right direction to compensate. The ever-present ratio has reared its head once more.

Active Repeaters

Active repeater satellites use receiver-transmitter systems to retransmit received signals on a different frequency back to earth. The corresponding equation for this type of satellite is as follows:

$$P_r = \frac{G_t G_r \lambda^2 P_t}{(4\pi)^3 R_1^2 R_2^2 G_L} \cdot \frac{K g^2 \lambda^2}{4\pi}$$

where all symbols have similar meaning to their passive-reflection counterparts with the following additions:

K = Power gain of repeater circuit in satellite.
g = Antenna gain of satellite transmitting and receiving antennas (assumed equal for both).

[5] Soifer, "High-Frequency Satellite Scatter," *QST*, July, 1960.

[6] For example, see Kraus, Higgy and Crone, "The Satellite Ionization Phenomenon," *Proc. I.R.E.*, April, 1960.

[7] "The World Above 50 Mc.," May, 1961.

This equation is used in the same way as the one given earlier.[8] Because of the highly particular nature of each repeater system, details of satellite circuitry cannot be discussed here. An example of a hypothetical "ultimate" system will be presented in a subsequent article.

Doppler Shift

One question we have not yet considered stems from the fact that, in general, an orbiting reflector is a moving body. Because of the Doppler effect, this motion will result in a frequency shift in the received signal.[9] The Doppler shift will vary with relative target velocity, and is approximately given by

$$\Delta f = \frac{f_t(V_{r2} + V_{r1})}{c},$$

where: Δf is the approximate Doppler shift in the same units as f_t
V_{r1} = Relative velocity of target with reference to transmitter.
V_{r2} = Relative velocity of target with reference to receiver.
c = Velocity of propagation (3.00×10^8 meters/sec).

The relative velocities can be computed by trigonometry.

Since the relative velocities vary with time, one can see that the received frequency will vary with time. Provision must be made for this variation when designing the bandwidth of the receiving system. The bandwidth revision must always be upward, thereby increasing the noise in the passband. However, the possibility does exist of alleviating this condition. If we know the satellite position relative to the transmitting and

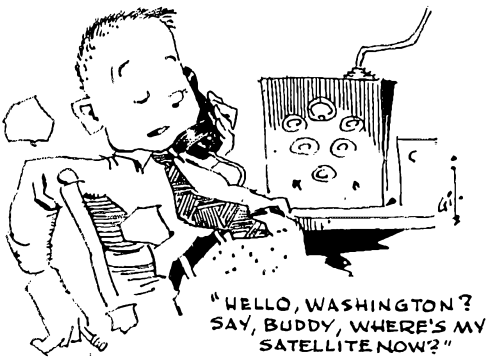
[8] The factor K is not necessarily a constant, but simply expresses the relationship between the power transmitted by the satellite and that received by it under the conditions existing at the time.

[9] For a description of the Doppler shift, see Garner and Wells, "Ground Support for Project OSCAR," *QST*, May, 1961.

receiving stations, as we must in order to aim our antennas, this information could be used to obtain the relative velocity at any instant. This in turn can be used to automatically adjust the transmitter frequency and receiver h.f. oscillator frequency so as to counterbalance the Doppler shift. It is easier said than done, but it does offer a direction of attack on the problem.

Tracking

In our discussion of factors contributing to the signal component of the s.n.r. we tacitly assumed that the transmitting and receiving antennas were aimed precisely at the relay point. In the case of some systems, this is a snap. Were we to have a dipole band, for instance, the antennas could be left fixed — right at the band — since the band position stays constant relative to



the Earth. Similarly, a satellite in so-called 24-hour orbit would present no problems. The antenna would have to be aimed but once. In moon-bounce, the problem is not quite so simple, but it can still be solved easily, since the moon moves slowly across the sky in a manner ideally suited to mechanical simulation at very low cost.[10]

It is plain that the above systems enjoy a great advantage over the other microwave techniques (tracking requirements for satellite scatter have not yet been determined, but appear to be simple) inasmuch as tracking, at its worst, can be an exceedingly difficult task. Nevertheless, we are not apt to have 24-hour amateur-band satellites in the near future, and many plans (notably OSCAR) are going ahead which will involve some tracking. So we will go ahead ourselves and explore the problem, in the hope that it will not be necessary to solve it.

A tracking system can be divided into three parts: finding where the relay point is (we will call this the "finder"), processing the information received from the finder into useful form (the "interpreter"), and using the processed information to aim the antenna (the "sharpshooter").

The sharpshooter is a rather simple-minded chap. Unless we give him a feedback loop back to the finder (which is extremely difficult in amateur practice), he cannot tell right from wrong. He simply does as he is told. In addition to being a simpleton, he also has a stubborn streak. That is, if the finder, through the interpreter, should tell him to move too fast in a given direction, he will not do it. This phenomenon is called the "maximum slewing rate limit," and is of greatest concern to radar designers. Sharpshooters generally consist of an arrangement of synchros and servos which drive an antenna rotator — not, however, the type used to drive that tribander on your roof. In a tracking system, the rotator must turn not only horizontally but in a vertical plane as well. That is, the antenna must move not only from side to side, but also tilt upwards. What is more, the rotator must be capable of instantaneously variable speed so as to follow the information supplied it by the interpreter. A fixed-speed motor simply will not do. Such rotators are expensive, and moreover do not *ideally* exist even in commercial practice. This is another area in which development work by amateurs is needed, to bring the cost down to a level which the amateur can afford.

Since finders and interpreters must of necessity be interrelated, we will discuss them together. Perhaps the simplest type of finder is an optical telescope mounted on the antenna. Theoretically, at least, one just aims the telescope at the relay point, and that does it. The interpreter would be the human observer looking through the telescope. While this method may work for experiments, there is little likelihood of its ever coming into use for meaningful communication. The reason for this is reliability. In our temperate American climate, at least in the Northeast, there are on the average 250 days during the year when the sky will be too clouded over to permit use of the optical technique. In addition, particularly with active repeater satellites, there will be only a small part of the day during which the satellite will be visible at all, because of astronomical considerations. Even with the brilliant passive reflectors, the satellite will be invisible when it is in the Earth's shadow, perhaps half the time. Assuming perfect communication reliability (ha!) the percentage of time for which an optical tracking system will yield useful results is probably around ten per cent. This is, of course, far too low — space communications, to be useful to us, must at least be comparable in reliability with our h.f. bands. Clearly, then, optical tracking will not do. Such reliability is achieved only with automatic electronic tracking.

Perhaps the most conventional of the electronic systems — i.e., radar — must be considered out of the question for amateur use. Construction of a satellite-tracking radar is far beyond reach of even the wealthiest club, and it is highly dubious whether the local surplus store will ever feature an FPS-16. An alternate system, used in many commercial installations, revolves around an interferometer which measures the phase differences along two intersecting baselines of received signals from a special transmitter on board the satellite. In the more sophisticated versions the interferometer takes the form of a suitably cou-

(*Continued on page 168*)

[10] LeBaron, "A Home-Built Parabolic-Type Reflector for 1296 Mc.," *QST*, April, 1961.

Amateurs at the Boat Races

Success on Two Meters

BY JON J. O'BRIEN,* W6GDO

THE annual Stockton-to-Colusa-and-return outboard motorboat race was held this year over the week end of July 29–30. This is a 319-mile race held every year in which the boats go from Stockton to Colusa one day and return the next.

Communications necessary to a boat race of this type include passing of official times from one race terminal to the other; reporting of boat progress so that each boat's "pit crew" can rendezvous with the boat if it needs help; handling of emergency traffic to ambulances, sheriff's office or others; liaison with Coast Guard Auxiliary boats and handling of traffic as necessary; and in general furnishing race progress information to such interested parties as the press and sponsors.

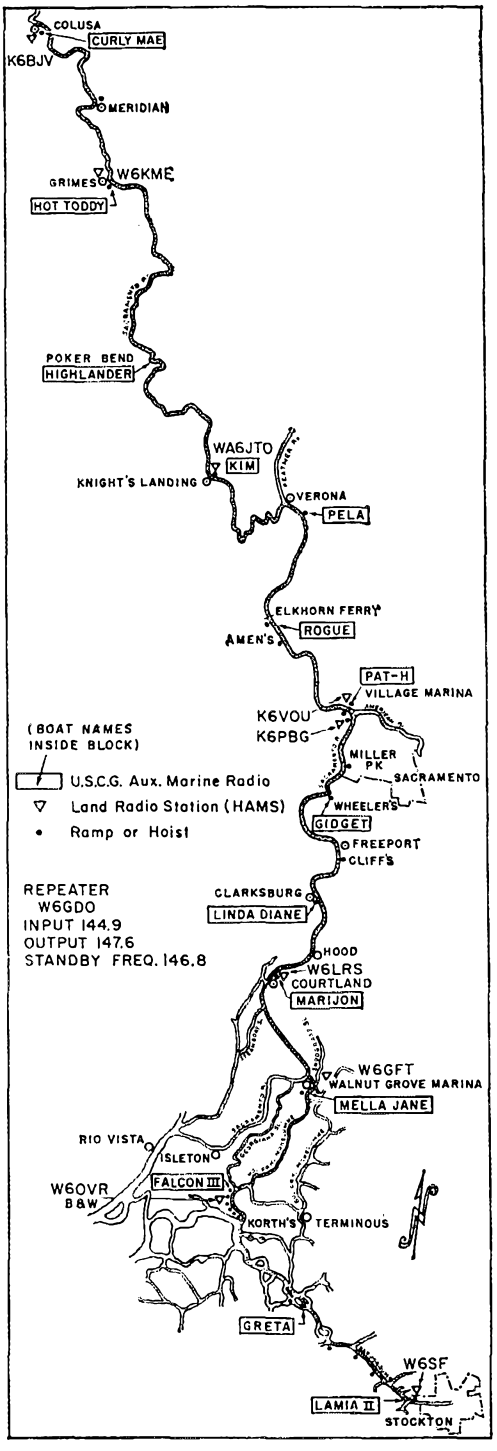
Because 75 meters in previous years proved unsatisfactory, communications in 1961 were handled entirely on two meters. An automatic repeater station was established on 2800-foot Mt. Vaca, west of Sacramento, providing line-of-sight communication with all race points. The repeater was in a building in which K6QIF maintains commercial v.h.f. and u.h.f. equipment.

Two-meter equipment was set up at intervals along the race course, with stations at Stockton, B & W Harbor, Walnut Grove, Courtland, two locations at Sacramento, Knights Landing, Grimes and Colusa (see map). Perfect communication was maintained between all stations transmitting into the repeater on 144.9 Mc. and receiving the repeater on 147.6 Mc. Thus, everyone was in instant contact with all other stations, permitting accurate progress information at all times on any boat.

The stations were located so as to be accessible to U. S. Coast Guard Auxiliary boats which were in contact with each other on the marine frequency, but usually were able to contact only the next boat. Information was relayed from boat to boat until it reached a boat near an amateur station, whence it was dispatched via the amateur network.

The Mt. Vaca repeater used a surplus Collins 51M-6 airport receiver into a Gonset Communicator III transmitter. The receiving antenna was the one described on p. 69 of August, 1961, *QST*. The transmitting antenna was an "extended double zepp." The antennas were constructed by W6PIV. A "stovepipe" cavity was used on the front end of the receiver to minimize interference.

Those who participated in the boat race communications were *K6s* RBB SFJ UII VOU PBG BJV SRF BNB ENK HHD, *W6s* PJF SF OVR DKI GFT LRS MIW KME GDO, *WA6s* OXX JTO. W6ASH chased casual stations off the repeater input frequency. W6MIW drove several hundred miles Saturday checking the repeater



* 6605 Fifth St., Rio Linda, Calif.

(*Continued on page 176*)

September V.H.F. Party Summary

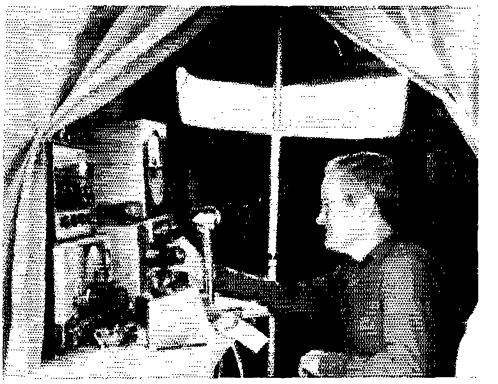
Rough Weather Knocks Down Activity and Scores

THE weatherman refused to cooperate with v.h.f. enthusiasts over the week end of September 16 and 17. The first sting of fall was in the air over much of the country, and even the stay-at-homes found the going in the September V.H.F. Party none too good. Cold windy weather doesn't provide much in the way of tropospheric bending, the great score-builder of many fall v.h.f. contests. Result: there are few new records to be found in the tabulation below.

Temperatures in Northeastern high spots dropped near freezing during Saturday night, and some Western mountaintoppers found it even worse. W7QPB/7, atop 10,800-foot Slide Mountain, near Reno, Nevada, had been in operation less than 4 hours when they were hit by one of the worst fall snowstorms on record. They departed in a hurry, and it was two weeks before they could get back up, with the aid of a 4-wheel drive vehicle, and rescue their gear. W6GGV/6 stuck it out on Goat Mountain, a 6121-foot elevation 100 miles north of San Francisco, but the temperature was on the wrong side of 40 most of the time, and rain and sleet were whipped across the mountaintop by 40 to 50 m.p.h. winds. With such conditions it is not surprising that scores and number of entries are off some from recent contest highs.

Still the scores and enthusiasm were of an order that would have been good for plenty of headlines a few years ago, and much credit for this must go to the hardy crews of the many portable stations. Of the 360 stations reporting, 68 were portables. W2PEZ/2, the station of the 6220 V.H.F. Club, operating from a mountain location near West Milford, N.J., worked 345 stations in 24 ARRL Sections on 50 Mc., 241 in 15 on 144, 28 in 8 on 220, 10 in 3 on 420, and 1 on 1215 Mc.; 625 contacts and 33,915 points, both highs for the country. Second spot was made by W2LWI/2, of the Dutchess County V.H.F. Society, with 461 contacts and 25,398 points. Their section multiplier of 51 enabled them to top K1OOR/1, the station of the King Philip Amateur Radio Society, who held forth on Mt. Greylock, the highest spot in Massachusetts. They worked 577 stations for 22,581 points.

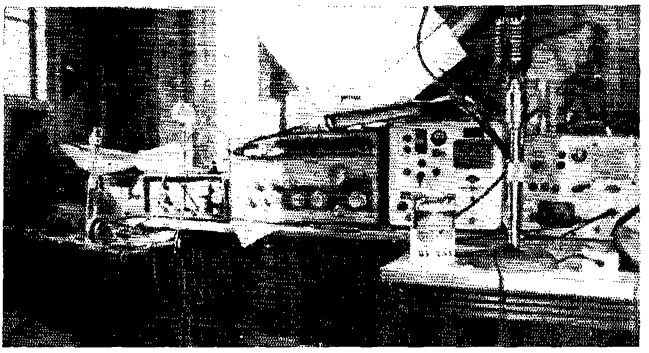
Stanley Smith, K3IPM, Philadelphia, worked 308 stations on 50 and 144 Mc., to post the country's second-highest single-operator score in the September V.H.F. Party, and win the E. Pa. Section Award.



WA2EBP, seen here operating the 2-meter setup of W2LWI/2, looks happy—and well he may be, for the Dutchess County V.h.f. Society placed No. 2 in the country, with 461 contacts and a multiplier of 51, for 25,398 points.

In the single-operator category, WA2BAH/2, E. N.Y. award winner, operating from a fine location near Schenectady, N.Y., worked 50, 144 and 220 Mc. for 250 contacts and a multiplier of 39, for 10,179 points, the highest score by one operator. K3IPM, Philadelphia, E. Pa. winner, made the most contacts, 308, but with a multiplier of 27 ended up with 8316 points. K8TOL, Cleveland, Ohio, also exceeded WA2BAH/2 in number of contacts, with 290, but his section total of 15 put him several layers down, with 4350 points This won the Ohio Section award by a good margin, however, and it is by ARRL Sections that honors and certificates are won in our v.h.f. contests.

A short sporadic-*E* skip opening Sunday afternoon helped the cause along, and enabled the best equipped and more alert 6-meter men to run up some nice multipliers. W5UQR, New Orleans, La., worked 110 stations in 24 sections on 6, and WØEAO/Ø, the Kansas City V.H.F. Club, caught 27 sections. This E_s works as a great geographical equalizer, helping operators in areas where the local activity may be limited to run up good scores by making the most of whatever skip comes along. Intensive effort on 50 Mc. exclusively resulted in awards being won in 17 ARRL Sections. K3HNP, 256-20-5120, was the leading 50-Mc.-only operator, though he was third in total score



This is just part of the gear used by the highest-scoring station in the West. Operating from 9000-foot Mt. Baldy, K6DBZ/6 used all bands from 50 to 3300 Mc. to work 361 stations for 5488 points. This is the second time that K6DBZ has shown the way in Southern California.

in his section, E. Pa. WA2CNJ took the NYC-LI Section certificate using 50 Mc. only. His setup is a bit unusual; the equipment is nothing extra (Gonset II, 5-element beam) but the antenna is atop a high apartment building at 11 Riverside Drive, New York City. A stone's throw from the Empire State building TV antennas, he probably doesn't worry too much about Channel 2 TVI, and that beam more than 600 feet above sea level didn't hurt him any.

Some very nice scores were made on 144 Mc. too. It is of interest to see that WA2CNJ on 50 Mc. and W2GOO, nearby E. NY, on 144 Mc. had almost identical scores. WA2CNJ: 212-16 3392; W2GOO: 205-16-3280. The latter made hay by frequent use of c.w. in chasing elusive sections on 144.

Participation set a farthest-north record this time, with KL7FLC at Ice Station Arlis II, north of Point Barrow, Alaska, coming through with 3 contacts: KL7AUV, VE8BY and VE6IP. VE8BY, Yellowknife, NWT, worked 5 stations in 4 sections: KL7FLC, VE6s IP and DB, W7EGN, and VE8PZ.

A surprising number of contestants managed more than 300 contacts, despite the poor conditions. These included W3WJC/3 375, W3JZY/3 331, W2JT/2 448, W1GB/1 338, W1BJ/1 373, K4VWH 325, K6DBZ/6 361, K2BJP/2 303, and the leaders already mentioned.

The bands above 1000 Mc. are coming to be more of a factor in the records of high-scoring stations all the time. Not all of this is the result of the APX-6 influence, either. Of the stations reporting, 14 used 1215 Mc. or higher bands. W3WJC/3 had gear for 3300 and 10,000 Mc. W1BJ/1 had a crystal-controlled 2C39 on 1296 Mc. W3CGV also was crystal-controlled on 1296. W6NLZ used 50, 144, 220, 420, 1215 and 2400 Mc. K6DBZ/6, the West's top-scoring station, used all these, and 3300 Mc.

Some random observations

Several 2-meter operators mention the needless voice QRM at the low edge of the band, making effective c.w. work all but impossible. Some choice section multipliers were lost this way.

W2GOO: "One v.f.o. sounded so bad that after its user called CQ on c.w. several other W2s were heard calling 'CQ aurora!'"

Never say die; K1OOR/1, driving to the last minute of the contest, picked up a new section multiplier, W8SFG, Ohio, on 2 meters 5 minutes before the end.

W8NOH: "Seems like someone always opens up the 6-meter band just for the contest — but sometimes you have to be keeping a close watch to reap any benefit!"

Youngest contestant? Could be 12-year-old Kenneth Howse, WN8AAC, who did right well on 145 Mc. in Detroit.

SCORES

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

ATLANTIC DIVISION

Eastern Pennsylvania

K3IPM 8316-308-27-AB
K3IUV 6110-218-28-ABCD
K3HNP 5120-256-20-A
W3BAO 2318-122-19-AB
K3JRO 1326-102-13-AB
W3ETB 1260-105-12-A
W3ARW 1218- 45-21-BCD
W3JXT 1008- 56-18-AB
W3NOK 935- 85-11-B
W3BKF/3 657- 73- 9-A
K3ISH 630- 35-18-A
W3MMV 432- 42- 9-BDE
W3BJG 360- 38- 9-ABC
K3HNG 96- 24- 4-A
W3WJC/3[1] (7 oprs.) 18,124-375-46-ABCE
W3PMG/3 (7 oprs.) 12,760-292-40-ABCD
W3YRT/3 (5 oprs.) 8928-225-36-ABC
W3QQB/3 (4 oprs.) 7752-223-34-ABC
W3OI/3 (6 oprs.) 7192-237-29-ABCD
K3EIH (9 oprs.) 5040-280-18-AB
W3JMP (W3JMP, K3JPL) 3717-177-21-AB
K3OKW (7 oprs.) 2205-105-21-AB
K3KYK/3 (11 oprs.) 1968-164-12-AB

Md-Del-D.C.

K3HFV 3969-144-27-ABC
W3CGV 3186-102-27-ABCDE
K3LNZ 2646-147-18-AB
W3NG 2610-141-18-ABC
K3AZH 1680-105-16-AB
K3CPA 408- 51- 8-AB
W3TFA 402- 67- 6-AB
W3HB 399- 57- 7-B
K3IJU 276- 46- 6-A
KN3OSZ 190- 38- 5-B
K3OWX 168- 28- 6-AB
K2UOP/3 136- 34- 4-AB
K3EJE 136- 34- 4-A
K8GTL/3 132- 44- 3-B
K3CRD 96- 24- 4-B
W3CPM 90- 30- 3-B
W3MSR 88- 22- 4-B
KN3NTA 78- 39- 2-B
K3GMB 69- 23- 3-A
K3OBU 45- 15- 3-B
K3NOG 42- 21- 2-A
K3EJF 36- 12- 3-AB
W3AHQ 20- 5- 2-C
K3LLR/3 18- 9- 2-A
W3JZY/3[1] (K3AKK, W3BPZK SFY) 11,254-331-34-AB
W3GCO (W3GCO, K3JZS) 2193-129-17-AB
K3MOY (K3s KST MOY NMK) 536- 67- 8-A

S. New Jersey

W2REB 2728-124-22-AB
W2ZUL 1768-104-17-AB
W2BLV 640- 32-16-BD
W2ESX 540- 45-12-B
WV2UOJ 27- 9- 3-B

Western New York

K2ERQ[2] 2352-112-21-AB
K2YCO 1918-137-14-AB
WA2VCM 1212-101-12-AB
K2GUG 1128- 94-12-ABC
WA2KVN 990- 90-11-AB
K2ZRX 960- 80-12-A
K2PBU 780- 60-13-AB
WA2KND 483- 69- 7-A
K2DBB 328- 41- 8-A
W2ROA 292- 73- 4-B
W2RTG 252- 42- 6-B
WA2OPK 160- 40- 4-A
WA2ILF 150- 50- 3-A
W2UCZ 150- 25- 6-A
WV2STX 102- 51- 2-B
WA2GCF 93- 31- 3-A
K2KWK 48- 48- 1-A
K2GF 18- 18- 1-A
WA2MQP 14- 14- 1-B
K2RRM/2[1] (8 oprs.) 8178-282-29-AB
K2PQZ/2 (10 oprs.) 5936-211-28-ABC
W2UPT/2 (6 oprs.) 5670-199-27-ABC
WA2FQV/2 (WA2FQV, W2BKH, K2YDP) 3197-136-23-ABC
K2ZBU (K2s QKU ZBU, W2EJZ) 915- 61-15-AB
K2DNN/2 (K2s DNN HNL) 165- 33- 5-A

Western Pennsylvania

W3BWU 2992-132-22-ABCD
K3CHC 1802-106-17-AB
W3CSA 160- 32- 5-AB
W3FUH 85- 17- 5-B
KN3PGN 84- 28- 3-B
K3ILD 21- 7- 3-B
W3UHN 10- 10- 1-A
W3UCA/3[1] (7 oprs.) 4984-173-28-ABC
K3BBO/3 (K3s BBO PHD) 3410-153-22-ABC
K3LLI/3 (K3s IUZ LLI, K4KWW) 3048-127-24-AB
K3HKK/3 (12 oprs.) 2550-150-17-AB
W3KWH (8 oprs.) 1484-100-14-ABC

CENTRAL DIVISION

Illinois

K9DWR 1534-115-13-ABC
W9DJ 736- 92- 8-AB

K9YXX 702- 78- 9-AB
K9BBN 525- 75- 7-AB
K9RVG 320- 80- 4-B
K9IBG 316- 79- 4-B
WN9AAM 240- 60- 4-B
K9LOA 165- 33- 5-AB
K9SLH 155- 31- 5-A
K9RBE 99- 33- 3-B
W9KLD 80- 20- 4-AB
KN9FBL 75- 25- 3-B
K9VBB (WN9AEN, K9VBB) 282- 47- 6-AB

Indiana

K9QCB 2472-206-12-AB
K9YCA/9 913- 83-11-A
K9MLZV 720- 88- 8-ABC
W9MHP 648- 79- 8-ABC
W9HPO 476- 68- 7-A
W9YDP 2- 2- 1-A
W9CSF/9[1] (13 oprs.) 3281-193-17-ABCE
K9YIA (4 oprs.) 2160-180-12-AB
K9SLQ (K9s MGI SLQ, W9AYW) 1390-139-10-AB

Wisconsin

K9WUI 1820-140-13-AB
W9FQ 248- 31- 8-AB
W9JOT 192- 48- 4-B
W9YT[3] 8- 4- 2-A
K9PJB/9 (K9s EYL PJB) 34- 17- 2-B

DAKOTA DIVISION

South Dakota

K9DEL 40- 8- 5-A
W9ENC 36- 9- 4-AB
W9FJZ 3- 3- 1-A

DELTA DIVISION

Louisiana

W5UQR 2800-112-25-AB

Mississippi

W5RCI 84- 9- 7-BC

Tennessee

K4VZL 816- 68-12-A
K4RIN 14- 7- 2-A
K4RUF (K4s CVA RUF) 868-124-17-A

GREAT LAKES DIV.

Kentucky

K4RZK 873- 97- 9-AB

Michigan

W8NOH 4032-160-24-ABD
K8QMX/8 2067-159-13-AB
K8HGZ 1605-107-15-AB
K8IXU 552- 69- 8-A
K8NGR 426- 71- 6-B
W8ZGW 240- 60- 4-B
K8GKX 117- 39- 3-A
W8CXS 75- 25- 3-AB
W8VRH 34- 17- 2-B
WN8AAC 32- 32- 1-B
K8SMC[1] (K8s JNE SMC) 1660-166-10-A
K8WPI (KN8C&H, K8WPI) 532- 76- 7-AB
K8IXH (K8s IXH SCD) 198- 66- 3-A

Ohio

K8TOL 4350-290-15-AB
K8NUE 3224-248-13-A
K8SSK 1458-162- 9-A
K8KXS 1280-128-10-AB
W8IXF 513- 57- 9-A
K8WYU 312- 52- 6-AB
K8PBE 282- 47- 6-A
K8ATQ 248- 62- 4-AB
K8RXD 32- 16- 2-B
K8MMM[1] (K8s MMM YVA) 6012-334-18-A
K8BLS (11 oprs.) 474-415-15-ABC
W8TXU (multioperator) 452-113- 4-AB

HUDSON DIVISION

Eastern New York

WA2BAH/2 10,179-250-39-ABC
W2GOO 3280-205-16-B
K2GXJ/2 2242-113-19-ABC
WA2ALJ 1995-110-18-ABD
WA2HAQ 238- 34- 7-AB
W2UKA 126- 21- 6-AB
W2LWI/2[1] (12 oprs.) 25,398-461-51-ABCD
W2KCE/2 (14 oprs.) 4137- 197-21-AB

N.Y.C. — L.I.

WA2CNJ 3392-212-16-A
WA2IKR 1400-140-10-B
W2SEU 1243-113-11-AB
K2PQY 876- 73-12-AB
W2KNG 872-109- 8-B
WA2PMW 560- 80- 7-A
K2DDK 396- 44- 9-B
WA2DTY 280- 35- 8-AB
WA2RCI/2 185- 37- 5-AB
WA2GGB 170- 34- 5-A
WA2OTN 87- 29- 3-B
WA2EUS 80- 16- 5-B
WA2CHP[1] (4 oprs.) 5250-250-21-AB
WA2KHW (WA2s DWL KHW) 2296-164-14-AB
WA2TIJ (4 oprs.) 816- 68- 12-AB

Northern New Jersey

W2GKR 2448-153-16-AB
W2DZA 1962- 87-18-ABCDE
WA2JAM 1469-113-13-B
WA2DHS 1452-132-11-B
WA2HFO 1313-101-13-AB
WA2JVO 718-103- 6-A
WA2BDP 264- 33- 8-A
WV2UUG 250- 50- 5-B
W2NTY 116- 14- 4-CDE
WV2SXP 81- 27- 3-B
WA2CCF 27- 9- 3-B
WA2UZH/2 3- 3- 1-B
W2PEZ/2[1] (10 oprs.) 33,915-625-51-ABCDE
W2JT/2 (12 oprs.) 17,460-448-36-ABCD
K2BJP/2 (14 oprs.) 8268-303-26-ABCD
WA2ANY/2 (4 oprs.) 6118-263-23-ABC
K2BBR (4 oprs.) 5751-213-27-AB
K2LNS (multioperator) 3766-269-14-B
WA2ALZ (4 oprs.) 2546-134-19-AB
K2BEV/2 (4 oprs.) 826-118- 7-B

MIDWEST DIVISION

Iowa

K9HBP 528- 48-11-A
K9ETX 330- 33-10-A

Kansas

W9YMG 1080- 68-15-ABE
K9GIC 915- 61-15-AB

Missouri

K9RMQ 498- 83- 6-AB
K9SBJ/9 469- 67- 7-A
W9EAO/9[1] (7 oprs.) 6670-239-29-AB
W9RVA (K9s KWJ, KWL, W9RVA) 350- 70- 5-AB
K9ZFK (K9s ZFK MUP) 126- 63- 2-A

Nebraska

K9SBV 2952-108-19-A
K9AB1 714- 51-14-A

NEW ENGLAND DIV.

Connecticut

W1MEH 5642-217-26-AB
K1PKQ/1 1331-121-11-B
W1YDS[8] 1152- 64-18-ABC
K1MNX 1023- 93-11-AB
KN1TKZ 592- 74- 8-B
W1AW[4][5] 585- 54-11-AB
W1MFT 330- 22-11-ABCD
K1PTK 245- 49- 5-B
W1HAX 75- 25- 3-AB
K1OAV 64- 16- 4-B
W1UCA 57- 19- 3-B
K1RGO 54- 27- 2-B
K1NFD 50- 10- 5-B
W1GB/1[1] (10 oprs.) 11,662-338-34-ABD
W1VMT/1 (5 oprs.) 1800-100-18-AB
K1OXW (K1s KR1 RLU) 195- 39- 5-B

Maine

K1NAY/1 990-110- 9-A
K1NTC 462- 66- 7-A
W1PLX/1 100- 20- 5-B
W1KBI/1 (W1s KH1 TLZ) 672- 56-12-B

Eastern Massachusetts

K1D1R 5319-197-27-AB
W1OOP 2492- 67-28-ABCDE
K1QHO 900-100- 9-A
K1AII 840- 42-20-AB
K1OOM[6] 276- 46- 6-A
K1GNC 204- 34- 6-B
K1QBV 108- 27- 4-B
K1CHY 66- 11- 6-ABC
K1MHC[1] (K1s PLX MHC) 2310-154-15-AB
K1OSG (4 oprs.) 1764-147-12-AB

Western Massachusetts

K1JIX[7] 6580-164-35-ABCD
W1HDQ/1 3992- 62-16-AB
K1JQT 510- 85- 6-A
W1UCB 45- 9- 5-AB
K1OOR/1[1] (10 oprs.) 22,581-577-39-ABE
W1BRF/1 (multioperator) 3358-146-23-AB
K1SGZ/1 (K1s DEU SGZ RKW) 960- 80-12-A
K3DLB/1 (K1GSK, K3DLB) 32- 8- 4-B

New Hampshire

W1FZ/1 3550-132-25-ABCD
K1OGR/1 2115-161-15-AB
W1UBH 840- 84-10-A
W1CTW 216- 24- 8-AC
K1KOB/1 1- 1- 1-A
W1BJ/1[1] (6 oprs.) 18,380-373-45-ABCDE
W1ALE (W1s FNO YQB) 2937-171-17-AB
W1GOM (K1OKX, W1FZS) 1610-115-14-AB
K1IZT/1 (5 oprs.) 770- 55-14-AB
K1KKK (K1s KKK JPH, KN1TOH) 287- 41- 7-AB

Rhode Island

W1AJR 2592- 73-32-ABCD
K1CRN 1820-130-14-B
K1JLE 720- 80- 9-A
W1FEO 50- 10- 5-B

Vermont

K1DRB/1 400- 50- 8-B
W1ENZ 48- 12- 4-A
W1UPJ/1 (8 oprs.) 5642-172-31-ABCD
W1JSM/1 (4 oprs.) 4060-137-28-ABC

NORTHWESTERN DIV.

Alaska

KL7FLC 9- 3- 3-A
KL7AUV 1- 1- 1-A

Montana

W7EGN/7 20- 5- 4-A

Oregon

W7HBH 95- 18- 5-ABD
W7ADR 42- 21- 2-A
W7ICS/7 (W7s ICS VTW, K7ELM) 220- 55- 4-AB

Washington

K7BRQ 600-109- 6-AB
K7JZP 324- 81- 4-AB
K7GKK 248- 62- 4-AB
W7YJE 99- 33- 3-A
K7QLC 23- 23- 1-A
W7ZSL 8- 8- 1-A

PACIFIC DIVISION

Nevada

K7QPB/7 (3 oprs.) 470- 42-10-ABC

Santa Clara Valley

K6HCP 1696-103-16-ABD
W6BDN 1020-102-10-AB

East Bay

K6RNQ 1221-103-11-AC
WA6NEL 486- 81- 6-A

San Francisco

K0GEY/6 354- 59- 6-B
K6VXI 160- 20- 8-AB
WV6PRS 156- 39- 4-B

Sacramento Valley

WA6GPI 354- 59- 6-B
W6PIV 322- 44- 7-ABD
WA6JDZ 308- 43- 7-ABD
W6GGV/6 (W6GGV, K6LLK) 5632-244-22-ABCD

San Joaquin Valley

W6FZA 336- 23-14-ABC

ROANOKE DIVISION

North Carolina

K4MHS 948- 79-12-AB
K4SWN 840- 84-10-AB
W4BUZ 308- 77- 4-B
W4ULX/4 296- 74- 4-AB
K4BEI/4 220- 44- 5-A
W4VHH 216- 27- 8-B
W4ACY 201- 67- 3-AB
K4YYJ 132- 44- 3-B
K4GPL 108- 54- 2-B
WN4CCK 98- 49- 2-B
WN4AIY 15- 15- 1-B

South Carolina

W4DEN 818- 53-16-AB
W4VIW 256- 31- 8-ABC
W4VRV 240- 30- 8-A
W4TLC 232- 27- 8-ABC
K4JQY 224- 28- 8-A

Virginia

K4LHB 1470-105-14-A
WN4ALX 88- 44- 2-B
W4GVQ 39- 13- 3-A
K4VWH (6 oprs.) 13,104-325-39-ABC
K4LJH/4 (K4s AJA LJH, W4DOE) 2280-120-19-AB

West Virginia

K8BLR 175- 25- 7-A

ROCKY MOUNTAIN DIVISION

Colorado

W0ISL 192- 48- 4-AB
K0TSD 114- 38- 3-AB
W0DKA 111- 37- 3-AB
W0DK/0 (4 oprs.) 84- 42- 2-A

New Mexico

K5UYF 1- 1- 1-A

SOUTHEASTERN DIV.

Alabama

W4TLV 65- 12- 5-BC

Eastern Florida

W4LIP 1302- 93-14-AB
W4RMU 476- 34-14-AB

Western Florida

K4HYL 1870- 85-22-A
W4SXI 539- 49-11-AB
W4CSS 253- 23-11-AB
K2AZT/4 92- 23- 4-AB
W4RKH 18- 18- 1-B

Georgia

K4KLD 352- 43- 8-ABC
K4SJF 85- 17- 5-B
K4FLR 5- 5- 1-A
K4VHC/4 (5 oprs.) 414- 69- 6-AB

SOUTHWESTERN DIV.

Los Angeles

W6NLZ 600- 27-15-ABCDE
K6DBZ/6 (6 oprs.) 5488-361-14-ABCE
K6ZDL (4 oprs.) 1674-279- 6-AB

San Diego

K6IBY 152- 15- 8-ABCD

Santa Barbara

W7QDJ/6 770- 55-14-AB

WEST GULF DIV.

Northern Texas

K5SMU 2430-162-15-A
W5AQS 520- 52-10-AB
K5ARU 268- 67- 4-A
K5KVE 189- 63- 3-A
K5UMD 188- 47- 4-A
K5WZZ 160- 32- 5-A
K5YKX 152- 38- 4-A
K5TXX 126- 18- 7-AB
WA5AEB 34- 17- 2-A
K5ZPC 16- 8- 2-A
W5HPT 3- 3- 1-B

Oklahoma

K5ZTH 1620- 90-18-A
K5DFM 1552- 97-16-A
W5YCJ 180- 36- 5-AB
W5LOW 140- 20- 7-AB
K5LRU/5 (W5s JZZ WAX) 60- 30- 2-AB

Southern Texas

K5RCO (K5s RCO VQV) 280- 28-10-A

CANADIAN DIV.

Quebec

VE2AXO 10- 5- 2-B

Ontario

VE3DIR 2775-107-25-ABC
VE3AIB 1551-111-14-AB
VE3IBGR 364- 91- 4-B
VE3BRI 90- 30- 3-B
VE3DNR/3 68- 34- 2-B
VE3AAH 60- 30- 2-B
VE3NN 58- 29- 2-B
VE3IR/3 6- 6- 1-B

Alberta

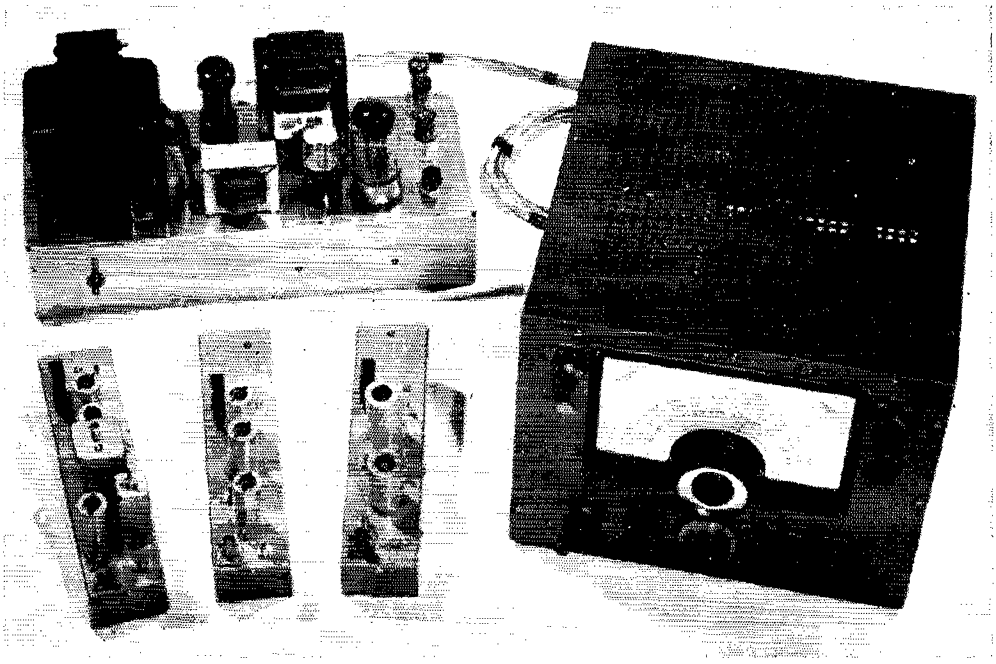
VE6IP 16- 4- 4-A

Yukon — N.W.T.

VE8BY 20- 5- 4-A

[1] Multiple operator Award Winner; [2] WA2OIR, opr.; [3] W9SZR, opr.; [4] W1WPR, opr.; [5] Hq., Staff, not eligible for award; [6] K1ADB, opr.; [7] W2BVU, opr.

Unit-Type Receiver Construction



A complete amateur-band receiver with separate power supply and plug-in converters for the 7-, 14- and 1.8-Mc. bands. The basic receiver tuning range is 3.5 to 4 Mc. The converters are crystal-controlled fixed-tuned units. The power supply employs a series regulator circuit for the principal voltage and VR tubes for lower voltages. Controls across the bottom of the tuner panel, from left to right, are for a.f. gain, i.f. gain, a.v.c./b.f.o. switch, and r.f. gain. Above to the left is the clipper-filter switch. The speaker-headphone switch and converter gain control are at the right.

Plug-In Subassemblies for Flexibility

BY PHILIP E. HATFIELD,* W9GFS

More and more amateurs are coming to the conclusion that the best way to combat today's complexity in transmitting and receiving equipment without freezing the design against tomorrow's developments is through the use of discrete interchangeable subassemblies, no one of which constitutes a major project.

The present interest in home-built amateur-band receivers has resulted in a wealth of ideas being published — more than can be incorporated in one receiver. One way to solve the problem of deciding what to include is to make provisions for changing circuitry and trying different ideas with a minimum of disruption of the basic receiver. This can be accomplished by making as many parts of the receiver as possible in the form of separate subassemblies that plug into a main assembly. By proper design of the main assembly, the receiver can be made to function in a usable manner when some of the subassemblies have been removed for repair, rebuilding, or replacement. The use of subassemblies allows a basic receiver to be built and put into operation on one band in a relatively short time, with additional frequency coverage and auxiliary units to be added later.

Using these basic ideas, the receiver shown in the photographs was designed and constructed. The usual home-workshop facilities, cost, and a desire to get the job finished within a reasonable time combined to require compromises that make the receiver short of ideal. What follows is a step-by-step description of the design, together with indications of what I would do if I were building another receiver.

General Requirements

Ideally, detailed plans should have been made to take into account all possible combinations of

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

receiver elements that could be used to assemble an amateur-band receiver. Practically, a specific receiver scheme was selected, and an attempt made to design the subassembly interconnecting wiring in a manner that would accommodate omission of some subassemblies and reasonably wide substitution of others.

A majority of the receivers today use multiple conversion and this scheme was adopted. The potential subassemblies into which the receiver could be divided were listed as follows:

1) A main tuning unit to cover a frequency range where stability is relatively easily achieved.

2) A low-frequency intermediate-frequency unit to achieve the desired selectivity.

3) An audio-clipping and filtering unit.

4) An audio-ouput unit.

5) Converters for the amateur bands to be covered.

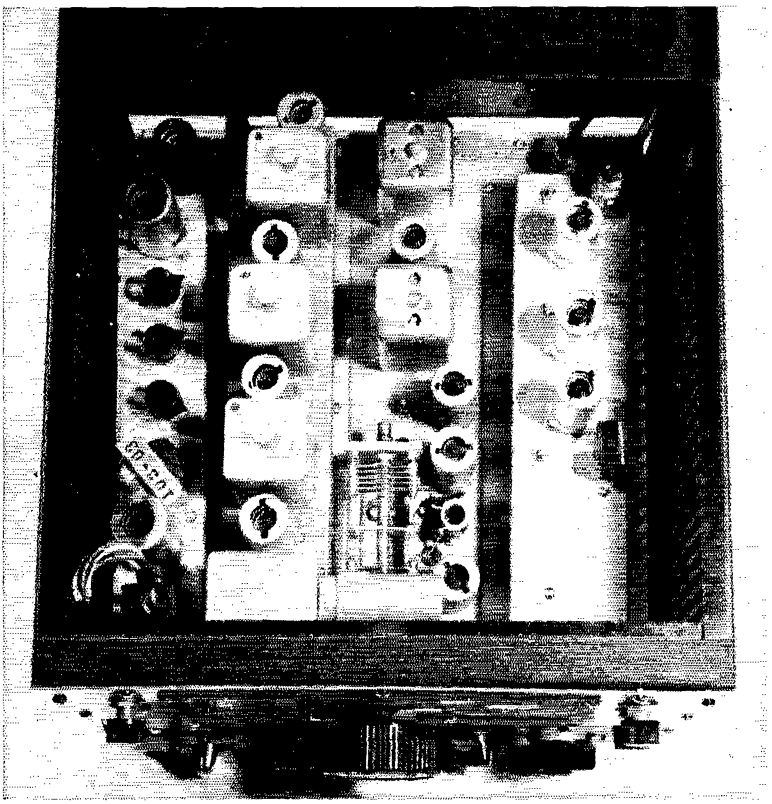
6) A power supply.

If this were an "engineering" article, the next step would be to design the units and then design an enclosure to fit. However, an amateur approach was used: a cabinet on hand, one from a prewar Meissner Signal Shifter, was selected and the units were designed to fit the cabinet.

If considerable effort was to be expended on the r.f. and a.f. portions of the receiver, it seemed logical to provide a power supply of high stability to match. In addition, it seemed wise to provide several levels of regulated voltage to accommodate any tubes that might be used in the receiver subassemblies. A supply meeting these requirements would be much too large to place in the cabinet as a subassembly. In addition, it would be a source of considerable heat. Therefore, it was decided to build the power supply on a chassis external to the cabinet.

Tuning Unit

This left five subassemblies to consider. Of the five, the tuning unit looked like a good starting point. The frequency range of 3.5 to 4.0 Mc. was chosen as one at which good frequency stability could be achieved and one that would allow practical operation of the receiver before any of the converter subassemblies were built. It was recognized that difficulty might be encountered with strong 3.5- to 4-Mc. signals when converters were being used for other bands. However, the use of a transmitting antenna with an antenna tuner, resonated at the band in use for all reception, was counted on to ease this problem slightly, and the risk seemed worth taking. The problem of making this unit mechanically stable and also easily removable was not solved, especially in respect to the design of a system for easily uncoupling and recoupling to a dial without losing calibration. Thus, as a compromise it was decided to build this unit on a flat, narrow plate to allow its construction as a unit but to bolt it firmly to the chassis for rigidity. This in turn necessitated the construction in a sheet-metal shop of a skeleton chassis consisting of side and end rails only.



Top view showing the receiver with a complete set of plug-in units in place. The audio section, including the clipper/filter, is to the left, followed by the low-frequency i.f. strip, the basic tuner assembly and one of the several crystal-controlled converters.

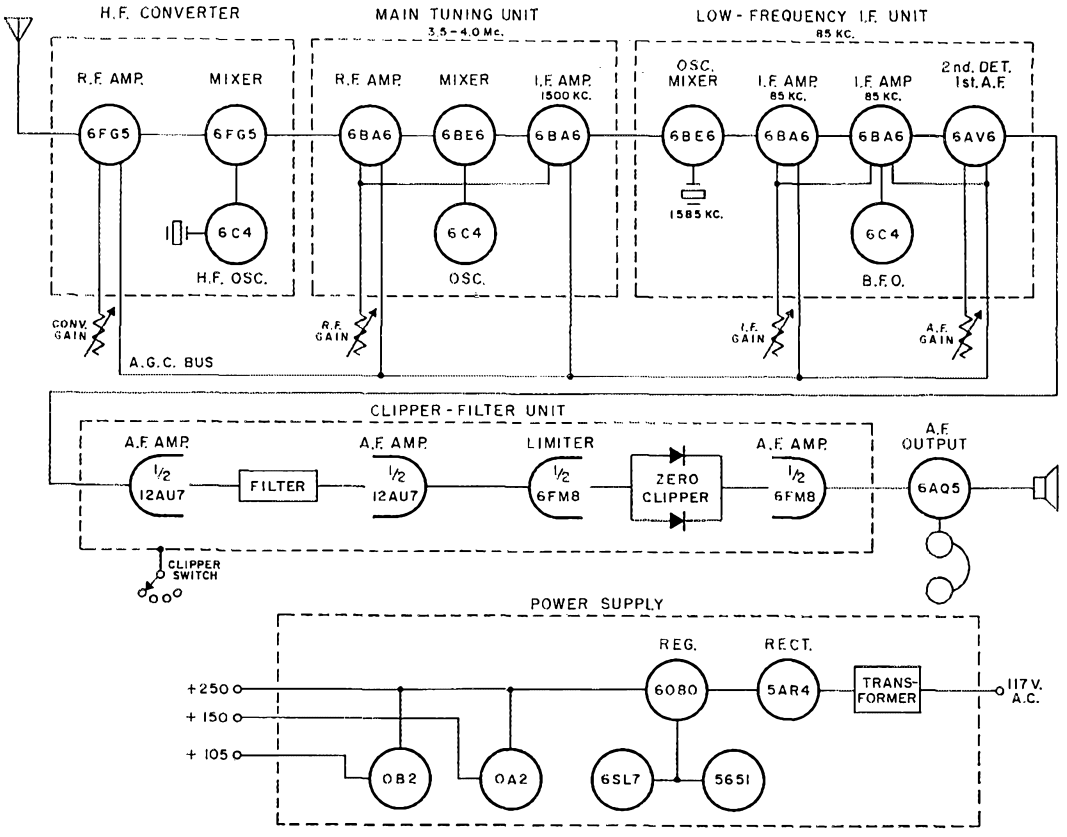


Fig. 1—Block diagram of the sectionalized receiver. The various plug-in units are outlined with dashed lines.

(At the time I was unaware of the existence of Seezak [1] chassis material, which would be ideal for this type of construction.)

The line-up selected for the main tuning unit was an r.f. stage, a mixer, an oscillator, and one 1500-kc. i.f. stage. This combination had the advantage that, with the addition of a germanium diode detector and an external audio amplifier, it could be put in working order before it was permanently mounted on the chassis.

The main tuning unit was built on a plate of 1/8-inch aluminum to obtain maximum rigidity. To make construction on a narrow plate easier, a strip running the length of the plate and mounted on pillars below the plate was equipped with the tie points to terminate bias and decoupling resistors .The tuning unit was mounted at the center of the skeleton chassis, and two plates of 1/16-inch aluminum were cut and fitted to cover the rest of the chassis on either side of the main tuning unit. Aluminum angle was attached to the free edge of each 1/16-inch plate, on the underside, to prevent buckling when subassemblies were inserted or removed. (Here again, Seezak parts could have been used; plates of various widths are available, and two plates could have been stacked to provide a rigid base for the tuning unit.) A panel and dial were then attached to the chassis. Construction of the receiver was now well under way — even though plans for the next step had not been made.

[1] Manufactured by Rimak, Inc., 10929 Vanowen St., North Hollywood, Calif.

Inter-Unit Connections

Plans were now made for the various subassemblies. The wide variety of pre-finished utility boxes available, especially in long, narrow styles suitable for in-line construction, made selection of chassis for the subassemblies relatively easy. However, when all of the subassemblies previously listed were considered there seemed to be insufficient chassis space to hold all of them. Therefore, the idea of making the audio output stage a subassembly was dropped, since space could be saved by placing the tube in a corner of the chassis, and the output transformer under the chassis. (I still think it *should* have been plug-in. However, this represents one of the numerous corners that I backed myself into.)

After suitable chassis for the subassemblies had been selected, attention was turned to the inter-unit wiring and the plug-and-socket system. It seemed well to make provision for the following lines to all subassemblies: 6.3 volts for heaters, + 105 volts, + 150 volts, + 250 volts

and ground. In addition, the i.f. subassembly required input, output, i.f. gain control, a.f. gain control, and a.g.c. output. The clipper and filter unit required input, output, and switching. The converters required input, output, gain control, and a.g.c. input.

There are many multiple-pin connectors available, but most of them have disadvantages such as cost, size, and that bane of all home constructors, rectangular mounting holes. The final choice was tube-base-style plugs with 8 or 11 pins. These are cheap and, if the type that fits into a mounting plate with a snap ring is used, slight amounts of angular error in mounting can be tolerated as the plugs and socket have some freedom to turn.

The sockets selected for the subassemblies were mounted and attention was turned to the rear apron of the chassis. A coaxial connector for the antenna, a 6-pin plug for the power cable, an 11-pin socket, and two phone jacks were mounted on the rear apron. The jacks are for the phones and speaker, as it is preferable that the cords for these do not run across the operating table from the front of the receiver. The 11-pin connector was included to allow external control of plate power to the receiver. Thus, B− and B+ 105 were brought to the socket in such a way that a plug with jumpers is required to complete their circuits. If switching of either of these circuits is necessary during transmission, no wiring changes within the receiver need be made. Both phone and speaker lines were also brought to this socket to allow permanent connection to other equipment.

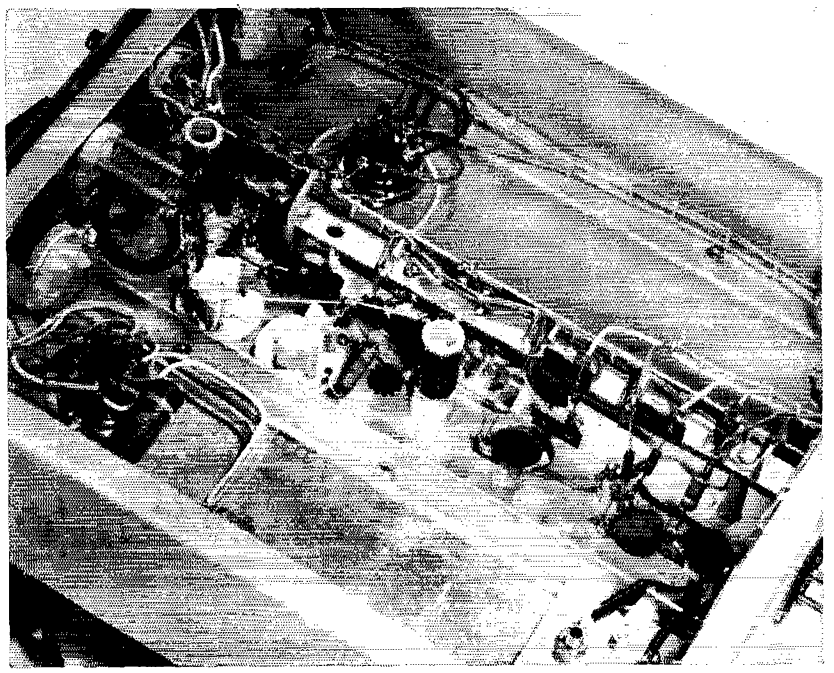
Panel Controls

Front-panel layout was next considered. Converter-gain, r.f.-gain, i.f.-gain, a.f.-gain, antenna-trimmer, and a.g.c.-b.f.o. controls were included. In addition, a switch was added to turn the speaker off when phones are being used. This eliminates the necessity for reaching to the rear of the receiver to pull out a plug. The switch marked CLIPPER gives the four normal modes of operation with a limiter/audio-filter system: "out," "limit," "filter," and "both." The hole filled with a hole plug, below the clipper switch, was placed there for any control or switch that might have been forgotten in the original design. This was done to eliminate hole drilling after the panel had been painted and the decals had been placed.

I.F. Amplifier

The low-frequency i.f. unit was now constructed. This unit included a crystal-controlled converter for conversion from 1500 kc. to 85 kc., two stages of 85-kc. i.f., a b.f.o., a second detector, and a stage of a.f. voltage amplification. Here the 11-pin plug did not furnish sufficient connections, and two banana plugs were used at the input end to connect to the output of the 1500-kc. i.f. amplifier in the main tuning unit. (Here, if I were starting over, I would use an 11-pin plug at one end of the assembly and an 8-pin plug at the other end. The normal looseness of removable mounting-plate plugs and sockets would have made alignment of two plugs relatively easy. In addition, if extra pins had been available, I surely could have found functions for them!)

A plug was wired to jumper the input and out-



Bottom view of the basic tuner strip. Wiring is facilitated by mounting tie points on an elevated strip of aluminum.

put leads in the chassis socket intended for the clipper-filter subassembly, a short coaxial cable was substituted for a converter, and the receiver was workable on 80 meters.

Audio Clipper

The audio clipping and filtering unit was constructed next. This consisted of a peaked amplifier, similar to one stage of the unit described by Campbell,[2] followed by a shunt diode limiter from the same unit. Between this and the output voltage-amplifier stage, another limiter using germanium diodes[3] was placed. In this subassembly the 11-pin connector provided insufficient pins for switching, and a Jones connector was placed on the top of the subassembly to mate with a plug on a short cable from the clipper switch. This switch was labeled with position numbers instead of functions for two reasons: (1) there was little room; (2) the optimum sequence was unknown. The present sequence of "out," "filter," and "both" seems satisfactory, but changes can be made without changing the panel marking. The audio clipping and filtering unit has three additional controls, but as these are of the "set and forget" variety, no thought was given to putting them on the panel.

High-Frequency Converters

When the static got too bad on 80 meters, converters for other bands were considered. Thus far, converters for three bands have been built. The bands covered are 14, 7, and 1.8 Mc. The same size utility box was used for each converter, but different circuits or tube line-ups have been used in each one. All of them are crystal-controlled and, of course, fixed-tuned. No attempt was made to cover a wide band in the 1.8-Mc. converter; rather, it was designed to cover the segment of the band available in this area.

[2] Campbell, "Modernizing the C.W. Clipper-Filter," *QST*, December, 1956.

[3] French, "The Zero Clipper," *Radio & TV News*, May, 1958.

The use of converters, with their relative cheapness and simplicity, makes it practical to try new "front-end" ideas without the necessity for tearing apart existing converters or disrupting operation of the receiver. (So far, this appears to be one subassembly where the plug and socket selected have an adequate number of pins.)

The power supply far outgrew the subassembly size and ended up on a rather large chassis. However, since it incorporates electronic regulation of the + 250-volt supply, plus gas-tube regulated supplies for + 105 volts and + 150 volts, it should serve for almost any receiver combination.

Hints on Construction

The accompanying photographs show some of the details of construction of the receiver. The block diagram shows the tube line-up with the 7-Mc. converter in use.

In the foregoing description some of the things that I would do differently are listed. Here is a summary of what I would do if I were building another complete receiver:

1) Use standard chassis parts (Seezak) and a larger cabinet.

2) Use sufficient connector pins on each subassembly to allow plenty of spares.

3) Make provision for two converters to be left plugged in at one time. This, together with switching, would allow choice of the fundamental range plus two additional bands without plugging in converters. In fact, the chassis could be made large enough to mount all converters.

4) Make the main tuning unit plug-in. This could be done by sectionalizing the front panel and removing a portion of the panel, the tuning dial, and the tuning subassembly as one unit.

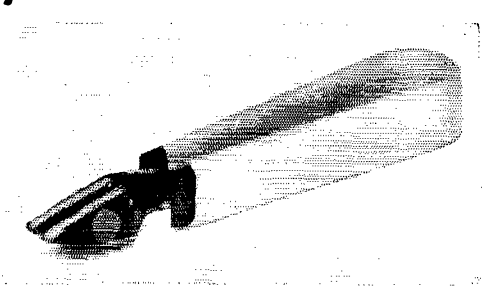
5) Make the audio output stage plug-in.

In closing, I will make the usual statement, found in most home-built-receiver articles, that this represents the best receiver that I have ever owned. However, I am not going to tell you what other receivers I have owned! QST

• *New Apparatus*

Miller Heat-Sink Tool

ALMOST every constructional article involving transistors or diodes reminds the constructor to "grasp the lead of the semiconductor being soldered with long-nose pliers, to protect it from the soldering heat." Unfortunately, this requires the use of one hand, leaving only one free for the soldering operation — which always seems to take at least two! The model 80 Heat Sink Tool, manufactured by the K. Miller Tool and Manufacturing Co., Inc., of West Springfield, Massachusetts, solves the problem by freeing both hands for the soldering operation. The tool has copper jaws for clamping on the lead, providing an excellent heat sink to protect the semiconductor. The jaws are opened by pressure on the loop handle, which is covered with a tough insulated plastic jacket. The tool has a secondary use as a holder for any small or delicate parts while soldering or assembling. — *E. L. C.*



The Red Polka Dot Paralyzer

BY JOHN G. TROSTER,* W6ISQ

MARGE, let's don't get each other Christmas presents this year."

"That's a good idea, John. We could put the money into something for the kids, or something for the whole family to enjoy. That's a good idea."

"Well, ahhhh — yes, Marge. Only I was thinking — maybe we'd do better if we bought our own presents ourselves — something like that."

"Yes, John, I know. You want a radio."

"Well, ahhh — I hadn't thought of that. Actually I was thinking it would be a chance for me to pick out my own neck tie for a change — like to choose my own colors, you know. But now that you mention it, Marge — maybe a transmitter — swell idea — glad you thought of it."

"OK, John. You win. But what shall we get the kids?"

"Well, I've been thinking we ought to get Junior a receiver. You know how he hangs around when I operate. Might as well get him started right. He could listen to me — sometimes I wonder if this rig gets as far as his room! Anyway, it's something every boy should have. Like a dog. Then there's the tremendous educational value, too. Short wave, police calls, overseas broadcasts — he could follow world events —"

"John."

"Ahhhhh, yes, Marge."

"Is this radio going to be like that doll's clothes line you bought Susie for her birthday? The one that now rotates 60 feet up on top of the tower?"

"Oh, no, Marge. Nothing like that. Susie knew I was fooling — besides she would rather use your drier. Wouldn't she?"

* * *

"What do you think of it, Marge. Beauty eh?"

"I thought you only wanted to choose your own color for a tie."

"You're kidding — ha. Well, I want you to know this is a real bargain. This, my dear is the new 'Potowatamee Paralyzer' final — It's got everything, I tell ya!"

"It's final all right! How much more was it than the tie you so desperately wanted to choose for yourself?"

"Now look, Marge, I got a real good deal. I traded off the old 'Kickapoo Kilowatt' for this. Remember that old thing I had kicking around for the last few years — the one in the dreary old black box? Well, look at this Paralyzer! Beautiful colors, don't you think? Now with the 'Scandohoovial Pulverizer' driving this 'Potowatamee Paralyzer' — well, this is it."

"Tell me more about that fantastic trade, John."

"Now wait, Marge, don't be too hasty. I got Junior's receiver in the same deal. He loves it, too. He already knows how to use most of the

dials and knobs — really learns fast. Chip off the old — Noooooo, just a minute, Junior. That's the control for the panadaptor — I'll show you that one later. You practice using that 30-cycle Automatic Signal Rejection Magnatomic Filter. Leave that dial alone, too — I'll show you how to snap in the fourth i.f. later — only need that one for Sweepstakes — ha. Here, put on the earphones — I'll tune in something for you. What do you hear?"

"Geeee, heep, foop, feep, urrrp, gasa, meee peep —"

"See that, Marge, he's picking up the code already! I tell you a real chip off the old — why, another 10 or 15 years he'll have it down pretty —"

"Marge, come back. Don't get mad. As a matter of fact, I got you something too."

"What color is it?"

"Chrome — ahhhh, don't be funny. What I got you is going to make all the difference in our family circle. You see, this is the new Super Dynamic Floating Crystal Uniaudio mike. Now the whole family can talk. With that old mike I used to have, it was pretty hard to make yourself understood. Had to get so close. Now you won't have to come in the shack here every time you want to talk. You can yell in from the kitchen. Then with Junior's new receiver — well, I can turn it up and you can hear the thing clear into the laundry! You'll be able to talk all over the world from any place in the house."

"John, what I have to say — I won't need a transmitter to be heard around the world."

"Susie, don't push that button. The clothes line is pointed in the right direction now. Junior, better not play with that receiver anymore now. OK, I'll buy a panadaptor — I mean I'll tell you about it next week or something — lookout,

(Continued on page 176)

* 15 Laurel Street, Atherton, California.

A simple trick, but one we don't recall having seen before. The two output voltages are not obtained simultaneously, but only one filter is required.

A Two-Way Power Supply

BY ARTHUR E. HAHN, JR.,* WA2RMA

ANYONE who has built a power supply knows that the transformer is the largest and most expensive part in the supply. Here is a little trick which doubles the usefulness of the transformer and makes the supply more versatile.

You will notice from the diagram, Fig. 1, that two more rectifiers and a switch have been added to a regular center-tap rectifier system. The circuit is switched from a full-wave center-tap supply to a full-wave bridge supply by changing the ground connection by means of S_1. With S_1 in Position 1, CR_2 and CR_3 are back to back and the anodes are left floating. They cannot conduct in this position, and since the center tap of the transformer is now at ground potential, the circuit conducts as a normal full-wave center-tap supply. With S_1 in Position 2 the anodes of CR_2 and CR_3 are put at ground potential and the center tap of the transformer is left floating. The circuit now conducts as a full-wave bridge rectifier, giving almost the peak a.c. voltage across the secondary as a d.c. output.

A supply of this type has many uses. One example is in a transmitter as the tune-operate control; the center-tap position could be the low-voltage "tune" position, and the bridge could be the high-voltage "operate" position.

With this type of circuit you are actually getting two supplies for the price of one transformer. One supply gives you low voltage and high current, and the other gives you twice the voltage but at a lower current. But if I know hams, they could probably get the same current from both supplies! When a new supply is being built, two more rectifiers and a s.p.d.t. switch might just as well be put in from the start, even if they are not needed at the moment. Power supplies are used for almost every piece of ham gear and they may as well be made as versatile as can be from the start.

The silicon diodes shown in the diagram have a peak inverse voltage rating of 800 volts, which is sufficient for a total transformer voltage of 560. When using a different transformer, choose diodes with a peak inverse voltage rating high enough to avoid breakdown. If higher voltages are needed for possible use as a supply for a final amplifier, 866As could be used with a larger transformer, or additional diodes could be used in series in each leg. In fact, this arrangement of components can be used for any supply where there is a possible need for the two types of output.

Also, you have to choose the voltage rating of the capacitors for the full-wave bridge and not the full-wave center tap, since the bridge will give you twice the voltage.

The circuit shown was assembled from available parts to prove the usefulness of the supply when connected in this manner. It is used as a bench supply for repair work but, as stated before, this type of hookup could be used for any supply. QST

*RCA Laboratories, Princeton, N. J.

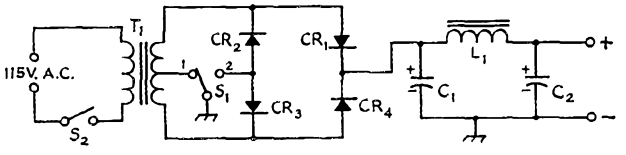


Fig. 1—Power-supply circuit offering a choice of two voltages.

C_1, C_2—4 μf. or more, as required for the particular application. For a transformer similar to that specified below, 450 w.v. electrolytics can be used in series.

CR_1–CR_4, incl.—Silicon rectifiers, 800 peak inverse voltage rating (RCA 1N3196 or similar).

L_1—Smoothing choke, 2 henrys or more, depending on smoothing required; 16 henrys at 80 ma. (Stancor C-1420) in the author's supply with the transformer listed below.

S_1—S.p.d.t. toggle.

S_2—S.p.s.t. toggle.

T_1—Power transformer, according to requirements. The transformer used in the supply built by the author delivers 260 volts each side of center tap at 90 ma. (Stancor PC-8404).

• *Technical Topic*

Open-Key Voltage in Cathode-Keyed Circuits

THERE is increasing interest in the use of transistors for keying c.w. transmitters, principally to replace mechanical devices, such as relays, in electronic keyers. The advantages of a fast-acting, purely electronic device are obvious. The transistor offers high current-carrying capacity and low voltage drop, but it is strictly limited in the collector-to-emitter voltage that it can handle safely. In cases where a transistor is to be used to replace an ordinary key, therefore, the voltage across the open key becomes a matter of considerable importance.

In blocked-grid keying systems the determination of the open-key voltage is usually no problem, since it is set by the voltage available from the blocking source. The voltage across the key in cathode-keyed setups is less easily established. Available measurements have indicated some inconsistencies that need to be resolved.

Take the cathode-keyed circuit of Fig. 1A, where only the d.c. paths are considered. One might guess that the tube could be replaced by a diode, in which case its plate-cathode resistance would be low and the voltage read on a high-resistance voltmeter would be essentially that of either the screen supply or plate supply (but which?). Or the opposite could be assumed — that the tube is essentially an open circuit, in which case the voltmeter would show zero reading. Actually, neither is true.

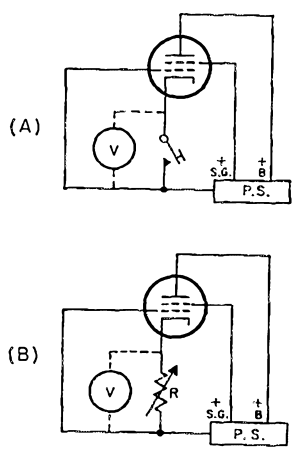


Fig. 1—Cathode keying reduced to its equivalent d.c. circuits.

A logical approach to the question can be based on the circuit of Fig. 1B. Cathode current flowing through R develops a voltage which biases the grid negatively. As we increase the value of R the bias also increases, so that the more resistance we use the less cathode current we get. If R is made large enough, the bias approaches the plate-current (and screen-current) cutoff value. Now if we assume that this process will continue no matter how large R is made — i.e., R approaches infinity — we can see that *in the limit* we have an open cathode, at which point the grid bias will have just that value which completely cuts off the screen and plate current. Thus, if we know the open-circuit values of plate and screen voltage, and have a set of characteristic curves for the tube, we can determine the exact value of cathode voltage (which is also the grid bias at which cutoff will occur).

This process would require more detailed tube data than are generally available. However, a good approximation can be made by a very simple calculation. In a tetrode or pentode the cathode current is almost entirely a function of the screen voltage, so the plate voltage can be ignored with little error. Knowing the open-circuit screen voltage, the cutoff bias can be found if the screen-grid amplification factor is known. It is generally given in the tube data, at least for transmitting tubes. As given, it is usually based on some value of cathode current near the normal operating value; the actual μ near cutoff is always lower. However, the published value does give us a starting point. To a first approximation, then, the open-circuit cathode voltage will be equal to the screen voltage divided by the screen μ. Actually, the screen-to-cathode voltage, rather than the screen-to-ground voltage, should be used in such a calculation. However, because of the decrease in μ near cutoff the calculated result generally will be nearer the truth when we use the screen-to-ground voltage. Even so, the calculated value will tend to be somewhat lower than what is measured.

Measurement Results

Measurements made on two small transmitting tubes (large ones aren't likely to be — or shouldn't be — keyed in the cathode circuit) confirm the usefulness of this approach. One, a 5763, had 300 volts from screen to ground with the cathode open. According to the tube data, the screen μ for this tube is 16, for conditions resulting in a plate current of 45 ma. This μ would indicate a cutoff voltage of 300/16 = 19 volts. Actual measurement showed 29 volts. The second tube was a 6146 with 300 volts, open circuit, on its screen. (The plate voltage was close to 800 under the same conditions.) The published screen μ for the 6146 is 4.5 at a plate current of 100 ma. This figure leads to a cutoff bias of 300/4.5 = 67 volts. The measured value was 80 volts.

Two voltmeters were used for the measurements, one having a resistance of 1 megohm and the other a resistance of 11 megohms. The meas-

ured voltages were consequently quite close to the actual cutoff voltages for the tubes, since the cathode current was only of the order of microamperes. Both meters gave the same answers, indicating that, at least in these cases, a cathode resistance of a megohm or more could be considered "infinite." That is, the assumption is reasonable that the voltage measured differs negligibly from the actual open-cathode voltage.

Because of the reduction in μ near cutoff, the calculated value of open-circuit cathode voltage needs to be increased by 20 to 50 per cent. With some such allowance, one can make a rather good estimate of the voltage to be expected.

Keyed Amplifiers

However, that isn't the whole story. The tubes in the circuits of Fig. 1 have only d.c. voltages applied to the elements. The case of the keyed amplifier is quite different.

With continuously running drive, the circuit has the simplified form shown in Fig. 2. In addition to the bias developed in the cathode resistor, there is also an a.c. voltage applied to the grid in series with the cathode bias. In other words, there are positive pulses, on half of each excitation cycle, tending to overcome the cathode bias. Nevertheless, there can be no conduction through the tube because the cathode circuit is physically open-circuited. What happens?

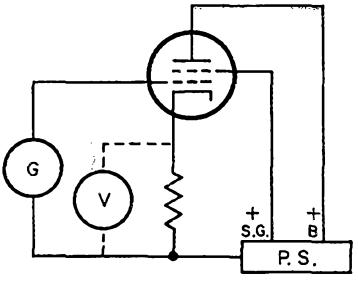


Fig. 2—An amplifier with drive continuously applied has two components of grid-to-cathode voltage. The r.f. voltage is represented by the generator G in this figure.

Using the approach outlined in Fig. 1B, it isn't hard to anticipate what will happen. To reach cutoff, more bias has to be developed across the "infinite" cathode resistance. There has to be enough to prevent the positive peaks from going beyond cutoff. This, in fact, is what occurs. The open-circuit cathode voltage rises with the amount of grid-drive voltage on the tube. By varying the r.f. voltage at the grid of a 6146 amplifier in a small transmitter, measurements showed that the open-circuit cathode voltage rose from the 80-volt figure under static conditions to as high as 300 volts at the maximum grid drive available. This drive was the unloaded equivalent of about 6 ma. of grid current under normal operating conditions and loading. At the rated key-closed grid current of 3 ma. the open-circuit cathode voltage rose to 175 volts.

Quite clearly, there is no way to anticipate what the actual cathode voltage will be in a keyed amplifier that has drive continuously applied to the grid. It will always be more, and possibly very much more, than the static value. Considerable caution should be used in keying such circuits with transistors.

Amplifier keying is not common practice, as it happens, except where differential keying is used. Even in this case it is not customary to key the amplifier *cathode*. If an attempt is made to do so, it is necessary to keep in mind the fact that shaping circuits will have the effect of closing the amplifier circuit after excitation is applied and of opening it before excitation is removed. During these periods the cathode voltage may exceed the static value by a considerable margin.

If you are tempted to use such an arrangement with a transistor "key," play it safe by measuring the voltage at the open cathode of the amplifier with the oscillator running continuously. Vary the excitation over the entire range the transmitter provides, and take the largest voltage you measure as the minimum for circuit design purposes.

Multistage Keying

A familiar keying arrangement opens the cathodes of two or more tubes simultaneously, one of them being the oscillator. Since an oscillator cannot generate any r.f. when its cathode is open, there is no r.f. voltage at its grid at that time. Thus the open-circuit cathode voltage of an oscillator can be calculated on the static basis.

Also, with this type of simultaneous keying there is no r.f. reaching the grid of the amplifier when the key is open. The amplifier's cathode voltage, too, can be calculated for static conditions. The method outlined above will lead to quite usable results with multistage keying of this kind. Since the cathodes of the oscillator and amplifier or amplifiers are connected together and to the "hot" side of the key, they will necessarily all be at the same potential when the key is open. Under these conditions the voltage will be that assumed by the tube that takes the *largest* open-circuit cathode voltage.

—*G. G.*

Strays

K3MOE had needed W. Va. for a long time, and finally happened across W3ILD operating mobile in that elusive state. A couple of months later K3MOE worked his first D.C. station by hooking up with W3ILD working mobile in the nation's capital. If W3ILD will just keep at it, K3MOE will make WAS yet.

—•••—

K4EQK, out on a hidden transmitter hunt, came upon an accident and reported it to K4FZI, who was stationed at the starting line. Conveniently, the starting line was next door to the local police station. When K4FZI reported to the desk sergeant, saying that he got the message by radio, the sergeant exclaimed incredulously, "We didn't hear it on *our* radio!"

• *Beginner and Novice*

A Combination Band Checker, Field-Strength Meter, and Monimatch

How To Improve the Operation of Your Novice Station

BY LEWIS G. McCOY,* W1ICP

THE unit shown in the photographs and Fig. 1 is a piece of equipment that has several different uses, all of which are important to the beginner in amateur radio. There are three basic applications for the instrument, the first being its use as a wavemeter or "band checker." In many instances, whether a transmitter is home-built or commercial, it is possible to tune up a rig on the wrong band, even though the band switch is set at the band you want to work. This is a very common problem with the Novices. The wavemeter described in this article can be easily calibrated for the different bands from 80 through 10 meters, and because it has a meter (M_1) in it, the unit will provide a visual indication of the band you are actually tuned up on. It's very handy for checking circuits in the transmitter, too. For example, you can check to see if an oscillator stage is working *and* on what band it is oscillating.

Another important function of the instrument is to show you when an antenna system is properly adjusted. Built into the unit is a Monimatch,[1] a standing-wave-ratio bridge which samples both the forward and reflected r.f. voltages in the transmission line and provides a visual indication, on M_1, of the relative amplitudes of these voltages. Obtaining the correct adjustment of an antenna coupler or a matching device at the antenna is very important if you want to get the maximum transfer of power from your rig to the antenna. The Monimatch will show you when you have the correct adjustment.

Still another use for the instrument is as a field-strength meter. In adjusting fixed or mobile antennas it is very helpful to have some type of field-strength indicating device to show you when you have the best adjustments on your antenna.

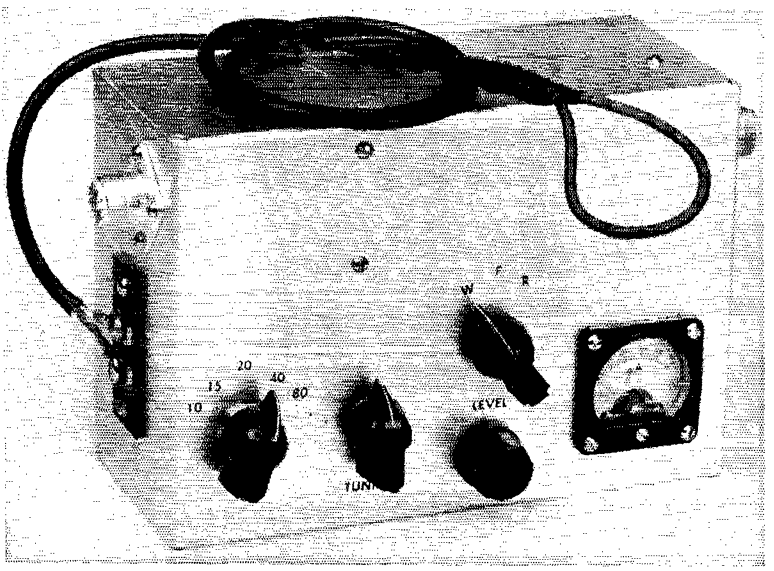
So much for some of the uses of the unit. You'll come across other ideas as you use it.

How It Works

As a band checker or s.w.r. bridge, the unit is designed to be inserted in the coax line and left

* Technical Assistant, *QST*.

[1] McCoy, "Monimatch, Mark II," *QST*, February 1957. (This issue no longer available from ARRL.)



Here is the completed wavemeter/Monimatch ready for use. The pickup loop for the wavemeter is attached to terminals E_1 and E_2. At the left is the knob for S_1 and to its right is the control for C_1. The letters above the S_2 knob are W for wavemeter, F and R for forward and reflected.

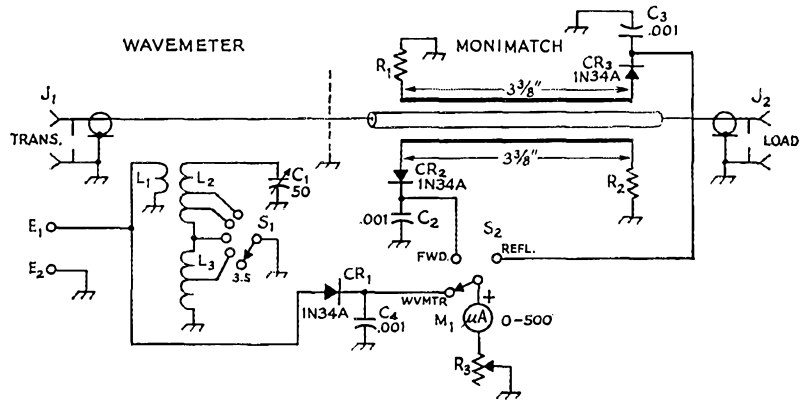


Fig. 1 —Circuit diagram of the combination wavemeter-Monimatch. Resistances are in ohms, decimal capacitances are in μf., others are in $\mu\mu$f.

C_1—50-$\mu\mu$f. variable (Hammarlund HF-50).
C_2, C_3, C_4—0.001-μf. disk ceramic.
CR_1, CR_2, CR_3—1N34A germanium diode.
E_1E_2—Two-terminal bakelite terminal strip.
J_1, J_2—Coax chassis terminal, type SO-239.
L_1—Three turns No. 20 insulated wire tucked inside L_2; see text.
L_2—14 turns No. 20, 16 turns per inch, 1-inch diam. (B & W Miniductor 3015).
L_3—48 turns No. 24, 32 turns per inch, 1-inch diam. (B & W Miniductor 3016).
40-meter tap: 12 turns from ground end of L_3.
20-meter tap: Junction of L_2L_3.
15-meter tap: 6 turns from junction of L_2L_3.
10-meter tap: 11 turns from junction of L_2L_3.
M_1—0-500-μa. meter.
R_1, R_2—150 ohms, ½ watt, for 50-ohm cable; 100 ohms, ½ watt, for 70-ohm cable.
R_3—50,000-ohm composition control, linear taper.
S_1, S_2—Single-pole, five-position switch (Mallory type 3115J); only three positions used on S_2.

there when the rig is operated. Referring to Fig. 1, there is enough coupling between the wavemeter tuned circuit, $L_2L_3C_1$, and the conductor carrying r.f. from J_1 to J_2 to induce an r.f. voltage on the pickup coil, L_1. This voltage is rectified by CR_1, and the d.c. output is read on M_1. R_3 is used to control the amount of current flow through the meter. S_1, the wavemeter band switch, shorts out portions of L_2L_3 to change the inductance for various bands.

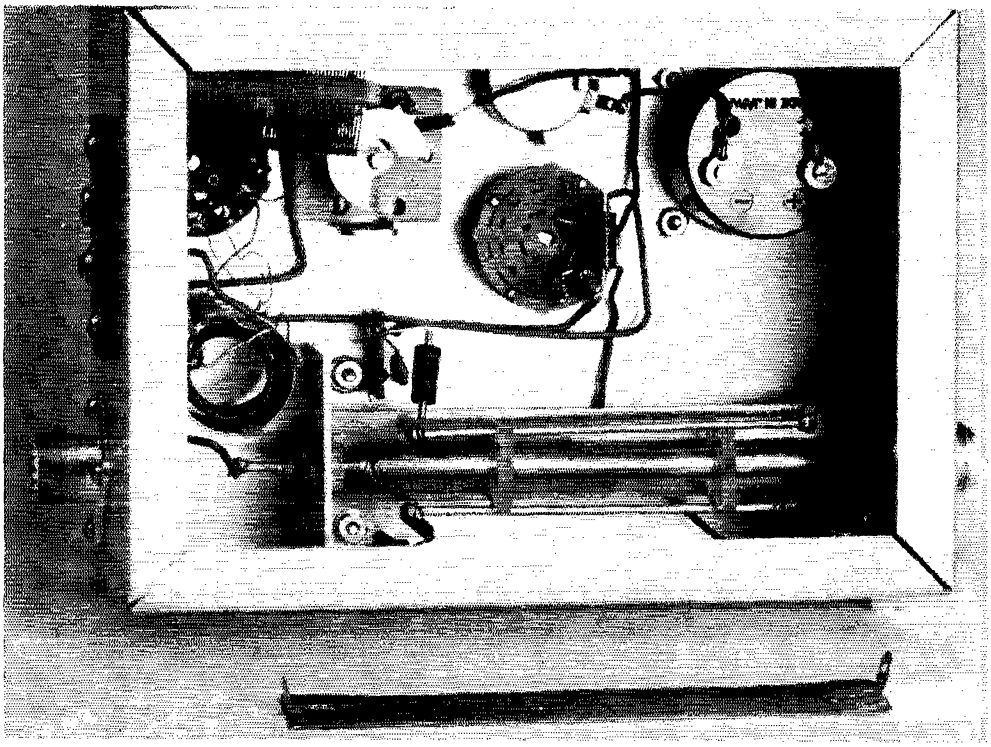
For checking tuned circuits or as a field-strength meter, the instrument is removed from the transmission line. A pickup loop, consisting of a single turn of insulated wire at the end of about two feet of RG-58/U or RG-59/U coaxial cable, is connected to the two terminals E_1E_2. The pickup loop can then be used as a probe around the circuit being checked. The unit is small enough to be hand-held, but this could prove to be dangerous, because more than likely you'll be checking "live" circuits and the unit is in a metal chassis. For field-strength measurements an antenna should be connected to terminals E_1E_2.

To use the Monimatch, the instrument is inserted in the coax line from the rig to the antenna or transmatch. The switch S_2 is first set for the meter to read forward power. With the transmitter on, adjust R_3 for a full-scale meter reading and then set S_2 to the "reflected" position. Adjust the transmatch, or matching device, at the antenna, for a zero reading in the reflected position. After making the adjustments that give you zero reflected reading *vs.* full-scale forward, you can switch back to the band-checking setup and leave the instrument at this setting. This not only shows you which band you are actually on but also serves as a visual output indicator, letting you know that power is actually coming out of the rig and going to the antenna.

Construction

The instrument is built inside a 3 × 5 × 7-inch aluminum chassis. Study the inside-view photograph before starting construction. The Monimatch components are mounted along one side of the chassis. A piece of ¼-inch o.d. copper tubing, 4⅝ inches long, is used as the inner-conductor section of the Monimatch. This length of tubing is mounted between a coax fitting at one end of the chassis and a feed-through insulator (National type TPB) which is mounted on an aluminum bracket. The bracket is 2 inches long and 1½ inches high, and is mounted 5 inches from one end of the chassis. Two spacers, made from bakelite or polystyrene, are used to hold the pickup wires at the correct spacing with respect to the inner conductor. Details for making the spacers are shown in Fig. 2. The pickup wires are solid No. 14 and are 3⅜ inches long. Two strips of copper, ⅝ inch wide and 4⅞ inches long, are used for the outer conductors. To mount them in place, solder a soldering lug at each end of each strip, allowing the end of the lug having the screw hole to project beyond the end of the strip. Bend this part of the lug at right angles to the strip. The strips can then be held in place with screws and nuts.

Be sure to use carbon or composition type resistors for R_1 and R_2. If you use 50-ohm coax in



This view shows the "innards" of the unit. At the left center are L_1 and L_2. Above them, at right angles, is L_3, which is mounted over S_1 and C_1. To the right are grouped S_2, R_3, and M_1. The Monimatch is shown along the lower edge of the chassis, with one of the copper strips removed to provide a better look at how its parts are arranged.

your station, then the resistors should be 150 ohms, ½ watt. Use 100 ohms, ½ watt, for 70-ohm coax. Keep the leads from the resistors and the germanium diodes as short as possible. In fact, it is a good idea to mount the resistors and diodes on the pickup wires before mounting the wires in place. When soldering the diodes and resistors, holds the leads on the components with a pair of long-nose pliers. This will prevent excessive heat from the iron reaching the body of the component and ruining it. Once the pickup wires are mounted in the spacers, a drop of Duco cement can be placed on the wires at the spacers to keep the leads secure.

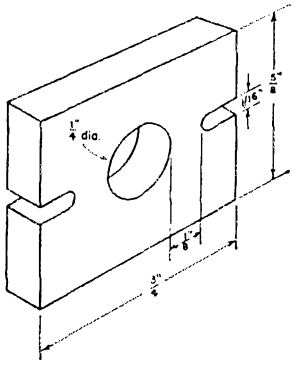


Fig. 2—This drawing shows the dimensions for the insulating spacers used in the Monimatch.

R.f. pickup for the wavemeter is obtained from a short length of wire which is installed between the end of the feed-through insulator coming from the Monimatch and the coax fitting on the end of chassis. L_2 is mounted near this pickup lead, as shown in the photograph. L_3 is mounted on the opposite side of the chassis. In order to get at the tap points on the coils, the adjacent turns on the coils can be bent in toward the axis of the coil. Make sure when you solder the taps that you don't splash any solder on the coils as this will short out turns and change the tuning range of the circuit.

The link, L_1, consists of three turns of No. 20 insulated wire tucked inside the top of L_2. The exact placement inside L_2 is not critical.

Checking the Unit Out

If you have followed the details on making and tapping the coils, you shouldn't have any trouble checking the wavemeter performance on each band. Feed an 80-meter signal from your rig through the instrument, set S_1 to the 80-meter position (all of L_2 and L_3 in the circuit), set S_2 to the wavemeter position, and tune C_1 for a meter reading. You may have to increase or decrease the sensitivity of M_1 by adjusting R_3. Follow the same procedure for checking out the other bands. If you have access to a grid-dip meter, you can couple the grid-dip meter to L_2

(*Continued on page 160*)

I.A.R.U. News

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as listed below. Cards for territories and possessions not listed separately can be mailed to the bureau in the parent country; e.g., cards for French Cameroons (FE8) go to REF in France; cards for VP8s go to RSGB in England. W, K, VE and VO stations only may send foreign cards for which no bureau is listed to ARRL.

For service on incoming foreign cards, see list of domestic bureaus in most *QST*'s under "ARRL QSL Bureau." **Bold face listings indicate corrections or additions.**

Algeria: G. Deville, FA9RW, Box 21, Maison-Carree, Alger
Angola: L.A.R.A., P.O. Box 484, Luanda
Argentina: R.C.A. Carlos Calvo 1424, Buenos Aires
Australia: W.I.A., Box 2611 W, G.P.O., Melbourne
Austria: Oe. V.S.V. Vienna I 9, Box 999
Azores: Via Portugal
Bahamas: Via ARRL
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Liberia: (EL1s only): HARC, P.O. Box 32, Harbel
Libya: 4A2TZ, Box 372, Tripoli
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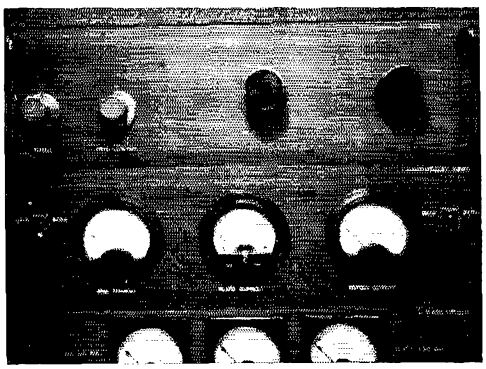
(*Continued on page 168*)

When you reach a kilowatt input, the only legal way to get more signal on the air is to improve the performance of your final amplifier. Until very recently, there has been plenty of room for improvement in amplifiers intended for 144-Mc. service. This article follows recent *QST* design information closely, and includes some simple and effective ideas for achieving maximum efficiency. Of interest to those who like to keep costs low is the provision for use of 4X150As as well as 4X250Bs.

Top Efficiency at 144 Mc. With 4X250Bs



Front view of the amplifier and its meter panel, mounted in a rack. Provision is made for reading grid and screen currents in either tube, as shown in Fig. 3.

Design and Adjustment Ideas for Optimum V.H.F. Amplifier Performance

BY LOUIS D. BREYFOGLE,* WØMOX

THE high-efficiency 2-meter kilowatt amplifier built by W1DXE and described in February, 1960, *QST*,[1] makes a fine amplifier if one can afford the pair of 4CX300As used. The writer had a pair of 4X250Bs on hand and decided to adapt the amplifier to use them. It has also been used with 4X150As, but more about that later.

As can be seen from the pictures and diagrams, the amplifier draws heavily from the 4CX300A amplifier. It is assumed that the reader has the original article on hand, and where construction details are similar to the W1DXE amplifier they will not be repeated here.

Construction

In external dimensions the 4X250B amplifier duplicates its predecessor. The plate lines are 1¾-inch-diameter brass tubing 9 inches long, slotted on the anode end, and held in place with stainless-steel hose clamps. (This size tubing slips over the anode, instead of butting against it.) The shorting bar was made from ⅜-inch brass stock, instead of ¼-inch, because it happened to be available. Otherwise, it is cut in a manner similar to that shown in Fig. 3 of Tilton's article. The center of the shorting bar is supported on a 1½-inch long standoff insulator made of ½-inch-diameter Teflon rod. The r.f. choke, RFC_5, is supported on the high-voltage-lead end by a 1-inch length of ½-inch Teflon rod. A short length of coax was used for the high-voltage lead, but any well-insulated wire may be used if the amplifier is properly balanced. The high-voltage lead is bypassed by C_8 where it leaves the chassis.

The plate tank circuit is tuned by a parallel disk capacitor, C_6, made of two 2¾-inch-diameter brass disks. The shafts are ¼-inch brass rod with a ¼-20 thread. The center hole of each disk is threaded, and the disk is held in place on the rod with a ¼-20 brass nut soldered to the rod and the back of the disk. The rods run through threaded holes 2⅜ inches from the plate end of the plate line. Fiber rod is used to extend the capacitor rods to the outside of the chassis. The output link is constructed as shown in the *QST* article.

To provide for rapid and accurate adjustment of the final plate circuit, a 2-inch-diameter brass disk (constructed in the same manner as the tuning-capacitor disks) was mounted on the rear chassis wall opposite the anode of one of the 4X250Bs. It is supported by a ¼-inch-thick brass plate with a hole threaded to accept the shaft of the disk. If it is necessary to add capacity to the front anode, a similar capacitor may be mounted on the front chassis wall, or a copper sheet may be mounted adjacent to the line and the disk on the rear of the chassis used for final adjustment.

The input capacitance of the 4X250Bs is roughly half that of the 4CX300As. This and the different socket configuration require a somewhat different grid circuit from that used in the 4CX300A amplifier.

The grid tank circuit is made of 12-gauge sheet copper cut as shown in Fig. 2A. Two pieces are required. The edges are polished with a file and then bent as shown in Fig. 2B, remembering that one side must be bent the opposite of the other. To simplify initial adjustment, a trick was borrowed from WØIC:[2] a slot to pass a 4–40

* 520 S. 44th St., Boulder, Colorado.

[1] Tilton, "A High-Efficiency 2-Meter Kilowatt," *QST*, Feb., 1960, p. 30.

[2] Maer, "The Perseids Powerhouse," *QST*, Oct., 1959, p. 32.

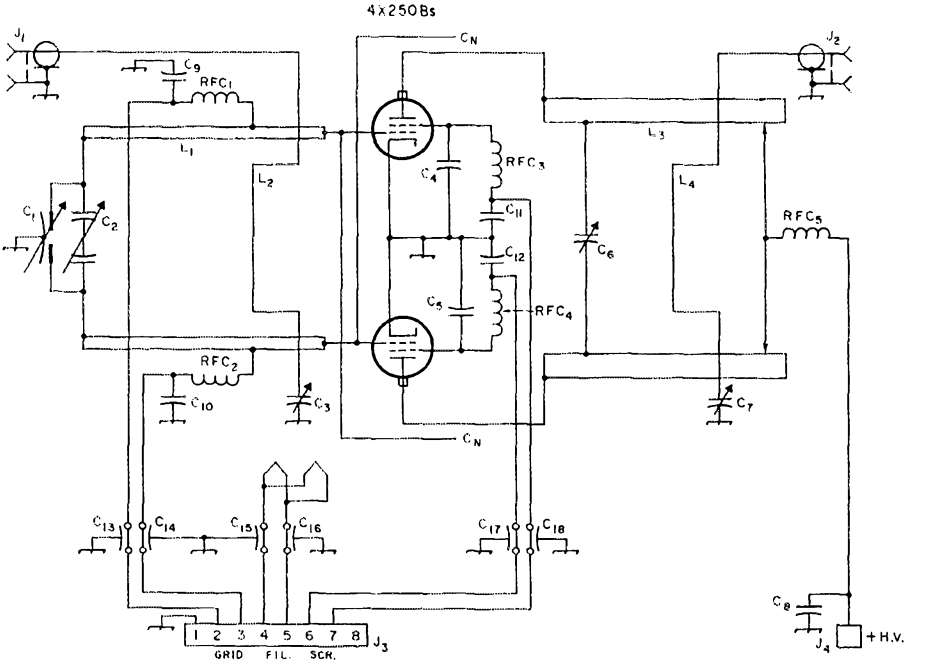


Fig. 1—Schematic diagram of the WØMOX high-powered 144-Mc. amplifier.

C_1—5-$\mu\mu$f. miniature differential capacitor (Johnson 160-303 or 6MA11).

C_2—50-$\mu\mu$f.-per-section split-stator variable (Hammarlund HFD-50).

C_3, C_7—50-$\mu\mu$f. variable, 0.03-inch spacing (Hammarlund HFA-50-B)

C_4, C_5—Screen bypasses built into tube sockets (Eimac SK-610).

C_6—Variable disk capacitor; see text.

C_8—500-$\mu\mu$f. 20,000 volts (Centralab TV 207).

C_9-C_{12} inc.—500-$\mu\mu$f. silver button standoff capacitors (Centralab ZA-501).

C_{13}-C_{18} inc.—500-$\mu\mu$f. feed-through bypass. (Centralab FT-500).

C_N—Neutralizing wires; see text and photographs.

J_1—Coaxial receptacle, type BNC (UG-290 A/U).

J_2—Coaxial receptacle, type N (UG-58 A/U).

L_1—Grid lines; see Fig. 2 and the text.

L_2—Grid coupling loop; see text and photographs.

L_3, L_4—Plate line and coupling loop; see photographs, text and February, 1960, *QST*.

J_3—Low-voltage power connector, male (Amphenol 86-CP8).

J_4—High-voltage power connector (Millen 37001).

RFC_1-RFC_5 inc.—1.8-μh. r.f. choke (Ohmite Z-144).

screw is cut in each grid line, and solder lugs held underneath the line by these screws make the connections to RFC_1 and RFC_2.

The grid circuit is tuned by means of C_2, which has its rotor ungrounded. The capacitor is supported by two 6-32 nylon screws extending through the chassis. Small Teflon washers insulate the rotor mounting lugs from the chassis. Metal screws and fiber shoulder washers could be used, but if this is done be sure to cover the exposed screw heads to prevent your hand from coming into contact with them. If you are tempted to ground the rotor of C_2, don't! Grounding can produce multiple resonances in the grid circuit very near the 2-meter band, making it impossible to stabilize the amplifier. The drive to the two tubes is balanced by means of the differential capacitor C_1, the rotor of which is grounded in the normal manner.

Driving power is fed to the grid circuit by means of L_2. The link is supported on two 2½-inch lengths of ½-inch Teflon rod. It is made of No. 12 wire, in a U shape 1½ inches long and 1¼ inches wide, and is located underneath the grid lines. In order to keep lead inductance to a minimum, ⅜-inch-wide copper strap is used to connect the link to J_1 and C_3.

All wiring, other than r.f., is made with shielded wire. The heater and screen wiring should be done before the partition is permanently mounted in the chassis. The bottom ends of RFC_1 and RFC_2 are supported by silver button bypasses, as shown in the close-up view of the grid compartment.

A small amount of crossover neutralization is employed. Insulated leads are brought to small feed-through insulators from the grids of the tubes. The total lead length on the plate side of the partition is 1½ inches. In order to completely stabilize the amplifier, it was necessary to shield the screen rings of the 4X250Bs from the neutralizing leads.[2] This is done with a piece of flashing copper 1 inch wide and 6 inches long, bent as shown in the photographs, and held in place on the partition by means of four solder lugs.

The cover plate for the amplifier is a standard chassis bottom plate. To facilitate the initial ad-

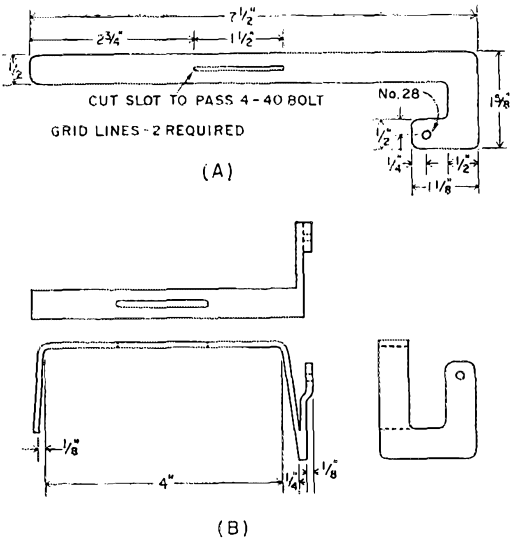


Fig. 2—Details of the sheet-copper grid circuit used in the 4X250B amplifier. The piece is shown before bending (A), and in its final form (B).

justment, 1-inch holes were punched over the center of the grid line, over the neutralizing leads, and over the output link. After final adjustment, these holes may be plugged with standard snap-type hole plugs.

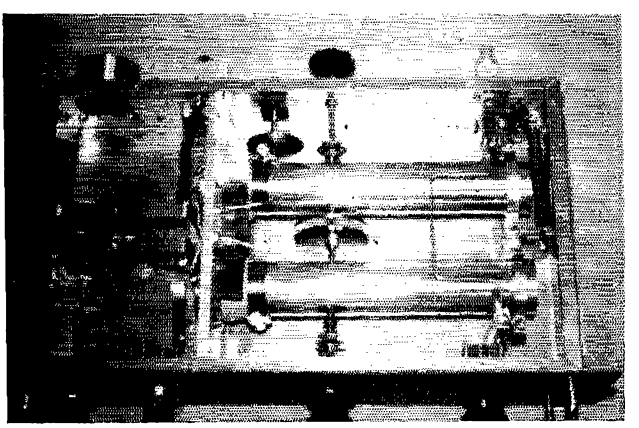
Forced air is brought to the amplifier through a length of air hose, via the air input seen on the left side of the rear of the amplifier. The opening was covered with copper window screen. Air hose is available at most auto-supply houses. The octal plug carrying the heater, screen and grid voltages is mounted in the cover of a 2¾ × 2⅛ × 1⅝ inch box (Bud CU 3000A). The box is held to the chassis by the six feed-through capacitors.

The wiring of the meter panel is shown in Fig. 3. Shorting (make-before-break) type switches must be used for S_1 and S_2, to prevent opening up the grid bias or screen-supply leads if the switches are operated while the transmitter is on the air. Resistors R_1, R_2 and R_3, R_4 should match the internal resistance of the grid and screen meters respectively. The writer used 100-ma. meters whose internal resistance was only three ohms, and so omitted the resistors. Note that the purpose of the resistors is to maintain essentially constant resistance in the meter leads, not to serve as meter shunts.

Adjustment

The best of amplifiers is useless unless it is properly and carefully adjusted, a fact that is particularly true in the v.h.f. region. The first step is to balance the plate tank. Lightly couple a grid-dip meter to the plate circuit, and resonate the plate tank with C_6. If the plate circuit is balanced, placing a short between the edge of the chassis and the exact physical center of the shorting bar will not change the reading of the g.d.o. meter. This is shown, with a screwdriver as the short, in one of the photographs. If the reading changes, move the screwdriver along the shorting bar to determine the position of least effect, which is the electrical center of the tank. The balancing capacitor on the rear of the chassis should be adjusted to bring the electrical center of the tank circuit to coincide with the mechanical center, retuning C_6 as necessary. Filing a small notch in the lip of the chassis exactly opposite the mechanical center of the shorting bar to hold the shaft of the screwdriver will greatly improve the accuracy of the adjustments. To check the balance, scribe a line ¼ inch either side of the mechanical center of the shorting bar. If the plate tank is balanced, equal deflections should be observed on the g.d.o. meter when the screwdriver is placed on either line, while no deflection should be observed if it is placed on exact center.

Although the shorting bar was bypassed in the original amplifier, the writer found that higher efficiency was possible without the plate-circuit bypass. Two factors may contribute to this. First, accurate balancing becomes nearly impossible with the shorting bar bypassed, as the mechanical center of the shorting bar is forced to be at nearly ground potential by the capacitor. This condition of "forced balance" does not guarantee that both halves of the plate tank are identical electrically. Second, in v.h.f. amplifiers such as this one, a second tuned circuit very near the operating



Top view of the amplifier, showing construction details of grid and plate compartments of the amplifier.

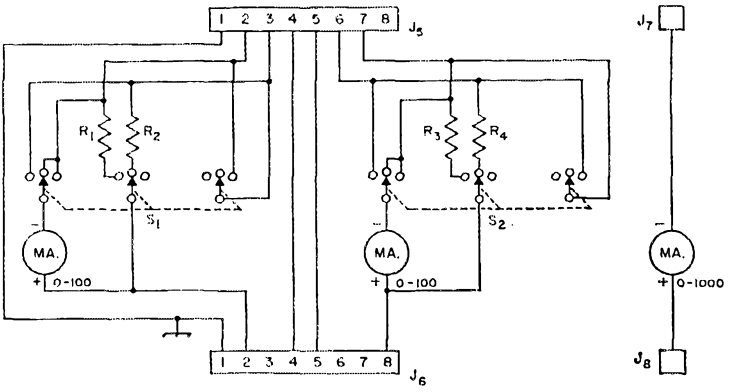


Fig. 3—Schematic diagram of the meter panel and its associated switching circuits.

J_5—Low-voltage power connector, female (Amphenol 78-S8).

J_6—Low-voltage power connector, male (Amphenol 86-CP8).

J_7, J_8—High-voltage power connector (Millen 37001).

R_1-R_4 inc.—See text.

S_1, S_2—3-section, 3-position progressively-shorting switch.

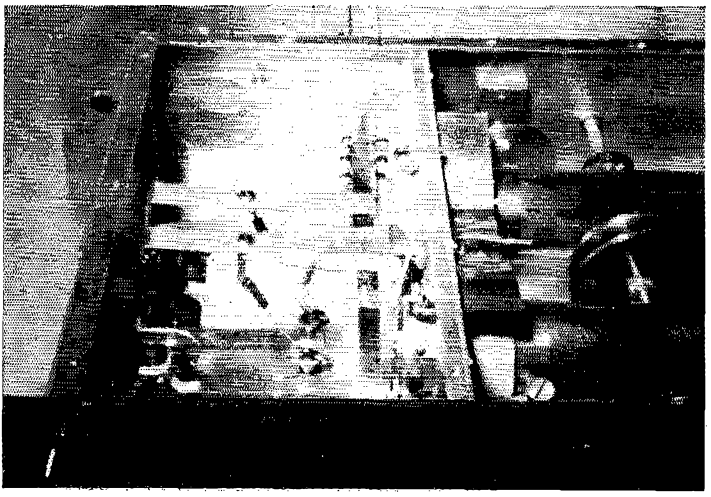
frequency may be produced by the addition of a plate bypass capacitor, allowing currents to flow along the plate lines, through the bypass capacitor, and down the chassis to the cathodes of the tubes. The nearer to the operating frequency these secondary resonances are, the more power must be robbed from the plate circuit to maintain the secondary current. If the amplifier is properly adjusted without the bypass capacitor, neither forced balance nor secondary resonances can exist.

After reading the above discussion, you may be wondering if your push-pull amplifier is properly balanced. As a quick check, remove the plate-circuit bypass capacitor and fire up the rig. If the plate circuit r.f. choke goes up in a cloud of smoke, you have some work to do!

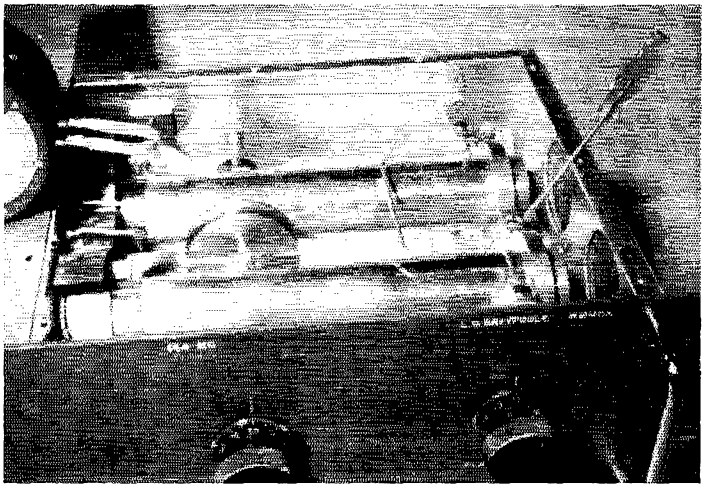
The rest of the adjustments should be made with the top cover in place. Couple the g.d.o. to the grid circuit through a one-turn link connected to J_1. Set C_1 for balanced capacitance to ground. Resonate the grid tank with C_2 and note the reading on the g.d.o. meter. Run a pencil through one of the holes in the cover and move its lead along the grid line until a point is found which causes minimum change in the g.d.o. meter. Remove the cover and move the 4–40 bolts along the slots to the point determined above. Replace the top cover and repeat the adjustment. This check must be made with the top cover in place, as the cover contributes significant capacitance to the grid ines.

Now apply heater voltage and grid bias for Class C operation. Do *not* apply screen or plate voltages. Apply grid drive to the amplifier through J_1, tune the grid circuit to resonance, and balance the drive by means of C_1. With about 20 ma. grid current per tube, adjust the position of the neutralizing wires for *minimum* r.f. in the plate circuit, while adjusting C_6 and C_7 for *maximum* output. A very sensitive indicator of r.f. is needed for this test. A diode and a v.t.v.m. on the output link will make a good detector. During the neutralizing procedure, the d.c. connections for plate and screen voltages must be open to prevent the flow of current. This current is derived from diode rectification within the tubes, allowing the tube to pass a small amount of r.f. energy. Under this condition, the adjustment of the neutralizing wires for minimum r.f. in the plate circuit will not give perfect neutralization.

The adjustment of the amplifier is now complete. It would be wise, however, to go through the entire sequence of adjustments again. It will be found that the second try at the adjustments will progress rather quickly.



Details of grid lines. They are cut from 12-gauge copper and bent to the shape shown in Fig. 2. Note the location of the button bypasses for the grid-line r.f. chokes, and the slots in the line for adjustment of the points of connection of the chokes.



View of the amplifier plate circuit showing the location of the grid-dip meter during the balancing operation. The screwdriver shaft is resting in a notch filed in the lip of the chassis directly opposite the exact mechanical center of the shorting bar. It provides a convenient means of shorting the plate line to ground to check electrical balance.

Results

The procedure set forth above has resulted in an amplifier which is beautifully stable in operation in both Class C and linear service. In Class-C amplifier service, with 4X250Bs in the sockets, maximum output and minimum plate current occur at the same setting of the plate tuning capacitor, a situation not often found in v.h.f. amplifiers. No significant change in grid current can be seen as the plate circuit is tuned through resonance. In Class-C service, with 2000 volts on the plates and 500 milliamperes of plate current, the grid current is 20 milliamperes per tube and the screen current is 10 milliamperes per tube.

The writer has used 4X150As in this amplifier, and found them to be nearly the equal of 4X250Bs in Class-C service. Using a pair of 4X150As, the amplifier was run at 1-kw. input for one hour, meteor style (30 seconds of high-speed c.w., 30 seconds off). The tubes seemed to take it OK, but their life might be shortened significantly by this treatment. The higher the efficiency the amplifier has, the safer it is to use the 4X150As, since any power not put out into the transmission line must be dissipated in the plates of the tubes and the associated tank circuit. A plate dissipation of 150 watts per tube is permissible with 4X150As, so a full kilowatt input should be safe if adequate cooling is provided.

Using 4X250Bs in Class-C service, 75 percent efficiency was obtained without silver plating the r.f. circuitry. Silver-plating resulted in an observable improvement. At 1 kw. input, the substantial additional output that resulted from silver-plating could not be obtained in any other manner.

For linear-amplifier service, the primary limitation is the plate dissipation of the tubes. Thus, if one is primarily interested in linear operation, maximum results will be obtained with 4CX300As. Successively lower power must be run with 4X250Bs or 4X150As. The previously published works on linear amplifiers are recommended reading if you plan to run this amplifier in linear service.[3]

The writer wishes to acknowledge the suggestions and advice given by W7LHL, WØIC, WØAZT, WØIUF and George R. Sugar. QST

[3] Tilton, "Linear Amplifiers for the V.H.F. Man," *QST*, Dec., 1956, p. 28.
Grammer, Technical Topics, "Linear Amplifiers for A.M.," *QST*, Feb., 1956, p. 39.
Southworth, "Using the 4X250B on 144, 220 and 432 Mc.," *QST*, Feb., 1957, p. 31.

Strays

The Air Force MARS Eastern Technical Net, meeting Sundays at 1900 GMT on 3295, 7540, and 15,715 kc., has issued the following December schedule.

Dec. 3 — To be announced later.
Dec. 10 — Illumination at Low Levels
Dec. 17 — The Voltage-Tunable Magnetron for Microwave Applications.
Dec. 24 and 31 — No net.

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The Board of Commissioners of Cuyahoga County (in the Cleveland, Ohio, area) passed a resolution designating the week of October 8–14 as Amateur Radio Week in Cuyahoga County. This coincided neatly with the ARRL Great Lakes Division Convention, held in Cleveland on October 13 and 14. The County Commissioners cited radio amateurs for their many technical contributions and public service.

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Have you written your senators about Senate Bill 2361? See pages 9 and 73, October *QST*, for further information.

You won't find a word here about holes, barriers, h_{FE} or I_{CER}. This is a how-to-make-it article with diagrams and essential operating information on several simple transistor circuits of practical everyday use to any amateur. All are in regular service at W4GEB.

Practical Ham-Shack Transistor Application

BY WILLIAM L. NORTH,* W4GEB

In view of the great strides made in the transistor field within the last few years, it is surprising that their practical application in the ham shack has not been more widespread. Perhaps some of the rumors often bandied about regarding high noise and instability have caused most amateurs to shy away from them. That at least some of these stories are nothing more than old wives' tales has been adequately demonstrated by W2TGP. His article [1] in an earlier issue of *QST* describes the surprising performance that may be expected from even a rather complicated device such as an all-transistor communications receiver.

For the past four years, the author has been experimenting with various transistor applications, from the simple to the not-so-simple, and is convinced beyond all doubt that these tiny gadgets are here to stay. In fact, if it were not for the danger of arousing skepticism, the phrase, "or why use tubes?" might have been added to the title of this article. Admittedly, in their early stages of development, transistors often proved to be quite noisy and unstable and far from uniform as to other characteristics. However, the ones that are available today at moderate prices are infinitely more reliable and can be made to do surprisingly numerous jobs with circuitry much less complicated than that associated with tubes. And it isn't necessary to have a close acquaintance with the physics involved in transistor theory to obtain good results. The author is far from an expert on solid-state devices. However, by simply referring to the many articles that have appeared on the subject and to literature available from transistor manufacturers, I have been able to put some of this information to work with most satisfactory results. I can assure you that most of the uncomplimentary stories that you may have heard are either exaggerations or are founded, in truth, on improper treatment, or failure to consider some of the transistor's peculiar features, rather than on actual vagaries of the transistors themselves.

The material that follows will describe several simple applications of the transistor, but ones that will be found highly useful in the ham station. All have been built and tested by the author and are now in regular service at W4GEB. No originality is claimed. It is readily admitted that most of what follows has been borrowed or stolen from published literature which so far, I fear, has been largely left unread by the average amateur.

Class A Audio Amplifiers

Fig. 1 is a circuit diagram of a Class A audio amplifier in present use as a preamplifier for a dynamic microphone. Ones like it are described in many places. It has sufficient gain to raise the level of a very low-output dynamic mike so that it will drive the usual crystal-microphone input circuit. At the same time, it transforms an impedance of less than 200 ohms up to a value of several thousand ohms suitable for feeding directly into a high-impedance input circuit. In the amplifier I built, the transistor is a 2N107 p-n-p unit costing less than a dollar. No transformers that might pick up hum are needed. However, all components should be well shielded against r.f. pickup from the transmitter.

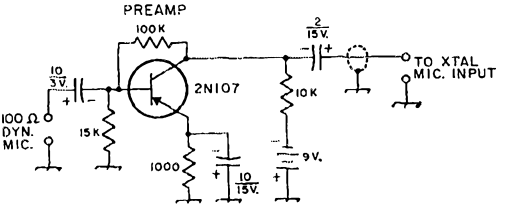


Fig. 1—Preamplifier circuit. Capacitances are in μf.; resistances are in ohms. Resistors are ¼ watt. Capacitors are electrolytic.

Several identical stages may be cascaded to comprise a speech amplifier. More than three stages should not be necessary in practical ham use. Surplus transistors, currently selling for 25 cents or so, should be perfectly satisfactory in this application. If an n-p-n transistor is substituted, merely reverse the battery polarity.

Class B Audio Amplifiers

Fig. 2 shows the circuit of a Class B audio amplifier that I used in a homemade 7-transistor

* 712 Hallwood Ave., Falls Church, Virginia.

[1] Priebe, "All-Transistor Communications Receiver," *QST*, February, 1959.

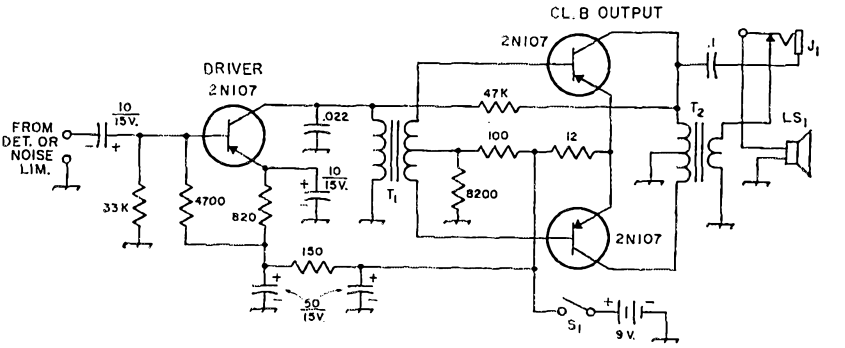


Fig. 2—Class B audio output amplifier with driver. Capacitances are in μf.; resistances are in ohms. Resistors are ¼ watt. Capacitors marked with polarity are electrolytic.

J1—Closed-circuit jack for headphones.

LS1—Loudspeaker.

S1—S.p.s.t. toggle switch.

T1—Transistor Class B driver transformer (Triad T-41X or similar).

T2—Transistor Class B output-to-voice-coil transformer (Triad TY-47X or similar).

broadcast receiver. I incorporated a duplicate in my 14-transistor double-conversion ham-band superhet which is similar to the one described by Priebe. This output stage delivers ample power (about 80 to 100 milliwatts) to make listening uncomfortable in a room of moderate size. Only a single driver stage is needed between the detector and the Class B stage. The driver circuit is similar to Fig. 1, except that a Class B input transformer is substituted for the 10K collector load resistor. Again, 2N107s are used and any similar type should work equally well. The input and output transformers cost 79 cents each and are listed in several mail-order catalogs.

The driver draws about ½ ma. and the Class B stage idles at about 2 ma. with a 9-volt supply. At full output, the output-stage collector current kicks up to 15 or 20 ma. Both stages should work satisfactorily on anything from 4½ to 12 volts.

Detectors

Several different detector circuits are being used in broadcast receivers. The circuit of Fig. 3 is similar to some of these and is described in *A Handbook of Selected Semiconductor Circuits*, NObsr 73231, available from the Government Printing Office, Washington, D.C., for $2.75. This handbook, incidentally, is a good source of information on many practical transistor circuits.

This detector is particularly handy from the amateur point of view. It supplies about 10 db. of audio gain after detection and, at the same time, can furnish a.v.c. voltage without the necessity for adding d.c. amplifiers. The modification shown in Fig. 4 is used in the author's amateur-band receiver where it does quadruple duty. It detects, amplifies audio, furnishes a.v.c., and also serves as an S-meter amplifier.

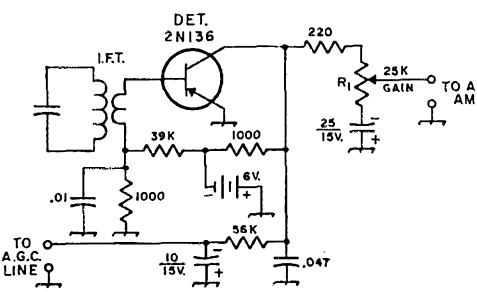


Fig. 3—I.f. detector circuit. Capacitances are in μf.; resistances are in ohms. Resistors are ¼ watt. Capacitors marked with polarity are electrolytic. R_1 is an audio-taper control.

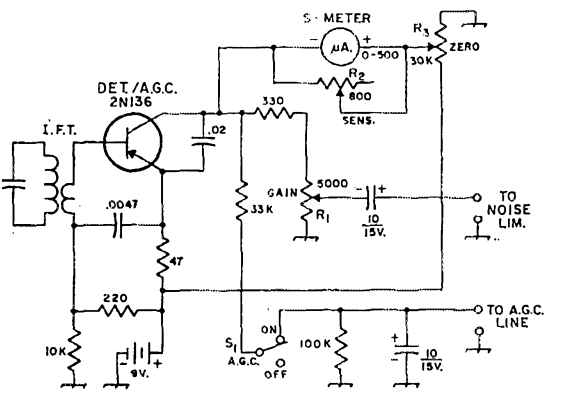


Fig. 4—I.f. detector circuit with S meter and automatic gain control. Capacitances are in μf.; resistances are in ohms. Resistors are ¼ watt. Capacitors marked with polarity are electrolytic.

R1—Audio-taper control.

R2, R3—Linear-taper control.

S1—S.p.s.t. toggle switch.

I.F. Amplifiers

Transistor i.f. transformers are available at prices of less than a dollar. Although this makes them attractive, most of these less-expensive units do not provide sufficient selectivity for amateur-receiver purposes. If they are used,

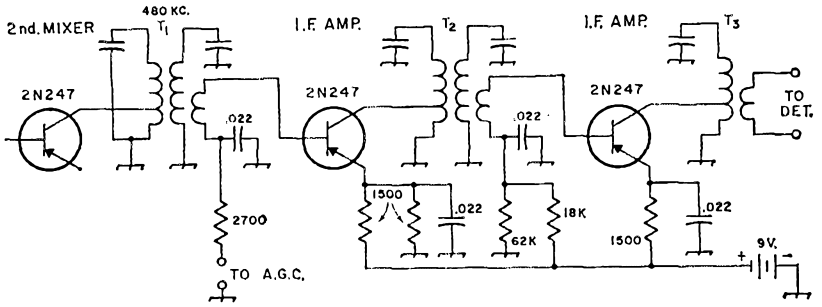


Fig. 5—Two-stage i.f. amplifier circuit. Capacitances are in μf.; resistances are in ohms. Resistors are ¼ watt. See text referring to T_1, T_2 and T_3.

additional selectivity may have to be provided by some sort of filter such as the one described by Priebe. To provide reasonable selectivity consistent with circuit simplicity and cost, the author used standard i.f. transformers modified in a manner similar to that described by WØMCN.[2] Approximately one third of the primary turns was unwound, and a tap was brought out at this point. The unwound turns were then rewound in scramble style. Rather than to use series tuning in the secondary, as suggested by WØMCN, I used parallel tuning and added a link output winding of 30 turns of No. 26 or No. 28 cotton-covered wire around the secondary. In the case of the transformers I used, this modification raised the minimum frequency to which the transformers would tune to about 480 kc., so I simply used this frequency in the i.f. amplifier. If a frequency of 455 kc. is a requirement (to match a standard filter, for instance) additional tuning capacitance may be used to lower the frequency.

Fig. 5 shows the circuit of the two-stage i.f. amplifier. Its selectivity is comparable to the average two-stage tube amplifier and its gain is about the same. In my receiver, additional selectivity is provided by the Q multiplier described later.

One important thing to remember about transistors in r.f. and i.f. amplifiers is that they load the circuits quite heavily and will impair selectivity unless the coupling to the tuned circuits is made quite loose. Loose coupling can be achieved by tapping the transistor output down on the transformer primaries, and using link-input coupling from the secondaries as described previously. This also serves to match impedances for maximum energy transfer. If selectivity, rather than gain, is the paramount interest, the primary may be tapped down lower and smaller output links may be used than required for maximum gain. This has been done in my station receiver.

If neutralization is to be avoided, the selection of a transistor may have to be restricted to certain types. For example, 2N247s usually do not require neutralization; neither do 2N170s. On the other hand, point-contact types may oscillate in amplifier circuits unless they are neutralized. Neutralization is usually not difficult to achieve in a fixed-tuned amplifier, but there may be considerable difficulty with a stage covering a wide band of frequencies, such as a tuned r.f. amplifier.

[2] Heinen, "An Experimental All-Transistor Communications Receiver," *QST*, May, 1956.

R.F. Amplifiers

All that has been said previously about i.f. amplifiers goes for r.f. amplifiers as well. However, in the case of r.f. amplifiers, there are additional factors to consider. Of primary importance is the ease with which transistors go into rectification. In a detector, this is just what is needed, of course, but in an r.f. amplifier, it can lead to frustration. In several previous attempts at building ham-band receivers, operation was plagued by spurious responses because of cross-modulation by strong signals, often well removed from the desired reception frequency. Additionally, image rejection was poor. A review of the literature indicated that the overloading by strong signals off frequency could best be avoided by concentrating on selectivity. Three general rules were evident. (1) Load the tuned circuits lightly. (2) Use as large a tank-circuit capacitance as practicable. (3) Keep the coil Q high. Although these measures involved some sacrifice in gain, they proved to be most effective in reducing spurious responses and cross-modulation, and the gain still appears to compare favorably with that of a manufactured receiver costing close to $400 against which the transistor receiver was checked. It should be mentioned, however, that it is very difficult to operate a transistor front end in the presence of extremely strong local signals if a large antenna is used. As an example, with an 80-meter dipole on the receiver, severe cross-modulation products occur when local broadcast stations are on the air. Three of these are less than 2 miles (one only 5 blocks) from W4GEB. However, sufficient sensitivity for most purposes is obtained with a piece of wire 15 to 30 feet long as an antenna, and the overloading is eliminated. Perhaps a high-pass filter would permit the use of a larger antenna.

Fig. 6 shows the circuit of the r.f. amplifier used in my receiver. The simplicity of Priebe's band-switching circuitry was copied. However, to

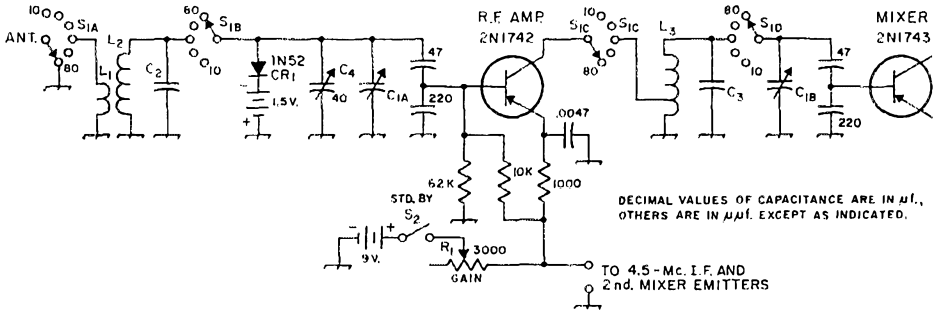


Fig. 6—Circuit of an r.f. amplifier. Resistances are in ohms. Resistors are ¼ watt. See article referenced in Footnote 1 for values not specified.

C_1—Tuning capacitor.
C_2, C_3—Bandspread padder.
C_4—Antenna trimmer.
CR_1—Back-biased diode for front-end protection against transmitter signal.
L_1, L_2, L_3—Receiver tuning coils.
R_1—Linear-taper control.
S_1—Band switch. See article referenced in Footnote 1, and also text of this article referring to Fig. 7.
S_2—S.p.s.t. toggle switch.

reduce cross-modulation problems, the transistor inputs and outputs are tapped much farther down on the tuned circuits.

Two new transistor types were substituted for those used by W2TGP. These are Philco types 2N1742 (T1832) and 2N1743 (T1833). They are MADT types designed for v.h.f. and u.h.f. use and are described as having low noise characteristics. The manufacturer's literature indicates that these transistors should be neutralized. However, in this application they are tapped so far down on the tuned circuits that oscillation is impossible, although some regeneration may remain, contributing to the selectivity as well as the gain.

Many different gain-control circuits were tried. Most of them involved the adjustment of the base bias in one way or another. None of these was entirely satisfactory, and the one finally adopted harks back to the days of the 201A. The supply voltage on the r.f. stage as well as on two of the i.f. amplifiers is varied to control the gain. This may not be the scientific way of doing the job, but it works very smoothly and permits the application of a.v.c. without using a complicated switching arrangement.

R.F. Oscillators

From available literature, it appears that transistors are adaptable to any of the commonly-used tube oscillator circuits. There is one difference, however. In a tube oscillator circuit, the grid or input circuit usually operates at a much higher impedance level than does the plate or output circuit. In a transistor oscillator, the reverse prevails, and the base or input circuit operates at a much lower impedance level than the collector or output circuit. Except for this small difference, there is nothing the least strange about transistor oscillator circuits.

The well-known principle of high C for stability is even more important for transistor oscillators. Otherwise the circuit to be selected may depend upon the particular application. Personally, I've had the best results from the Colpitts configuration in circuits operating up to 50 Mc. One of the articles appearing in the government publication mentioned previously points out that the internal base-emitter capacitance of a transistor may be rather unstable. Since this capacitance is rather high (on the order of 100 μμf. for some types), the obvious treatment is to use a large external swamping capacitance in parallel. From this con-

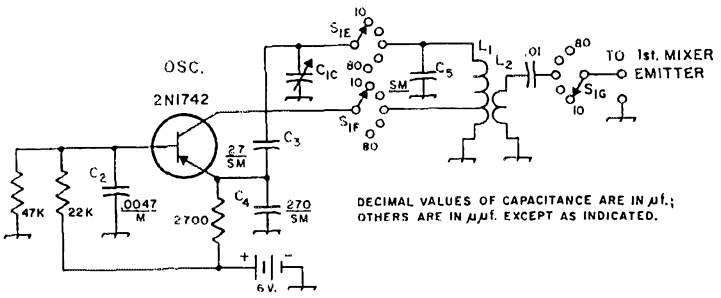


Fig. 7—Receiver high-frequency oscillator circuit. Resistances are in ohms and resistors are ¼ watt.

C_{1C}—Oscillator tuning capacitor ganged to r.f. tuning capacitor in Fig. 6.
C_2, C_3, C_4—See text.
C_5—Bandspread padder. (See article referenced in Footnote 1 for appropriate value.)
L_1, L_2—Oscillator tank and coupling coils. (See article referenced in Footnote 1 for appropriate values.)
S_{1E}, S_{1F}, S_{1G}—Part of S_1 in Fig. 6 (see text).

sideration, the Colpitts circuit is more readily adaptable than some of the others.

Fig. 7 shows the oscillator circuit used in the author's ham-band superhet. C_4 is of prime importance in swamping out the base-emitter capacitance of the transistor. This capacitor should be a silver mica unit and should have as large a value as practicable. However, if the capacitance is made too large, the circuit may not oscillate.

The value of C_2 is of almost equal importance. It should represent a virtual short circuit for r.f. and the capacitor should be of good quality.

The emitter is tapped down on the tuned circuit by means of the voltage divider C_3C_4. The step-down ratio C_3-C_4 should be as large as possible while still permitting the circuit to oscillate reliably. The values shown are suitable for the approximate range of 3 to 30 Mc. and need not be changed when shifting bands. For lower frequencies, it may be necessary to increase the value of C_4, and higher frequencies may require a smaller value. Some v.h.f. applications may require the omission of C_4 entirely, and the reduction of C_3 to only a few $\mu\mu$f.

Tapping the collector down on the tank circuit is also important from the consideration of frequency stability, especially at the higher frequencies. Although this makes it necessary to provide one more band-switch section than used by Priebe, the improvement in stability makes the addition well worth while. In general, the tap should be placed as far down on the coil as possible while still maintaining reliable oscillation. The degree of tapping will depend to a certain extent upon the Q of the coil. In my own receiver, I found it possible to tap about two thirds down from the hot end on 21 Mc. At 3 Mc., however, the tap had to be placed near the top end of the coil to maintain oscillation.

All tank and bypass capacitors should be silver mica, and the fixed padding capacitances should be as large as possible consistent with the desired tuning range.

This particular arrangement has been found to be extremely stable under power-supply voltage changes. Reducing the voltage from 9 volts to 3 volts changes the frequency less than 1 kc. at 21 Mc. An increase from 9 to 12 volts causes about the same deviation. As a result, it has been found unnecessary to use any form of voltage regulation, even on 10 meters, and even when a Class B audio stage is operated from the same battery. (Actually the frequency change is less at 28 Mc. than at 21 Mc., because the h.f.o. on the former band operates at 12 Mc., the second harmonic being used for mixing.)

In the author's home-brew receiver, long-term frequency stability is excellent on all bands. It is best, of course, on the lower frequencies but, even on 10 meters, the h.f.o. drifts only a few cycles over periods of 15 minutes or longer. The drift is believed to be less than that of most s.s.b. stations, and is much, much less than that of the comparison manufactured receiver.

If good mechanical stability is built into a transistor oscillator, physical shock will not cause detuning. Although the author does not make a practice of beating on the cabinet with his fist while receiving, it makes a good demonstration for visiting firemen to show that it can be done without losing "copy" on an s.s.b. station.

Q Multiplier

Having covered some of the basic applications of transistors, it may be interesting to see in what other ways they may be put to use in the ham shack. As suggested earlier, receiver selectivity can be greatly improved by the use of a Q multiplier. Fig. 8 shows the circuit used at

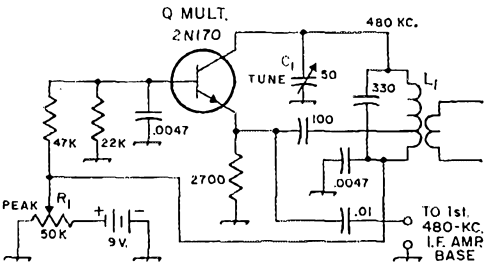


Fig. 8—Q-multiplier circuit. Resistances are in ohms and resistors are ¼ watt.

C_1—50-$\mu\mu$f. variable.
L_1—See text.
R_1—Linear control.

W4GEB. The coil L_1 is a miniature shielded transistor broadcast-oscillator transformer. The usual collector winding was not used, and the frequency range was lowered to match my i.f. of 480 kc. by a 330-$\mu\mu$f. silver-mica capacitor. If this circuit is to be used to provide a notch in the pass band of the i.f. amplifier, rather loose coupling should be used between the Q multiplier and the i.f. transformer. The exact amount of coupling will have to be determined by experiment. On the other hand, if the multiplier is to be used for peaking the selectivity, tight coupling is required. The latter function was the one desired by the author. After much trial and tribulation in attempting to obtain smooth operation without severe reaction on the i.f.-transformer tuning, it was found that the desired objective could be reached by coupling the Q-multiplier transistor emitter to the first 480-kc. i.f.-stage transistor base through a 0.01-μf. ceramic capacitor. With this arrangement, the selectivity of the receiver is greatly improved, adjustments of peaking and frequency are stable, and an S1 signal can be brought up to S9 before the multiplier goes into oscillation.

Grid-Dip Oscillator

Another handy unit is the grid-dip oscillator described in the *ARRL Handbook*. The one constructed here works extremely well. The circuit, Fig. 9, was slightly modified in the oscillator portion by adding a lever-action wafer switch to disconnect the transistor from the tuned circuit.

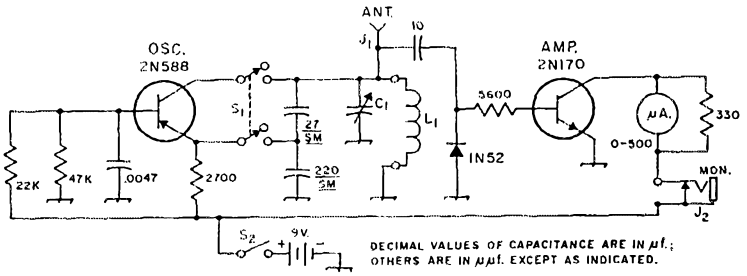


Fig. 9—Combination grid-dip oscillator circuit. Resistances are in ohms and resistors are ¼ watt.

C_1L_1—See *ARRL Handbook*, measurements chapter.
J_1—Pin jack.
J_2—Closed-circuit headphone jack.
S_1—D.p.d.t. lever-action switch.
S_2—S.p.s.t. toggle switch.

With this addition, the unit serves the purposes of a g.d.o., phone monitor, c.w. monitor and field-strength meter.

Conelrad Alarm

Several articles on self-powered c.w. monitors have been published and these suggested an idea for a Conelrad alarm. The circuit is shown in Fig. 10. In this case, instead of using a rectified signal from a tuned circuit to power an audio oscillator, the rectified voltage is applied to an audio oscillator so as to keep it from oscillating in the presence of a local broadcast signal. A simple audio amplifier is added to the audio oscillator to provide sufficient volume to operate a small speaker. As long as the broadcast station remains on the air, the monitor is silent, but if the station goes off the air, the oscillator operates and a tone is heard in the speaker. A 15-foot piece of wire is sufficient as an antenna at this location for operation from a 1-kw. broadcast station a half mile away. This unit draws only 1½ ma. from a 1½-volt penlite cell, so no battery switch was included.

R-C Bridge

Fig. 11 shows the diagram of a resistance-capacitance bridge used with a transistor audio oscillator to measure unknown capacitances. It was calibrated using known values of capacitance across the "unknown" terminals. It is accurate enough for most purposes and covers the range of 10 μμf. to 20 μf. Those who have boxes of unmarked or questionably-coded surplus capacitors will find this unit a handy item to have around. In checking low-capacitance values, the oscillator frequency should be set at a rather high value — one or two kilocycles — by adjusting the values of capacitance (0.02 μf.) and resistance (12K).

Frequency Marker

Fig. 12 is the circuit of a 200-kc. crystal (surplus) oscillator and 10-kc. multivibrator. It gives usable points up to 20 Mc. Low-frequency transistors (2N170s) were used. High-frequency transistors would probably extend the useful range. The range may also be extended to 30 or 50 Mc. by the addition of the tuned amplifier circuit shown to the right of the dotted lines. This has been done in breadboard fashion by the author, but has not yet been installed permanently. A surplus TV slug-tuned 252-kc. i.f.-transformer primary or secondary should be satisfactory for L_1.

Transistor Checker

Fig. 13 is the diagram of a transistor checker that I found in the Spring, 1961 issue of *Radio-TV Experimenter*. It gives a pretty good indication of beta and a very good indication of leakage current. The beta value is obtained by multiplying the current reading of the milliammeter by the multiplying factor for which S_1 is set. As an example, 0.2 (ma.) × 100 (multiplier switch in center multiplier position) = 20 (beta). Leakage current is read directly from the meter.

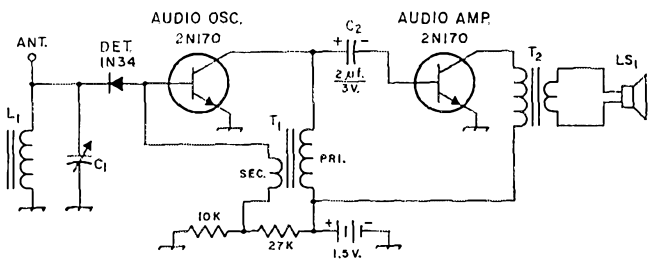


Fig. 10—Simple Conelrad alarm circuit. Resistances are in ohms and resistors are ¼ watt.

C_1L_1—Circuit tuning the broadcast band. L_1 may be a "loopstick."
C_2—2-μf. electrolytic.
LS_1—Loudspeaker.
T_1—Transistor Class B driver transformer (Triad T-41X or similar).
T_2—4000-ohms-to-voice-coil transistor output transformer.

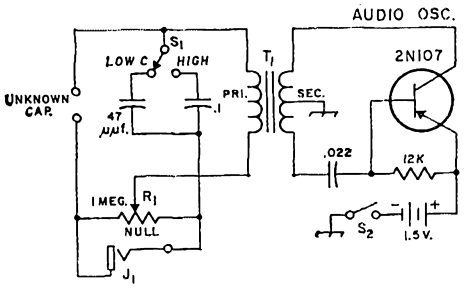


Fig. 11—Capacitance-checker circuit. Unless otherwise indicated, capacitances are in μf. Resistances are in ohms and resistors are ¼ watt. Low-C range is 10 μμf. to 0.05 μf.; high-C range is 0.05 μf. to 20 μf.

J_1—Open-circuit headphone jack.
R_1—Linear control.
S_1—S.p.d.t. rotary switch.
S_2—S.p.s.t. toggle switch.
T_1—Transistor Class B driver transformer (Triad T-41X or similar).

Conclusions

Only a few of the possible applications of transistors have been covered here. Those who have not tried transistors are missing a good bet and a lot of fun. With a little practice, circuits like those described can be thrown together in a half hour or so. The author doubts that he will ever use tubes again for low-power applications. Transistors perform as well as tubes in these applications and sometimes much better and at considerably less cost. A 2N588, good up to better than 50 Mc., now costs $1.45. A 2N247 (drift) costs around $3.00, and it is good up to 30 or 50 Mc. in some applications. A 2N1832 costs less than $3.00. They say it will work well as an oscillator to 1300 Mc. It does a great job as an r.f. amplifier at 30 Mc.

Transistors recommended as Class A amplifiers can be used effectively in Class B amplifiers and they can be purchased for less than a buck. They will fill a room with 100 mw. or so of audio. N-p-n and p-n-p audio types may be used interchangeably, but don't forget that this requires a reversal of power-supply polarity. Failure to observe this will most surely lead to burned-out transistors.

In the various oscillators, and in r.f., i.f., or a.f. voltage amplifiers, the base-biasing voltage dividers are not at all critical. If the ratios are maintained within 10 to 20 per cent of those shown in the diagrams, no ill effects should occur. For example, in Figs. 7 and 8, the 47K 22K divider could be changed to 33K/12K or 100K/47K. Similarly, in Fig. 5, the 62K/18K divider could be 82K/18K or 82K/22K without incurring any really noticeable change in operation. The same goes for Fig. 1 where the 100K/15K divider could be changed to 100K/22K or 82K/12K. In Class A audio voltage amplifiers, where the base biasing voltage is obtained from a voltage divider, I have found that any divider ratio from 5/1 to 10/1 seems to work out OK. In oscillators, the ratio can be varied from 10/1 to 2/1. The point is that no one needs to rush out to get the exact values shown in the diagrams if he has something in the junk box that will hit anywhere near the

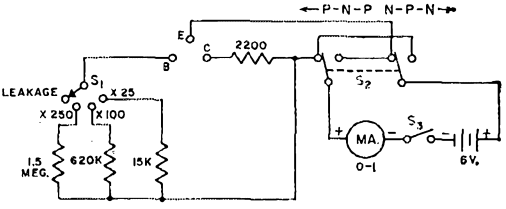


Fig. 13.—Circuit of the transistor checker. Resistances are in ohms and resistors are ¼ watt. S_1 is a rotary switch. S_2 and S_3 are toggle switches.

ratios shown, since these will usually work. I would not, however, treat a Class A *power* amplifier (such as the driver for the Class B amplifier in Fig. 2) so contemptuously.

If this article has stimulated your interest in transistors, get acquainted by buying a few manufacturers' handbooks and reading *QST* and the *ARRL Handbook*. Hello transistors, good-bye tubes. Now, let's see — I wonder what the price of tunnel diodes may be!

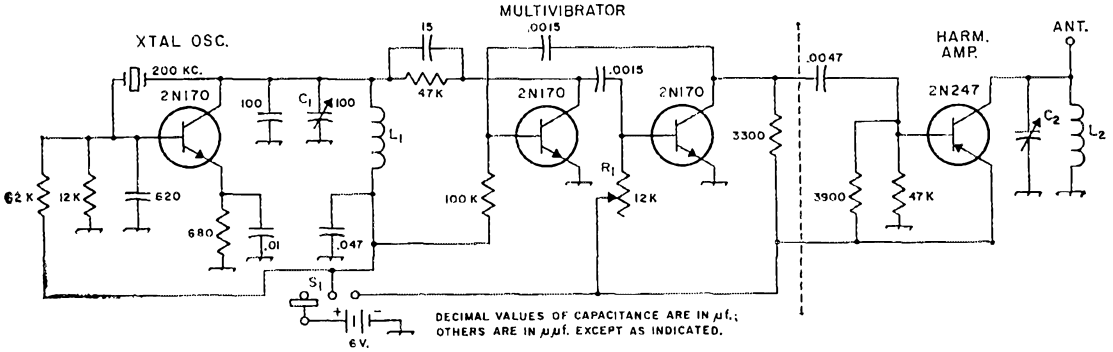
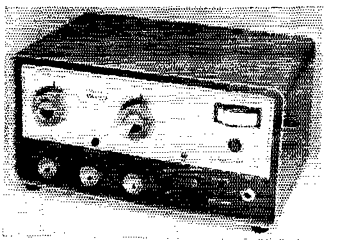


Fig. 12—Frequency-marker circuit. Resistances are in ohms and resistors are ¼ watt.

C_1L_1—Circuit tuning to 200 kc. (see text).
C_2L_2—Circuit tuning to desired harmonic.
R_1—Linear control.
S_1—Single-pole three-position progressively-shorting rotary switch.

• Recent Equipment —

HT-40 Transmitter and HT-40K Kit



YEARS from now we may look back on this era as the blossom time of the kit business. Latest of the old-line equipment manufacturers to succumb is Hallicrafters, entering the field with a transmitter kit (HT-40K) and a receiver kit (SX-140K, described in an accompanying article) designed especially for the newer amateurs. If you don't like the smell of hot resin on a soldering iron, you can get the same models wired and tested.

The HT-40 transmitter has a frequency range of 3.5 to 54 Mc., c.w. or a.m. phone. It is a two-tube circuit using a 6CX8 oscillator-buffer and a 6DQ5 r.f. amplifier. The triode section of the 6CX8 is used as a modified Pierce crystal oscillator, but is disabled by a switch when an external v.f.o. is used. The pentode section is a buffer-multiplier tuned by a pi network. The newcomer constructing this kit will probably trust the factory labels on these coils, but the old-timer may have to convince himself that Hallicrafters did not mislabel the six- and ten-meter coils for the 6CX8 pentode stage. The final operates straight through on 80 through 10 meters, but doubles to six meters, so the six-meter coil is cut for 25–27 Mc. and is a bit longer than the 10-meter coil.

A block diagram of the transmitter is shown in Fig. 1. The 6DQ5, TV's gift to the amateur, runs 75 watts input on c.w. and 75 watts peak-envelope input on controlled-carrier a.m. phone. The output circuit is a standard pi network designed for an unbalanced low-impedance load. The 6DQ5 amplifier is stabilized by a fixed neutralizing circuit consisting of a lead from the plate circuit of the driver to a tie-strip connection on top of the chassis adjacent to the 6DQ5 plate.

Tuning up the HT-40 is accomplished with the aid of a panel meter (0–5 ma.) which may be switched to read either grid current or relative r.f. output. In the r.f. output meter position, the meter reads a rectified sample of the actual output. There is no provision for measuring d.c. input to the final tube, so both the plate loading and plate tuning are adjusted for maximum r.f. reading. Hallicrafters uses an interesting scheme to overcome meter bounce: The meter is shunted with a 100-μf. electrolytic capacitor which gives some extra damping to the meter movement.

The speech-amplifier section of the transmitter is handled by three resistance-coupled triode circuits in cascade (two sections of a 12AX7 and the medium-μ section of a 6DE7). The screen of the 6DQ5 final r.f. amplifier is modulated by the lower-μ half of the 6DE7 operating as a cathode follower. A neon lamp on the front panel has been wired into the modulator circuit in such a way that it will flash when the modulation percentage reaches about 80 per cent (see Fig. 2A).

On c.w., the oscillator runs continuously, while the buffer and final are keyed simultaneously in the cathodes. In an interesting innovation the 6DE7 modulator is converted into a series electronic voltage regulator to stabilize the voltage on the oscillator and the final amplifier screen. This circuit is shown in Fig. 2B. The panel neon lamp modulation indicator, I_1, is used as a voltage reference for the grid of the 6DE7 regulator tube while in the c.w. mode.

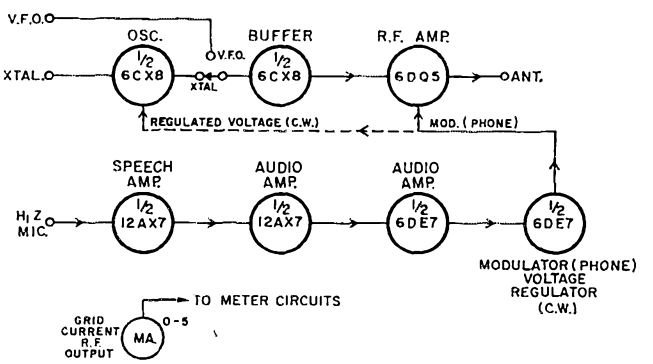


Fig. 1—Block diagram of the HT-40.

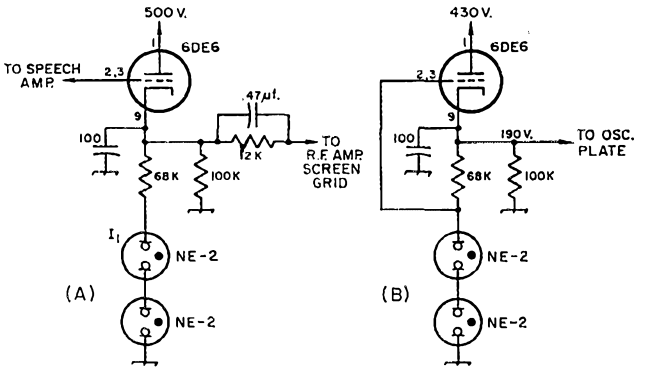
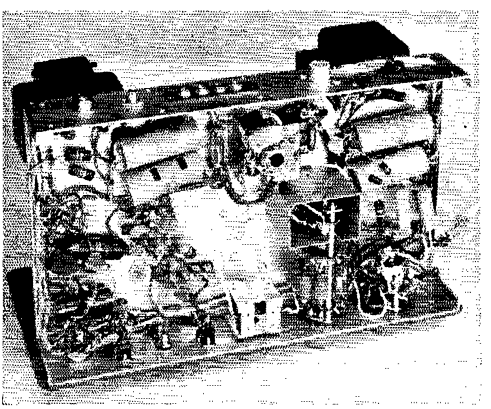


Fig. 2—The 6DE6 tube serves a dual purpose in the HT-40. In the phone mode (A), it operates as a cathode follower screen modulator. The neon lamp I_1 is mounted on the front panel and serves as a modulation indicator. On c.w. (B), the 6DE6 operates as a series voltage regulator and supplies about 190 volts regulated to the crystal oscillator plate and final amplifier screen. In this condition, the neon lamps regulate the grid voltage of the 6DE6. Unless otherwise indicated, capacitances are in $\mu\mu$f., resistances are in ohms.

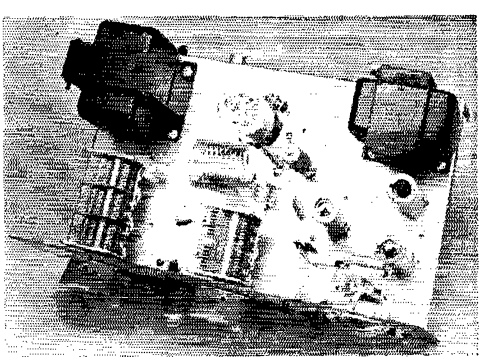
The power supply of the HT-40 generates little heat since it uses a pair of silicon diodes instead of a tube rectifier. The circuit is a full-wave voltage doubler followed by a capacitor-input filter using a 5-henry choke with two 40-μf. electrolytics in series on each side. A line filter is incorporated in the unit to reduce the possibilities of interference to other electronic equipment. The power supply is not fused, but if you want fusing it is an easy matter to substitute a fused plug for the a.c. plug on the line cord.

One of the attractive constructional features of the unit is the use of two wiring harnesses. Plenty of wire was provided in preparing the harnesses, so that they can be easily dressed against the chassis. In most cases, ½ to ¾ inch could be snipped off the wire ends for maximum neatness. Pigtails on the small parts can be left a bit longer than specified so that the components can be lined up horizontally and vertically for a more pleasing appearance and easier trouble shooting.

The wiring directions in the instruction manual are explicit. Anybody, however, green, who can read (and will take the trouble to read!) can put this kit together; the instruction book even gives full instructions on how to solder. The transmitter also is available wired and tested, but why rob yourself of the fun and pay twenty dollars besides? The entire project took about 15 hours. It could probably be done much faster, but since the kit was wired in the workshop at W1AW, there were many interruptions from interested visitors.



Here's how the HT-40 looks from the bottom. At the right, on the panel side, is the function switch. To its left is the band-switch assembly, which includes the grid coils. The variable capacitor in the center is the drive control. The crystal-v.f.o. switch, crystal sockets, meter switch and key jack are to the left. The electrolytic capacitors and bleeder resistors in the power-supply occupy the upper right-hand section; the silicon rectifiers are draped over one of the filter capacitors. Rear-apron controls are, from left to right, mike connector, mike gain control, external switching terminals (for antenna relay control and external send-receive control), coax antenna connector, and the a.c. line cord.



Top view of the HT-40. The 6DQ5 r.f. amplifier is at the center rear, with the power transformer to the left and the filter choke to the right. Also visible is the pi network with the plate loading capacitor on the left and the plate tuning capacitor in the center. The oscillator and buffer tube, a 6CX8 triode-pentode, and the 12AX7 and 6DE7 dual triodes used in the speech section and modulator are to the right. Attached to the rear of the edgewise-mounting meter is a 100-μf. electrolytic capacitor for improving the damping.

How about performance? On 80 through 15 meters, the HT-40's output was a little better than 50 watts. On ten meters the output fell off a bit, to about 40 watts, and on six meters, where the final amplifier is also being used as a doubler, the output was in the vicinity of 25 watts. These measurements were made with a calibrated wattmeter, since the output meter on the HT-40 gives relative readings and cannot be relied upon for exact values of output on each band. However, it can be used for rough output measurements provided a resistive load of 50 ohms is used. Each

of the five divisions on the scale represents approximately 10 watts.

Front panel operating controls of the HT-40 include a FUNCTION control, which has five positions and selects the transmitter's mode of operation, a six-position BAND SELECTOR switch, and a DRIVE control, which tunes the pi network between the buffer and final-amplifier stage. Function control positions are a.c. OFF, TUNE, STANDBY, A.M. and C.W. There is also a CRYSTAL-V.F.O. switch and an R.F. OUTPUT-GRID CURRENT switch for the metering circuits. The PLATE TUNING and PLATE LOADING controls are part of the amplifier's pi-network circuit. A screwdriver-adjusted audio gain control is mounted on the rear wall of chassis. — *P. F. W.*

HT-10 Transmitter and HT-10K Kit

Height: 7 3/16 **inches.**
Width: 13 3/8 **inches.**
Depth: 8 1/4 **inches.**
Weight: 17 **pounds.**
Power requirements: 105–125 volts, 60 cycles, 175 watts.
Price class: $90 kit, $110 wired.
Manufacturer: The Hallicrafters Company, Chicago 24, Illinois.

SX-140K Receiver

THE Hallicrafters kit model SX-140K (available wired and tested as the SX-140) is an inexpensive, single-conversion ham-bands only communications receiver. It is designed for reception of a.m., c.w., and s.s.b. signals on all amateur bands between 80 and 6 meters. Two of its many features are a built-in calibration/alignment oscillator and an S meter.

The receiver circuit includes five tubes and two semiconductor diodes in a straightforward superheterodyne circuit. A block diagram of the circuit is shown in Fig. 1. The pentode section of a 6AZ8 is used as an r.f. amplifier. Its input circuit is tuned by a front-panel ANT TRIM control while the plate circuit uses slug-tuned coils which are fixed-tuned to the center of each amateur band during the aligning process. An R.F. GAIN control in the cathode of the r.f. amplifier controls the gain of this stage.

The triode section of the 6AZ8 is used in a crystal oscillator circuit for checking the dial calibration on each band. A 3.5-Mc. crystal is furnished; it provides calibration markers at the low-frequency edges of all bands through 10 meters and at 52.5 Mc. in the 6-meter band. This oscillator can also be used for aligning the receiver.

The r.f. stage is followed by a 6U8 pentode

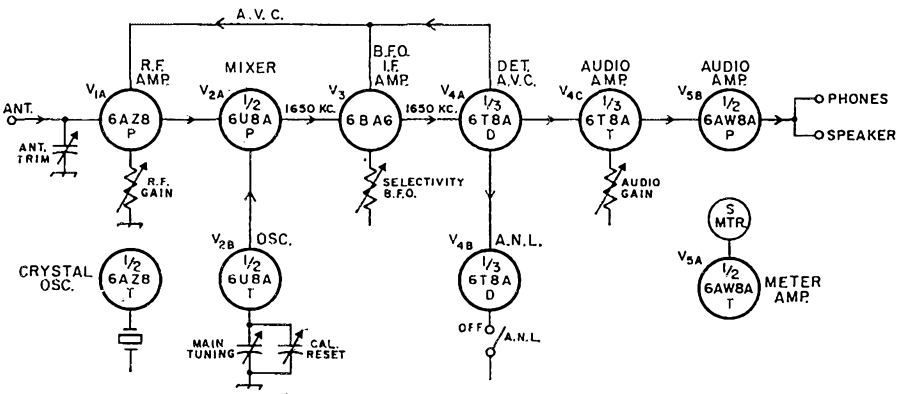


Fig. 1—Block diagram of the SX-140 receiver.

mixer/triode h.f. oscillator. The main tuning control is a variable capacitor in the oscillator circuit which is string-coupled to a pointer on the slide-rule dial. Also part of the oscillator tuned circuit is another variable capacitor connected in parallel with the main tuning capacitor. A shaft from this capacitor runs out to a front-panel CAL RESET control to permit electrical recalibration on each band. It is used along with the built-in calibrator for setting the low-frequency limit of each band.

A 6BA6 1650-kc. amplifier also doubles as the b.f.o. in the SX-140 (see Fig. 2). The panel control SELECTIVITY-B.F.O. is a potentiometer, R_1, which applies adjustable positive bias to a silicon diode, CR_1, shunted from the suppressor grid to ground; this controls the regeneration in the stage by varying the effective resistance between the suppressor grid and ground. When R_1 is in the minimum selectivity position (with the arm to the right in Fig. 2), a positive voltage is applied to the diode, CR_1, which is connected in the forward direction and is conducting. The suppressor grid is effectively grounded through the conducting diode and the tube operates as a Class A i.f. amplifier. However, as the control is advanced towards maximum selectivity, the voltage across the diode is reduced and finally the diode stops conducting. This raises the impedance from the suppressor grid to ground, reducing the shielding between the plate and grid and the circuit becomes regenerative. Finally, it will go into oscillation, at which point the control becomes the b.f.o. pitch adjuster.

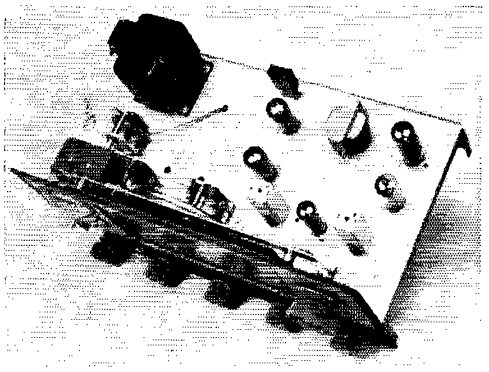
Following the i.f. amplifier/b.f.o. is a 6T8A, one diode of which is used as a detector/a.v.c. rectifier. A second diode plate is used in an automatic noise limiter circuit, while the triode section of the tube serves as the first audio amplifier. The power pentode section of a 6AW8A is used as the output audio amplifier while the triode section operates as a d.c. amplifier in the carrier-level meter circuit.

Two silicon rectifiers connected in a full-wave voltage-doubler circuit furnish the operating voltages for the receiver. The power-supply filter is a pi-type arrangement using resistance and capacitance.

Front panel controls for the SX-140 include, besides those already mentioned, the AUTOMATIC NOISE LIMITER slide switch, the CALIBRATION on-off slide switch, the BAND SELECTOR control, the AUDIO GAIN control, and a four-position FUNCTION switch (OFF, STANDBY, A.M. and C.W.-S.S.B. Also on the front panel are a PHONES jack, carrier-level meter and the slide-rule dial.

Some auxiliary switching circuits have been included in the receiver for controlling other station accessories and components. Two pairs of contacts are closed when the receiver is turned to the STANDBY position. These contacts have connections at the receiver's rear apron.

It took this writer about 15 to 20 hours to build and align the receiver. The kit parts were grouped into several plastic bags and small paper boxes. With the aid of the instruction manual it



Top view of the SX-140K. The three variable capacitors, from left to right, are the antenna trimmer, calibration reset, and oscillator tuning capacitors. The 3.5-Mc. calibration crystal is near the back of the chassis. The two metal knobs on the front panel, just below the S meter, are the ANTENNA TRIMmer and CALibration RESET controls. Also on the front panel, from left to right, are the FUNCTION switch, PHONES jack, BAND SELECTOR, CALibration switch, R-F-GAIN control, ANL switch, SELECTIVITY-BFO control, and the AUDIO GAIN control.

was no trouble at all to identify the individual components and check them against the parts list. No shortages were found. The parts were all good quality, and a few deserve special mention: A wiring harness which helped to make the receiver wiring neat and rigid, and the hookup wire — the insulation of which did not melt halfway down the wire when the leads were soldered! Many of the screws and nuts furnished with the kit had built-in lock washers.

No difficulties were encountered in wiring the receiver. A 32-page assembly manual and an 18-page operating and servicing pamphlet do a fine job of keeping the builder on the right path. There are also 12 large pictorials to aid the constructor.

The built-in crystal calibration oscillator makes alignment of the finished kit quite simple. Using the 3.5-Mc. crystal, the 80-through 10-meter bands are aligned at their low-frequency ends and the 6-meter band is aligned at 52.5 Mc. Incidentally, by substituting a 1650-kc. crystal (which is not supplied with the kit) and using the S meter as an output indicator, the 1650-kc. i.f. transformers can be aligned.

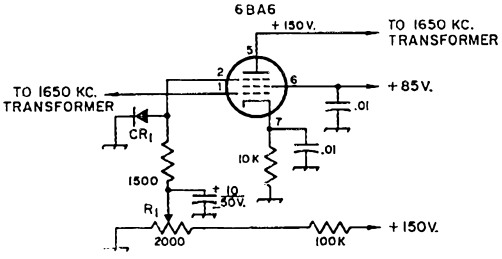
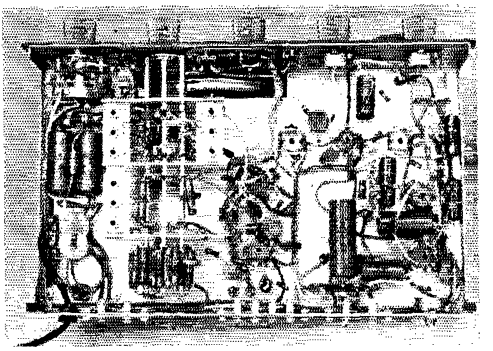


Fig. 2—Diagram of the 6BA6 i.f. amplifier and b.f.o. The potentiometer, R_1, controls the regeneration in this stage which doubles as a b.f.o. Capacitances are in μf., resistances are in ohms, resistors are ½ watt.



Bottom view of the SX-140K. The silicon rectifier power supply is near the left edge of the chassis. Next to it is the band-switch assembly, which comes factory wired. From left to right on the rear panel are the ground and antenna connection, two pairs of contacts for transmitter and antenna switching, speaker terminals, and the S-meter zero set potentiometer.

In general, this writer's receiver operated quite well. One thing we did notice was that the dial readings were in some error on the higher bands as we tuned away from the low-end calibration frequency (there was a 50-kc. error on 6 meters at the dial extreme). Also, adjustment of the ANTENNA TRIMMER and R.F. GAIN "pulled" the oscillator frequency slightly. However, for a receiver in its price class, the SX-140 does a respectable job — even on 50 Mc.

The SX-140 is housed in a gray cabinet which is open at the back for ventilation. The panel is finished in two-tone gray.

— *W. F. L.*

Hallicrafters SX-140 Receiver and SX-140K Kit

Height: 7 3/16 **inches.**
Width: 13 3/8 **inches.**
Depth: 8 1/4 **inches.**
Weight: 13 1/2 **pounds.**
Power requirements: 47 **watts at** 117 **volts,** 50/60 **cycles.**
Price class: $100 **kit,** $125 **wired.**
Manufacturer: The Hallicrafters Company, Chicago 24, Ill.

New Receiver Line from Hammarlund

THE Hammerlund Mfg. Co., New York 1, N. Y., has redesigned several of their communication receivers, and to one has added a built-in 5-watt transmitter. Since the basic receivers have been described before in *QST*, only additions and new features to the line will be discussed here.

HQ-100A

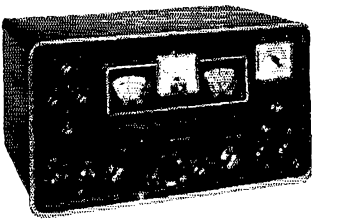
The HQ-100A is similar to the HQ-100 [1] but has a separate built-in b.f.o. In the HQ-100, the *Q* multiplier was made to go into oscillation to provide the beat frequency for c.w. and s.s.b. reception.

The only noticeable difference on the front panel is a new B.F.O. PITCH control located midway between the main and bandspread tuning dial scales. Also, the FUNCTION switch is now labeled OFF-REC-SEND and BFO. The *Q* multiplier, which was formerly turned on and off by the function switch, is now controlled by the SELECTIVITY control, with "off" being in the extreme counter-clockwise position.

If you're wondering where the new b.f.o. tube fits into the HQ-100A chassis, the 6AL5 tube originally used as a detector and a.n.l. has been replaced by a 6BV8 dual diode-triode tube. The diodes supersede the 6AL5, and the triode section operates as the b.f.o. The 12-hour clock timer has been replaced with a 24-hour model.

[1] "Recent Equipment," *QST*, January, 1957.

HQ-145 X



A crystal-controlled local oscillator is the new feature of the HQ-145 X. The receiver can be tuned the same as the HQ-145 [2] or it can be

[2] "Recent Equipment," *QST*, June, 1959.

switched to crystal control to receive on any desired spot frequency throughout the entire frequency range of the receiver. This should come in handy for net operation, time-weather information, and for calibration and test purposes.

Switching between the variable frequency oscillator and the crystal oscillator is done through the former NOISE LIMITER switch, which now has four positions: VFO, VFO-LIMITER, XTAL, and XTAL-LIMITER.

To operate crystal control, it is necessary to turn the panel NOISE LIMITER switch to the proper position, insert a crystal and tune the receiver to the desired frequency. Crystal frequencies for various spots can be calculated from information furnished with the receiver. For the first three bands (0.54 to 10 Mc.) the crystal is chosen 455 kc. higher than the received signal frequency. On the higher bands (10 to 30 Mc.), where double conversion is used, the crystal should be 3.035 kc. below the input signal frequency. The HQ-145 X also has a new 24-hour clock.

HQ-105 TR

This combination transmitter-receiver is basically an HQ-100A with a crystal-controlled 5-watt 10-meter transmitter included in the same package. The transmitter is a two-tube affair using a 6CX8 triode-pentode combination. The triode operates as a simple crystal oscillator and the pentode as a plate-modulated r.f. amplifier.

Modulation power is supplied by the receiver's audio amplifiers, which are switched when going from transmit to receive. A spare triode section of a 12AX7 in the receiver circuit is used as a microphone speech amplifier, and is out of the circuit when in the REC condition. Manual changeover from send to receive is accomplished by throwing the front panel FUNCTION switch to SEND, or, if push-to-talk operation is desired, by putting the switch in the REC position, in which case the station can be controlled by a built-in relay actuated by a push-to-talk switch on the microphone. The microphone connector is located at the rear of the chassis.

— *E. L. C.*

Strays

W7CKV of Tucson, Arizona, started "Operation 52" in 1957 through a desire to help children at the National Foundation for Asthmatic Children in Tucson. Through the cooperation of other hams throughout the country, children at the Foundation were able to talk over W7CKV to their parents. In subsequent years W7CKV (himself confined to a wheel chair) got help from other Tucson hams, and now some three dozen of them pitch in at Christmas-time to provide communication between parents and children who can't be together for the holidays. In 1960, 48 of the 56 children at the Foundation were able to talk with their parents, thanks to the advance preparation by the Operation 52 Committee, which was headed by K7LJY last year. He's in charge again this year, and is looking for help from other hams in the following cities:

Saugus, Mass.; Westville, N. J.; Brooklyn, N. Y.; Freeport, N. Y.; StonyPoint, N. C.; Levittown, Pa.; Pittsburgh, Pa.; Parkside Chester, Pa.; York, Pa.; Nashville, Pa.; North Charleston, S. C.; Abilene, Tex.; Big Springs, Tex.; Crockett, Tex.; Dallas, Tex.; Houston, Tex.; Midland, Tex.; San Francisco, Calif.; Minneola, Kans.; McCook, Nebr.; Montreal, Que.; San Luis Obispo, Calif.; Santa Cruz, Calif.; Miles City, Mont.; Klamath Falls, Ore.; Prineville, Oreg.; Larson AFB, Wash.; Seattle, Wash.; Waitsburg, Wash.; Livonia, Mich.; Toledo, Ohio; Shady Spring, W. Va.; Bonfield, Ill.; Maywood, Ill.; Rock Falls, Ill.; Rockford, Ill.; DePere, Wis.; Towner, Colo.; Ft. Madison, Iowa; Hugoton, Kans.; Haley, N. Dak.; Toronto, Ont.

If you live in or near one of these towns, and can operate on 7.210, 7.230, 14.245, 14.290 21.330, 21.380, 28.650 or 29.300 Mc., phone, please write immediately to Dr. Ken Wertman, K7LJY, 2233 E. Waverly St., Tucson, Ariz.

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Are you in favor of reciprocal licensing arrangements with other countries? Then be sure to ask your senators to support Senate Bill 2361.

OUR COVER

Season's Greetings from the staff at Headquarters. The array of Hq. QSL cards on this month's cover includes most of the hams on the staff, and *all* who have the "headquarters" card. We hope you'll recognize your favorite authors and correspondents among the lot, and perhaps you even have cards from some of this gang on your own wall. (Incidentally, we know of only one person who has worked and received a QSL from each ham at Hq. How many have *you* worked?)

A Happy New Year to you, too, from the ARRL gang!

Hints and Kinks For the Experimenter

CERTIFICATE AND QSL HOLDER

A new plastic material called Holdit Plastick, manufactured by Eberhard Faber, Inc., of Wilkes-Barre, Penna., and available at most five-and-ten-cent stores, can replace the old-fashioned tacks, tape, staples or paste usually used to hold certificates and QSLs to the wall. The material looks and feels like ordinary window putty. When ready to use it, roll it into small balls, place one on each corner of the object to be mounted, and press firmly to the wall. It will not stain either surface, apparently lasts indefinitely, and will not dry out. Holdit can also be used to seal tubes, vials, and bottles of radio chemicals, or it can be stuck to the corners of radio equipment to act as feet to keep the cabinet from scratching the surface it is sitting on. Plastic can be used over and over again and will not scar or mar the surface it has been attached to.

— *Ellen White, W1YYM*

HEATHKIT WARRIOR NOTES

The bias supply filtering system in the Heathkit Warrior can be improved by removing the 11-ohm 5-watt resistor and installing a Zener diode in its place. A current limiting resistor is placed between the bias line and the 100-μf. capacitor. The circuit in Fig. 1A shows the

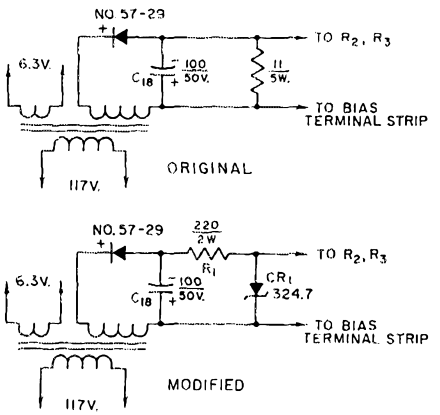


Fig. 1A—Improved bias circuit for the Warrior.

original and modified bias circuits. The Zener diode, CR_1, that I used was an International Rectifier Corp. type 3Z4.7 capable of 3.5 watts dissipation. In this application, the dissipation is less than one watt, and therefore, no heat sink is required. The current limiting resistor, R_1, limits the current through the Zener diode to about 45 ma.

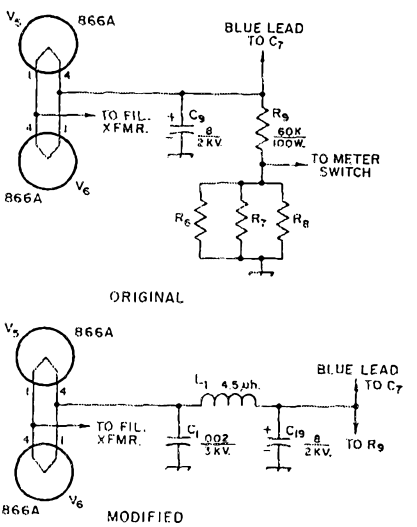


Fig. 1B—The addition of C_1 and L_1 reduces rectifier noise in the Warrior.

Fig. 1B shows a modification to the high-voltage power-supply section that will eliminate annoying impulse noise caused by the mercury vapor rectifiers. I noticed the noise especially on 40 meters and it appeared to climb with the 811s biased to cutoff. The noise was eliminated by adding a .002-μf. 3000-volt capacitor, C_1 (actually two .001-μf. units in parallel), between the heaters and ground, and a 4.5-μh. coil, L_1, B & W Miniductor No. 3104), between the 866A heaters and the load.

— *Joe Santangelo, W1NXY*

INEXPENSIVE CONTROL KNOBS

I have found that electricians' solderless wire connectors can be screwed onto control shafts and used as knobs. These connectors are usually black in color and come in several different sizes. Almost any electrical supply house or hardware store carry the item which sells for only a few cents each.

— *Roger M. Corey, W1HNG*

SIMPLE ALIGNMENT TOOL

A plastic nut starter, such as one of those furnished with some electronic kits, can be converted into an alignment tool by breaking off a piece of razor blade and inserting it into the end of the nut starter. The broken blade should be a little oversized so that it will make a tight fit.

— *Tom Rugen, W12NYQ*

DUAL-PURPOSE PRODUCT DETECTOR

THE circuit in Fig. 2 shows a novel approach to switching between a.m. and s.s.b. detection. Although I worked out the scheme for my own homebuilt receiver, it should be of value to someone converting a commercial receiver or designing his own.

Tube V_1 in Fig. 2 is the last i.f. amplifier of a conventional arrangement. A basic characteristic of a product detector is that when no b.f.o. voltage is injected into it, it operates linearly; thus, it can also operate as a good audio amplifier. The idea in this circuit is to use the product detector as a mixer while in the s.s.b. mode, and as an audio amplifier on a.m. V_2 is an added triode, connected as an infinite impedance a.m. detector. Audio from V_2 is fed through T_3 to the product detector. I.f. is switched via links from T_2 to T_3 for either s.s.b. or a.m. modes.

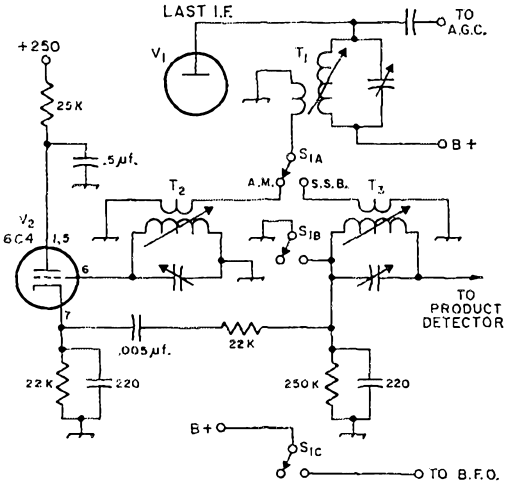


Fig. 2—W2GOO's system for making a product detector do double duty. Unless otherwise indicated, capacitances are in μμf., resistances are in ohms, resistors are ½ watt. T1, T2, T3—See text.

When used on a.m., T_3 acts as an i.f. choke in series with the product detector trapping out the i.f. component. When used on s.s.b., i.f. is injected directly into T_3 by way of the link, and the b.f.o. is switched on.

Transformers T_1, T_2, and T_3 are conventional i.f. transformers, separated from each other and, if possible, individually shielded. The links are hand wound over the windings with about 10 turns or so over the cold ends of the coils.

T_1 and T_2 are best tuned up in the a.m. position and adjusted for maximum signal. While still in the a.m. position, jump the switch S_{1C} temporarily to turn on the b.f.o. Now adjust T_3 for the minimum beat note, which indicates the best trapping action of T_3.

— Eugene A. Anthony, W2GOO

DIPOLE CENTER INSULATOR

THE porcelain base from a common flange type light bulb fixture can be used for an insulator at the center of a dipole antenna. Take the fixture apart and discard everything but the base itself. Connect the antenna wires to the two small holes formerly used to mount the socket and run the coax feedline up through the large hole that originally enclosed the lamp base. The porcelain is very strong and should hold even the heaviest dipole.

— Dennis Marandos, K1LGQ

EMERGENCY POWER — CHEAP

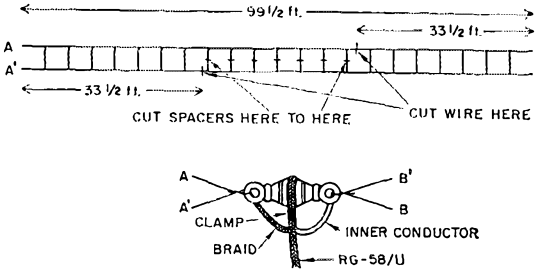
THERE is a fine fire-tower location not far from the summer place of K1GBC in Tolland, Mass., and Pete wanted some means of running low-powered v.h.f. gear up there without the risk of a dead car battery. Portable a.c. generators cost money, so he looked around for a ham approach to the problem.

The solution was suggested by a Heathkit MP-10 Power Converter that had been used to power the K1GBC Communicator in mobile work for some time. Why not run this off the output of a car generator, instead of from a 12-volt battery? A 1955 Chevrolet generator was located in a junk yard, and this was hooked up to a 1-horsepower gas engine from a discarded power mower. This combination delivers around 200 watts a.c., more than enough for the purpose Pete had in mind. The total weight of all three units is less than the smallest commercially-available gas-engine generators — and the total cost was a fraction of the going price for portable generators.

— W1HDQ

NOTE CONCERNING "A NOVICE THREE-BAND ANTENNA SYSTEM"

IN regard to W1ICP's article in the October issue, "A Novice Three-Band Antenna System," instead of cutting the 99½ feet of 300- or 450-ohm line in the center, cut it 33½ feet from one



end on one side of the line, and 33½ feet from the other end of the remaining side of the line (see Fig. 3). Now join A to A' and B to B' as illustrated, and there will be no need for splices or waste.

— Dan Ditto, W9CMI

• Technical Correspondence

THE TRANSISTORIZED "ULTIMATIC"

201 Clifton Ave.
Minneapolis 3, Minn.

Technical Editor, *QST*:

Early reports from those duplicating the circuit in my article on the transistorized "Ultimatic" keyer (*QST* for September and October, 1960) indicated some malfunctions which have since been corrected. These corrections were made on all circuit boards sent out after January 1961. The purpose of this letter is to pass on the recommended circuit changes to those who obtained boards prior to January, and to supplement the article with suggestions sent in by those trying the circuit.

The most serious malfunction was first noticed by W2QYW which turned out to be a congenital defect in the seizure circuitry. When an "a," "w," "j," or numeral "1" was formed by the "squeeze" technique, the dash failed to come out except when the dot lever was released. This happened on the average of once in a dozen tries and was traced to the seizure circuit which showed a dead spot near the time the opposite memory was reset. That is, the dash-lever actuation failed to seize the dot closure if it coincided with the time the dot memory was reset. This was cured by the circuit change of Fig. 1.

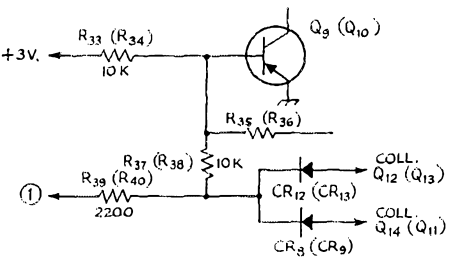


Fig. 1—Revised seizure circuit. C_{14} (C_{15}) and C_{16} (C_{17}) have been removed. The values of R_{33} (R_{34}) and R_{37} (R_{38}) have been changed and R_{37} (R_{38}) and R_{39} (R_{40}) have been relocated. The polarities of CR_{12} (CR_{13}) and CR_8 (CR_9) have been reversed.

The next change was aimed at reducing the parts count of the keyer by resetting the dot (dash) memory 1 dot length after the start of the dot (dash) instead of at the start in the original circuit. In practice, this extra dot-length memory capacity is not needed because strings of dots (dashes) are made by holding the lever for the duration of the string rather than by actuating the lever for each dot (dash) in the string. This modification was carried out by replacing R_{25} (R_{28}) with a short circuit, increasing R_{26} (R_{27}) from 4.7K to 10K, eliminating C_{26} (C_{27}), removing the cathode of CR_6 (CR_7) from the collector of Q_4 (Q_6) and connecting it to the collector of Q_3, and removing the end of R_{31} (R_{32}) connected to the collector of Q_5 (Q_{10}) and connecting it to the collector of Q_6 (Q_5).

An occasional long (5-element) dash, which occurred because of the shunting of the dash reset pulse by C_9, was eliminated by decreasing the value of C_9 from 0.1 to 0.01 μf.

From W2QYW comes the circuit for direct grid-block keying without the relay, shown in Fig. 2. In this circuit, the relay transient-shunting diode CR_4 is eliminated, and Q_{15} is replaced with a high-voltage 2N398. The monitor is keyed by deriving its supply voltage from the collector of Q_{15} via the 1N450 which disconnects the monitor from the grid-block voltage under key-up conditions. The 2700-ohm resistor is for the elimination of monitor clicks, and the resistor R is inserted to prevent the grid of the keyed tube from going positive with the key down. When using this method of keying, occasional clicks between characters may be noticed. Because of the finite length of the start pulses, a lever actuation closely following the leading edge of a start pulse may pass the trailing edge of the pulse to the dot (dash) generator which may not be sufficient in amplitude to trigger the generator but may be audible in the monitor as a click. This is not noticeable when using the relay because of the insensitivity of the relay to the spikes. Changing C_3 from 0.1 to 0.01 μf. will shorten the start pulses and reduce this effect.

For those wishing faster relay action, overdrive is the answer. This would necessitate a higher-voltage supply. If the original supply voltages are to be retained, a high-sensitivity, low-resistance relay is needed. A Sigma 5F-1000 will give some improvement if the two coils are connected in parallel (aiding) instead of the original series connection. The result will be a 250-ohm relay with about the same pull-in current as the 4F-1000. A 220-ohm resistor is then inserted in series with the modified relay to reduce the time constant. The price paid for the faster action is about twice the current drain from Q_{15}.

K3MTW experienced a situation of occasional extra dashes, and a continuous string of alternate dots and dashes when keying an audio oscillator. He traced this to stray coupling between his relay-contact leads and paddle leads which caused feedback.

Another cause of extra dashes (dots) is contact bounce on the release of a lever. This may be cured by placing a 0.1- to 1-μf. capacitor across each lever contact.

A precaution to be observed when installing r.f. filtering in the power leads and in experimenting with a.c. power supplies is to be sure to avoid any series resistance in the plus 6-volt lead. This lead is the common connection as far as the circuit is concerned and any resistance in it will cause undesirable coupling between the various flip-flops.

Directly under the section "Testing and Adjustment" in my article, add the following: With the speed control fully clockwise, check to see if the control is wired to give maximum resistance. This will give an approximately linear decrease of speed with clockwise rotation. To get the more conventional increase of speed with clockwise rotation requires a pot with an inverse log taper which is not a stock item for 100K. Some crowding will be noticed in the rotation *vs.* speed characteristic near mid range because the log taper is only an approximation to the taper required for linear speed control.

In the original first paragraph under "Testing and Adjustment," change "clockwise" to "counterclockwise" and "counterclockwise" to "clockwise". In Part II (October issue), under the heading "Letter and Word Space," mention is made that the ideal word space of 6 dot lengths cannot be obtained on the keyer, but W6MMC.7 points out that 7 dot lengths is the correct word space which is indeed obtainable on the "Ultimatic." Under the heading "Time Base," the speed range is given as 5 to 50 w.p.m., but using the conventional w.p.m. equals dashes in 5 seconds, the speed range is 6.25 to 62.5 w.p.m.

Recent price reductions on the 2N362 (Raytheon) makes it quite practical to use it throughout the keyer proper except, of course, for the n-p-n Q_1 and Q_2. The 2N213A (Sylvania) with a minimum beta of 100 is a better choice for Q_1 and Q_2 than the more expensive 2N169s specified originally.

(Continued on page 174)

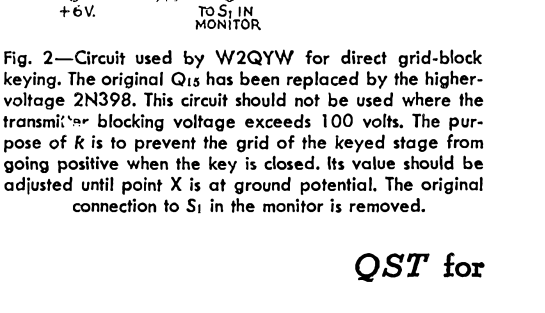


Fig. 2—Circuit used by W2QYW for direct grid-block keying. The original Q_{15} has been replaced by the higher-voltage 2N398. This circuit should not be used where the transmitter blocking voltage exceeds 100 volts. The purpose of R is to prevent the grid of the keyed stage from going positive when the key is closed. Its value should be adjusted until point X is at ground potential. The original connection to S_1 in the monitor is removed.

K5CBZ—Portable Iron Lung

BY BOB DOUGLAS,* W5GEL, AND DWIGHT P. KELLER,** K5HRH

BILLY WHITE, K5CBZ, is a bright young amateur of 13 years. A victim of bulbar spinal polio, he has spent the last eight years in an iron lung, immobilized from the neck down, but daily he travels the airwaves, visiting friends, meeting new people and filling his time through the magic of amateur radio.

The problem of keeping an active mind occupied in spite of such physical confinement has never been great for Billy, what with school work, reading, television, etc., but now keeping up with his ninth-grade classes may be more of a problem. Somehow, 40 meters is usually more interesting than algebra and history.

It was largely through the efforts of Larry Riney, K5OMR, that Billy was introduced to amateur radio. After months of hard work and lots of help from K5OMR, W5SIL, and others, a Novice license and the call letters KN5CBZ were obtained. A station was assembled and antennas erected by friends, and KN5CBZ was on the air. Because the station could only be operated when Billy was out of the respirator, activity as a Novice was limited, but many contacts were made over a period of months. Continuing to work hard on code and theory, Billy found his efforts rewarded when he passed the code and theory examination for Conditional Class license. Having developed a terrific memory, the theory examination was no great problem, but the code was something else. Code is sent by holding a stick in the teeth and manipulating the key by slightly moving the head. Copying is done with a pencil used in the same manner. Copying by pencil requires such effort that a facility for copying "in the head" was developed quite early, and a good sense of rhythm and a sensitive touch on the key makes K5CBZ's code better than the average newcomer. Incidentally, there was so much code practice going on for such a long time that Billy's mother and sister have also become adept in the dits and dahs.

With the Novice restrictions removed and phone operation a possibility, thought was given to the problem of providing a station that Billy could operate while in the respirator. The Collins KWM-2 seemed like a good choice. Weighing only 18 pounds and being entirely self-contained, it was deemed feasible to mount the transceiver on the respirator, using the regular respirator mountings that are normally used to hold a mirror, book rack, etc. A special mounting plate was fabricated and holds the transceiver in a vertical position with the controls in the proper position so that they can be operated by means of a stick held in the teeth. The telegraph key and beam rotator can also be reached easily in the same manner.

It was necessary to make a special fifteen-foot power supply cable extension so that the transceiver power supply could be mounted on the floor out of the way. A remote relay was fabricated to automatically change antennas when the band selector switch on the transceiver is changed. In order to conserve weight, the meter and switch from the HAM-M rotator control box were removed and mounted in a small aluminum box and fixed in position. A small speaker was mounted in another box and fastened to the lid, thus completing the installation. The entire assembly can be removed and reinstalled easily in seconds.

At present, Billy can fully operate the equipment except for changing bands and retuning the transmitter. After the transmitter is tuned on a particular band, he can manipulate all the controls required for normal operation on both s.s.b. and c.w. It is planned to modify the controls so that he will be able to change bands and retune.

(Continued on page 174)

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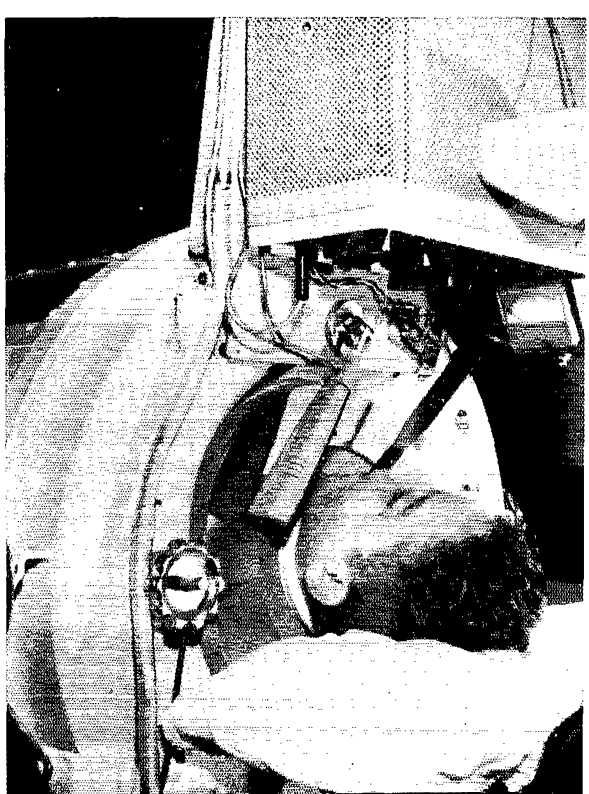

Using a cake spatula held in his teeth, 13-year-old K5CBZ operates c.w. even though confined to an iron lung. A victim of bulbar spinal polio, Billy White has spent eight years in the respirator. He is able to operate voice and c.w. on the several bands covered by the KWM-2, and during hurricane Carla spent many hours on the air handling emergency traffic.

For 20 years McSnood had lived this two-faced existence

The DX King

BY LAURENCE L. PRIDDY,* K5HTM

Joe McSnood had two life-long ambitions: to have his call on the DX honor roll of countries worked and to be promoted from third assistant clerk of the second assistant manager of Binney and Schultz, accountants, to first assistant clerk of the general manager of the firm.

DX-wise, McSnood's ambitions had been realized, for his call was always high on the *QST* DXCC listing, and often it would be at the very top. Promotion, however, had passed Joe by and he had remained a third assistant clerk for all the twenty years he had worked for Binney and Schultz.

Looking at McSnood, one would wonder why he had never advanced, for he looked as though he would be the perfect clerk. He was pallid, near-sighted, and exceedingly polite — the type who would probably always be on time and quietly conscientious in performing his tasks. But he was not such a clerk. Four mornings out of five McSnood punched the time clock ten to fifteen minutes late, and four evening out of five there were unfinished papers on his desk when 1700 rolled around.

Ironically, this promotion-destroying inefficiency was directly the result of Joe's success in achieving his DX fame. Almost every morning he would put off going to work to get one more crack at a new one and end up by getting to the office late, and just about every afternoon he would find himself daydreaming of the rare one he had missed the night before instead of doing whatever it is that third assistants to second assistant managers are supposed to do.

Considering that on the job Joe was a quiet, timid little man, it may appear odd that he was ever able to get up enough gumption to join the pileups and work all those countries, and it may also seem strange that on a third assistant clerk's salary he was able to afford the equipment to enable him to compete with his more wealthy DXer adversaries. The truth is that Joe McSnood at home was quite a different man from Joe McSnood at the office. He was the stoop-shouldered, near-sighted, mild-mannered clerk McSnood in the elevator from the office to the ground floor, on the bus ride home, and even up to the very front door of his house. But when McSnood entered his front door, he hung his meekness along with his coat, hat, and umbrella on the nail in the front hall by the door and stood revealed as lionhearted McSnood, straight of shoulder and commanding of eye, conqueror of rare DX from AC3 to HE9. Feeling that he must demonstrate his leonine majesty, he would growl at his XYL, telling her that he would expect supper in half an hour because W8XX was going to be on Bustard Island tonight and he wanted to be sure to work him. His thin, browbeaten YF would bow meekly to the ground while the two ragged McSnood harmonics peeked timidly from behind her skirts at their magnificent OM. Then McSnood would stalk over the worn carpet of the living room floor and ascend the creaking stairs to his shack.

The McSnoods had no car, their meals were cooked on a woodstove, there was a big hole in the living room floor where his mother-in-law had broken through the termite-ridden flooring, the harmonics' shoes had holes in them, and Mrs. McSnood hadn't had a new dress in ten years. From the trash-littered yard knee deep in grass to the weather-beaten gable with its peeling paint, the whole McSnood house was in ruins. All, that is, except for one room — the shack. *That* was immaculate. In a custom-built console reposed a brand-new 1000K receiver and a gleaming DX-Master-2 transmitter. Neatly installed cables and feedlines led through the window to a multitude of arrays installed on a ninety-foot rotating tower. Joe's family was raggedly clothed and ill fed and his house was about to fall apart, but DX King McSnood had the best rig in the section.

Once or twice a year, the XYL would summon her courage and ask Joe for a little money to buy new clothes for the kids, or to pay the ice man or

* 1851 Ederville Rd., Fort Worth 3, Texas

water company. The wrath of McSnood on these occasions was instant and terrible. Didn't she realize, he would ask, how *badly* he needed a new tower so he could get his beams up to the two-hundred-foot level? Wasn't it just the other day that Gunkle across town had worked 8F1Z ahead of him because his $120 final tube was soft? Under this barrage, his long-suffering spouse would gently close the door of the shack, which she had opened only a crack, and shuffle back downstairs to sit and stare at the blank face of the TV set, which hadn't worked since Joe had borrowed a couple of tubes from it to fix his receiver.

For twenty years, McSnood had lived this two-faced existence — mild, mediocre McSnood at the office, DX King McSnood at home — spending his money on newer and better rigs and neglecting his work while his house got dingier and dingier, his family's clothes more and more threadbare, his chance of advancement to first assistant clerk lower and lower, and his DX total higher and higher.

One night McSnood sat in his shack, trying to work the first station ever to be on Epiglottis Island. The pileup was terrific and the station, EPiØX, was weak, but McSnood was confident of success. After all, he *did* have the best rig in the section. Joe was employing his usual operating tactics, not only calling loud and long each time EPiØX stood by at the end of a QSO, but also searching out stations who were working EPiØX, carefully zero-beating them, and sending his call repeatedly just as they were sending their RST reports and QTHs. This particular evening, however, the DX was so rare and the pileup so bad that even the Big Boy Top Ops like McSnood were having to wait in line.

Joe became so engrossed in trying to bag EPiØX and so infuriated when that lowly scum Gunkle got him first that he did not notice the buildup of the intense electrical storm in the sky overhead. So bemused was he by Gunkle's coup that not even the static popping in his ears warned him of the impending danger.

The lightning struck with a crackling roar, and McSnood felt himself being knocked out of his chair to the floor. The lights went out and came back on, and McSnood found himself seated on the floor with his back to the wall. Facing him, seated in McSnood's own chair, was an old gent with a long white beard, wearing a flowing white gown.

In his right hand, this strange visitor held an object which struck mortal terror into McSnood's heart. Long and irregular in shape, dirty with the dust of the years, its tip dyed bright red by the blood of countless DX hogs and lids, it was the fearful and mighty Wouff Hong. As soon as Joe recognized the Wouff Hong, he knew its wielder to be none other than The Old Man himself, and he realized that his visitor had come for one purpose — to judge him.

The Old Man gazed sternly down on the violently shaking and frightened DX King for several seconds and then spoke in a calm, grave voice.

"Joe McSnood," he said, "you stand accused by your deeds, recorded in the Black Book of Hamdom, having violated the following provisions of the Amateur's Code:

"The amateur is gentlemanly . . . He never knowingly uses the air for his own amusement in such a way as to lessen the pleasure of others. He abides by the pledges given by the ARRL in his behalf to the public and the Government." (McSnood turned green and shook even more violently, for he knew his discourtious DX tactics must have taken the fun out of hamming for many others.)

"The amateur is loyal . . . He owes his amateur radio to the American Radio Relay League, and he offers it his unswerving loyalty." (Joe's teeth started chattering — the only time *he* looked at *QST* was when he peeked at a copy in the radio store to see how he stood in the countries-worked totals. *Buy* a copy? Join ARRL? — not McSnood!)

"The amateur is progressive . . . He keeps his station abreast of science. It is built well and efficiently. His operating practice is clean and regular." (McSnood couldn't read schematics — he forgot how right after he took his General — all he knew was how to change tubes and how to turn the knobs on his DX-Master-2.)

"The amateur is friendly . . . Slow and patient sending when requested, friendly advice and counsel to the beginner, kindly assistance and cooperation for the broadcast listener; these are marks of the amateur spirit." (McSnood always bragged that he had never listened to a Novice station. As for broadcast listeners — well, Joe's policy was never to answer the telephone or doorbell while operating.)

"The amateur is balanced . . . Radio is his hobby. He never allows it to interfere with any of the duties he owes to his home, his job, his school, or his community." (Joe rolled over on his stomach and crawled under the operating table as he thought of his wife with no TV set, his sorry performance on his job, and the sad condition of his house.)

"The amateur is patriotic . . . His knowledge and his station are always ready for the service of his country and his community." (To McSnood, a flood or tornado was simply a weather condition usually accompanied by static which made the DX harder to work. Traffic and emer-

(*Continued on page 172*)

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS, W1FZJ

Project WORTHWHILE

AMATEURS have, since the beginning, been involved in more projects than they can possibly handle. The average ham has anywhere from ten to twenty programs in process. One of the advantages of the OES organization is the requirement of making a monthly project status report. When you sit down to make out your report, you are of necessity forced to review your program in terms of progress. Many of us have a tendency to shift our interest from month to month and as a result many projects that seemed important are now pushed aside in favor of a new, hot-off-the-press idea. Now for a guy who is pursuing a hobby, it is obvious that a worthwhile project has a slightly different definition than you might expect in industry. For instance, a ham project need not have an end result. For example, one of my pet projects has been working 75-meter DX. During the months of December and January I have, for the past twelve years, spent an average of eight hours a day operating, and two days each week end building antennas. Each year when you start to smell wood smoke at sundown and there gets to be a bite in the morning air, old project "DX 80" gets hauled out. This project has no end point, but it does have a purpose and most important of all, it is worthwhile to *me* . . . so we have the first criterion for a worthwhile ham project: It must be a project which you think is interesting. Now if you think it is interesting, it is reasonable to assume that you think other hams will share your interest. And so we have the second criterion: In order for a project to be worthwhile, it must be one that can be shared.

There are two ways you can handle a project. The American way or the iron-curtain way. If you have an intense desire to prove how great you are and have small faith in your ability to prove it, if you feel that people will laugh at your failures, then maybe the iron-curtain way is best for you. The American way, and, traditionally, the ham way, has been to share both the successes and the failures. The OES reporting forms are designed to help you share your projects with the rest of the fraternity. (If you are not the holder of an OES appointment, drop a line to your Section Communication Manager. You will find his address on page six of every issue of *QST*.)

If you are an OES and you are wondering what happened to all that information you were supposed to get, take a look at your last report form. How much did you contribute? Are you working on a project that is worth sharing with others? If you are, and you tell about it, you will find that the news will be expeditiously disseminated. No fair marking your letters "not for general information, do not publish." The only place I can find around here where I can be sure that it won't be general information is the waste basket! If you have secrets to keep, don't tell *me* about them. I have no patience with iron-curtain tactics.

Speaking of worthwhile projects, we have been advised of a couple of general interest. The first is an effort to get the "serious" 144-Mc. operations moved up to the c.w. band. The advantages of this move are obvious. The effort involved for many is, of course, considerable. The fact remains that we have been allocated a c.w. subband extending from 147.9 to 148 Mc. and it behooves us to take advantage of it. If you insist, I will be glad to haul out some of the more vociferous of the letters I received on the desirability of such a subband. (I will assume that you won't insist.) Suffice it to say that there is now a movement afoot; you have all winter to get that behemoth converted over for high-end operation. Now is the time to start the arguing phase. Do not argue with me, however, as my antenna and transmitter work at both ends. What we need is

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W1HDQ, v.h.f. editor of *QST* (on the left) with visiting v.h.f.er from Germany, DL3FM; probably settling the v.h.f. problems of today.

to find a few topnotch stations in relatively rare states to take a stand. I am sure, for instance, that if W1AZK will accept schedules only on the high end there will be the biggest beam shortening epidemic you ever witnessed. The same goes for many others. The decision is up to you. But if we are going to do it, let's get at it.

Another item of interest is the possibility of 10,000-Mc. contacts, using Project West Ford ("Needles" to you). Assuming that the commercial part of the project goes according to schedule, we will find ourselves with a ready-made reflecting layer which could conceivably be used on our 10 k Mc. band. With a layer height of 2000 miles, it is quite reasonable to expect coast-to-coast contacts. The official word is that there is nothing in this project to interest hams. Obviously, the official word-giver must not be a ham or he would be aware of the fact that there is no such thing as "can't be done" in our vocabulary. So far I have an antenna and a receiver going. The transmitter is still being built. Since we are not permitted the luxury of using pulse, I am going crystal control all the way. Present frequency is five kc. inside the low end (old timer, ha!). How about some action on this? Due to the urgency of getting something done, all letters and inquiries will be answered the same day. (Good grief! — *Helen.*)

50 Mc. WAS

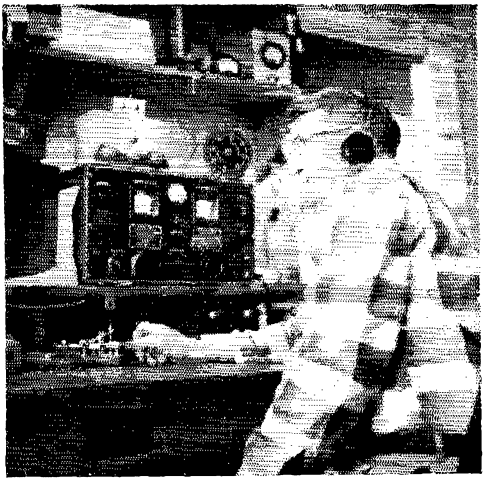
1	W6ZJB	20	W6TMI**	40	W0DO	60	W6NLZ**
2	W0BJV	21	K6EDX	41	K9DXT	61	W7MAH
3	W0CJS	22	W5SFW*	42	W6ABN*	62	W8ESZ
4	W5AJG	23	W0ORE	43	W8BAZ	63	W2BYM
5	W9ZHL	24	W3ALU	44	VE3AET	64	W7ACD
6	W9OCA	25	W8CMS*	45	W9JFP	65	K6PYH*
7	W6OB	26	W0MVG	46	W0QIN	66	W4HOB
8	W0INI	27	W0CNM	47	W0WWN	67	K0JJA
9	W1HDQ	28	W1VNH	48	K9ETD	68	K6RNQ**
10	W5MJD	29	W0OLY	49	W0FKY	69	W9QWT*
11	W2IDZ	30	W7HEA	50	W8LPD	70	W6EDC**
12	W1LLL	31	K0GOG	51	W0ZTW	71	K6VLM**
13	W0DZM	32	W7FFE	52	W6GCG	72	K6GOX**
14	W0HVW	33	W0PEP	53	W2RGV	73	W0EDM
15	W0WKB	34	W6BJI**	54	W1DEI	74	W9JCI
16	W0SMJ	35	W2MEU	55	W1HOY	75	W0LLU*
17	W0OGW	36	W1CLS	56	W6ANN	76	W7RT**
18	W7ERA	37	W6PUZ	57	W1SUZ	77	W7RDY
19	W3OJU	38	W7ILL	58	W1AEP*	78	W6KIN
		39	W0DDX	59	W5LFH		

* 49 states ** 50 states

VE7CN	45	EI2W	37	LU3DCA	27	SM5CHH	20
KL7AYV	44	CO2XZ	36	LU3EX	27	LA7Y	20
VE1EF	42	ZS3G	32	ZE2JV	26	VQ2PL	18
VE4HS	41	SM6ANR	30	LU9MA	26	JA8AO	18
XE1GE	39	CO2ZX	30	CO2DL	25	JA8BU	17
VE2AOM	38	SM7ZN	29	CT1CO	24	JA1AAT	17
KH6UK	37	PZ1AE	28	CO6WW	21	JA1AUH	16
		SM6BTT	28	LA9T	21	VP5FP	7

50 Mc. and Up

Let's deviate from the norm this month and make it "Up and 50 Mc." for the benefit of those neglected v.h.f.ers who are working on or with equipment on 432 Mc., 220 Mc., and 1296 Mc. Nothing much has been said recently concerning this ever-growing group and they'll begin to resent it in a bit if we neglect them entirely. Old friends not heard from in some time are Hal and Joe, K2ITQ and K2ITP, who have both been studying madly and are continuing their studies at the present time. However, they wish to advise any and all concerned that they intend to protect their still-standing record (1958) for the VHF SS in January of '62. Joe tells us that a very helpful stunt in eliminating TV hash on the low end of 220 Mc., is to make the local oscillator injection chain end up on the high side of the signal frequency. Much less junk to contend with around 230/240 Mc. than there is around 210. 220 Mc. Joe says they inject at 225 and tune 220/222 by tuning (backwards) from 5 to 3 Mc. Incidentally,

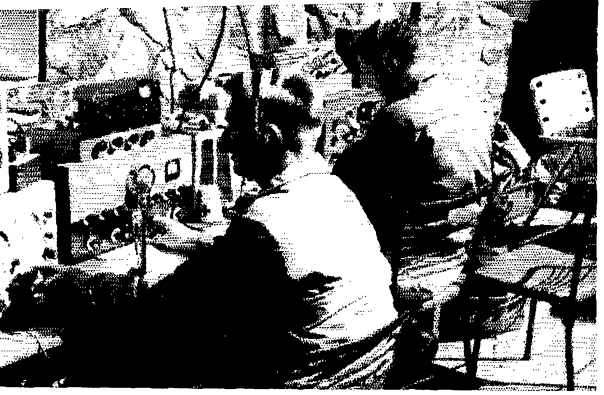


One of the very well-known, but very little seen, v.h.f.ers. W1AZK in New Hampshire.

the boys, Joe and Hal, favor the 221/222 Mc. portion to be used as "the band." 221.4 is used locally as the net frequency by the Mt. Airy VHF Club.

From a distant spot across the country W7IST, Allen, in Auburn, Washington will be listening and transmitting nightly whenever possible on 220 Mc. Transmitting frequency will be 223.425 Mc. At 0400 to 0140 GMT Allen will transmit and receive (he hopes) in a southerly direction; from 0410 to 0420 southeasterly; from 0420 to 0430, easterly; from 0430 to 0440 northerly; he will listen from 220 to 225 Mc. and beginning the 1st of October operating time will be changed to 0500-0540. In East Petersburg, Pennsylvania (Box 73), W3JYL is still keeping skeds with K8VNY in Youngstown, Ohio on 220 Mc. Sked is held on Monday nights at 1030 EDST and anyone is welcome to join in, or to make different skeds with Tony on 220 Mc. Best time is evening or early morning. K4FLR tells us that on September 3 he heard K4KLD in Hoschton and believes this to be the first 220-Mc. signal ever heard in Gainesville. You can see that there are still many, many "firsts" to be accomplished on the v.h.f.

From California WA6BFC *sez* "no skip on 220 Mc. but a lot of long distance line-of-sight." Another 6, this time K6KLY, *sez* that 220-Mc. activity in the San Leandro area is very low; Russ would like to hear from any 220-Mc. stations in the Bay Area and start a ragchew net on either 223.45 or 224.1 Mc. Russ also listed the following as stations active on 224.1 Mc. as of the June VHF Contest: K6QAX, W6ISO, K6HMK, W6YX, K6RNQ, W6NNS, W6GGV, W6GCG, W6GCG, K6DTR, W6ASH, W6OKR, W6GGW and K6LLK. W2SEU, Freeport, L.I., New York, wishes his 11 over 11 beams for 220 Mc. were not rotated via the armstrong method; it's quite wearing trying to peak up a signal when you're running in and out of the house to do it. (Ever use a rotator, Fred?) Fred's frequency is 220.364 and he's looking for contacts on week ends; will be running 100 watts with 5894 in the final. Word received from W2BVU/1 and K1JIX reports that they got back on 220 and 432 Mc. just before the recent QSO party, and are now running 100 watts on 220 and 50 watts on 420 Mc., with bigger and better antennas on both bands. During the two weeks following the QSO party (not including the contest) they worked ten different stations in five different states. This came about through random CQing and mainly on Tuesday evenings. Stations included W1AJR (Rhode Island), W1WAS (Maine), W1VNH (Massachusetts). Activity in the Connecticut, New York and New Jersey areas seems to be lacking according to John, and just in case there is activity in those areas — K1JIX calls CQ to the southwest at 2100 Tuesday evenings and any other evenings that conditions are good on two meters. Wednesday evening is 432 Mc. time in the Harvard, Mass., area (QTH of K2BVU/K1JIX) and they have recently worked W1VNH and W1WAS on this band also. Look to the northeast when 144 Mc. is jumping. That's the word from K2BVU/K1JIX. During



A portion of the setup at W1GB/1 Connecticut, during September contest. That's W1SBM on the left and K1HTV on the right.

the aurora-tropo opening of September 30–October 1, K1JIX worked W3RUE on 220 direct at 0100. W3UJG and W3LCC in Maryland were also worked on 220 Mc. around 0900. John's wondering where the 220 and 432 Mc. boys in 2- and 3-land were during this opening. According to K2UUR conditions have not been good on 432 Mc. so far this year, with only a few poor to fair openings; and during these openings — no activity. Bob sez that simple crystal mixers are doing fine business on 432 Mc. Most i.f. around 26–30 Mc. Wonder if K2UUR knows that he is being heard on 432 Mc. by W1VNH and W1QWJ. From his new location just north of Schenectady, N.Y., Stan, WA2BAH, sends a summary of his 220-Mc. activity from that QTH. Although his transmitter is capable of running 500 watts, Stan is presently running the rig at an input of about 175 watts, both phone and c.w., and his antenna is a ten-over-ten stacked ½ wavelength at a height of 50 feet. To date he has worked New York, Vermont, Massachusetts and New Hampshire, and farthest contact was with K1JIX in Harvard, Massachusetts, a distance of 167 miles. In Norwood, New Jersey, Fred, WA2HFI is working on antennas; now has five elements on 220 Mc., 32 elements for two meters and a six-meter beam all ready to go atop a 40-foot tower. Report from Springfield, Massachusetts, and W1QWJ, sez that "during the September VHF Contest at 1950 hours, 432-Mc. transmissions were reflected off the sodium cloud. W1GB portable at Hampden, Connecticut went from an S6 to 10 db. above 9 for about a minute. Earlier W2LWI 2 reported that W1GB's 432-Mc. signal was 60 db. over 9. Down Texas way Leroy, W5AJG, sez "we have a pretty good circuit going now on 432 Mc. between Dallas and Wewoka, Oklahoma, a distance of about 200 miles or so. The station is W5HTZ and he has his paramp going pretty good. Just now going to work on my receiving end (August). Have mostly been furnishing him a signal for several weeks daily to allow him to get it in final shape. Now I need to start on my receiving gear. Using 2C40's at present but expect that they are not so hot. Also in this area we have W5SWV of Denison, Texas, now on 432 and K5JHG of Atlanta, Texas, on 432. K5JHG is located about 200 miles away, has transmitting gear but no receiving gear as yet, and W5SWV is in the same boat. Have heard both of them numerous times here in Dallas." This is news received several weeks ago, so there is a good chance that by the time you read this item there will be several more Texas stations both transmitting and receiving on 432 Mc., including the two just mentioned who were not as yet receiving. K3KLR in Allentown, Pennsylvania, is also ready for 432 Mc. Has both transmitter and receiver going with only a few bugs to iron out. Don is also thinking of readying equipment for 10,000 Mc. using a modulated oscillator. Another 6-lander back on 432 Mc. is Ken, K6HCP, who sez: "I am back on 432 Mc. with a 4X250B in a square sheet metal cavity. This cavity is much easier to build than the round cavities. It also has as much as 5 to 10% more efficiency than the round cavities. If anyone is interested, I will send them the construction drawings if they will send me a self-addressed envelope—1109 Norval Way, San Jose, California.

From Wewoka, Oklahoma and W5HTZ we hear that there was a good 432-Mc. opening the night of September 6, when Merlin worked K9AAJ and W9AAG in Illinois, a distance of about 440 miles. He has also been running skeds with Leroy, W5AJG at Dallas, Texas, every morning, and the boys usually both get through with weak signals, a distance of about 175 miles. W5SWV at 100 miles puts in S9 signals most of the time on 432 Mc.; W5NU has a 432 Mc. Converter going in Savoy, Texas; W5KFU in Dallas also has a converter going and copies me but no transmitter as yet." Looks like the 5-land boys are really getting with it. There seems to be a lot more activity on 1296 Mc. or thereabouts than most of the V.H.F. gang realizes, and we would like to give out with a few quotes from some of the letters received, just to let you know that there is a lot of work being done in that area. W5HTZ "I have been very interested in the moonbounce project for some time. I have completed my 1296 converter and also have the 1296 paramp almost completed. You mentioned in *QST* that the AN UPX4 would take 600 watts and deliver about 300 watts. I have secured one of these and plan to put it on 1296 Mc. There will be several of these transmitters in this area, (Oklahoma, Arkansas, and Texas)". K2UUR: "Have worked W3ZFW, (Richboro, Pennsylvania) twice from here (Parlin, New Jersey) on 1296 Mc., both times 5–6 or better. Could probably work often but he, K3EH, K3JXC and a few others are spending most spare time building 1296-Mc. gear. (Welcome to the club) W2DZA and K3CLK and another W2 in Rutherford, N.J., all show interest in 1296; the fellow in Rutherford has a converter but has failed to hear me to date." W1QWJ: "Transmitter running 8 watts output into 32-element extended collinear on 1296 Mc. S9+ results over 16-mile path." W1QKA: "W1DUB and myself have completed converters and partly completed paramps for 1296 Mc. Being heard across town on 1296 with W1DUB skeds, both using corner reflectors." K3ADS: "Presentingly converting an APX-6 for 1215 Mc. K3HNJ is doing likewise." K2SCD: "Work has finally begun on a parametric amplifier for 1296 Mc." K8BGZ "W8OCK has converted an APX-6 for 1215 Mc., 10 more APX-6's have

220- and 420-Mc. STANDINGS

220 Mc.

W1AJR	11	4	480
W1AZK	9	3	412
W1HDQ	11	5	450
K1JIX	10	2	
W1OOP	12	4	400
W1RFU	15	5	480
W1UHE	11	4	385
W2AOC	13	5	450
K2AXQ	8	3	230
WA2BAH	4	2	167
K2CBA	13	6	650
K2DIG	4	3	140
W2DWJ	15	6	740
W2DZA	12	5	410
K2ITP	11	5	265
K2ITQ	11	5	265
K2KIB	12	4	300
W2LRJ	10	4	250
W2LWI	12	4	400
W2NTY	12	5	300
K2PPZ	11	4	190
K2QJQ	13	5	540
W2SEU	4	2	150
K2UUR	4	3	105
W3AHQ	4	3	180
W3FEY	10	5	350
W3JYL	8	4	295
W3JZL	4	3	250
W3KKN	10	4	355
W3LCC	9	5	300
W3LZD	15	5	425
W3RUE	9	5	450
W3UJG	13	5	400
W3ZRF	5	4	112
K4TFU	8	4	400
W4TLC	4	1	165
W4UYB	7	5	320
W5AJG	3	2	1050
W5RCI	8	5	700
K6GTG	2	1	240
W6MMU	2	2	225
W6NLZ	3	2	2540
K7ICW	1	1	250
KA7XII	10	5	1050
W8IJG	9	5	475
W8LPD	6	4	480
W8NRM	8	4	390
W8PT	10	5	660
W8SVI	6	4	520
W9AAG	9	4	660
W9EQC	11	5	740
W9JCS	5	2	340
W9JKP	9	4	540
W9OVL	6	3	475
W9UED	4	4	605
W9ZIH	10	5	500
K0DGU	5	3	425
K0ITF	6	3	515
KH6UK	1	1	2540
VE3AIB	7	4	450

420 Mc.

W1AJR	10	4	410
W1HDQ	8	3	210
W1MFT	8	3	170
W1OOP	11	3	390
W1RFU	7	4	410
W1UHE	6	4	430
W2AOD	6	4	290
W2BLV	12	5	360
K2CBA	5	3	225
WA2DTZ	6	3	200
W2DWJ	10	4	196
W2DZA	5	3	130
K2KIB	4	2	100
W2NTY	3	2	100
W2OTA	10	4	300
K2UUR	7	3	175
K3CLK	9	4	
K3EOF	6	3	250
W3FEY	7	2	296
W3LCC	2	2	
W3RUE	2	2	96
W3UVG	6	6	4
W4HHK	6	4	550
W4VVE	7	4	430
W5HTZ	5	3	440
W5RCI	10	3	600
W6GTG	1	1	180
W7LHL	2	1	180
W8HCC	3	2	355
W8HRC	3	2	250
W8JLQ	4	2	275
W8NRM	3	2	390
W8PT	5	3	310
W8RQI	4	2	270
W8TYY	7	4	580
W8UBT	3		255
W9AAG	5	3	375
K9AAJ	4	3	425
W9GAB	9	4	608
W9OJI	6	3	330

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

been ordered by the local gang, myself included." K1LPL: "*Activity has been started on 1296 Mc. in Providence area; anyone interested get in touch with K1LRP.*" Others interested in 1296 Mc. who are actively working on equipment for the band include *W4WGI, K4IQU, WØMOX,* WA6GHW (who is also one of the few with equipment *going* on 10,000 Mc., W4UAR, W4HHK.

A letter received from *K3CLK (just under the deadline)* brings us to task for not having more about 432 Mc. in the column. Looks like we just barely beat him to the punch by trying to get a lot of such news in this month's column. It is difficult to pick and choose from the material sent in, particularly when there is very little sent in to us concerning that particular band. However, we will try to reform and give out with a little more info concerning 432 Mc. in the future, and for the present will impart a bit of the information sent us by Gene, K3CLK. "Let it be known," sez Gene, "that this band is 30 Mc. wide, any type of modulation can be used, a greater variety of circuitry can be used and tops for antenna experimenting. The advantages of the band overweighs the power limitation. DX can be worked!" In his area (Philadelphia, Pa.), there is activity on 432 Mc. *every night* and Gene gets on about 2100 and operates until 2300. Gene lists about thirty stations in Eastern Pennsylvania, Delaware, Maryland, Northern and Southern New Jersey, Long Island, New York, Rhode Island, Massachusetts, Connecticut and Virginia, which he has worked on 432 Mc. during this past summer — all crystal controlled. Now for future reference, there are a few of the things that everyone is interested in about 432 Mc. Who's on — particularly in low activity areas. What's the use? Particularly any new, novel, or unusual equipment. Unusual distances covered regularly or on sked! Comparisons of this band with others (144 Mc., 220, etc.) as to regularity of contacts, distances, readability, etc. We take it for granted that if the gang on any of the v.h.f. bands does not send in information concerning that band, their activity, etc., that they are not interested enough to sit down and write — hence, not interested enough to read it if it were in the column. *Send us the news,* and we'll print it, or at least that portion of it which tends to be of most interest to *all* concerned. *Another thing,* we can always use good articles — send us that article you've been meaning to write, and if at all feasible it will appear in *QST.*

If you take the trouble to locate Yellowknife on the map (it's on the north shore of Great Slave Lake, about 250 miles below the Arctic Circle) you might get the idea that *this is not* much of a 6-meter location. It's a long way to anywhere for VE8BY, and it's some 1300 miles to Ice Station Arlis II, in the Arctic Ocean north of Point Barrow, where KL7FLC is in business on 50.04 Mc. But VE8BY heard or worked *KL7FLC* 16 times on 12 different days from Sept. 3 to Oct. 15. Several of the "heard" reports were reception on the Sixer that VE8BY uses to check on the band while away from base. Reception is usually T9, and on a direct line, but multipath effects were observed Sept. 12 and Oct. 9. On the latter date there was a definite two-signal echo.

VE8EW and VE8CM, Whitehorse, Yukon, were worked Oct. 20. This is a 700-mile path, and EW was using a Sixer and a vertical dipole! *VE8CM* was worked during the September V.H.F. Party also.

Two-meter men will be glad to know that *VE8BY* is now running 100 watts, c.w., on 144.096 Mc., feeding a *10-over-10* array, during all 6-meter openings.

144 Mc.

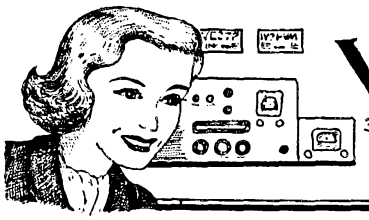
Lou, W8NOH in Grand Rapids, Michigan sez that on September 8 he was hearing the beacon signal of W4HHK for 45 minutes on 144 Mc.; while K4EUS in Chester, Virginia reports that on September 9 at 2225 EST VE3DIR was 5–9–9, for a very short period. Sam sez that his best *DX* on 144 during the *VHF Contest* was W1MEH. On September 30 W1DUB, W1JSM and W1HUD were worked by K4EUS on aurora, then he worked W1JSM all over again on tropo. For the remainder of that evening Sam worked 1's and 2's on tropo between the aurora signals which he didn't have much luck contacting (the aurora, that is). On October 1 he worked W1AZK followed by W1VNH, K2SWZ, and W2KME. Hearing VE1CL Sam called him repeatedly on c.w. and after getting no reply switched to phone, whereupon VE1CL came back to him immediately. At 2255 that same night Sam collared W1COP in Maine for state #26 on 144 Mc. Signals were S6 and 7 with some QSB. Tony, VE3DIR, was heard once again on September 16 by K1AII 5–7–9, but other than that Art sez that conditions were average during the contest. Down south, W4VTJ of Lantana, Florida, reports working K4AIB of Aiken, South Carolina on c.w. during the last week of September. Jay also reports exceptionally good meteor pings during that period. Extremely pronounced tropospheric bending reported by K1DRB on September 30 when he worked K3KEO and K2GOS 3. These same conditions mentioned by KN1RZL, who also heard 2's and 3's on the nights of September 30 and October 1. The night of September 6 was good at Seymour, Indiana on 144 Mc., and Adah, W9RTH, took advantage

(*Continued on page 164*)

2-METER STANDINGS

W1REZ	32	8	1300	W5YYO	7	4	1330
W1AZK	28	8	1205	W5UNH	6	3	1200
W1KCS	24	7	1150	W6WSQ	15	5	1300
W1RFU	24	7	1120	W6NLZ	12	5	2540
W1AJR	23	7	1130	W6DNG	9	5	1040
W1HDQ	22	6	1020	W6AJF	6	3	800
W1MMN	21	7	1090	W6ZL	5	3	1400
W1IZY	20	7	1180	K6HMS	4	3	850
K1CRQ	19	6	800	K6GTG	4	2	800
W1AFO	18	6	920	W6MMU	3	2	950
K1AFR	17	5	450				
				K7HKD	13	5	1130
W2NLY	37	8	1390	W7JRG	12	4	1040
W2CXY	37	8	1360	W7LHL	5	3	1050
W2ORI	37	8	1320	W7CJM	5	2	670
W2GQI	33	8	1200	W7JIP	4	2	900
W3BLV	30	8	1020	W7UJ	4	2	235
W2AZL	29	8	1050				
K2IEJ	27	8	1060	W8KAY	38	8	1245
K2LMG	25	8	1160	W8IPT	38	9	1260
W2AMJ	25	6	960	W8SDJ	37	8	1220
K2CEH	24	8	1200	W8IFX	35	8	980
W2ALR	24	8	1100	W8SFG	34	8	1040
K2DWJ	23	6	860	W8LOF	33	8	1060
K2HOD	23	7	950	W8RMH	32	6	910
W2PAU	23	6	753	W8GGH	32	8	1180
W2RXG	23	8	1200	W8BAX	32	8	980
W2SMX	23	7	1090	W8NOH	31	8	1090
W2LWI	21	6	700	W8SVI	30	8	1080
K2KIB	21	5	930	W8SHW	30	8	860
W2DSX	21	6	750	K8AXU	29	8	1050
W2UFH	20	7	880	W8LPD	29	8	850
W2WZR	19	7	1040	W8WRN	28	8	680
W2RGV	19	8	720	W8DX	26	8	720
K2RLG	17	6	980	W8ILC	25	8	800
WA2GCH	3	3	140	W8JWY	25	8	940
				W8WNM	25	8	900
W3RUE	33	8	1100	W8GFN	23	8	540
W3GKP	31	8	1180	W8LCY	22	7	680
W3SGA	31	8	1070	W8BLN	21	7	610
W3TDF	30	8	1125	W8GTR	17	7	550
W3KCA	28	8	1110	W8NRM	17	7	550
W3BYE	28	8	1070				
W3EPH	32	8	1000	W9KLR	41	9	1160
W3LNA	21	7	720	W9WOK	40	9	1170
W3NKM	20	7	730	W9GAB	34	9	1075
W3LZD	20	7	650	W9AAG	33	8	1050
				K9VAJ	31	8	1070
W4HJQ	38	8	1150	W9REM	31	8	859
W4HHK	37	9	1280	W9ZIH	30	8	830
W4ZXI	34	8	950	W9PRP	28	8	820
W4LTU	34	8	1160	W9LVC	27	8	950
W4MKJ	33	8	1149	W9QQC	27	8	820
W4AO	33	8	1120	W9QJL	27	8	910
W4VLA	26	8	1050	W9ZHL	25	8	700
K4EUS	26	7	1130	W9BPV	25	7	1030
W4EQM	25	8	1040	K9VQF	23	7	990
W8AIB	25	8	930	W9LF	22	7	825
W4WNH	24	8	850	W9KPS	22	7	690
W4JCJ	23	6	725	K9SGD	21	7	1100
W4VVE	22	6	720	W9CUX	21	7	800
W4RMU	21	7	1080	W9ALU	18	7	800
W4TLV	20	7	1000	WØBFB	37	9	1350
W4IKV	20	6	720	WØIHD	31	8	1030
W4OLK	20	6	720	WØSMJ	29	9	1075
W4RFR	18	9	820	WØLFE	28	7	1050
K4YUK	18	8	830	WØQDH	27	9	1300
W4LNG	18	7	1080	WØRUF	23	7	900
W4CPZ	18	6	650	WØMOX	22	6	1150
K4VWH	18	6	590	WØINI	21	6	830
W4MDA	17	6	757	WØTGC	21	7	870
				WØRYG	20	8	925
W5RCI	37	9	1215	WØIC	19	7	1245
W5AJG	32	9	1360	WØAZT	18	7	1100
W5FYZ	29	9	1275	WØJAS	18	6	1130
W5JWL	29	7	1150	KØAQJ	16	6	1120
W5UFU	28	9	1300	WØIFS	16	6	1100
W5PZ	27	8	1300				
W5LFG	25	7	1000	VE3DIR	30	8	1330
W5KTD	23	8	1200	VE3AIB	28	8	1340
W5ML	16	5	700	VE3BQN	19	7	790
W5FSC	12	5	1390	VE3AQG	18	8	1300
W5HEZ	12	5	1250	VE3DER	17	8	1340
W5SWW	12	4	745	VE3HW	17	7	1350
W5CVW	11	5	1180	VE3BPB	14	6	715
W5NDE	11	5	620	VE2ABF	10	4	580
W5KFU	11	4	1300	VR7FJ	2	1	365
W5VY	10	3	1200				
W5EDZ	8	5		KH6UK	1	22	2540

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



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

YL IS FOR YOUNG LADY

YL is for WHAT? Young Lady? That's a misnomer if there ever was one. She's fifty if she's a day.

Sssssssh — don't let her hear you. She's proud of the fact that she's a YL. She worked hard for the privilege. For years she fought the thing and was just a disgruntled XYL.

XYL? What's THAT? How could she be an ex-YL before she was a YL?

An XYL is the unlicensed wife of a licensed ham. Just between us, it doesn't add up to me either. Like mature skin, it's just one of those things we have to accept.

Wait a minute. Some YLs I've heard on the air must be XYLs too. At least they seem to have husbands lurking in the background. A YL can be an XYL and an XYL can be a YL? I'm confused.

You along with some 250,000 other hams too. You just have to develop a sixth sense about it all.

How did this merry-go-round get started anyway?

No one knows exactly, but in the early days the male ham operator referred to his girl friend sitting by in the radio shack as his "young lady" —abbreviated by c.w. operators to "YL". A wedding band, it was generally concluded, transformed a YL into an ex-young lady or "XYL". There were so few women hams then that they were virtually unheard of. Came a heavier influx of the fair sex into the hobby as licensed operators in their own right, and the terms YL and XYL were really shuffled around. Perhaps deep down no one cared that much anyway. The most important thing to a YL was that she had her very own license. It wasn't worth developing a psychosis over what she was called.

You mean there are really no fine points of distinction after all?

Well, yes and no.

That's a nice general, illogical, evasive, feminine conclusion.

In 1939 Ethel Smith, W7FWB, aired her famous query in *QST*, beseeching women hams everywhere to make themselves known. The girls who stepped forth and made their declaration as bona fide hams decided to unite, and the Young Ladies Radio League was formed. Right from the start members of the YLRL were always referred to as YLs by themselves and by everyone else. This identification was just taken for granted. But, of course, some of these YLs are XYLs too — not all of them, though.

So, we're right back where we started?

As a mere man, can you suggest a solution?

Well, if the male operator is referred to as "Old Man" why not the female operator as —

Not on your life! You could alienate the affections of all YLs everywhere for all time with that one.

What about "Old Girl"?

Let's renew a basic premise. Regardless of calendar years we like to think of ourselves as eternally young, so please delete the word "old" from all further suggestions.

"Woman Operator?"

How unimaginative.

"Lady Ham?"

Better but not too chic.

"Hamess?"

It sounds like a disease.

"Hamette?"

Say — that may have possibilities. "Hamette!" "Hamette!" "CQ Hamette!" I don't know though. We're so used to YL.

I give up, madam ham.

Don't take it so hard. Leave it to the individual YL anyway. She'll handle the situation in the way she wants. Perhaps the one subject about which a woman is most discreet is her age. If she's a young, young YL, she'll announce her age with pristine innocence — along with her school grade. If she's under 25, she usually will feel at liberty to divulge her age, marital and occupational status. If she's between 25 and 45, she may casually mention the age of her children. If she's over 45, the QSO may leak reference to grandchildren. Somewhere after 60 the pendulum

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

Fifty-two YLs enjoyed the 11th Midwest YL Convention at Chicago sponsored by the Ladies Amateur Radio Klub. We won't identify the girls individually, but maybe you can recognize familiar faces.

Season's Greetings
to YLs all over
the world from
W1QON

Early-riser Martha Burns, K4NHM, of Decatur, Georgia, looks for 40-meter c.w. contacts everyday between five and six A.M.! Licensed in Sept. '60 as a Novice and in April '61 as a General Class licensee, Martha became interested in the hobby after she had an opportunity to talk to her son at Okinawa via ham radio. *Photo via W4URL.*

Do pre-school children keep you from getting on the air? Dottie Cohen, WV2RPN, of Oceanside, N. Y. has three, ages 1, 3, and 4, but she takes time daily for a "ham break." The XYL of WV2RPC, Dottie uses a DX-20 and an SX-101A.

Midwest YL Convention chairman Bernice Schmidt, W9SJR, uses the specially assigned call W9YL for a convention contact, while Mary Koctur, K9BWJ, logs. Lending moral support are l. to r. W9YWH, K9IVG, W9AYX, W8MHE, W9LRT, W4DEV, W8ATB, and K9UXV. *(Photo courtesy Chicago Tribune)*

swings back, the age may be revealed with considerable pride, perhaps as an inspiration to others to make the grade, too.

Yes, Mam. Well — in any event, "Vive la difference"! And if you will excuse me, I just remembered a sked coming up with an operator — specie, female.

Novice WAC Record?

Kitt Carr, KN7QNN, of Las Vegas, Nevada, may have set a novice record for WAC on 40 meters. On Sept. 16 between 1600 and 1800 PDST Kitt worked all continents. Operating on 7159 kc., Kitt used only 75 watts to a folded dipole antenna. (Info via K7KBN).

CLUB NEWS

Portland Roses — As hostess YL club for the 1962 ARRL National Convention in Portland next Labor Day week end, the club anticipates a very busy session ahead. Watch for convention news notes in later issues. New club officers are Pres. Bettie Mayer, K7BED; V.P. and Treas. Lillian Pullen, W7GRC; Secy. Dee Wilson, W7ZKY; Pub. Chmn. Beverly Welker, W7HPT.

WRONE — The new officers for '62 are Pres. Mary Hadley, K1ADY; V.P. Edie McCracken, K1EKO; Secy. Treas. Edith Shaughnessy, W1ZJS; Net Membership Chairman Virginia Powell, K1LCI; Hospitality Mary McLain, K1ICW.

WAYLARC — New officers elected at the Sept. meeting are Pres. W3TSC; V.P. K4EAM; Secy. W4TVT; Treas. K4BNG.

N.Y.C. YLRL — On Oct. 7 the club held a special luncheon at The Three Crowns Restaurant in N.Y.C. in honor of visiting DX YLs Denise, VK1YL, and Susan, VQ2WZ. Club members and guests present included K2s ETC, JYZ, MGE, OTW; W2s EEO, IQP, JZX, OWL, QWL, TBU, TEX; WA2s FQX, GPT, HTI, W1ZEN, W1ZJS, and associate member Helen Zuparn.

Revised Certificate Rules

K5GBX, Custodian of the YL-OM Certificate issued by the Texas YL Round-Up Net, announces a revision of the certificate rules as follows:

Contact must be made with 25 licensed, paid-up members of the TYLRUN. All contacts must be made by the contestant from the same location, under the same call, over any period of years providing that the YL was a full member of the net at the time of contact.

Each net member has been certificated with a net certificate on which there is a number and date of issuance. The 25 QSLs submitted must bear the member's membership certificate number on the QSL.

Contact made during any regular net meeting will not count.

QSLs sent to the custodian by first class mail must be accompanied by list of claimed contacts, including call, full name of operator certificate number, date of contact, time, and band — arranged alphabetically by call. Sufficient postage must be sent to finance their return by first class mail, plus 10c to cover cost of mailing certificate. QSLs and list should be sent to Custodian Bernell Johnson, K5GBX, 1822 S.W. 3rd St., Grand Prairie, Texas. Decisions of the Custodian regarding interpretations of the rules shall be final.

An endorsement sticker will be awarded for each additional 25 confirmations of contacts.

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Any challengers for W6PIR's claim to be the "Youngest Female Amateur Radio Operator who is a Postmaster"? Newly-appointed Postmaster of the U. S. P.O. at Alamo, California, Mary Gwynne, W6PIR, thinks she may be the *only* YL Postmaster or Postmistress in this country, hence her "claim". (The new Postmistress didn't reveal her age, so any possible YL contenders please discreetly contact W6PIR direct.)

Strays

We have an interesting account of a field day in Bermuda, sent us by W2YCX. In Bermuda you can't start setting up more than two hours prior to the start of the operating portion of the field day. If it takes you longer than two hours to get set up, you have to take the time from the operating portion of the week end. Not a bad rule!

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Available without charge from the Champion Spark Plug Co., Technical Services Department, Toledo 1, Ohio, is a 16-page booklet dealing with the suppression of ignition noise in order to improve mobile radio reception. It's chock-full of pointers, and well worth writing for.

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

When:

In 1936, a quarter of a century ago, a noisy little monster violated the pact of Locarno and ordered German troops to reoccupy the Rhineland. . . . Another clownish bully drove Emperor Haile Selassie into exile and annexed Ethiopia to the Italian empire. . . . Devastating Ohio Valley floods killed hundreds and rendered nearly half a million homeless (incidentally providing amateur radio with one of its most dramatic emergency roles). . . . . Dispatches filed by a young author-adventurer named Hemingway told that Spain's civil war reached a climax in the bloody siege of Madrid. . . . The "greatest love story" saw Britain's Prince of Wales become King Edward VIII, then abdicate his throne for eventual marriage to a Mrs. Simpson (even Hollywood gasped at such an *outre* plot). . . .

Yes, '36 was a lively year for the world at large; it was also eventful for the world of DX. That year's December *QST* presented a modest new column heading for the approval of readers, a collection of DX notes hitherto sprinkled throughout the magazine, over the signature of ARRL staffman and well known DXer W1JPE. It caught on and hung around. By Goodman eventually changed his call to W1DX but that column title remains the same, along with its basic How-What-When-Where format. By's opening effort so long ago is breezy reading today:

"Is W1AAK the first W1 to complete a 28-Mc. phone WAC? He made it in October. . . . U3AG, Moscow, needs Vermont and Kentucky for WAS. Look around 14,420 kc. OA4AB needs Utah and South Dakota. . . . W9VKF submitted cards [for WAC] averaging an S7 report although his final boasts only a pair of 46s." Hey, that W9VKF guy — why, that's Pete Morrow, now W1VG, an ARRL Hq. veteran and still chasing DX. In fact, many of the contributors to that first column still prowl the kilocycles for rare ones. Recognize any of these fellows? W1s DUK KH SZ WV, W2s BSR IOP JXH, W3s BES FHY ZX, W4s AUU CXX, W5FIO, W6s AC CUH GPB JN MCQ, W7s AHX ETK, W8s CHO IWI JK KXK LIR, W9s PNE RBI and VPG. Sure you do! As for the DX mentioned, many an oldtimer still treasures yellowing QSLs from ES5C, FB8AB, FT4AB, FR8VX, Js 2KJ 2LL 3CR 5CC, KA1s AP BH MD, PKs 1MX 3ST 6AK, SU1SG, U9AZ, UN2A, VSs 1AA 8AA, YR5VC, ZTs 2B 6M, ZUs 1C and 6P.

Alas — historical perspective, one of the attributes that separate man from brute, is hard to maintain. This is especially true for hams because we're so doggoned QRL. In addition to our routine bread-and-butter pursuits we're blessed with the busiest and most intriguing of hobbies. But we pause long enough this month to call your attention to a silver DX anniversary, the 25th birthday of "How's DX?". With your continued help and encouragement we'll reach the 50th in no time at all.

What:

Another commemorational date well worth note in this DX corner: On a chilly December 12th, sixty years ago, one G. Marconi raised a kite antenna near St. John's, Newfoundland, and pulled in the historic letter "S" sent across the Atlantic by a 25-kw. spark at Poldhu, Cornwall. Now we hams can do it with a handful of watts and mama's clothesline, but it's still a thrill. So much so that Jeevesie's mailbag, as usual, is crammed with commentary on this QSO, that QSO, and the ones that got away. . . .

10 phone performs according to expectations of K1HTV, WA2OBN, K3JIQ, W1LJV, K1KSY, K6ROU, WA6s DNM IVM, K8JCB, K9QMJ, K9RNK, EL4s A and YL who report plenty of 28-Mc. action by **CRs** 6JL 7CF 7CK, **CT1s** AP VA, **CX1FL**, **EA8CK**, **HI8DGH**, **HK6AI**, **HP1FA**, **JAs** 1FKY 1GDN, **KB6CB**, **KP4s** AOO AOW, **KR6LY**, **KZ5WE**, gobs of LU-PY friends, **PJs** 2AP 3AD (28,455 kc.) 1600 GMT, **TI2PT**, **VKs** 2ADE 3ANQ 4EP, **VPs** 2LA (478) 16, 5BL (s.s.b.), 5EM 6AM, **VQs** 2JM (480 s.s.b.) 16, 2MS 4DW 4HX, **VR2BC**, **YN4CB**, **ZEs** 2JA 7JV, a flock of New Zealanders, **ZSs** 3AH 7L (328) 17, 9G, 4X4FR, 5A5TA and 5N2AMS (315) 18. K4KSY remarks, "Some Africa signals off rotary beams seem quick to fade out but the rhombic of VQ4HX stays in solid for hours at a time. Advice to 10-meter Africa-hunters: Point your beams east on week ends and keep tuning."

10 c.w., also a week-end diversion these days, keeps K3ILC, K6CJF, WA6s DNM IVM and EL4A busy with **CX2BT**, **DJ4XQ**, **F8IH**, **HB9IK**, **VKs** 2ADE 2APK 2GW 2QL 4XJ, XE1OK, **ZLs** 1AH 1AMO 1NG 2RC, **ZSs** 2DD 17 and 6BCT 16. The propagational ice is getting thin, all right.

15 phone entertains many a former 28-Mc. buff and the fishing's great, according to K1s HTV MOD, WA2s FQG IKL KMY KWB OBN OGC SLB, K3KHK, W4LJV, K4s IKV KSY, K5FKD, K6ROU, WA6s DNM IVM ORS, K8s JCB OKM, K9s BHR QMJ, KØs JPL RNK, EL4s A and YL. The catch: **CEs** 3BG 3NI 6AC 23, **CRs** 6AK 6DU, **CT1JJ**, **EL2U**, **GD3UB**, **HH2s** GR R RS,

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

HI8DGH, HPs 1LB 6MA, HRs 1FO 2HA (s.s.b.), HV1CN, HZ1AB (s.s.b.), JAs 1ADD 1CON 2AVO 2BEK 3BAM 4CI 6AFO 7UJ 9UU ØSU all between 1 and 5 GMT, KA2HO, KB6BS, KGs 4AN 6NAA (s.s.b.), KR6s HY T, JG 2, NG 13, KV4BY, KW6DF (s.s.b.), KZ5TB (330) 23, LX1s BC BG, OD5CU (230) 19, OE1ES (s.s.b.) 13, OX3DL, PJs 2AQ 3AI, PZ1s BA BE (251) 19, OD 23, SV1AH, TIs 2AB 5RV, TT8AD, VK9NW, VPs 2AR 2DQ 2GW 2LA 2LS 3RW 4NC 5AK 5BB 5BH (s.s.b.), 5LG 8DW, VQ2s JM VZ (240), VR2BC, quite a few XEs, YN4DWN, YV5s AGM AYB 0, ZB1FA, ZE2JA, ZD7SE, 4X4s FF JS, 5A3TQ, 5N2AMS (242) 17, 9M2FX (210) 15 and 9Q5EB.

15 c.w. is hospitable to K1s HTV JFF MOD, W2WMG, WA2s FQG (117/98 countries claimed worked/confirmed), IKL KMY KWB LDC OBN OGC (31/9), QMJ SLB, K3s CUI ILC (70/43), KHK, K4s IKV KSY WVT, K5s CWR FKD FPU JBW, W6s RCV WAW, K6s CJF ROU STZ, WA6s DNM (42/36), IVM ORS, W7POU, W8YGR, K8s JCB OKM, K9BHR, K0s JPL RNK, EL4A and VE7BBB, generously supplying QSOs with CEs IAD 2OF 3RC, CO2IF (34) 23, CRs 6DA (35) 20, 7IZ, CTs 1GE 1HX 1TT 2AI, DM3s VL PVL VVL, EA6AM, EL4YL, FAs 2VT 8TT, FB8ZZ, G3s GJQ GPE and OMV all/VS9, GC2FMV, HAs 1KSA ØDA, HC1AGI, HR2MIT, HZ1AB, JAs 1ANO 1BWA 1CE 1CON 1DZC 2AXP 3AF 3BDO 23, 3IW 3KE 4DZ 5AD 6AKW 7RH 8AHX 8BY 8YF, K7DRK/VO1, KA2MA, KGs 1AA 1FD (25) 14, 4AN 6AJS, KW6s DF DG, KZ5TD, LU1ZL (45) 22 Ellsworth, LZ1s KPZ KSP, OA4JH, OE8SH (71) 19, PJ3AN, PZ1BH 23, SW0s WG WZ/Crete (30) 15, TI2LA 22, TN8AU (20) 16, UAs 2KAA 0GF (58) 23, 0EH (56) 0, 0KFG (18) 0, 0LL, UB5s FG (3) 15-19, JX KAD, UC2BB, UP2s KBC KNP (35) 17, UQ2AN, VK9GP (35), VPs 4TR 5BH (42) 18, 5GT 5MJ (22) 18, 6AF, VQs 2MS 2VG 3HD 5IB (45) 19, 5IG 8BC, VR1B, VS9MB, VU2JA, WG6ALD, WH6ECU, WP4s BAF BCX, XE1AX, XZ2BB, YN3KM, YOs 6XI 14, 8CF, YV4DV, ZB1s HC (60) 20, OKV, ZC4PB, ZE6JY, ZPs 5BC 9AY, 4S7RN, 4X4s II (20) 18, MH NJ, 5As 2TC 3TQ, 5R8AD, 6W8BL (43) 20-21, 5U7AC (58) 23, 7G1A, 9K2AD (10) 16, 9Q5PW (43) 20 and 9U5MC.

15 Novice DX is a lively topic once again. WV2s RQZ TJT, WV6SBO, KN8ZTP and WN0AEY await decorative wallpaper from DJs 2KS 7AB, DLs 1IB 4EL 4VO 5HT all between 17 and 20 GMT, EA7JW, F8FC 21, G2FFV 21, HB9s ABI AC IC, HK7YB 22, JAs 1ALZ 1BFF 1BWA 1COU 1CPZ 1CWM 1HEJ 4IO 5KF 6AKW 7KF 7LK 70J 7RH 8AF 8AH 8YF, KA2MA, KL7AIZ, KH6EFO, KX6BU, KZ5SW, LU8NA, OA4s AA 23, BP 2, OK1SV 15, OZ6HS, PYs 1RG 2FY 4AUN 4EY 0-1, PZ1BH 22, SM6AOQ, SP9RF, UAs 2KAA 16, 3SE 1, 3SS 0KIG 1, 0LL 2, VE8BC 2, VKs 2APK 23, 2PX 22, 3RJ 3, 3XB 2, 4DQ 2, 5NQ 2, VO1DJ 19, VS6EC 0, WP4AYP, YN4AN, YV4BH, ZC4FB 16, ZL1s AJ 2, LE 3 and 5A3CAD. The frosh are doing well!

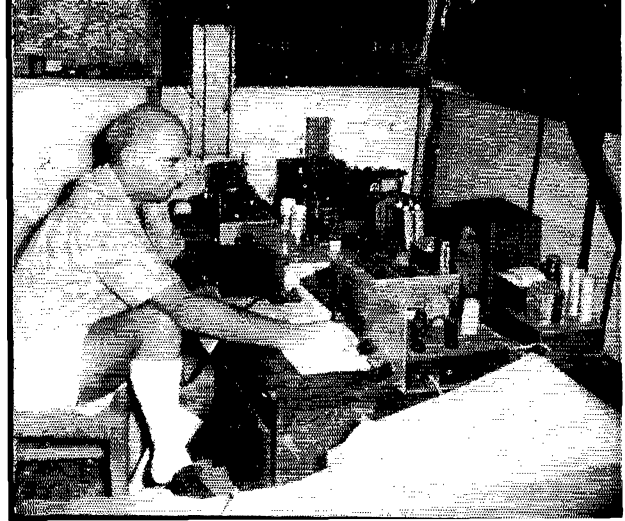
40 c.w. sounds more like 20 every night, and many a complacent rag-chewer finds himself swamped by a sudden pile-up of DX hunters. Forty-meter fans K1s JFF HTV MOD, WA2s KWB LDC, K3s ILC KHK, K4WVT, K5s CWR UMC, W6s MDK RCV WAW, K6s CJF ROU, WA6s IVM NNJ (35 countries on 40), W7s DJU LZF POU, W8YGR, W9JJN, W0PAM (79 on 7 Mc.), EL4s A and YL are having a late-fall ball with CE1s AD DN NC, CM8RM, CO2PY, CX1OP, DU7SV, EL4s A and YL 1-2, FG7XI, HAs 1KSA 4, 3KGC 5AT 5KDZ, HC1s CE JU 0-1, HI8DGH 14, HKs 1CC 1GF 1QQ 2ADF 3AH 7YB 7YC 3, HM4AQ, HP1IE, JA1s BFF CBE CUM CZG EC EMU EZK FYH FT GBC GCA GDN GNX GTZ GXA HVE IAM ISH JE YZ, JA2s ANS ASM AXB AXF BAA (YL), BDY BFZ BVS CA, JA3s AQN AUZ BJZ BQH CCX WU, no JA4s reported, JA5s ADR AFH/mm FQ TX VK YAK, JA6s AGS AHY/mm ACW ANX BCY YE, JA7s AFN LK NQ, JA8s ABE ADQ AEA AFE AHL BB, JA9VH, JAØs ACO AIC AK, KA2KS 13, KG1s GD FD FR 7, KM6BI 0, KV4s CE CI/mm, KR6NG, KZ5s in quantity, Antarctica's LU1ZL (6) 23-0, LZ1KSV, M1HD, OA2C, OE7FW (5) 5-6, sufficient PYs, PZ1AY, Sweden's SL5ZL, SPs 2KAE 2UN 2WT 8MJ 8WJ 9YP, SV1SM/mm, TI2WR, UA0s CX GL KKC LJ LL LU, many UB5s, UW3GQ, VE8s CD DU 2-3, NR, VKs 7MZ 7ZZ 9GP 0VK (26) 10-11, VPs 2LD 2VL 3ER 5BH (10) 3, 5MJ 6AF 7NQ 9BD 0, 9BL 0, 9BV 1-2, 9DC 18, VRs 2DK 3L, VQ3HD, VS1GZ, a half dozen XEs, YN3KM, a fistful of YUs and YVs, ZB2AD, ZE3JJ, ZS3HX, more ZLs and ZSs than we can list, 5A3TQ and 6W8BL. It's just as WA6NNJ says: "Boy, this looks like a promising season for 40 meters! Quite a difference in band conditions this year, a lot better. Good openings to Europe from Six-land, some fine S8-S9 signals coming through."

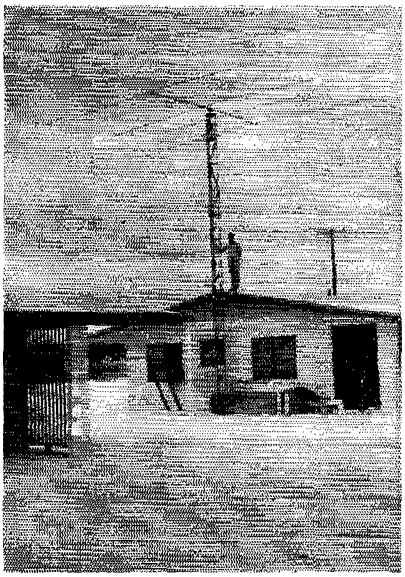
40 phone is even catching the spirit. K1HTV, W9YGT and W0PAM capturing HI8DGH (205) 7, HK2WO, HR3HH*, HZ1AB*, KH6s GF* GG*, LU1ZL*, VKs 2AXK (97) 9, 3DQ (101) 9, XE1UV, ZL3s PD (100) 6 and LE*, the asterisks meaning single-sideband stalwarts.

80 c.w. grudgingly gives DX ground under the stubborn urgings of K1HTV, K3KHK, WA61VM, W7DJU, W8s EZX 4, YGR, W9JJN, KØJPL, EL4s A and YL. In addition to the usual European crowd, activity was registered by HK3AH, JA3ANH 14, KL7IR, KP4AXU, VPs 5BH (6) 4, 7NQ (5) 23, UAØZB, W4VCA/KH6 and some VK-ZLs. Atrocious atmospherics scored some unseasonal encores as autumn waned toward winter up our way . . . . . On **75 phone** K1HTV reports resounding radiations by G2PU and YV5ANS.

20 phone, where single-sideband rules the roost, is the subject of reports from K1HTV, W2WMG, K2s IEG TDI UYG, WA2s IKL KMY OBN, K3KHK, W4s LJV IUO, K5FKD, K6ROU, WA6IVM, W8KML, K8JCB, W9YMZ, K9QMJ, KØJPL, VE3PV and EL4A, particularly concerning the 14-Mc. voice ventures of CE2AK (332), CN8s FU (282) 22, IK (306), JF, CRs 6CA (346), 9AH, DU7SV, EA6AZ (278) 22, GC3LXK (320) 22, GD3ENK (334), HH2P, HK2YO (311) 12, HP3DA (319) 12, HR2DK (326), HS5OSQ (306), HV1CN (300) 21, HZ1AB (334) 3, JA6FO 3, K6CQV/KS6 (270), KAs 2EB 2KS 2USA 8CK 8DM, KC4USN (269) 0, KGs 1AA 1BM 1FR (330) 19, 4AE 4AO 4AP, KR6s DO GF GP IW LZ MB, KV4BY,

ZK1s AK and AR of Aitutaki, left and right, account for the lion's share of Cook Islands DX traffic these days. Norm, the former, now closes down his 20-c.w. 807s and 829Bs transmitters for return to New Zealand. You may also remember him as the 1948–'51 ZM6AK. Colleague ZK1AR will continue active with a sturdy 6146 modulated by 807s, Eddystone receiver and associated operating aids. Norm and Trevor, Civil Aviation radiomen, sign ZL1s FT and UY, respectively, when home in New Zealand. (Photos via W1DGL)





KW6s DF and DG (inset), OM Bob and son Layne, have scored more than 14,000 contacts since firing up on Wake Island in August of 1960. Their HT-32A, HT-33A, HQ-170, TH-4 rotary and sloped dipoles are ever ready for DX action on 10 through 80 meters. Though accommodating swarms of W/K/VE callers, KW6s DF and DG have managed to accumulate over 130 countries on c.w., nearly a hundred on phone. They formerly signed KØs TFP and SLD, so they know what it's like to hunger for rare ones, and they know how vital it is for a rare DX installation to maintain a reputable QSL policy.

MP4s BBL 21, BBW (330) 16, OA4BR (336), OY7ML (306), PJ2AA, SP5PO (340) 21, SV1s AP (321), AR (310) 19, TF2s WFX (300) 16, WGB (300) 21, TI2s CHV (320), HD (334), TN8AT, UAs 3CG (300) 14, 3CR (345), 3DR (323) 12, 3FG (347), 9DT (300) 13, ØBP (290), UB5s UG (340) 17, UN (344), UR2AR (317) 12, VEs 3BQL/SU 8MC (347) 1, 8MS (209) 4, VK9NW, VPs 1WA 2AB 2DA 5BH (303), 5BL 5LG 9MM, VQs 2AB (315), 2AC 3GX (305), VR4CB, VS9s AAC (333), APH (315), KGA KPH, YN1CI, YS1MS (114) 22, YU1AD (318) 14, ZB1A (282) 22, ZD7SE (130) 23, ZS7P (316), 5A4TC, 5N2AMS (327), 9G1BU (300) 21, 9K2AM (317) 19 and 9M2FX, almost all of these fellers suppressing their carriers and one or the other sideband.

20 c.w., as they redundantly say, needs no introduction. Especially to K1s HTV JFF (95/86), MOD (142/117), W2WMG, K2UYG, WA2s IKL KMY (119/103), KWB (65/35), LDC OBN SLB (14/3), K3s KHK KMO MNJ, W4IUO, K4WVT, K5s CWR (22/16), FKD, W6s MDK (155/151), RCV WAW, K6s CJF ROU (132/106), STZ, WA6IVM, W7s DJU LZF POU (83/71), W8s KML KX (214/203), YGR, K8s JCB (159/139), ØKM, W9s JJN KCR, K9s LIO QMJ, KØs JPL RNK, VEs 3PV 7BBB, EL4s A and YL, who give us the goods on AC5PN (70) 13, AP5CR, BV1US, CEs 9AS ØAD (45), CN8IK (32), COs 2AP 2WD 2WU 7AH, CRs 6CA 7IZ (72) 19, DMs 2BCN 3PVL 3VEN, DU7SV, EAs 8BF 9AY ØAC, EP2BB, FAs 8CR (6), 9AT, FB8s WW XX ZZ, FO8s AC (98) 16, AK (18), AQ, FY7YI, GB3LY of England, GC2FMV, GD3CA (39), HA1KSQ, HB4s FD FE of Switzerland, HCs 1LE 2CB, HH2s CB CE OT, HKs galore, HM1AJ, HP1IE (75) 22, HR2FG, HZ1AB (50) 23, IS1ZUI (40) 22, IT1TAI, JAs 1CG 1CJN 2UJ 4IO 7WB 8HH 8LG 8XP ØAQ ØBD, KA2s AO KM MA VO, KGs 1BM 1BO 1GD 6AIG (90), 6AJS, KH6EDY (90) 6 of Kure, KJ6BV, KM6CU, KR6s KS LJ (9) 12, LY MS, KV4AA (82) 21-22, KW6s DG DM, far-south LUs 1ZL 1ZO (22) 2, 3ZO 4ZM, sundry LZs, MP4QAQ (11) 23-0, OX3s DL (20) 17, NK, OYs 7ML (20) 21, 8RJ, PJ3AD, PY7LJ (5) 23-0, PZ1s AP BF, SV9s WB WC WI (51) 20, WN (90) 22, WO (30), TI2s AL (45), DL PZ, TU2AL, UAs 1KAE 1KAE/6 1KED of F.J.L., 2BD (31) 22, 9CC 9DN 9DS 9FX (20) 3, 9FJ 9JH 9KAG 9KID 9KOG 9MC 9VE (62) 13, ØAZ ØBP ØEK ØEV (50) 4, ØJB ØKCA ØKCC ØKCF ØKUV ØLJ ØLL ØOM ØVE, UB5s FY HC KAB KND KNF KNH TO, UC2s AR CS KAA, UD6s BE GF, UH8s BA BI BO, UL7FA, UN1AE, UO5AA (41) 20, UP2KNP (69), UQ2s DB FF KAE, UR2s BV KAE KAT, UT5s BX CC, UW9AC, VE8s DX EE (76), VO2AC, VKs 9CP ØFZ ØJB ØTC ØVK, VPs 3MC 4WI (77), 5BF (40) 3, 5BH 5BK 5MJ 6LN 7CB 7NQ 8CW 8EG (50) 1, 8FV 9EP 9QQ, VQ2EW, VRs 2BZ (60), 2DK 3L (50), 4CV (50), XT2A (2) 18-0, XZ2TH, YN3KM, YS1O (75), scads of YVs, ZB2s AD (5), I 21, ZC4s CS TV (24), ZDs 6RM (24) 13, 7SE (55) 23, ZEs 2JS 8JJ, ZK1AR, ZP5CF (22), ZSs 3EW 7M, 4X4s BS HC JO KK (30) 21, KP, 5A3s CAD CAN (48) 20, 5N2s JKO (24), IND (31) 21, LKZ (37) 22, RSB (91) 21, 5R8CQ, 6W8BL, 5U7AC, 7G1A (50) 20 and 9G1DE (82) 19-20. Got 'em all? Confirmed?

160 c.w. stirrings, a sure harbinger of winter, crop up in this month's Jeevesian mailsack. Ks 1KSH and 4KSY document the phone and c.w. manifestations of DXpeditioners FP8s AS and BV, for one thing. For another W1BB, Mr. 160 Meters himself, comes through with the customary considerations concerning the annual Transatlantic and World-wide 160-meter DX Tests. Between 0500 and 0730 GMT on December 3rd and 17th, January 7th and 21st, February 4th and 18th, your concentrated efforts are invited in a search for 1.8-Mc. brethren far away. Stew exhorts, "DX on 160 is challenging and extremely interesting. Surmounting static, BC harmonics, loran, etc., requires great patience and perseverance, as well as a top-notch station and operating ability. There are many 'firsts' yet to be made, many unusual propagation conditions to observe. So join in the fun — get those long-wires up high and strong for the winter storms, check your receivers and transmitters for best performance, and store up a little extra rest for those wee small hours when 160 is at its best!" A glance through last season's developments as reported in this rubric will help get you in the 1.8-Mc. mood. W1BB and "How's DX?" will look forward to hearing from you on the subject — good hunting!

Where:

Asia — TA2AR, claiming status as Turkey's only licensed amateur. QSLs via bureau unless supplied International Reply Coupons and self-addressed envelopes. VERON's *DXpress* reports Erim hopeful that more legitimate TAs will soon be active . . . . . FEARL(M) *News* warns that your QSL may be a disappointment if you fail to (1) identify the emission used, (2) clearly define your location, and (3) use Greenwich Mean Time reference. The KA bureau receives cards for such FEARL nonmembers as KAs 2JR 2KW 2RB 2RR 5MC 7CP 8AB 8CS 8DD 8JR 9CG and 9JG which cannot be forwarded. It's a members-only arrangement similar to that of many other overseas QSL bureaus, so make sure your KA contacts are qualified for such service. Your ARRL QSL Bureau is available to ARRL members and nonmembers alike but this setup is no universal rule . . . . . "I have been acting as KA2YA QSL manager for the last six months," writes WA6BKQ from Japan, Yakota A.R.C. secretary. "We have replied to all cards received. Some cards were sent out via bureau, so anyone still missing a deserved KA2YA QSL should check his local bureau. By the way, the mailing address of this station has changed several times in past years. Cards are received okay via FEARL but direct mail is speedier." . . . . . Despite a shackful of thousands of W/K/VE QSLs, Bill of VS9MB tells K1MOD that the Gan island gang still is game for 100-per-cent card swappage . . . . . WGDXC understands that W8BF has HM1AQ logs dating to September 11, 1961, with promise of regular future delivery.

Africa — "After being steamed into action by various opinions passed through the usual channels, I would like to make clear some points on QSLing," pens 5N2LKZ. "As you may expect, I send cards only to those stations who have sent me theirs and have requested mine. Cards received direct without IRCs will be replied to through the bureaus. To illustrate the possible time involved, it takes four months by sea mail from, say, W6/K6, up to two months from W2/K2, etc. Thus cards sent via bureau are likely to take six or eight months before receipt, and the bureau route both ways will take twice as long." Yes, relax,

OM — a year or so isn't bad for some channels. If you *must* hold your breath, deal only direct with proper postage defrayal . . . . . VR1B, who will close down for a six-month leave in March, tells K2UYG he wants QSLs only via VK2EG . . . . . WGDXC's *DX Bulletin* points out that the 5R8 label used by the Malagasy Republic (Madagascar) does not apply to other FB8 areas such as the Comoros (FH8), Glorieuses, Tromelin, Crozet, Amsterdam, Terre Adelie, etc. . . . . After the first of the year your QSL to EL4s A and YL won't rate reply unless you use GMT. Ken & Co. urge you to *write out* the month in QSO dates to eliminate confusion, for 10/2/61 means February 10, 1961, in much of the world, October 2, 1961, in many other regions . . . . . Further from EL4A, "Harbel Amateur Radio Club announces that as of January 1, 1962, they can no longer accept QSLs for all of Liberia. Anyone lacking the address of a legitimate EL station can send his card to me, and I'll forward it if at all possible." . . . . . VE3BQL/SU told Chuck of W1AW, "As soon as my QSL stock arrives I already have six weeks of operation to catch up on."

Oceania — "Pass the word along that the first VK9RR, Papua, logs have arrived," notifies W2CTN, DX QSL manager de luxe. "They date from June 23, 1961." . . . . . "Thanks to K2KGJ and W4ML I have some new logs from VKØVK," reports W1AGS (ex-K2QXG). Mac's new address is P.O. Box 1145, Weston, Conn., and that W1 suffix is a reissue of the label he was assigned 'way back in 1922 . . . . . W1WPO hears that OZ5KV got results from the ex-PK5AA QTH in the glossary to follow . . . . . IRCs are of no value in the Solomons, according to word from VR1CV via WGDXC, and airmail there costs dearly. Al's cards are dribbling through nevertheless . . . . . VK8TB/9M2AF, in addition to the address in the list to follow, recommends for non-W/K/VE/VOs: C. H. Watters, Systems Engineer, RAAF Base, Darwin, N.T., Australia . . . . . WA6PMK finds that KW6DG risks writer's cramp in topping the 5000-QSL mark for QSOs made by himself and the OM, KW6DF. Each card goes via bureau if no s.a.s.e. is handy . . . . . W8KX relays a compliment from 6O1MT to the Hawaii DX gang: "Those KH6s really QSL, and fast!"

Europe — Polar Bears Radio Club, Solgardsgatan 15, Ornskoldsvik, Sweden, has some effective arrangements for securing hard-to-get U.S.S.R. QSLs. You might also investigate their offer of Russian call books and other interesting DX operating aids . . . . . "Logs have arrived for the 1961 Monaco activity of DL9KP as 3A2BZ," states W2CTN. S.a.s.e., to be sure . . . . . WGDXC learns that QSLing for this year's OH0A Alands escapade has been completed. Inquiries on the matter are still welcomed by logholder OH2ER.

Hereabouts — "QSLer of the Month" nominations roll in thick and fast, by golly. W8YGR, WA2QMJ, WV6SBO, Ks 1MOD 2UYG 3KHK 4KSY and 9LIO salute the following fast dispatchers of QSO evidence: CR6DU, EA6AM, FO8AC, HK3VV (two votes), HR1FO, KZ5TD, MP4s BBE QAQ, TI2OA, VPs 3RW 6LN, VQ5s IB IG, VSs 6EC 9MB, ZB1FA, ZD7SE, 7G1A and 9U5MC. DX QSL agents Ws 2CTN 2JXH 9FJY and 9WHM also are commended for devotion to duties. We ought to tally up these honorable mentions some day and supply suitable awards to high scorers, eh? . . . . . Ks 4KSY 5CWR and 9VLQ offer their services as QSL aides for deserving rare-DX brethren . . . . . W1TQS would like a tracer on ZM6AS, if you please . . . . . K3COW, now handling QSLs for VP2SQ and HR3JW, ships via bureaus unless s.a.s.e.s. are provided . . . . . Veteran shortwave enthusiast LeRoy Waite, 39 Hannum St., Ballston Spa, N. Y., operates the SWL/QSL Bureau for the purpose of distributing the many listener's reports that find their way into QSL bureau channels. He explains, "This Bureau is nonsponsored and operates, with the cooperation of the ARRL QSL Bureau, for the handling of incoming overseas s.w.l. cards, and QSLs destined for W/K/VE s.w.l.s. . . . When s.w.l. cards and QSLs arrive with complete addresses, each s.w.l. is notified by postcard with a request that a business-size s.a.s.e. and extra stamp be sent to me. Many arrive with incomplete addresses; s.w.l.s. desiring to do so may file their 'calls', names and addresses with the assurance that they will receive notice should cards arrive for them at the SWL/QSL Bureau." This column and ARRL facilities are, of course, dedicated to the transmitting amateur but we applaud Roy's determination to bring some order to a DX angle that has long burdened ARRL QSL Managers — the steady influx of overseas "heard" reports . . . . . PZ1AY tallies his now terminated Moengo QSL ratio at 1600 sent, 1200 received. Gad, 400 slackers in the crowd? . . . . . Via VE2LI, W3ICD disclaims connection with FY7YI QSL matters. Miscopied version of "via W3AYD", perhaps . . . . . This month the readership is indebted to W1s AGS TQS WPO, W2s CTN WMG, K2s IEG TDI UYG, WA2s EFN FQG KNC KMY KWB, K3s CUI ILC KHK MNJ, W4IUO, K4s IKV KSY WVT, K5s FKD PSO, WA6s DNM PMK, WV6SBO, W7s LZF UVR, W8s KX YGR, W9JJN, K9LIO, KØJPL, EL4s A and YL, KW6s DF DG, VE3BQL/SU, FEARL *News* (KA2LL), ISWL *Monitor* (P. Bysh, 12 Gladwell Rd., London N.8, England), JDXRC *Bulletin* (JA1DM), KRC *Splatter* (K8BIT), NCDXC *DXer* (K6CQM), NNRC *Bulletin* (L. Waite, address in the preceding paragraphs), OVARA *Ether Waves* (K8VDV), PBRC *DXer* (SL3ZO), VERON *DXpress* (PA0FX), WGDXC *DX Bulletin* (W5ABY), WWDXA *DX Northwest* (W7JPC) and K6BX's *D X-QSL Newsletter* for the customary collection of postal detections:

BV3HPT, P.O. Box 7031, Taipei, Formosa
CE3NI, C. Browne, Box 13579, Santiago, Chile
CN8IK, P.O. Box 2475, APO 30, New York, N. Y.
CP5EA (via W1BAN)
DL2JD (to G3LWI)
DL5DU, R. Porter, U.S.A. Area Support Component 7990, APO 757, New York, N. Y.
EA6AZ, L. Pons, P.O. Box 303, Las Palmas, Mallorca, Balearics
EL2U, J. Walton, Box 183, Monrovia, Liberia
FA2GI (to F2GI)
FP8BU (to W9HPS)
FP8BV (via W2VCZ)
FW8AS (via W7PHO)
FY7YI (via W3AYD)
G3GPE/VS9 (via RSGB)
HB1MQ/fl (to HB9MQ)
HC1AGI, NASA, % U. S. Embassy, Quito, Ecuador
HH2CE, 41 Rue Faubert Petionville, Haiti
HK2YO (via W2CTN)
HK3AH, L. Clavijo, P.O. Box 1505, Bogota, Colombia
HL2AG (via KARL)
HP6MA, Santiago, R.P.
HR3JW (via K3COW)
JA5AI (via W1AGS, formerly K2QXG)
K7DRK/VO1 (via VO1AA)
KB6BS, R. Luuwai, Box 85, Canton Island
KB6BT, USPO 06/50000, Canton Island via Honolulu, Hawaii
KH6DFQ/KG6, Box 445, Agana, Guam, M. I.
KW6DM (via KW6CGA)
KX6AI, J. Bogdanoff, Navy 824, Box 846, FPO, San Francisco, Calif. (or to K6QHC)
KZ5TB, Box 20, Ft. Amador, C.Z.
LX3KP (to DL9KP)
ex-MP4MAH (to VU2TA)
OA4BR (via RCP)
OA4JF (via K1EKO)
OK3MM, J. Horsky, Krajinska Rd. 2934, Piestany, Czechoslovakia
OX3UD (via W2CTN)
PK2HT, J. Ejong Dil, Raja 87, Gombong, Djatang, Indonesia
ex-PK5AA, L. de Vos, Gebbekuillaan 12, Putten Gld., Holland
ex-PZ1AY, J. Guillonard, % Mrs. C. Vermeulen, 14 Vredestraat, Nijmegen, Holland
PZ1BF (via W2WJS)
TA2AR, E. Kumbaraci, Kizilay Sumer Sodak no. 23/5, Ankara, Turkey (or via PA4WWP, W. Ingenegeren, P.O. Box 33, Soest, Holland)
TF2WFX (via K4IUV)
TF5TP (via W2MUM)
TI5RV, R. Valverde, Box 21, Quesada, Costa Rica
UA2BD, T. Buratevich, P.O. Box 136, Kaliningrad, U.S.S.R.
UA3CR, P.O. Box 82, Moscow, U.S.S.R.
UA0BP, Box 328, Krasnoyarsk, U.S.S.R.
UH8s BI BO, P.O. Box 93, Ashkhabad City, Turkoman S.S.R.
VE8CR, % Federal Electric Corp., Winnipeg, Man., Canada
VK8TB-9M2AF, C. H. Watters, % 1237 18th St., Huntington, W. Va. (see preceding text)
VK9GP (via W1A)

PZ1AY shuts down this cozy hamshack in favor of the Netherlands after thousands of DX contacts with 112 countries and all United States since activating at Moengo in July, last year. John is retiring from a supervisory position in Surinam's bauxite industry and looks forward to resuming his ham career in Europe.

7G1A really pins Guinea to the DX map and is also famed for such DXpeditionary endeavors as 7G1A/tz, Mali. Josef favors 21-Mc. c.w. when the band is good but dispenses many a 20-meter c.w. and s.s.b. Conakry contact as well. (Photo via K2UYG)

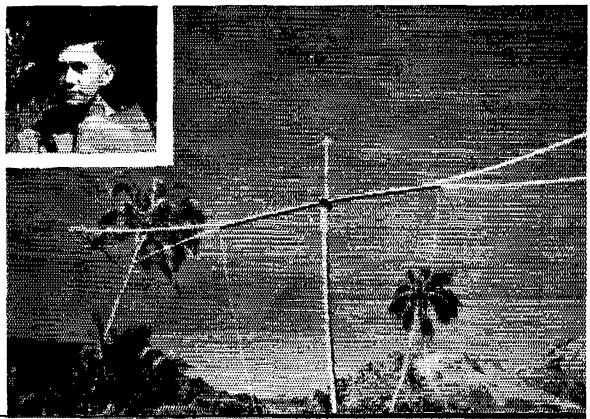
VK9RR (via W2CTN)
VK9UA (to WØAKR)
VK0JB (via WIA)
VK0VK (via W1AGS, formerly K2QXG)
VP5BH (via W4OMW)
VP7CB, % Patrick AFB, Cocoa, Fla.
VP8EG (via G8KS)
ex-VP8GE, M. Meade, Sarsfield St., Kilmallack, Limerick, Eire
VQ2AB (via W6BAF)
VQ4GT, L. Mazery, P.O. Box 30025, Nairobi, Kenya
ex-VQ8AB-VQ8CB (to VQ4GT)
VQ8BR (via K4PDV)
VR2BG (via K4LRX)
VS4BY, B. Young, % BSP Co., Ltd., Miri, Sarawak
VS6EC (via HKARTS)
ex-VS9ADL-MP4TAF (to 9M2AD)
VS9APH (via GW3IEQ)
VS9s KAC KGA KPH (W/Ks via W7PHO; others via G3GJQ)
VU2WA (via W4YWX)
W2HQL/KC4/Navassa, J. Reisert, WA6TGY, 1722 Berrywood Dr., San Jose 27, Calif.
ex-W7QPX/KW6 (to KW6DM)
W8AMG/VO1, W. Haeske, AEWRON 11, Navy 103, Radio, FPO, New York, N. Y.
W9NLJ/VE1 (to W9NLJ)
XE2WC, E. Navarro, Box 460, Tijuana, Baja California, Mexico
XT2A (via REF)
XZ2AD (via WØUUV)
YV5ASU, Box 1909, Caracas, Venezuela
YV5AWG (via RCV)
ZD6HK, P.O. Box 24, Blantyre, Nyasaland
ZD6PR, P.O. Box 41, Zomba, Nyasaland
ex-ZD8SC, S. Crowe, Friarnin, Park Av., Ingatestone, Essex, England
ZS3EW, Box 131, Swakopmund, Southwest Africa
3A2BZ (via W2CTN)
5A3CAD (via RSGB)
5R8CQ, P.O. Box 587, Tananarive, Madagascar
ex-9Q5FR, 2960 Wakefield Av., Berkeley, Mich.

NOTE: No guarantee of accuracy or officiality goes with the preceding QTH catalog. Feel free to disregard the whole business, by all means. On the other hand, you just *might* hit the jackpot.

Whence:

Africa — VE3BQL/SU, assisted by VE3CJ, forwards interesting observations from Rafah. "Now in DX biz with a 51J-4 and KWS-1 for single-sideband or c.w., plus a Valiant and GPR-90 for a.m. and c.w. Openings back home to VE-land have been few and far between, although the path to W/K is open almost every night. On my last tour here in 1957–'58, I had a pipeline into Canada almost every night of the year. These so-called DX doldrums don't seem to apply to the rest of the world, however — plenty of signals from Asia, Europe, Africa and South America with bang-up two-way results. This all applies to 20 meters; there are a few signals on 15, but 10 is absolutely dead here most of the time. Is everybody listening and nobody calling? I note that FB8XX, ET3RS, 9Q5FR and 9U5FW continue to arouse interest on 14 Mc. and can often be found from 1800 to 2000 GMT with good signals." Elvin is not pleased by the contemptuous disregard of directional CQs so often encountered on DX bands; a good way to permanently disqualify oneself from collecting certain juicy QSLs. VE3BQL/SU now hits 7-Mc. a.m. and s.s.b. with excellent DX results, and means to give 80 and 160 meters a world-wide whirl when conditions optimize . . . . . 6O1MT writes W8KX about his nearly-DXCC (114/95) countries total and an almost completed WAS (minus New Mexico). Mauro aims for several citations and has already posted such awards as Russia's W-100-U, USKA's H-22 and WGSA, sticking close to 14 and 21 Mc. Forty is filled with phone splatter in Somalia, 80 is blasted by static, but 10 is fine when it's open. W6CAE and K6UOM were Mauro's first California contacts in August. The pet peeve of 6O1MT, who does no hamming below 14 Mc., is that DX delicacies like SU TA YK and ZA go right over his head. "As a good Italian I'm trying to get the WAIP certification but it's very hard to catch from here." . . . . . "Our shipment of radio parts finally came from the U.S.A.," remarks EL4A, "but the s.s.b. rig and kw. amplifier were badly damaged en route. We now have the kilowatt going on 20 and we'll repair the sideband stuff when there's time. In addition to the usual c.w. frequencies you'll find EL4A and EL4YL voice signals on 7077, 14,154, 21,231 or 28,304 kc." . . . . . K2UYG says 7G1A is readying another Mali maneuver with his KWM-1 and ground-plane . . . . . More Africa tidbits thanks to NCDXC, PBRC and WGDXC: XT2A paid an autumn visit to France. . . . 5N2AMS seeks Idaho, Nev., Ore. and Utah for WAS. . . . W5PQA of ZM7DA fame was hoping to sign rare west Africa prefixes around this time. . . . Say, CR6CA is one of those mental math whizzes capable of calculating cube roots in half a second, fifth roots in one second, etc. Handy fellow to have around in the closing hours of a DX test when you're in doubt as to whether a multiplier-chase is worth while.

Asia — VU2AJ tells KØKKU he hunts for Ark., Utah, Vt. and Wyo. daily on 20 c.w. around 0300. Guess why . . . . . "HZ1AB wants it known that they're going on RTTY, 14,090 kc., for a few months until the outfit shuts down," relays WA2KMY . . . . . K8YUW moves to Okinawa for some KR6ing, and W1BDI mentions a current U.S.A. tour by OD5LX . . . . . Several dozen HMs and HLs are grinding out local Korea QRM now, according to W6MDK. The *DXer* of PBRC alludes to Novice-style 14-Mc. activity by one HM1SBM . . . . . K2UYG finds VU2CQ itching for another AC5CQ skirmish . . . . . VS9MB's rig won't load on 40 or 80 but staffman Bill indicates the possibility of future action on those bands in lines to K1MOD . . . . . Japan comments from here and there: W6IAH visited delightfully with JA1s AC AQA DWT EB HM ID JH and others. A tour of Tokyo's five 50-kw. TV rigs and 1093-ft. tower was impressive, too. . . . W6MDK captured WAT No. 21 and WFKAS in September. . . . K6CJF nears his 600th JA station worked. Bill's getting so well known over there that brand new JAs greet him by name, and others baffle him with Japanese salutations. . . . KA2YA is manned by Yakota Amateur Radio Clubbers Ws 4BAX 5WJS, Ks 1HOH 4YDK 5EAF 5YGQ 8WKV, WA6BKQ, KA2s MM RP and s.w.l. H. Waldo. They have a Collins gallon warning a 90-ft.-high three-curtain rhombic, among other equipments. WA6BKQ writes, "Although KA2YA has been active for more than eight years we have only recently begun gathering QSLs for assorted certifications. Seven more states will clinch our WAS." . . . . . VE3BQL/SU observes much 14-Mc. DXcitement in his area inspired by AP2MR, EP2s AF AG AT BE HF, MP4s MAH TAO, TA2AR, VS9MB, 9M2s, AD and DX at 1800–2000 GMT . . . . . Club Asian shorts via NCDXC, PBRC, VERON and WGDXC: AC5PN is back at the



VR6TC's intriguing skywire goes well against a picturesque Pitcairn island backdrop. That's operator Tom Christian, inset, descendant of participants in one of the greatest romantic adventures of all time, the Mutiny on the Bounty. (Photos via W4TAJ)

KG6GX was reactivated with a bang this August and now sprays solid 14-Mc. sideband signals Statesward off a Vee beam. Capt. C. J. Alley mans the mike while Cmdr. J. L. Gates, K3CJM/KG6 (seated), Lt. P. H. Jacobsen, KG6AKG, and Lt. J. T. Boyle (right) monitor inaugurational proceedings. KG6GX is housed at the transmitting site, U. S. Naval Communication Station, Guam.

shack after a few months abroad. . . . UH8DA's rare s.s.b. is rockbound on 14,302 kc., 1500–2000 GMT. . . . 9M2DB feels that scarcity of moderately priced single-sideband components is discouraging Asian s.s.b. growth. . . . AP5CP of East Pakistan may be catchable on 14,040 kc., 1030–1200 GMT. . . . W6EJA got a kick out of Japan's recent All-Asia Test in noting the ages of his competitors. Where were the guys in the 30s bracket? . . . Ex-YK1AT is said to be in Vietnam these days, striving for hamming privileges to no avail. . . . JA1EEB's 7-Mc. c.w. Marcus availability may terminate this month. . . . OD5CL plans Jordan emanations on week ends. . . . Kamaran island's rarity status was jeopardized by G3s GPE GJQ and NAC signing, respectively, VS9Ks PH GA and AC in October. Erratic conditions were sporadically surmounted by their persistent s.s.b-a.m.-c.w. sorties.

Oceania — W8KX checks up on the Lord Howe island DX situation via VK3ARX. 'Tain't good — no resident activity at all. VK3ARX muses, "I operated from there November 19 to December 1, 1958, as VK3ARX/lh. In November-December of '59 I went for a vacation to L.H. and was active with a friend as VK2APX/lh and with my own call. VK2FR was resident there for about seven years and is well known as elusive, mainly on d.s.b. VK2FR returned to Melbourne in early '61 — no Lord Howe action now. FB spot for vacations with its coral reef, lagoon, surf beach, mountain view, 230-volt a.c. and no police. It's only three hours from Sydney by flying boat." VK3ARX, by the way, was first licensed in 1928 and now has a 177/163 DX tally with 100 watts and a ground-plane, the latter soon to give way to a triband quad. Rick stalks QSLs from Ala., Ky., Miss. and S. C. to clinch his nifty fifty. According to W1AW's *Amateur Radio*, Australia's top DXers by call area are VKs 1EG 2ACX 3KB 4FJ 5AB 6RU and 7LZ . . . . . KW6DG's newest local QRM is KW6DM, formerly W7QPX/KW6. Layne also notes ex-KG6AFH pounding brass at KJ6BV, and hears that VR2DW readies an a.m. outfit for DXtensive 14-Mc. deployment . . . . . KX6AI (K6QHC) reports from KX6BU: "We're getting out our 40-meter beam soon. Forty-meter conditions have been very fine with openings to Europe over the long path almost every morning, 1700–1900 GMT. In the evenings we work 7-Mc. Africans, and 75-meter s.s.b. is great for the States. I'll have KX6AI on the air now and then with 6146s rockbound, 7022 kc., and there are eight or ten other KX6s contributing local Kwajalein QRM." . . . . . NCDXC, PBRC and WGDXC volunteer Pacific addenda: VKØVK says there's a chance that Heard may be heard next month. . . . YJ1RD is reported rebuilding for the DX wars. . . . VKØFZ, still in need of ten states for WAS, goes back to Australia from Macquarie this month. Fred likes 14,090 kc. shortly after 0600 GMT on Mondays, Wednesdays and Fridays. . . . Willis island's dull routine includes airplane supply drops (no airstrip), scarce ship visits, irksome bird deposits, cyclones, some lagoon fishing and no hamming inclinations among the meteorological personnel. . . . VK1SS is pessimistic about possible early CR1Ø DX output . . . . There's 240-volt 50-cycle a.c. available on Tonga, according to VR5RZ, whose recent operational visit succeeded in interesting the reigning prince in the possibilities of amateur radio. . . . PK2HT's 21-Mc. phone frequently is audible between 1100 and 1600 GMT but W/Ks are still on the outside looking in (ITU-FCC Ban List).

Europe — "DXCC²" No. 44 (see p. 69, July 1959 *QST*) is filed by OK3EA who has been a member of ARRL's DX Century Club since 1956. Harry claims QSLs from 189 countries; only lack of S. Dak. and Utah QSLs blocks his WAS-DXCC achievement (confirmed QSOs with DXCC members in all United States) . . . . . K3CUI learns that UB5s FJ and KAB copped single- and multiop honors in last year's Czech DX contest, while OKs 3AL 1ZL and 2QR scored homeland highs. Ws 2EQS 4KFC and K3CUI ran 1-2-3 for our side . . . . . RSGB's 1961 21/28-Mc. Telephony test is rampant as this *QST* gets around. Don't forget that your entries must be mailed no later than the 18th of this month. In the 1960 affair G3NNT was U.K. champ, OH5SM the non-U. K. kingpin. Other continental leaders were EP2AT, LU8CW, VE3ENH and ZD2JKO. Yank entries were paced by W1FZ, W3HQO, Ks 1OCU and 8CFU in that order . . . . . In this year's VERON (PACC) DX Test PAØs LOU VO LV VDV and VB led Netherlands participants in the single-op c.w. category while PAØs LV HBO SNG ADP and HSJ took the cake on phone. Some U.S. call-area highs: Ws 1WY 5WIQ, K8PYD and WØMCX. Next year's PACC shindig is scheduled for April-May . . . . . K9LIO's friend K9ICG embarks on a two-year Continental assignment and possible c.w-accented rare-type DX work . . . . . W7DJU notes YL Wilma passing out 14-Mc. code contacts from UQ2KAE . . . . . Sweden's PBRC observes that Russian phones, including juicy items like UA0YB, are on the increase in the 7050-kc. region.

Hereabouts — The 45th "DXCC²" is submitted by W4HVQ, closely on the heels of OK3EA's entry. Marty writes from Norfolk, "When you first came out with that scheme I figured, along with hundreds of others, that it was a lead-pipe cinch for oldtimer DXCC fans. But when I went into my QSL file I found I was just a beginner — an earlier 'housecleaning' made it necessary for me to start working hard at reconfirming QSOs with overseas DXCCers. I got a wonderful response from fellows who QSL *200* per cent when necessary! No luck with LZ1KSZ, VP5s BL DC or PJ2AN, however." . . . . . "Receiving conditions were not ideal at Moengo," remarks ex-PZ1AY, now bound for the homeland. "I was on top of a bauxite hill about thirty miles from the ocean." . . . . . VP3RW dropped in on WA2FQG en route Europe, heading for a possible eventful VS-style assignment . . . . . Phony RST reports rile WA6IVM and other conscientious DXers. "I'll give a DX station a carefully evaluated 348CK report, and then some local yokel gives him 589 or 599X." A few weak-minded W/Ks appear to believe that dishing out preposterous reports reflects some sort of glory on their receiving equipment. Ignorance and misuse of the valuable RST tool, however, is merely another way to spell L-I-D . . . . . KN1TDP wonders how many DX hounds are in the XYLs' dog house . . . . . K4KSY learns that W5CIE replaces K4THQ/VE8 on Resolution isle . . . . . The School for Latin America, Albrook AFB, C. Z., has KZ5TA in high DX gear with emphasis on 14-Mc. sideband. K4KTR finds KZ5RC (ex-W3JZO) chief op with plenty of enthusiastic student participation . . . . . NCDXC, PBRC and WGDXC chorus local items: HB9TL's roving s.s.b. transceiver visited VP3YG. . . . W2HQL left 275 countries behind to become WA6TGY. . . . VP8EG's new relief operator is G3LET, a keen DXer, while VP8GE anticipates early return to Eire. . . . HK1QQ intimates an early-'62 Baja Nuevo probe by the HKØTU gang, plus further Malpelo merriment. . . . HC1AGI was temporarily manned by ace contester W3EIS. . . . Ex-YN1TAT expects two years of DX fun as HH2P. . . . *Vasme III* & Co. (VP2VB/mm) expect to produce French Oceania QSOs pretty soon if not sooner.

Ten Years Ago in "How's DX?" — Ever work Outer Baldonia? Well, there *is* such a country just off VE1-land, according to research by W9HUZ as reported in the December 1951 column kickoff . . . . Old 160 comes back to DX life, Ws 1BB and 9CVQ getting across to ZL1AH . . . . EK1CW highlights a host of transoceanic 80-meter QSOs reported, and the 75-meter phone gang frolics with several KZ5s . . . . MD2s FM JB, SU1GB, VS7NG and 9S4AT are the pick of 7-Mc. candidates . . . . Twenty-c.w. is the haunt of C3s AB MY, ET3Q, F3AT/FF8, FD8AA, FE8AC, FK8AK, HE9LAA, KM6AW/KS6, KT1s LM LU OC, LB8CH, MD2DW, MI3s GC UF US, OQ5s AA VN, ST2GL, SU1s RX XZ, UP5A, VK1BS, VT1AB, YI3s BES ECU EFE, YK1s AC AH and 9S4AX . . . . Phone sports on 14 Mc. grab stuff like CR8EB, CS3AA, HC8MM, HI6EC, KT1BB, LA1QC/Antarctica, MI3RH and ZS8A . . . . On 10 voice you can catch MD2GC, MI3s AB ZX, MP4KAG, OQ5s a-plenty, curious TDRK of Guatemala and ZD4BG . . . . HB9MA and HE9RDX amassed 1342 QSOs with 51 countries as 3A2AD, VQ1RF and W5HBM threaten Zanzibar DX action, while Ws EFK and ELA prepare an elaborate Borneo-Brunei-Sarawak incursion . . . . Jeeves labors over an excessively-metered final, and there are photos of PX1AR, JA2OM, OH3NA and KZ5TB for your viewing pleasure. QST

RACES in Alaska and Hawaii
Geneva Regs Implemented
Third-Party Traffic With Bolivia
Panel of Experts

RACES IN ALASKA, HAWAII

FCC has issued a notice of proposed rule-making to make available for RACES operations in Alaska and Hawaii the frequencies 7245–7255 and 14,220–14,230 kc.; these channels are already in the RACES frequency list for the continental U. S. Final date for filing comment is January 2, 1962.

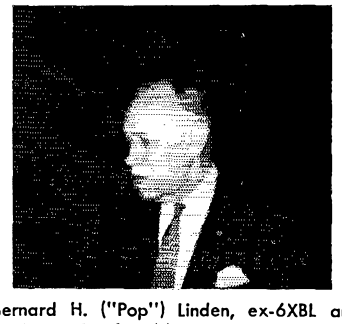
GENEVA REGS IMPLEMENTED

Now that the Senate has ratified the radio regulations agreed to at the Geneva Radio Conference of 1959, the Federal Communications Commission has issued a final order amending Part 2 of its rules to conform, with an effective date of December 1, 1961. The only practical change affecting the amateur service will be deletion of our present 3500–3700 megacycle band, and its replacement by 3300–3500 Mc., as agreed at the Geneva meeting. Thus we shall be shifted back to the same portion of the spectrum originally assigned to the amateur service in the post-World War II allocations. However, the actual change will not be effected until amendment of the appropriate section of the amateur rules, Part 12, expected later in the year.

BOLIVIAN THIRD-PARTY TRAFFIC

The governments of Bolivia and the United States have signed an agreement permitting the interchange of third-party message traffic by amateurs. There are the customary restrictions limiting conversations or messages to purely personal and relatively unimportant matters — except, of course, in emergency.

The full list of countries with which U. S. amateurs may freely handle such unimportant traffic is: Bolivia, Canada, Chile, Costa Rica, Cuba, Ecuador, Haiti, Honduras, Liberia, Mexico, Nicaragua, Panama, Paraguay, Peru and Venezuela. If you have the placard from October *QST* on your shack wall, please correct it by adding Bolivia.



When Bernard H. ("Pop") Linden, ex-6XBL and 6ZG retired on August 1, after 44 years of service to FCC and its predecessor agencies, 200 old-timers in radio—amateur and commercial—turned out for a testimonial dinner. For the past 26 years, Pop Linden has been FCC Engineer in Charge of the 11th District, with headquarters in Los Angeles. To quote ham columnist K6UFL, "The hams all loved Pop because he was never too busy to talk to them . . . (answering) their questions no matter how technical or detailed . . ."

PANEL OF EXPERTS MEETS

To study the unsolved problems of congestion in the frequency bands between 4 and 27.5 Mc., the Geneva Radio Conference of 1959 set up a special Panel of Experts (see page 63, January *QST*). Extensive preparatory work has been under way during the past year to nominate a U. S. candidate as a panel member (Captain Paul D. Miles, of the Interdepartment Radio Advisory Committee — who later received the largest number of votes in the international election process), and to provide him with background information and statistics covering the various matters to be taken up by the study group.

The Panel has now completed the work of its first session, held in Geneva, Switzerland, during September. It concentrated on various means of relieving congestion in the bands of services other than amateur, such as technical and operating improvements, transfer of activity to other portions of the spectrum, technical and economic assistance to new and developing countries, and the like. The amateur service, as hoped, was not included in the Panel's study (although considerable preparatory work was done by the League — just in case). At this point, therefore, it would not appear that the eventual recommendations of the Panel will involve the amateur service. QST

The Goldwater bill for reciprocal licensing needs your support. Write to the senators from your state and the members of the Commerce Committee today. Full details pages 9 and 73, October *QST*.

Correspondence From Members-

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

TEAR-OUT CARD

¶ I just received October *QST* and hasten to write you a congratulatory letter on the inclusion of page 64 A and B. Placing all of this very valuable information onto a tear-out page is a very excellent idea. I feel that I am just one of the very many who will congratulate you on this splendid publishing effort. — *John F. Rider, W2RID, New York, N. Y.*

¶ Putting the extract on a tear-out page was smart; I, like other League members, consider *QST* to be golden. I would just as soon tear a part out of my transmitter than deface my issues of *QST*. — *J. Scott Kenya, WV6SLT, Mountain View, Calif.*

¶ I think your tear-out card idea is terrific! I was in the process of compiling a similar chart when this came out. This form is much neater and handier. — *John Fehlandt, KN9GQU, Chicago, Illinois.*

¶ It is especially valuable to me because I normally operate only one band and when I do have occasion to go to another one it sort of takes the romance out of it when I have to fumble through back issues of *QST* to find out what the band limits are. — *Richard E. Berger, W3IEF, Washington, D. C.*

¶ I was just wishing for a handy list of bands available and you come up with exactly what I needed. With the large numbers of new amateurs coming along each month they are bound to find such information very useful.

I just can't conceive trying to participate in this ham hobby without the expert help the League provides. — *L. J. Julien, K9DEV, Villa Park, Illinois.*

¶ First off your tear-out card is a step in the right direction. *But* let's print them only on one side so they can be put under glass or on the wall where they can do some good. When you print them on both sides they are better in the magazine. . . . — *J. E. Reynolds, W0JMB, Colorado Springs, Colo.*

¶ After hunting through many back issues for this information in the past, this new card is really appreciated. — *George J. Selas, W9QVI, Milwaukee, Wis.*

¶ . . . Only complaint perforations were too close to binding and so it was difficult to tear out of the magazine. But let's have more of these! — *Hartland B. Smith, W8VVD, Birmingham, Michigan.*

¶ It is always right in front of me in the shack under a glass top. This is only one of the many benefits one receives by belonging to the League. Keep up the FB ideas. — *Wayne E. Brenner, WA2NXF, Massapequa, L. I., New York.*

[Editor's note: Thanks to — K3MCJ, K8GPT, W2PEI, W8HXC, WA6JJP, W1BGJ, W5AKT, Ø, W4PJG, W1PLA, K8WFH, W6USV, W4KQP, WA2JXG, W2VIB, K2CCK, W2BHJ, K3HGX, W4MXO, W1ALP, K2GZW, W8DVY, K9IQS, W4TVC, W6HAB, W3JKX, W3ARM, K7ETV, K5HWO, W2OWL, W7VIF, WA6NDP, K1LOY, W8QKU, K4TZK 4, W4TVY, K1CUH, W5WNU, W5JZT, WA6CAK, WA6IXR, K4LCF, WA6JSA, WN9AFI, W6CCE, WA2FZJ, KØUZE, W9RWD — and others — for their comments.

One member suggested a tear-out card in *each* issue, confident that the Hq. could create useful information to fill the space. This is not the problem; rather it is the expense of publication of the special insert which will prevent us from using it monthly.]

FORTY YEARS . . .

¶ Just a note to thank all of you for what you have done to keep our hobby more enjoyable these past 40 years I've been a member!

Reference to my *QST* file for Oct. 1921 notes this was the convention issue (the first), also plans for Paul Godley's momentous trip to Scotland — another evidence of the League's pre-planning and the members' cooperation on the "silent periods" that helped make it a success.

On page 55 of the 40-year old issue is also a letter from one D.H. Mix, 17S of Bristol, Conn., complaining of the QRM from "these daw-gone radio 'concerts,' so-called." However, the writing is on the wall in the form of the Crosley ads on pages 60 and 61!

Keep up the good work you are doing for all of us and many thanks. I hope to be with you for another 40! — *Fred Elser, W6FB, Palm Springs, Calif.*

HOORAY FOR LOUIE!

¶ Yes, I mean Lewis G. McCoy; he has done more to help us non-technical amateurs than anyone else. He is sure down to earth and I am very pleased with his articles. Let's have more of Louie every month. — *Robert G. Thompson K9RTG, Milwaukee, Wisconsin.*

RECOMMENDATION

¶ In answer to "Helping Hand" of *QST*, September, 1961 Correspondence column, I say hold on to your sponge.

Judging from the amount of time and effort you have given to your rig and the fact that you did make some contacts, I suspect your trouble is not in your transmitter. Your trouble in all probability, is in your antenna.

My early hamming experience closely paralleled the trouble you are having now. In fact, most of the hams I know had similar difficulties. It seems that there is a lot of truth in the old saying, "If there's a will, there's a way."

Antennas, in my humble opinion, are the least understood and appreciated element of a communications link. The best action you could take at this stage, is to soak up all you can from the ARRL *Antenna Book*. I also recommend that you get a copy of my article in *QST*, November, 1955, on the "Budget 40-Meter Vertical." It's an antenna constructed from empty beer-cans. It's an excellent antenna for your purpose at practically no cost. In addition, look at my antenna article on page 18 of this issue. — *W. Pete Czerwinski, W2JTJ, Shrewsbury, New Jersey.*

¶ I would recommend to Mr. Bosinski — if he has not already done so — that he follow his own suggestion and become a philatelist. Four hours a night (and plenty of money) should enable him to become an outstanding stamp collector. On request, I will be happy to supply him with his first series of Canadian stamps.

It is regrettable that Mr. Bosinski's reaction to his first set-back should be a critical condemnation of hams in general. There may be some un-cooperative members in the fraternity, but there is plenty of help available, and one of the best ways to obtain assistance is to become a member of the local radio club.

Unfortunately, experience does not come in kit form, nor without persistence. Happily for those who lack patience or persistence, there are other hobbies — such as stamp collecting including the privilege of "beefing" if you do not get all the cooperation guaranteed to each citizen in the "Bill of Rights".

So what else is new? — *L. Jacques Filion, VE2AES, Chamedry, P.Q., Canada.*

POWER LEVEL

¶ After reading several letters asking for lower amateur r.f. power requirements, I feel that I must write before too many persons actually start taking such a bad suggestion seriously.

Since the time of the first transatlantic QSOs on 160 meters many years ago, the end-point to which amateur radio has been headed may be summed up in only two words — reliable communications. Whether the amateur is engaged in DXing, ragchewing, antenna design, or just plain

(*Continued on page 162*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, W1DGL, Ass't. Comm. Mgr., C.W.
ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

To What End Certificates? Award certificates, the time honored means of recognition for various amateur achievements, reflect the integrity of the sponsoring organization and are valued accordingly. Certificates reflect continuing performance values as in SCM appointments, or an earned achievement as with CP, DXCC, WAS, or RCC.

Bob Murphy, K6CQM, editor of the Northern California *DXer*, devotes an editorial to certificates, suggesting that societies around the world are the logical ones to administer certificates, rather than individuals. He deplores individual offerings as well as those commercially promoted, especially "where the many fees seem excessive and the certificates unduly prolific." K6BX also has stressed the principle that any award to be recognized should aim at a "suitably high" achievement and be of a continuing nature. It must be supported by an organization large enough to administer the award consistently and honestly, and must be for something worthwhile . . . which is to say it generally must be for more than working a handful of a club's members. Unfortunately so many of the new ones are just that! Here is part of K6CQM's comment with credit to *The DXer*.

"How many have noticed the sad state which the certificate field is in now with everyone and his brother getting into the act, offering certificates for anything and everything, and expecting you to pay for them besides. There has been a trend towards certified lists instead of QSLs submitted. However, most of the worthwhile and prized certificates require cards (or reserve the right to call in specified cards). I, for one, think that submitting a certified list for such awards would detract from their authenticity and value. After all, a QSL is still the only legal proof of QSO — so there's no reason why anything less should be required. There are too many new certificates showing up every day. Not only that, but some new awards offer a separate certificate for each class or degree of award for the same accomplishment. The number of classes reach up into the ridiculous. . . . Originally, certificates were offered free or with a nominal charge (up to a dollar) for actual postage and/or return of QSLs by registered mail. Yet the price, even with certified lists proposed instead of a true review of presented QSLs, remains the same. This is a system which it seems can show a tidy profit at the end of the year. . . . I refuse to buy my way to the top. . . . We are open to pros and cons on the subject but think those bestowing honors should do this gratis or for the return QSL costs. . . ."

Fixed-Test Messages and Holiday Traffic. All amateurs can use this holiday season to demonstrate to themselves and others that their stations are truly capable of handling communications. The "personal service" represented by traffic deliveries is great at any time of year, and is especially appreciated on holidays. Accuracy and speed are most assured when messages are routed via one's section c.w. or phone net.

The volume of Christmas traffic is one of our organizational problems. A brief way to send messages is to use the ARRL list of fixed or standardized texts. You will find this in your ARRL Log Book, or CD Form 3, available by requesting it from ARRL Headquarters. CD-3 gives a wide selection of "greeting and seasonal messages" as well as an example of the exact message form to follow in starting any such message. We strongly urge spelling out the numbers representing the text to reduce error. Please remember that it is the delivering stations responsibility to expand any message using fixed texts. The brief individually worded radiogram will often be preferred, but the ARRL system of ARL-text messages has helped amateur radio to do a bigger job of handling emergency messages. A few well handled radiograms can make yours a traffic-Christmas.

Starting and Routing Your Message. If your station is part of a net, you have no problem. The net should have liaisons with the National Traffic System for the surest routing. If you are not on the air, you can file your radiogram with another local amateur, preferably an ORS, OES, or OPS appointee with traffic

George Thurston, W4MLE, rates a gold star for his SEC work in Western Florida. Here he is at his operating position. George's shack is one of those which do not look impressive at first glance, but on closer inspection you find that there isn't much he isn't set up for. When he gets time from his ham work, he runs a press service at the state capitol in Tallahassee.

connections. But there is a great satisfaction in starting the messages from your own home station and have your call appear as the "station of origin." You can try and snag someone right at the destination by going over the bands to find an active and dependable station "right there." But this is more of a gamble than to work through a traffic-dedicated net. Under FCC's Section 12.102, U. S. hams can freely handle traffic as long as no compensation, direct or indirect, is involved. Since similar privileges are not generally granted amateurs in other countries, it behooves us to develop and use our ability and our privilege to the fullest. Christmas is a good excuse, even if you are a newly licensed amateur, to send some messages.

Consult *Operating an Amateur Radio Station* for details on net operation and message handling. Setting up the traffic should be pure routine; using an ARRL message blank automatically puts your message in the right order to send. The address should be complete and correct. In sending be sure all parts are in the correct order. Remember, traffic delivered is an advertisement for amateur radio!

ARRL Code Proficiency Program. Last year W1AW and W6OWP received nearly 4000 submissions of copy in the Code Proficiency Program. As of last December, 37,759 people had been certified in the CP Program! All persons not already certified at 35 w.p.m. are urged to strive for a higher-speed *endorsement sticker* until you prove your ability at 35 w.p.m. In sending in copy for check, please mark your one minute of solid copy which you think will qualify. For five-character words and the spaces-between them (10–35 w.p.m.), it takes 59, 89, 119, 179, or 209 consecutive characters and spaces respectively to qualify. We suggest to those amateurs going up for FCC code examinations that they listen as often as possible to speeds *faster* than they can copy solid. To make sure you pass, strive to earn a certificate at one or even two speeds above the FCC speed for which you are aiming. This will allow for any possible nervousness when you take the exam.

For the Newcomer. Getting your first ticket is naturally a matter in which you can take much pride. Whether a Novice, Technician, or General/Conditional, go beyond what you have to even greater results. Accomplishments in amateur radio reflect one's own efforts and application. Equipment and operating arrangements can be constantly improved. Also one's results in DX, traffic, and awards can come as much from operating know-how and participation as from a new beam and new equipment.

The Amateur Radio Emergency Corps invites your registration from the moment you receive your license. Get a Form 7 AREC registration blank either from your local Emergency Coordinator or from ARRL Hq. to add your strength to organized emergency preparedness. The Official Experimental Station appointment from your SCM likewise is open to all amateurs, newcomers included, that work v.h.f. Activity can be in nets, propagation reporting, or experimental projects of all kinds. Novices or Technicians can earn this appointment. Whatever your brand of operating, send a concise report of your on-the-air results direct to your SCM each month in accordance with his invitation on page 6 of this issue of *QST*.

Looking ahead to February, the newcomer can look forward to the Novice Roundup, February 3–18, to expand your number of states worked. Complete announcement will be in January *QST*. There's nothing like on-the-air operation to gain confidence before going up for a code test. The ARRL Code Proficiency Program will also help you with your c.w. copying ability. Mighty popular with all the new gang coming into the game, is the Rag Chewer's Certificate. Just work an RCC member and get him to nominate you. You can locate one by asking those you work: "RCC?" . . . and save those QSLs for WAS. New states keep counting even after you get your General or Conditional ticket.

Making Proper Use of the NCEFs . . . to Keep Them Effective. Thanks to all reporting success in getting states and moving traffic via NCEF when nets were not in session. We just have room for a few quotes this time to emphasize correct operational use of the National Calling and Emergency Frequencies.

"A directional CQ to Rochester, N. Y., October 18th got a quick reply from WA2NNZ . . . W8TBP was listening and did a wonderful QNB job. On one CQ and a half hour the message was close to Rochester by NCEF . . ."

"Please urge all stations to ignore non-directional CQs on the NCEFs." — *K2UBG*.

"NCEF-1 report: Using 7 and 3.5 Mc., in 57 minutes operating, worked S. C., Ohio, and N. Y. . . . 4 hours and 15 minutes total." — *K1PNB*.

"Response on 7100 and 3550 NCEF very good for this location." — *KØYRQ*.

"The 3550 NCEF is being mobbed these nights. After calling and contact they use it for ragchew. QRM by those not moving frequency at once tends to handicap NCEF use for new directive calls or emergency. Publicize the need for courtesy in getting off the NCEF at once. Move up or down, as soon as contact is made." — *W1CHR*.

August *QST*, page 78, has the full how-to-use treatment on NCEFs. In conclusion it must be emphasized that the plan calls for each amateur to keep his receiver tuned to an NCEF a good share of the time he is in his shack but not necessarily on the air. Make calls on an NCEF but only with a specified object (place) in mind. Move to another frequency for any traffic or rag chewing. The rules for NCEF use:

1. Keep your receiver on a C and E channel on the band and mode you work, so you can hear calls for your area or any emergency QRRR.

2. Make directional calls *only* on an NCEF. Give state or city for traffic or emergency or in pursuit of WAS.

3. All callers on finding a contact should at once indicate frequency up or down to carry on the body of the contact . . . a proper and expected courtesy to leave the NCEF clear so others can take their turn. Let's make this a habit whether the frequency seems busy or not.

—*F. E. H.*

The Cumberland County Emergency Net (Maine) was advised at 1540 Aug. 2 that a 9-year-old boy was lost in the woods about 30 miles from Portland. The mobile communications center operated by the net was dispatched to the scene and acted as a field headquarters for all agencies involved in the search. Seven mobiles and three hand-carried units were dispatched, a net control was established in Portland and a relay station was set up near the scene. After a one-hour search in the rain the boy was found by *K1s* ANM and OYB, unharmed but wet and cold after five hours in the woods. Word was quickly radioed back to the mobile center and the search was discontinued at 1715. Other amateurs participating were *K1s* ACF CUC JDA LPB LQZ LTZ MBM MZB NND PPM RQE RQF, *W1s* AHM EPB LWD WST. — *K1JDA.*

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On Aug. 11 the Red Cross of Albuquerque, N. M., called on the AREC for communications assistance during flood conditions. W5WNU was net control and W5ZHN set up at RC headquarters. The boys did a first-class job under some pretty touchy conditions, mostly involving evacuation and relay of official information. Participating were *K5s* ZCA CXN KWU DQI DIIZ, W8PDP/5. — *W5ZHN, SEC New Mexico.*

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A bad tornado hit the Plainfield-Green, Iowa, area on Sept. 1 at about 1800. Blackhawk-Bremer County EC WØPTL took an emergency crew of amateurs to the area on Sept. 2. Communications were setup for news reports to a local radio station using base stations WØJPJ at Waterloo and WØOLF at Plainfield. Others participating were mobiles WØPTL, WØDCV and WØJFF. — *KØKXN, SEC Iowa.*

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On Sept. 4 a boat crossing Lake Spiridon, near Kodiak, Alaska, capsized, drowning two of four occupants. Washington SEC W7HMQ was asked to provide communications between KL7DVB in Kodiak and Tacoma, Wash., for the families of the drowned men and the Tacoma Unit of the Mountain Rescue Council which was called to rescue survivors and recover the bodies. K7DQV and W7WHV provided the Tacoma end of the hookup. — *W7HMQ, SEC Washington.*

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While engaged in a c.d. exercise in St. Lambert, Que., on Sept. 15, the Montreal AREC gang was contacted by VE2BVD mobile on his way from Montreal with other mobiles to assist in a search for a lost five-year-old boy in Ville Jacques Cartier. The amateurs joined up and stayed with the task until the boy was found, about 0300 the next day. Other mobiles taking part were *VE2s* ER EP SC AEW BFB AUU AKK TM AFM. Fixed stations included *VE2s* AJI (operating VE2ADX), AGM and AUV.

Amateurs were in action during the disastrous forest fire in the Russian River area of California over the Labor Day week end, Sept. 2-4. W6UDL and K6RCR set up one of two base stations operating from Guerneville. The other was operated by W6SFG, K6ALI and WA6IWH. Still another station, operating from the local firehouse, was WA6FLX. W6PZE was in operation near the fire line. K6RCR and WA6RPU made several trips to Monte Rio with supplies and gear, and together with K6GOZ maintained communications from that area. — *W6BIP, SCM San Francisco.*

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In Mid-September Hurricane Esther posed a very definite threat to the New England states; but when she finally got there, she wasn't nearly so ferocious as she was billed. Nevertheless, many amateur groups were on fullscale alert and ready for the worst. We have reports from Winthrop, Boston and Waltham, all in Eastern Massachusetts. Possibly more will come in later, because Esther didn't confine her activities to the Boston area.

The Winthrop Emergency Radio Net went on alert on Sept. 20 and remained active until the next morning. Nets were in operation on 2, 6, 10 and 80 meters from c.d. control headquarters at the report center, all set to operate from emergency power if necessary. About 20 amateurs were supplemented with non-amateur commercial operator permittees for full scale operation had it been required.

In Gloucester, W1PSG reports that five fixed stations and a number of mobile units were active on two meters, with active liaison to the Red Cross Net and other services.

The Waltham C.D. Net had a good turnout for Esther. Rigs were active on two meters at c.d. headquarters, Red Cross, Public Works Dept., two c.d. rescue vehicles, the c.d. mobile control station, the *News Tribune* office, the police station and a few mobiles and fixed home stations. The sector net tie-in on 6 meters was also activated. Thirteen amateurs participated under EC W1JSM.

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In the Boston area, the Northeastern University Radio Club station, W1KBN, was activated to provide backup communication for the Boston Chapter of the American Red Cross. The club station went on 3900 kc. with a kilowatt of power and established an emergency net on Sept. 21. During nine hours of continuous operation, 235 stations were checked in representing all the New England states, Penna., N. J., N. Y. and the eastern provinces of Canada. More than 20 stations reported from the threatened Cape Cod area, while others were in Nantucket, Martha's Vineyard, Block Island and Long Island. Many reported emergency power capability. K1HGP reported from aboard a tanker which was skirting the storm, providing "on the spot" reports of wind and weather. At W1KBN, a crew of five stood watch from 0845 until 1800, with K1JAU helping out as NCS when the going got rough. The Boston headquarters station, W1UBU, operated on ten meters, dispatching local mobile units. Liaison between this station and W1KBN was conducted on two meters through W1EAE. W1GQF set up a two-meter link from an isolated disaster shelter.

Much ado about not very much, as it turned out. But it all shows that we are ready for it if it comes, and this is far better than having to start scrambling for organization after the blow strikes.

Northeastern University Radio Club members gather around the equipment at the club's quarters in Boston. Seated are (l. to r.) *K1s* BMP and DXJ. Standing are *K1s* NCS GRG and W1HIV. The group was commended by the Red Cross for setting up an emergency net during Hurricane Esther. Club call is W1KBN.

At approximately 0900 Sept. 29, the AREC of Clinton County, N. Y., formed a net to assist in a search for two missing officers from Plattsburgh AFB on Lake Champlain. WA2JOI and WA2JKC went mobile in the latter's private plane and started a search of the lake. WA2SNW acted as NCS and conducted all ground contacts for the aircraft mobile. Within 47 minutes of the alert, WA2JKC aeronautical mobile spotted the missing boat and rescue was completed, another successful service rendered by the AREC of Clinton County. — *WA2GCH, EC Clinton County, N. Y.*

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Members of the Branch County (Mich.) AREC sprang into action on Sept. 30 when Coldwater, Mich., experienced a very severe windstorm. K8DKT acted as net control until line noise forced him to turn it over to K8ZED. With the city divided into quadrants, mobile teams consisting of *K8s*, TWT ZGO TZI and AXN, accompanied by police officers, patrolled assigned sections reporting trees blocking traffic, downed wires and other wind damage. Their reports were received at K8ZED and quickly dispatched to appropriate authorities. A spokesman for the police department said: "We had heard of the Emergency Corps that the local hams had formed a week ago, but had not seen it in action. We frankly had expected a few rough edges but were extremely pleased at the smoothness of their operation during actual emergency conditions." — *KN8ZKS.*

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A communications emergency occurred in Essex County, N. Y., when many of the police and fire radios ceased to operate during an 8-alarm fire at a hotel in Lewis and the Essex County AREC was called into action at 1403 GMT. WV2RNB/mobile was at the scene with portable equipment for work in and around the fire. WA2DZN/mobile was dispatched to the pumper trucks at the pond where he kept a constant report on pressure readings and maintained communications between the fire trucks. WA2JTO kept these two stations in constant touch with fire and police headquarters at Elizabethtown. WA2CTH stood by at c.d. headquarters. — *WA2DZN.*

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Oh-oh! We almost overlooked another Hurricane Esther report. K2OVN, EC for Kings County, N. Y., reports that K2UAG and W2LDC were tracking Esther all day Tuesday Sept. 19, and on Wednesday the county AREC and c.d. went on standby alert. Twelve amateurs were on the job and waiting for the worst, but when Esther decided on a sea voyage the net secured after twelve hours of vigilance.

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Twenty-seven SEC reports were received for August, representing 12,794 AREC members. Again, this is a drop in number of reports but an increase in members. The record now shows 232 reports received from 44 different sections in 1961. In 1960 at this time we had 210 reports from 40 different sections.

August reports were received from the SECs of Ont., S. Dak., Utah, NYC-LI, Minn., W. Mass., Va., Iowa, Ga., E. Fla., Ala., Ind., Ore., Wash., Wis., E. Bay, Colo., Mich., Alberta, So. Texas, E. Mass., Tenn., E. Pa., S. N. J., Los A., S. C. V., Md.-Del.-D. C.

Members of the Western Penna. Traffic Net and the Keystone Slow Speed Net got together for a "Gabfest" at Parker Dam State Park on Sept. 10. The get-together was sponsored by the Brasspounders Amateur Radio Fraternity. In the picture, left to right, kneeling: W3WRC, W3KUN (RM), W3KNQ, K3KMO (W4UWA); standing: W3WRE, W3SMV, W3UHN (SCM), K3HID, W3NEM, W3MFB, K3LVA, K3PXH, K3GAO, W3IDO. *(Photo by W3SMV.)*

RACES News

On Sept. 26 the U. S. Weather Bureau at Grand Rapids, Mich., issued a severe weather forecast with possibility of tornadoes for lower Michigan, including Ottawa County. Consequently, the Ottawa County RACES Net was alerted, consisting of seven area base stations and eight mobiles. Some of the latter were dispatched as spotters, others held on stand-by. At 1720 a tornado touched down at Marne, Mich. A mobile with c.d. personnel was quickly dispatched to the scene to survey the damage. As a result of reports received from this mobile, the county c.d. crash truck was dispatched to the scene to make repairs and provide other services needed. — *W8QOL, KO Ottawa County, Mich.*

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for September Traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	248	1597	1343	241	3429
W9JOZ	5	1452	1452	5	2914
K6BPI	99	1154	1052	102	2407
W0SCA	23	915	890	13	1841
W9LGG	216	722	691	39	1668
K4AKP	172	622	581	39	1414
K4ONK	152	627	595	18	1392
W0RDR	193	457	375	9	1034
W7BA	4	514	457	54	1029
W8UPH	13	494	424	68	999
W6EOT	3	487	434	32	956
K2UAT	158	362	320	6	846
W6WPF	5	419	403	16	843
W7DZX	7	404	367	31	809
K0WWD	36	95	385	290	806
W3EML	16	380	326	48	770
K6KCB	15	388	318	28	749
K4SJH	78	384	267	3	732
W8DAE	38	362	249	70	719
K6EPT	5	355	250	105	715
W9DYG	102	329	242	42	715
W3VR	42	391	271	9	713
W6GYH	152	285	254	12	703
K4KGB	79	322	278	8	687
K2UBG	24	343	292	25	684
K9OZM	21	321	196	116	654
W4PL	7	318	308	12	645
W0IPZO	23	306	243	57	629
WA2GPT	16	305	265	38	624
W5GY	6	302	158	144	610
W4TUB	6	306	287	8	607
W9USR	15	275	225	50	565
W0OHJ	6	265	250	18	539
WA6JDB	18	250	240	2	510
W5CEZ	18	257	177	57	509
Late Reports:					
W5ORH/5 (June)	145	680	10	660	1495
W3IVS (Aug.)	6	570	556	14	1146
W8DAE (Aug.)	31	460	328	82	901
W5ZHN (Aug.)	31	263	183	62	539
K9UGY (Aug.)	32	246	194	33	505

More-Than-One-Operator Stations

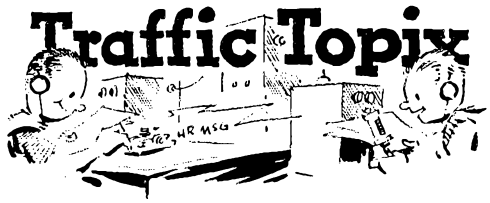
Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W6YDK	2880	150	99	36	3165
W6IAB	82	1413	1404	9	2908
Late Reports:					
W6YDK (Aug.)	2985	146	89	44	3264
W4PFC (Aug.)	19	371	347	5	742

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

WN4BMC	273	K0VPH	130	K1MZM	108
WA6LVX	165	WA6CDD	120	KP4WT	106
K0LTJ	153	W2GKZ	117	W4CGE	103
K0WVK/0	148	WITXL	114	W5SNK	103
K8KMQ	142	K9RMI	114	W3WRE	102
K2CMJ	133	W0ANT	113	Late Report:	
K6GZ	133	W2EW	112	K2GAO (June)	157
W5AIR	131	WA2CCF	109		

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K3IMP, K9RMI, K0VTG.

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



Our request for "guest writers" for this column brought some response. None of the writers claimed to be very great shakes with the pen and all disclaimed any intention to be quoted word for word, so we'll do a little cagey paraphrasing and add a few ideas of our own so those who suggested the topics not only won't recognize their words but might not even recognize their ideas. Before we begin, we'd better give credit to WA2HGB and W3ZRQ for planting the germ that hatched this monster.

It's about the "Q" signals — when you use 'em, when you don't use 'em, and *if* you use them, *how*? A long time ago (two ARRL General Managers ago, as a matter of fact), one K. B. Warner, W1EH, wrote an article in *QST* (June, 1940, p. 56, if you want to look it up) entitled "Say It With Words," which decried the common phone practice of using c.w. abbreviations. Such a practice is not so commonplace now as it was then, but we still have a few carry-overs. Add to them the "ham lingo" used in voice operation and you will find that phone talk on the ham bands today is almost as unintelligible to the layman as it was twenty years ago. In addition to CQ (we gave up on this one and now even W1AW uses it), we still hear operators complain about the "QR Mary" and "QR Nancy" and ask other stations to QSY, and it is not uncommon, in phone traffic circles, to hear someone offer to QSP a message. It just doesn't seem right, somehow, to use the words "interference," "atmospherics" or "relay" in their place.

Some of the phone lingo used nowadays is not a throwback to c.w. terminology, but it is still lingo. Nothing wrong with this, we guess, except that casual non-amateur listeners get an erroneous impression of our mental ages. In phone traffic handling, we ought especially to set the example of clipped, efficient, business-like procedure, and do away with artificial laughter, smacking of chops, noisy breathing into the mike and "pet" phonetics. We also ought to "say it with words" rather than use the c.w. Q signals. This takes longer, you say? Sometimes, but not always. Is "no traffic" longer than QRU, or "queen roger uncle"? We ought to save the c.w. abbreviations for c.w.

And that brings up the next subject — using the Q signals on c.w. and using them properly. Every now and then someone goes through the Atlantic City or Geneva documents and wises us up to a number of Q signals that could be used in amateur work that most of us never heard of. As far as traffic work is concerned, there are a few such, but whatever is lacking in the standard list we make up for by our own "QN" signal list. It might be very smart for you to pull an obscure Q signal out of the hat and throw it at somebody, but usually it succeeds only in holding up the net. Every traffic man should be familiar with the meanings of traffic-useful Q signals and how to use them.

Now be truthful: Do *you* know the real meanings of QRU, QRV, QSG, QSL, QSM, QSP, QSZ, QTA, QTB and QTC — all signals which can be, should be and frequently are used in traffic work? Did you know that QRX no longer means "standby"? Ever use QTX? How are you on the "QN" signals? If an NCS threw a QNJ at you, would you know what he was talking about? Did you ever know that QN signals are *never* used with a question mark? How often during a net session do you have to scratch around for your copy of Operating Aid 9?

Some time ago we changed the meanings of two of the QN signals, to eliminate meanings that were obsolete or hardly ever used and bring these particular signals into regular use. Since then, we have frequently heard NCS of some of our better nets spell out the meanings of these signals (QNQ and QNV) without using them. How come? It seems to us much easier to say "W1NJM QNQ up 5 W1BDI ARRL" than "W1NJM up 5 wait for W1BDI to finish then send him tfc for ARRL." Probably some of the NCS know what the signals mean but are afraid to use them because they won't be understood; but we'll never get used to them, at that rate. Let the net members scramble for their QN list a few times; it's the best way to make them learn.

To sum up: When handling traffic on phone, be brief and concise, but don't use c.w. abbreviations and avoid "phoney" lingo. On c.w., use the abbreviations and Q signals to the maximum; get a copy of the Operating Booklet and Operating Aid 9 and bone up on this. — *W1NJM.*

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September Net Reports.

Net	*Sessions*	*Check-ins*	*Traffic*
7290 Traffic	46	1820	815
Mike Farad E & T	51	479	1139
North East Area Barn Yard	26	863	12
20 Meter Interstate S.S.B.	20	642	1732
Early Bird Transcon	30	...	115

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National Traffic System. You know, our world is getting so complicated that we have specialties within specialties within specialties. You might consider radio itself a specialty, but within that you have amateur radio, amateur radio traffic, amateur radio traffic nets, amateur radio National Traffic System Nets, and amateur radio National Traffic System Net Control Stations. This is getting down pretty fine, but it is about NTS net control stations that we want to say a few words.

One prominent NCS of one of our more prominent NTS nets once mentioned to us that he was going to give up his regular NCS assignment "to give some of the other boys a crack at it." He actually felt that he had been hogging a good assignment and that there must be many eager amateurs waiting to have their chance at it. NCSing, to him, was a challenge and an achievement and a source, when done right, of the greatest enjoyment and satisfaction. It was his specialty, the thing he liked best to do.

We have other NTS specialists. Some of the boys have a flare for organizational administrative work. Others are proud of their high-speed operating ability. Still others find their chief source of satisfaction in relaying traffic over long distances and become stalwarts in the TCC. Whatever their traffic specialties, we can find a place for them in NTS, in one or another of the coordinating jobs that weld NTS into a nationwide system of traffic handling in which each operator performs the job for which he is best suited and enjoys.

September reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
EAN	30	1009	.667	33.6	97.8
CAN	30	1244	.904	41.4	97.8
PAN	30	1265	.698	42.2	97.8
1RN	56	554	.323	9.9	64.5
2RN	59	476	.398	8.6	89.4
3RN	60	636	.388	10.6	100.0
4RN	57	462	.271	8.1	84.9
RN5	56	727	.371	13.0	73.7
RN6	37	783	.470	21.2	86.8
RN7	58	385	.234	6.6	....
8RN	59	353	.200	6.0	94.5
9RN	59	899	.661	15.2	56.3
TEN	90	966	.501	10.7	62.5
ECN	20	66	.158	3.3	91.7[1]
TWN	30	242	.290	8.1	80.7
Sections[2]	1038	5417		5.2	
TCC Eastern	99[3]	451			
TCC Pacific	113[3]	1001			
Summary	1769	16936	CAN	8.3	3RN
Record	1651	21234	.942	15.4	100.0

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

[2] Section nets reporting: NEB (Nebr.); MIDDS (Md.-Del.-D.C.); BUN (Utah); SCN (Calif.); NJN (N.J.); WSSB, WIN (Wis.); ILN (Ill.); QFNS, QFN (Fla.); WSN (Wash.); QKS (Kans.); AENT, AENP Morn, AENP Eve, AENO, AENM, AENB (Ala.); OSN (Ore.); NJQ, SDN (S.Dak), S. Dak. 75 Phone; SCN (S.C.); CCW and HNN (Colo.); NSPN Noon, MSPN Eve, MSN & MJN (Minn.); GSN (Ga.); CPN & CN (Conn.); VFN & VN (Va.); TN (Tenn.); GBN (Ont.); RISPN (R.I.).

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

About these section net reports: Many are coming to us incomplete and cannot be counted in the above tabulation for that reason. We suggest that each section net manager use a standard form CD-125 for reporting net info, and *be sure your NTS liaison is indicated.* If you don't use CD-125, be sure to give us (1) number of net sessions held, (2) total traffic handlings in directed session and (3) your NTS liaison. Note that CD-125 is for use only by NTS section nets.

This month's summary shows a rather sharp decline in traffic, although an increase in number of sessions. Both previous records in these categories were set in 1960, as well as the previous high "rate." The previous high-average was made in 1952. Looks like we need a steady flow of more good traffic.

W9DYG reports all going well on CAN; RN5 missed three times, but on two occasions K4AKP filled in. Conditions are plaguing PAN, sez WA6ROF, who has a date with Cupid in February. W3UE reports 3RN going strong with 100% representation again. RN5 handled quite a bit of Hurricane Carla traffic; W5RIT has been awarded his RN5 certificate. RN6 is back on the map again, with K6KCB as manager. W8DAE commends K8MYU again for representing West Virginia in 8RN; more needed. WØDUA is the new TEN manager, replacing WØLCX; give him some help, fellows! Representation is looking up in ECN, with Maritimes represented nineteen times out of twenty sessions. Manager Emeritus KØEDH put out the Sept. TWN Bulletin while WØFEO took a vacation.

Transcontinental Corps. The hearts of all of us go out in sympathy to WØBDR, TCC-Central Director, who recently lost his XYL, Tina. Although not licensed, Tina was one of us. She accompanied Russ to conventions and hamfests, listened intently to all the talk, much of which must have been incomprehensible at first, and got to know the sound of certain voices. At home she listened to Russ handling traffic and reporting into nets and soon knew who was who just by the sound of their signals and fists. We're going to miss Tina, but hope Russ will be back with us soon.

September reports.

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern	99	71.7	1431	451
Pacific	113	85.0	1978	1001
Summary	212	74.2	3409	1452

The TCC roster: Eastern area (W1SMU, Dir.) — *W1s* AW EMG NJM OBR SMU WEF, K2SSX, K3IMP, *W3s* EML FAF WG WRE, W4DVT, *W8s* ELW UPH, VE2AZI/W1, Pacific Area (W6EOT, Dir.) — W5ZHN, *K6s* DYX GID, *W6s* EOT HC, *WA6s* ROF GRG, *K7s* NWP IEY, *W7s* DZX GMC, *KØs* DTK EDH, *WØs* WME WHE BES KQD.

ELECTION NOTICE

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

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

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

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

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by 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*	*Present Term Ends*
San Joaquin Valley	Dec. 11, 1961	Ralph Sarovan	Oct. 10, 1961
East Bay	Dec. 11, 1961	B. W. Southwell	Oct. 14, 1961
Manitoba	Dec. 11, 1961	M. S. Watson	Dec. 10, 1961
New Mexico	Dec. 11, 1961	Newell F. Greene	Feb. 10, 1962
Eastern New York	Dec. 11, 1961	George W. Tracy	Feb. 10, 1962
Virginia	Dec. 11, 1961	Robert L. Follmar	Feb. 11, 1962
Maritime	Dec. 11, 1961	D. E. Weeks	Feb. 15, 1962
South Carolina	Dec. 11 1961	Dr. J. O. Dunlap	Mar. 4, 1962
Northern New Jersey	Dec. 11, 1961	J. Sparks Remeczky	Deceased
Alaska	Jan. 10, 1962	John P. Trent	Mar. 10, 1962
Georgia	Jan. 10, 1962	William F. Kennedy	Mar. 18, 1962
North Carolina	Feb. 9, 1962	B. Riley Fowler	Apr. 11, 1962
Tennessee	Feb. 9, 1962	R. W. Ingraham	Apr. 15, 1962
Arizona	Feb. 9, 1962	Kenneth P. Cole	Apr. 15, 1962
Washington	Feb. 9, 1962	Robert B. Thurston	Apr. 30, 1962
Louisiana	Mar. 9, 1962	Thomas J. Morgavi	May 31, 1962

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.

Wisconsin	*Kenneth A. Ebacher, K9GSC*	*Oct. 10, 1961*
Rhode Island	John E. Johnson, K1AAV	Oct. 12, 1961
Saskatchewan	Jack Robinson, VE5BL	Dec. 10, 1951
Mississippi	Floyd C. Tretson, W5MUG	Dec. 10, 1951
Alabama	Harvell V. Tilley, K4PHH	Dec. 14, 1961
Western Florida	Frank M. Butler, jr., W4RKH	Dec. 15, 1951
Illinois	Edmond A. Metzger, W9PRN	Dec. 10, 1961

In the Arkansas Section of the Delta Division, Mr. Odia L. Musgrove, K5CIR, and Mr. Richard L. Hoyt, W5RIT, were nominated. Mr. Musgrove received 98 votes and Mr. Hoyt received 56 votes. Mr. Musgrove's term of office began Oct. 13, 1961.

In the San Diego Section of the Southwestern Division, Mr. Don Stansifer, W6LRU, and Mr. Roy R. Maxson, W6DEY, were nominated. Mr. Stansifer received 350 votes and Mr. Maxson received 202 votes. Mr. Stansifer's term of office began Oct. 15, 1961.

W3BPZ, Bob Dressell, EC for Lehigh County (Allentown), Pa., at the key of his station.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

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

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

SUGGESTED RTTY OPERATING FREQUENCIES

3620, 7040, 14,090, 21,090 kc.

GMT CONVERSION

To convert to local times subtract the following hours:

ADST −3, AST −4, EDST −4, EST −5, CDST −5, CST −6, MDST −6, MST −7, PDST −7, PST −8, Honolulu −10, Central Alaska −10.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Dec. 16 at 0230 GMT. Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,700, and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Dec. 7 at 0500 Greenwich Mean Time on 3590 and 7129 kc. *CAUTION:* Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given. *Example:* In converting, 0230 GMT Dec. 16 becomes 2130 EST Dec. 15.

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

W1AW conducts code practice daily at 0230 GMT on all frequencies listed above with speeds of 15, 20, 25, 30, and 35 w.p.m. on Tuesday, Thursday, and Saturday, and at 5, 7½, 10, and 13 w.p.m. other days. Approximately 10 minutes' practice is given at each speed. To check your copy, the texts used on several transmissions are listed below. The order of words in each line of *QST* text is sometimes reversed. To improve your fist, try to send in step with W1AW.

Date	Subject of Practice Text from Oct. *QST*
Dec. 5:	*Waging War on Malpelo Island*, p. 18
Dec. 8:	*A Filament Choke for Grounded-Grid . . .*, p. 48
Dec. 13:	*A Junk Key*, p. 51
Dec. 21:	*A Complete Two-Band Station . . .*, p. 28
Dec. 23:	*A Novice Three-Band Antenna System*, p. 54
Dec. 27:	*Performance Tests on the Big Wheel . . .*, p. 60
Dec. 29:	*Amateur Radio Report*, p. 66

W1AW SCHEDULES

(December 1961)

Operating-Visiting Hours

Monday through Friday: 3 P.M.-3 A.M. EST.
Saturday: 7 P.M.-2.30 A.M. EST.
Sunday: 3 P.M.-10.30 P.M. EST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn, about 4 miles south of West Hartford. A map showing local street detail will be sent on request. The station will be closed Dec. 25, Christmas Day.

Operating Frequencies

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800 kc.
Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000, 50,700, 145,800 kc.

Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibrating purposes.

Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time:

C.w.: Monday through Saturday, 0100; Tuesday through Sunday, 0500.
Voice: Monday through Saturday, 0200; Tuesday through Sunday, 0430.

Caution: Note that in the U. S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

W1AW CONTACT SCHEDULE

Would you like to work W1AW? W1AW welcomes calls from *any* amateur station in accordance with the following schedule:

GMT	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0030–0100	.....	.....	7255	.....	7080	.....	7255
0120–0200[1]	.....	.....	7080	3555	7080[2]	3555[2]	7080
0210–0230[1]	.....	.....	3945	50.7 Mc.	145.8 Mc.	3945	3945
0330–0430	.....	.....	3555	3945	7080	1820	3555
0440–0500[1]	.....	.....	3945	14,280	3945	14,280	3945
0520–0600[1]	.....	.....	3555[2]	7255	3555	7080[2]	3945
0600–0700	.....	.....	14,280	14,100	3555	14,100	.....
0700–0800	.....	.....	7255	3945	7080	3945	7255
2000–2100	.....	.....	14,280	21 /28 Mc.[3]	14,100	.....	.....
2100–2200	.....	14,280	21 /28 Mc.[3]	14,100	21 /28 Mc.[3]	21,330	.....
2200–2300	.....	14,100	14,280	21,075[2]	14,280	14,100	.....

[1] General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0200 and 0430 on phone and at 0100 and 0500 on c.w. Starting time is approximate.
[2] W1AW will first listen for Novices before checking the rest of the band for other contacts.
[3] Operation will be conducted on either 21,075, 21,330, 28,080 or 29,000 kc.

CLUB COUNCILS AND FEDERATIONS

Central California Radio Council, Rose Buckley, Secy., 901 Grafton Ave., San Francisco, Calif.

Cleveland Area Council Amateur Radio Clubs, Gertrude E. Maxim, W8OIS, Secy., 23644 Woodhill Drive, Berea, Ohio

Council of Amateur Radio Clubs of Delaware Valley, Adam M. Bodzioch, jr., K3MEJ, Corr. Secy., 3355 Mercer St., Philadelphia 34, Pa.

Federation of Eastern Massachusetts Amateur Radio Associations, Eugene Hastings, W1VRK, Secy.-Treas., 28 Forest Ave., Swampscott, Mass.

Indiana Radio Club Council, Inc., Doris Singer, K9IXD, Secy., 7070 East 21st St., Indianapolis, Ind.

Michigan Council of Clubs, Robert H. Pinder, K8NTE, Secy., 1277 Cricklewood Dr., S.W., Wyoming, Mich.

Ontario Amateur Radio Federation, Inc., A. K. Meen, VE3DAR, Secy., 19 Richmond St., W., Toronto 1, Ont., Canada

Puget Sound Council of Amateur Radio Clubs, William T. Brown, K7LED, Secy., 19687 Military Rd., So., Seattle 88, Wash.

Wisconsin Council of Radio Clubs, Dan F. Beyersdorf, Chairman, Lien Rd., Madison 4, Wisconsin

A.R.R.L. AFFILIATED CLUB HONOR ROLL

We're pleased to present herewith the second section of our Club Honor Roll. The purpose is to extend special recognition to all those affiliated clubs whose *entire membership* consists of members of the League. (See page 81 of June '61 *QST* for the earlier listing.) Our Honor Roll includes all affiliates with 100 per cent ARRL membership and this listing includes the additions since June. The Honor Roll is prepared from data received in connection with each club's return of the Club Annual Report or survey form. In early 1962, probably in February, a new survey form will be sent every active ARRL-affiliated radio club calling for new annual filings in connection with continuing affiliation and our further *QST* listings. All the following-listed Honor Roll clubs now will receive our "100% ARRL club" certificates shortly after the distribution of this issue of *QST*:

Beacon Radio Amateurs, Philadelphia, Pa.
Blossomland Amateur Radio Assn., Inc., St. Joseph, Mich.
The Cleveland Twist Drill Amateur Radio Society, Cleveland, Ohio
Coffee Dunkers, Detroit, Mich.
Columbus Amateur Radio Club, Inc., Columbus, Ga.
Decatur Amateur Radio Club, Decatur, Ala.
The DX Club, Lansdale, Pa.
Greene Amateur Radio Club, Greene, N.Y
Helix Amateur Radio Club, San Diego, Calif.
Loudon County Amateur Radio Club, Lenoir City, Tenn.
The Mahanoy Valley Brass Pounders Club, Mahanoy City, Pa.
Miami Valley Amateur Radio Contest Society, Centerville, Ohio
Montevideo Radio Club, Montevideo, Minn.
Northeast Oklahoma Radio Amateurs, Vinita, Okla.
Northwest St. Louis Amateur Radio Club, St. Louis, Mo.
Providence Radio Association, Inc., Providence, R.I.
Radio Association of Erie, Erie, Pa.
The Reading Radio Club, Inc., Reading, Pa.
The Saginaw Valley Amateur Radio Assn., Inc., Saginaw, Mich.
St. Louis Amateur Radio Club, Inc., St. Louis, Mo.
South Bay Amateur Radio Society, Chula Vista, Calif.
South Lyme Beer, Chowder and Propagation Society, South Lyme, Conn.
State Line Radio Club of New York and New Jersey, Montvale, N.J.
Sunrise Radio Club, Cambria Heights, N.Y.
Valley Radio Club, Eugene, Ore.
Victor Valley Amateur Radio Club, Victorville, Calif.
Westside Amateur Radio Club, New Orleans, La.
Windblowers VHF Society, Inc., Wyckoff, N.J.

A.R.R.L. ACTIVITIES CALENDAR

(Dates shown are per GMT)

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

OTHER ACTIVITIES

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

Dec. 2-3: 21/28 Mc. Telephony Contest, RSGB (p. 81, last month).

Dec. 9-10: Kansas Centennial QSO Party, Kansas Federation of Amateur Radio Clubs (p. 128, last month).

Dec. 9-10: New England QSO Party, Conn. Wireless Assn. (p. 132, last month).

Dec. 10: Wisconsin QSO Party, Milwaukee Radio Amateurs' Club (p. 111, this issue).

Jan. 20-21: Third New Mexico QSO Party (next issue).

Jan. 20-21: Fifth Pennsylvania QSO Party (next issue).

Jan. 27-28: New Hampshire QSO Party (next issue).

Feb. 24-26: First Rhode Island QSO Party.

CONTEST NOTES

The following corrections are to be noted for the June V.H.F. QSO Party report of September *QST*. K2IXJ/2, incorrectly listed in the Eastern Pennsylvania section, is the certificate winner for the Western New York section with a score of 9408 points. In the South Texas section the scores for K5LEP and W5TGQ were correct as listed, but should have been listed in reverse order with W5TGQ certificate winner. Add the score of KØETX with 1800-72-25-A to the Iowa section. WA6GAG was incorrectly identified in the photo on page 30 as WA6GNG. The Los Angeles section multioperator winner should have been listed as W6NSW 6.

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In view of further documentary information from FCC, the phone score of K2DGT, reported in October *QST* as being disqualified from the 1961 ARRL DX Contest, is hereby ruled a valid entry. K2DGT's score is 75,600-112-225-C-60, thereby making him phone certificate winner for the N. Y. C.-L. I. section. The club score of the Lake Success Radio Club is therefore amended to 634,086, with K2DGT winner of the club's phone certificate.

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Also in the DX Contest Results of October *QST*, W6LDD was mistakenly reported as the phone winner for the Northern California DX Club. W6SIA is the winner of that certificate and should have been so reported. Our apologies to these two fine gentlemen.

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In the DX Contest Results (October *QST*) the phone score of KØMNO of 27,306 was erroneously listed in the c.w. results. KØMNO is, therefore, the phone certificate winner for the Kansas section.

DXCC NOTES

Announcement is hereby made of the addition to the ARRL Countries List of *Kamaran Islands*. The Kamaran Islands are located in the Red Sea off the coast of Yemen. DXCC credit claims may be made for this addition starting February 1, 1962. Confirmations for contacts with the Kamaran Islands must be dated November 15, 1945, or later. DXCC credit claims for this addition received before February 1, 1961, will be returned without credit.

DX Century Club

The following list contains the call letters and country totals of holders of the Postwar DX Century Club Award who have submitted confirmations to ARRL for the period from October 1, 1959 thru September 30, 1961. *QST* space considerations make it necessary to limit the size of the list. The total number of DXCC certificates issued as of September 30, 1961 was 7959. Since the necessary space to run the complete DXCC Roster is not available, this list contains only the calls of those who have shown an active interest in their DXCC rating over the indicated 24 month period.

• 315
W2AGW W3JNN

• 314
W8JIN PY2CK

• 313
W4DQH W6CUQ KV4AA

• 312
W1GKK W2HUQ W3KT W6AM W9NDA W9RBI

• 311
W3GHD W7GUV W8BF W8BRA W8DMD W9YFV

• 310
W6EBG

• 309
W1ME

• 308
W5ADZ W5ASG W7GBW W8BKP W8UAS CE3AG

• 307
W2BXA W6ENV WØQVZ

• 306
W1JYH W3BES W4TM W7PHO LU6DJX ZL1HY

• 305
W1CLX W2HMJ W2LPE W8KIA W8KML W9LNM WØELA VE7ZM 4X4DK

• 304
W1BIH W3LMA W5MMK W9HUZ

• 303
W2JT W8LKH CX2CO

• 302
K2GFQ W4QCW W7AMX W8JBI WØAIW G2PL HB9J

• 301
W3GAU W6YY W7ENW

• 300
W1FH W2TQC W5KC W6DZZ W6GPB W6SYG W8TMA W9KOK WØDU G3AAM G4CP G6ZO ZL2GX

• 299
W2QHH W2WZ W4BPD W8HGW

• 298
W9FID

• 297
W2ZX W5AFX W6VE W7AC

• 296
W3JTC W5ABY W6TS

• 295
W4ML W8EWS DJ1BZ

• 294
W2GUM W6ADP W8DAW W9YSX OE1ER

• 293
W2LV W6MX ZS6BW

• 292
W3ECR W4GD W6LDD W6TT W8MPW W9AMU GM3EST SM5LL

• 291
W4MR W5CKY W6BZE W6CYV K6EVR W6NNV HB9EU VK3KB

• 290
W1ZW W2DS W3EPV W5OLG K6ENX W6QNA W8KPL WØBFB DL3LL VE2WW VK2DI

• 289
W2OKM W7KTN W9WHM

• 288
K2BZT G3FKM

• 287
K2BU W5PQA W6TI W7FZA W8PUD W9FJB

• 286
W1TYQ W2ZGB W3CGS W5BGP W7GXA WØNLY

• 285
W2BOK W2CNT W2SUC W3EVW W4AIT K4RID W5UX

• 284
W1MV W2AYJ W2UVE W6NGA VE3DIF G3AAE ON4DM

• 283
W1ADM W2FXN W5KBU W6NTR W9FKC

• 282
W1FZ W2SAW W7HIA LA7Y

• 281
W2TVR W4AAU W4EPA W6BVM W6KSM WØNTA

• 280
W1HX W1HZ W2JVU W2KUW W2LAX K2OEA W2YTH W4CFD W4FVR W4LVV W6CHV K6CQM W6KEV W6UHA W8UPN W9ABA W9UXO WØQDF I1AMU

• 279
W4KFC W6OME WØDAE G5VT

• 278
W1AXA W1ZZK W3KDP W3WGH W6MUR

• 277
W3RUT W5CE W6KZL

• 276
W2DEC W3IYE K4LNM W4LYV W6TXL W7ADS W8EV

• 275
W1TW W5FFW W7HKT W9SFR WØPGI

• 274
K6EC W6YMD WØGKL WØMLY WØQGI PAØFX

• 273
W2HQL W4HA W6FOZ W9GIL F8BS G3DO

• 272
W1HA W2CYS W6ZEN W8CLR W8IRN W8SYC KP4CC

• 271
W1IAS W2BBS W2CR W2ESO K2LWR W2NUT W3OP W4AZK W4OM W6CAE W6NJU W6UJ W8NGO W8QJR WØVBQ DL7AA G3YF

• 270
W1BIL W2BRV K2DCA W2SSC W3OCU W3PGB W4BYU W4GXB K4PDV W4PLL W5BZT W5EGK W6EFR W6GMF K6KII W6UOV W6WWQ W8WZ WØSYK VE7GI G6RH G8KS I1AOF

• 269
W2AEB W6BSY W9FDX W9FVU W9KXK HB9MQ

• 268
W9RKP

• 267
W3RNQ DL1BO

• 266
W1RB W2DOD

• 265
W2IWC

• 264
W1VG W3FGB W5AWT W5HDS W6OSU W7YGN VE1PQ ZP5CF

• 263
W2DGW W2IRV WA2IZS K4AIM W4IMI W4OPM W7EJD W8GLK W9IU G3HLS

• 262
W2QJM W5MMD W6DQH W6EPZ W6OBH W6SIA W6TZD W9YNB PY1HX SM3BIZ

• 261
W1EQ W2CTN W2CTO K2SHZ W4VPD W6ZVQ KH6CD W7FB KL7PI W9JUV W9QNO DJ2BW ON4NC

• 260
W1EOB W2BYP W2FBS W2GVZ W2MUM W2RDD K2UVU W3NKM W4CXA W4GRP W4YWX K5BGB W5HJA W5LGG W5OGS W5PM W5WZQ W6IBD W6ID W6WO W8UDR W9GRV W9HCR W9QLH WØBCI VE2NV VE3BWY CO2SW KP4KD LA3DB YS1O ZL2HP

• 259
W4VYP W6LRU W6ULS K6UYC VE3RE

• 258
W1GYE W2HO W5NW W6RLP W9GFF

• 257
W1WDD G6YQ ON4AU

• 256
W1OJR W4LZF W5PZL W8ONA VE6NX GI3IVJ PY1GJ

• 255
W4EEE W6BUO W7GUI VO1DX

• 254
W1KXU W1NLM KP4YT

• 253
W1ICP W3LMM W5TIZ W7BGH WØYCR G6XL

• 252
W1OOS W3ADZ W3LMO W4KWC W4TFB W9GDI WØBSK

• 251
W2DSB W2GNQ W3ALB W3FYS W5URU W6ANN W6LTX W8CED W8VDJ K9BVR HB9TL I1SM

• 250
W1BGA W1ELR W1HGT K2CPR W2CWK W2FXA W2HSZ W2ICO W2LSX W2PCJ W2RWE W3AYD W3DKT W4DHZ W4DKP W4ECI K5ADQ W5BRR W5DA K5LIA W5PSB W5QVZ W6YK W7AH W8JSU W9QIY VE7SB G3FNN PY4ZS ZL1AH

• 249
W4BQY K4HNA W8SDR PAØTAU

• 248
W1TS W2EQS K6EWL WØANF IT1TAI

• 247
W1QNC W1WY K6LGF

• 246
W1IJB K2FC W5BUK W9UIG CN8JX

• 245
K4LPW WA6EYP W8CQ W8ZCQ EA2CA

• 244
W3NCF K4GSU W4UXI W6GMC W9PQA JA1DM ON4RC

• 243
W3WU W6UQQ KZ5WZ OY7ML

• 242
W1TX W2FZY W2TWC W4WDI W6DBP K9ECO W9ERU W9WYB W8WT DL3RK JA1AG KP4WD

• 241
W1JNV W3VKD W5IGJ K6RWO W8SZS WØBTD VE1EP VE3JZ DL7AB PAØLOU PAØRLF PY4AO TG9AD

• 240
W1LHZ W1LZE W2EMW K4BVQ K4ICK K6AYA W6BIL K6ENL W6LN W6SQP W7AUS W7GHB K9AGB W9MQK W9TKV W9WFS WØAJU WØTJ VE2YU WØAIH/VE3 VE3ES VE7MD ON4PA SM5WI SM7MS

• 239
W1CBZ W3KFQ W6BIF WØBPA VE3DKY G2BVN

• 238
DL7AH ON4NB

• 237
W2FAR DL1IN DL6EN EA1BC PY1HQ ZP5ET

• 236
W3GEN W9ABB G3BKF

• 235
W1BLO W1OOA W1ZL W6KUT W9HKL KV4BB

• 234
W1ACB K2PIC W3KZQ W4BJ W9DWQ K9EAB VE3AIU VE6JR

• 233
W1BGW W2TP K5KBH W5VU DL1GU SM5CCE

• 232
W1AEW W1FFO K2QXG W3BQA W3EYF K4HRG W8UMR W9PIO KØDQI WØIJW I1UA SM5CO ZS1BK

• 231
W1BOD W3AYS W3RBW W3SOH W9WIO ZS1RM

• 230
W1AZY W1PFA W2OBX WA2OJD K4EHA W4HVQ W4SRT W4THZ W4UKA W5QK W6ATO W6BYB W7CMD W8DUS W8TJM W8WFB K9CJK W9EU W9RQM G3AIZ G3EYN HB9MO I1XK OZ7BG SM5AHK

• 229
W2AZS W2BUI K4CTU W4JAT WØIEV CE3HL DL7AP PY1DH SM5WJ

• 228
W2VYX W6LDJ W8PHZ WØMCX VE3PK

• 227
DJ3KR

• 226
W2AYU W2CKY W5CKT DL3BK G2MI YU1AG ZL1PV

• 225
K6EDE GI3NPP

• 224
K4YCW W8ILG W9EHW W9KA ZS1OU

• 223
W1AJG W1BFT W1WK W2KJZ W4GJW K5BGT W6ONK WØUQV HB9MX HB9UL OE1FF ST2AR ZL4BO

• 222
W1QMM W2AZX W2PZI W3CA W3JKO W6KG W6PLK W7ZAS W8LY F8PI

• 221
K1JDN W1LOP W1RAN W1UOP W2JBI W4LRN K8LSG W9UZS W9VP DJ2AE G6UT KV4BQ LA5HE LU5AQ PY4OD ZL2AFZ

• 220
W1NS W1OHA W1ORV W1QJR W1VAN K2IRO W3AXT W3GRS W4CKB W4JII K4KOY W5VIR W6RAN KH6BLX W9BQE K9IYW W9JIP W9OTS W9QYW VE7ZK G6BS OK1CX SM5BCE

• 219
W1BGY W1TSL W3BCY W3FMC W3LPF W7AQB W9LTR JA2JW JA7AD

• 218
K2JGG W2ROM K2UKQ W3VRJ W8ZJM

• 217
W5ERY W5RDL W8IBX

• 216
W2QKJ W4EEO W8GB DL1EE

• 215
W1FPH K2JYH W4AUL W4IEH W5GNG KØHGB OZ8SS

• 214
W2GDX W6MVL KH6QH W8MCC K9ATZ W9UX KØRAL G3JAF

• 213
W1WLW W2ZKQ W8KBT DL1BS DL1DC 5A5TO

• 212
W1CKU W1NHJ W2CGJ W2RA W3MWC W4NT W5ARJ WØLBB F3FA JA8AA OK1KTI ZL3AB

• 211
W1LQ W1QM W2BMK W2DSU W2NOY W2SHC W2UWD K2ZKU W3NOH W4BBR W4JBQ K4LTA W4RNP W5CEC W6TOT W7DAA W7PQE W9HQF VE2BV DJ3JZ DL3ZI F8EJ HB9NU OZ3Y

• 210
W2BHM W2KIR W3DBX W3KA K4ASU W5DML W6CG W6MUM K6SHJ K6SXA WØDEI KØGXR KØLFY WØVBK DL6MK JA6AO PY2OE PY7VG VS6AE ZL1AJU

• 209
W1FQA W7ACD VE2WA ZS2AT

• 208
W4NBV VE7CE I1FO VK3YL ZL3IS

• 207
W1YPK W6IPH W5TPC W9QGR W9RH F9RM

• 206
K5AHZ LA6U

• 205
K2DGT K4JVE W8LAV K9CLO WØOAQ VE1WL VE2YA DL1DX DL1JW JA8AQ

• 204
W1CKA W3QQL W4JJL W4NNH K4RPK K4SXO W4VZB W5MCO W6FUF W6SRU W8ELL W9BPW W9IHN KØBIT WØZYB OE3WB ON4MS PZ1AX VQ2GW

• 203
W1UCA W2BTA W3LEZ W4WM W8OGV W9INN W9IRH W9KMN WØCPM WØSMV VE5RU VQ4KRL

• 202
K2MGR W3DWY W3WPG K4RJN W7CSW WØDAO JA1AB KP4AIO ZK1BS

• 201
W1ICW W1FTX W2BHU W3KVQ W4AAW W4CYR K4DRO K5DGI K5KES K8IKB W9MZP W9SWR K9PPX WØOJW VE2AYY DL3SZ DL6YK F9RS G3BHW G3LET ZL4GA

• 200
W1HWH W1JTD W1MDO W2MZB W2PDB K2QHL W3DPS W3IPO

W3RPG W4BFR W4COC W4DXI K4HFS W4IF W4MCM K4SXR W4TP K5JZY W5RX W6EAY W6ETJ K6GLC W6NXP W6ZMX W7ABO W7ATV W7BA W7NRB K8KAE W8NJC W8TTN W9GRF WØCDP WØDMA WØRBA VE4XO VE5JV VE6MN VE7KJ DL1YA DL7EN EA2CB EA4CR F9IL G6RC G6VQ LU8BAJ OH2LA SM3AKW SM5DW SP7HX YV5BZ ZP5LS

• 199
W1AUR W3KHU W3MJF W4FID K4GSS W6HYG W6OF W8SCU

• 198
W3JZY W5JCY W6AGO W8VLK DL9RK GM3CIX

• 197
W4VZQ

• 196
W1JSS W2PTD W2RGV K9CAN CE8AA

• 195
W1EIO K4EJO PAØWWP

• 194
W2ZY W3JNW

• 193
W8JXY W9LQF WØEWH VE7YR VO6EP VK5QR

• 192
W1ICV W2CDP K2VUI W4IKL W5EJT W6OUN W6QDE W9ZRG GM2TW SP8CK

• 191
W3AFU W4HZZ W4SHX W5VGR W8AE W9MBF W9TKD WØFNN WØLPA VE3IR KP4RK SM5AJU ZS6A ZS6EU

• 190
W1AW K1MLI W1WAI K2HIY W2VUF W3PN W7BTH W7CWE W7IAA W7UMJ W8TUO W8YCP W9ALI W9NN WØSLB WØSNL VE3CIO VE3HB DU7SV G2IO HP1BR PAØVO SM5KV VK5RX XE2FL

• 189
CR7LU

• 188
K9COS DL1LZ KP4AOO SM5BPJ

• 187
W1CUX W1HRI W1NI W2BAC W4EFX OK1JX ON4FL

• 186
W1IKB KH6BXU W7WDM W9LJU W9PVA DJ1VS EI3R SM7ANB

• 185
K6DDO DL7CS

• 184
W2LJR W4IUO W6ABA W6LV K7GIE DL8CM JA6AK SM7ID

• 183
W2GZZ W6FLT K6SED W7MCT W9ZTD WØCU WØDSP WØOQK HB9KU I1KDB IT1AGA SM7TQ ZS6IF

• 182
K2BSM W2JVZ W3BVL W5QN KL7MF K8DYX K9CUY W9UXS G2YS HB9QO OH2YV OH3TH

• 181
W1HUU W1ZDZ W2AXR W3EEB W4QT K6LAE K6OYE KL7PIV W8AYS W8JRG W8KAK W8KMD W8KZT G6VC I1FIC PAØZL SP9RF

• 180
K1IFJ W1UMC W2DEO W2EOH W2FXE K2GUN K2JFV W2LNB W2QQ W3ARK W3TXQ W4AIS K4CLT K4EDF K4IEX W4MS W4NO W4SSU W4TAJ W5CK K5ESW K6CWS WA6DTA K6VVA W6VVR W8RVU W9GHK W9QFC W9WHY WØAUB WØYPQ VE7EH DL3TJ DL9KP G2FYT G5VU OH2QQ

• 179
W1CV W1MIJ K2HXL W2RWN W3MSR W4BEY K4TWK W5TJ WA6AMZ W6JU K6LEB K9GZK W9OVF

• 178
WA2DIG W3RZL WØDGH

• 177
W1KMY W2SKE DL9PF G3HJJ JA2DN LA8LF

• 176
W1EXY K2DJD W4BWP W4WSJ W8DWP K9BGL K9ENB DJ3BB LA2B LA3SG

• 175
W2BXY K2DPJ W5RDA W8IQS G4FN OH3NY OZ7GC XZ2TH

• 174
K6CTV K7GCM W7HDL SP4JF SP6FZ

• 173
W1KXP K2LGN W2WMG W5ACL W5INL W5RHW W6BZ KH6WW K8BOD K8ONV KØPIE VE3ADV G2AFQ HB9NL HZ1AB I1RC

• 172
W1AZW W1DGT W1GVZ W2BUY K2DBN W3HDZ W3JVA W3KBC W3QMG W3WSF K4QIJ W5FJE W6UNP W8YPT W9KQD W9VZP W9WNB VE3DCI CR7BC G3JZK SM3AZI

• 171
K1CCA K2PFC W2REH W4CXQ W4GMR W4KPK K4TEA K6OYD W6PHN W8QHW W9NLJ WØGBJ DJ4TZ G3JLB HB9KC LU5ABL PAØOI SM6VY

• 170
W2GBX W2GUR W2QDY K2UPD W3HER W3MQC W4FYI W4HQN W4RVW W4ZMC W5LV W6BAG W6PHF W8BIE W8HEV W8TQY K9KDI W9NZZ VE1EK EA2CR EA7CP G2AJB G3KZI G8PL ZL4CK

• 169
W4CWW W4KAC W5PWW W6APH W6JH WØRSZ DL1YQ DJ2KU JA3DY

• 168
W4YGZ K6IYJ WØQBA WØVAF VE7QL G3JNX SP9DT

• 167
W1GDY W3KJJ K4CIA W6GRX W6NZ K6RTK 4X4CJ

• 166
W1AWE K4JEY K6IEC KH6RR WØBMQ WØIFW DL1IA F8SK G4JZ MP4BBE ZL1AMD

• 165
W1RCQ W3BYI K9BHD KT1EXO OZ5PA ZS6IW

• 164
KH6DKA W7DNU W8QZA G2FFO G3CCN OH2LX TI2CMF OA4FM

• 163
W1YNP W3EIS W4FZO W6AUT W6KXG WØDIB WØFLK DL6GP DL9TJ I1CJW

• 162
W2BXC K2DSV K2IAD W2IQH W3ZBF W6JKJ W9HLY VE5KG DJ4OP DL9YX ZS6ATA

• 161
K1EFI W3MVQ W4EJN W4JZQ K8IQQ W8QWI DL1FZ G3IEW SM6AMR PAØVDV SM5AQB

• 160
W1ALK W1CTW W1IVT W1NF W1UQP W2FLD K2TQC W2ZXL W3CLP K4JQR K4OMR W4TK K4ZKZ W5AUJ K5BDO W5CPW W5LEF K6ANP W6CBE K6HOR W6VX W6ZMW K7CHT K8DTZ K9ALP W9AZP W9ESQ W9PCF W9PNE KØESH WØYZB VE2BK CN8DJ HB9TT OZ7KV ZS1FD

• 159
W1APA K2YXY W4ZD W6BFW K6OWQ EA9AP F9TX G8QZ HB9EO 4S7NX

• 158
K8AEK EL4A G3LP SM5CXF

• 157
W9LNQ WØOBW DL3AR DL3JV DL8CH DL9OH G2KI SM5BFE

• 156
K1BEB W7LEV K9GTK W9GVZ DL6EQ G3KAA KZ5LC YU3OV

• 155
W1SU W2EHN W2HDW K5BEU W7GJ W8ESR W9CMQ K9HOL W9LSV KØMNO EA3GF HB9DX SP8AG

• 154
K5JKH KH6DLF W7UVR W8YAH VE5TK F8GB SM5BRO UC2AR UB5DW

• 153
W2ONQ W3HTF W3VXE K4AJ K4BCN W6NUQ W7LVR K9GVE W9UNG JA6MW LA1K SP5HS

• 152
K2QQQ W3DJZ W4GF W4HUE W4MZP K6BX K6GCF W6HJ W7QNI W7YEY K8GHG W9AKH W9DSO W9UKG WØIUB WØJMB WØWAN VE5GF DJ2UT G3GSZ I1CHJ I1ZQ VP7NS ZS2U

• 151
W1YRO K4DKE W4IPR W4LCY W6WQT W6WX W6YC W8BWS W8VOW W9GGO W9LJR W9SD KØWQI VE3BMB G3CXM G3HIW JA3FT OK1AEH OQ5IG PY4ZI SP9KAD UC2AD ZB1CR ZE3JO ZE6JY ZS6ASW

• 150
W1DGJ W1EKO W1IJO WA2AYM W2BRR W2GND W2MOF W2NIY W2RQH W2YLS W3CDG W3HFF W3INH W3ZHQ K4AL W4BHG W4HTV W4JUJ W4PDP W4SNR K4TFI W4UHC K5JCC W5KOD W5MY W6MDK K6QXF W7DWM W7GPP W7OEV W8BQV W8DDK K8KTZ W8MQR W8OKB W8VVD W9BVM K9CAZ W9FYM W9ROK W9TKU WØCTW WØVIP VE2DR VE3BMO VE3EHR VE6TP CN8IF DJ3FW F3ZU F8SC G8ON I1IZ OH2VZ PAØFAB PY2AJK SM5AJR ZE7JV ZL2GH ZL2PM

• 149
K4JYQ W6ERB W6HAL KH6CQS W7BAJ WØMAF G3LVC I1BAF OE1FT OH1SN

• 148
W6ERS F3CB OK3EA OZ5KQ

• 147½
K2PKT W6WLY WØVFE DJ2YL PY2AK ZL1NG ZS3S

• 146
W1AJZ K1DMG W1QQV W1YQF W4KKB W8BMX W8MTQ W9ONB SP1JV

• 145
W1WTF W2KXK W2IP W5OJL K9PJN VE1EX VE2AFC F8PM ON4LX ZS1NQ

• 144
W1YXD W2AAU WA2CCC K3CIO W3SW W4FUI W8QQH EA4GA HH2LD OZ9N ZS5LU ZS6LW

• 143
W3QJJ W3YPI W4CQI K5LMJ W6LER W7GDS W8AAI K8OHG CX9AJ DJ2BO G5DJ G5OO HA5BU I1ZN OE8KI ZL1ARY

• 142
W1MLG W1QV W2PUX W3UDN W4SXE W7ITN K8HFO DJ2MN SP8HR TG9AL

• 141
W1CJU W1CSC W1DBM W2JWK W2OCL K2YOR W3JW W3YZI W4OMW W5II W6WLO KH6BTX W7VIU K8MTI K9DJN W9IVG WØTQD CE3ZO EA8BC KW6DG OE8SH OH3SE PAØZV SM4AEQ ZS1ACD ZS6APQ ZS6J

• 140
W1GKJ W1PPN W2BTG WA2CBB K2QIL W3QLW W4FNS W4HSJ W4REZ W4WHN W4YKH K5EJQ W6JNX W7JWE W7TMF K8CVQ W8ETU W8ZNO W9BZW W9CMC W9IWX W9KXZ W9PWM W9TPA WØGTU WØRZU WØVXO CT1NT SM5DX SM5WZ SM7BHF VS1JF

• 139
W2DVC W4GOG K5MZD K6COP W7OQO FS7RT HB9DK ZD2DCP ZE7JY

• 138
K1IJG W2KOY K4GLA W6KNM W6QQW LA8RB OK3OM OZ3GW

• 137
W2VCB W4NYF W7LIO W9POB VE3TB DJ4HR OE6AI OD5CT ZB1FA

• 136
W1MD K6JC JA1BF OH3TQ SM5BVF SP6BZ SP8HU

• 135
K4ELK K4OYR VE3KP VE8PB DL1ES LA5ID

• 134
K6BHM W6JFV W9GWO OK3UI SM7CNA UR2BU VQ2RB 4X4BR 9G1BQ

• 133
W1BRX W1JLN K2CQP K2HVN K4TKM W9GIH W9WNV WØFDL KØIAD VE7ANR DJ2IV SM6BDS ZD1AW ZE8JJ ZP9AY ZS6AJH

• 132
W1AJO K2IQP K2KFP K2OUS W5UVR W6HVN KH6ACU K8QJH K8VDV W8VZ W9YZG DL6OS DL7BC EA1GZ G3IZJ G8CD I1ZCN LA1MB OA7I SVØWI UO5AA ZS5KU ZS5RS

• 131
W1FJJ W1GZP W2ABL W2AWH K2MDL K2UVV W3AZQ K4BVD W4KET K5ABV W5CYE K5IIX K6AKS K8EZU W9PYE W9YZA WØCDV WØQPL KØSLD WØTGQ DJ1WT EA3IT KA2DE ZC4AK ZE3JJ

• 130
W1BDI K1GUD K1IMP W2BO K2DNA K2FG WA2GFW K2IXP W2MES K2USA W3GGT W3GYP W3LSG W4GUV K4LNA W4NPT W4ORT W6GEB W6ISQ K6OCX W6SQX KH6EQ K7ABV W7PB W7STC W7YAQ W8GMK W9MAK W9MQZ W9YFD KØHWB WØNGM VE1DB VE3AGC VE3BOR VE4OX CR7BN DL3FL DL3LB DL6BP F9EP KA2CB KW6DF OA4HK PAØNLC SM5VN SP9TA

• 129
K2BG W2BWC W4WSY K5UYF K6IXS W6OAZ W9YHE DJ5GG LA8F VR2DK

• 128
W2PEV W3LE CR7CR DL9EH HB9TU PAØPFR

• 127
W1AZU W2KHT KL7BHE WØWMA VE8TO DL1XS OQØDZ

• 126
K4QIE W6CQW WØQKC KØITF OE7GF SP9EU VQ2W ZS2HI

• 125
W1BPW W1KNU W1VKZ K2GKM W2HUG W3VQE K6BTU K6JBP W8TAJ K9EUZ K9LSN WØDUA VE3PN VE3PV F9TV G3ASG G3BFP G3KAY G3ZY UQ2AN VP9BO XE1AX ZL2JO

• 124
W3AHX K3DKD K4HMX W6HHI K6ZIF W6ZSS K9UHH DL3OC G4QK JA5AF JAØAC LA6FA OH2RL OZ7CF PAØHT SM5CFC VQ4WLH

• 123
W1JVZ K2GHM K4HDR W4HKQ K4VUR W7CNL W7LOC W8DSZ DM2AEJ DJ2US DL9PT EAØAC OE6RS OK3EE SM6APH SM7CAB ZS4UP

• 122
W3QYG K4BUJ W8KSR K9JLR VE3XK DL1GN DL1TS G3LGL OZ6RL SM3ADP SM3AZV YU1AA ZL1TB

• 121
W3NHA W4KWY K4MWB W5ANZ W5JPC K6HZP W7DH W7NNF W7YAM K9OTB W9RUB DL6TQ F9BB G2DCG G3HQX G3ISX G3JFB G8DI LA3HA LA5HF OZ2NU UA2HK VQ2IE

• 120
W1EHT W1ONP W1YZL W2BOT K2EUH W2QZI W2UNS W2VCZ K2YMO K2ZRO K2ZYR K3ALD K3DCP K3AMH/4 K4BQU K4ZYU W5NXF W6BLZ K6EXO WA6EXR W6LJH W6VUN W7AIR W7IAM W7MH W8CUT W8LUZ W8NAN K9GOQ K9OKD W9WWJ WØDVZ KØEUV KØLEQ VE3LZ VE3UOT VE6HG VE7KX DL1CF EA3IH F8DF F3II G3GMY LZ1KNB OH2NQ OZ2KD SM5BEU SM5UU ZD2GUP

• 119
K2GKU K6CJF W6WGC W7TVF W9HUV KØMTO CX2AM EAØAB SP5ADZ VK9NT YU3OS

• 118
W1MQV K4QBP W7DIS W9MES

• 117
K1DIR K1LST W3HUV KH6COB W9JUO VE2IJ JA1AAT PAØNIR UD6AM VQ3CF ZS6AJO

• 116
W1BBN W1PH W1YYM K3ERC W3TMZ K4TWF W4YYJ K9KFS VE2CK CE1AD DL1TA DM2ALN DL6WD DL7HU G3KIM FL8AB K6TSQ/KG6 PY5FO SP2DX SP8HT UAØKJA ZS2HX ZS6AEA

• 115
W1OPB W2JKH K4DSW K4HDQ W5LJT W8OFE K8PUU F9TE DL6VN I1ANN KP4AVQ OX3RH UB5CK 4X1FU

• 114
K2PXX W3TEC W4USM W7EMY W8AL WØHNA CT1SX G5RP JA1AS JA2LC JA3BG JA3EK JA3SJ OH2IK OK1MG

113
K1APQ W1ECH W2PCI K3BUV W3LC K4DSV W4JQM W4UG K5DCO W5JD K6LGH W7JC W8SCJ WØNCS

(Continued on page 104)

Station Activities

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

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: *DUI. RM: EMIL. PAM: IVS.* We welcome the following new appointees: K3KTC and W3GJA as OPSs. 2UZN transfers from California as an OES. ELI was elected commander of his American Legion Post. OY attended the New York State Convention at Niagara. After two years NNL has been forced to give up the 3RN spot because of night school. 4DVT is applying for a 3rd district call and hopes it's something he can send on c.w. PVY and XYL Hilda have now joined the Red Cross "Three Gallon Donor Club." New Gear Dept.: ID a new HRO, NOH a 75A-3, K3NLW a triband vertical and a 20-meter dipole. HNK received the WANJ Award. Ole' timer ADE joined the QCWA. *EMIL became a grandpop for the fourth time.* The teachings of K3LAM resulted in new Novices KN3QGV, QGT, QCQ and PKN, all in the Lebanon Area. New club officers: University of Penna. ARC—K3EMD, pres.; BWI, vice-pres.; K3JTE, secy.; JXS, treas. Mahanoy Valley Brass Pounders ARC—CUK, pres.: K3LEE, vice-pros.; K3KNR, secy.; K3KNP, treas.; ORJ, act. mgr. The Hilltop Transmitting Society—K3COA, pres.; K3CVM, vice-pres.; HLD, secy.; APF, treas. The West Philadelphia Radio Assn.—K3ITD, pres.; K3EID, vice-pres.; KN3PWY, secy.; Mrs. D. Ambrosia, treas. Short Skip RC—21LN, pres.; K3AWD, vice-pres.; ZQP secy.; ZPK, treas.; DVB, act. mgr. K3CNN is running 150 watts on 2 meters. K3JJJ converted his Gonset I for mobile use. K3ADS is operating on 220 Mc. K3LKR is on 432 Mc. and is looking for other stations for frequency checks. ZJD has been accepted at LaSalle University as a pre-med student. K4LPR/3 is cramped for antenna space and now is using a trap antenna. IVS and K3GSU stopped at your SCM's shack while on an extended tour which took them to Western Pennsylvania. Once again we were threatened by a lady called "Esther" in the form of a hurricane. The traffic nets stood by throughout the night in case it made its way to our area. In behalf of the League, its officials and myself, Merry Christmas to all and a Happy and Prosperous New Year. Traffic: (Sept.) W3CUL 3429, EMIL 770, VR 713, K3IMP 433, W3FAF 206, W4DVT 143, W3UIU 109, HNK 98, AXA 84, ZRQ 67, K3BHU 40, HTZ 40, JSX 40, MVO 36, KTC 23, CAH 21, W3NNL 19, BFF 14, EU 10, OY 10, BNU 9, ITZ 9, K3KNL 7, W3ITI 6, K3NLW 6, W3NQB 4, OML 3, BNR/6 1, ELI 1. (Aug.) W3IVS 1146.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—Asst. SCM Delaware: M. N. Nelson, jr., K3GKF. SEC: CVE. MDD Traffic Net meets on 3650 kc. at 0015 GMT daily; MDDS (slow) Net on 3650 kc. at 0130 GMT daily; *MEPN* (phone) Net on 3820 kc. at 2300 GMT weekdays and 1800 GMT Sat./Sun. September appointments: HQE as Asst. EC for PG County; K3JYZ as RM for MDD/3RN liaison; K3AXW and W4JNE/3 as ORSs; K3OGA and K3OWX as OESs; K3AXW and K3EST as OBSs. The Washington RC meets the 1st Fri. of each month and welcomes all visitors. K3ANA is now operating portable from Michigan, where he is attending school. BUD reports the St. Marys ARA has purchased a 2-kw. emergency generator. EC K3BYJ says the New Castle County AREC 6-meter mobiles served as emergency communication for the town of Elsmere, Del. CDQ reports she is ready for heavy winter schedule. The *Foundation meets* the 1st Thurs. of each month and is already laying plans for the Gaithersburg Hamfest to be held next September. CFA reports the First State ARC (Del.) operated K3QBD from a prominent show window for two days. New officers of the PVRC are GRF, pres.; 4ZM, vice-pres.; 1PO, secy.; K4ORQ, treas. SVØWK/5A1TX was a speaker at its Sept. 25 meeting. K3CNI helped K3GKF set up emergency equipment for the hurricane scare. K3CXX passed his Extra Class exam and now has a tribander. At its Sept. 13 meeting the Baltimore ARC had a speaker from Hallicrafters. K3CYA/3 sends in a nice traffic count by Air Mail. ECP helped activate PZA during Hurricanes Carla and Esther, and reports the ROTC group at Johns Hopkins now operates K3OHH. EEB is providing a Delaware outlet for MDD. EOV spent considerable time relaying storm bulletins during the hurricane alerts. EQK received a severe electrical shock through his headphones while working on the transmitter and spent two days in the hospital. He advises his friends to Switch to Safety. W4EXM/3 retired from the USAF after 23 years of service. K3GEK is now back at the U. of Delaware. K3GZK keeps MDDS going steadily. K3HDW is moving to a new QTH. K3HJD has a new 6-meter beam. HKS is helping to keep the Delaware boys active. HQE is getting a new 40-meter beam ready for the winter. K3IZM is building 2-meter handie-talkies. K3JIQ has 10 countries on 80 meters. K3JYZ turns in his usual good traffic count. KHA likes CD Parties. K3KHK has finished building new mobile gear. EC LDD is helping to organize the Havre de Grace RC. K3LFD is busy with MDD and 3RN activities. K3LLR is now weather observer for the MDD AREC. K3LWD is active on 50-Mc. MCG has reactivated the *MDD Net Bulletin* and reports net control positions are available. GRF now has a three-element 80-meter quad. K3MDL has mobile on his scooter. EC MVB sent a fine AREC bulletin to all D.C. amateurs. K3NCM passed the General Class exam. K3NKX is now back on from Baltimore. K3OGA has a new three-band vertical. K3OWX reports KN3RBM as a new Baltimore amateur. TN maintains his high level of traffic activity. UE is now dividing time between 3RN and his new job. K3WBJ checks in from Walter Reed Hospital. YZI reports plenty of s.s.b. DX. ZAQ remains the section's leading QO. ZNW is trying to squeeze a mobile rig into his Fiat 600. Traffic: (Sept.) K3JYZ 154, LFD 139, W3TN 95, MCG 77, UE 76, K3CYA 68, W3ZNW 50, K3WBJ 42, W3ECP 40, K3MIZY 34, GZK 31, W3HQE 21, OHI 20, EOV 19, BUD 18, K3BYJ 15, W3BKE 12, EEB 12, *K3JIQ 10*, KHK 10, LWD 7, W3EQK 4, K3NCM 4, W3OYX 4, K3HDW 3, OGA 3. (Aug.) K3JIQ 18, W3HQE 15, JFR 11.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: K2ARY. RMs: W2BZJ, W2ZI and W2HDW. New appointment: WA2LBL, Lawrenceville, as OBS. WA2VAT, Audubon, is QRL on NJN and 2RN. W2RG, Merchantville, enjoyed a visit to Vermont. N.J. Phone Net totals for Sept.: Sessions 30, QNI 578 and traffic 112. The net plans to hold its 4th Annual Dinner near Freehold. Contact W2ZI or K2SLG for information. WA2KWB has received the WAS certificate. The Bridgeton Area Radio Klub has a new code and theory class with 17 students. Millville has a new 2-meter c.d. net. W2BAY and W2II are making antenna repairs. W3YLL, formerly of Philadelphia, is now slant 2 in Cinnaminson. W2HBE won 1st prize in SJRA's Field Day Photo Contest. W2REB was top S.N.J. scorer in the June V.H.F. QSO Party. K2UUY and W2AFZ have new tribanders. W2SUA's new QTH is Sewell, Gloucester County ARC plans to resume code classes at Pitman HS. The club meets in Glassboro. W2EIF, Camden, continues to do a fine job as OO. W2OSD, Erlton, is SJRA's Sweepstakes chairman. K2ECY, Riverton and K2MOV, Delance, expect to operate from KX6-Land this fall. Burlington County Radio Officer K2HJY plans a meeting of RACES and AREC personnel to coordinate the efforts of the two organizations. The county station is K2QGE, located in Mt. Holly. Reports from Cape May and Mercer Counties are solicited. K2CPR continues his DX- and certificate-chasing. Fifteen Form 1 reports were received. Keep up the fine work. Change in club officers and election reports will be appreciated. Publicity will add greatly to your club's coverage and service. We will be very glad to help through this column. Traffic: WA2VAT 234, W2RG 97, WA2HJD 60, W2ZI 38, K2RXB 21, K2CPR 12, WA2KWB 8, K2SOX 7, WA2ARJ 4, WA2MEQ 2.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF, W2EZB and W2FEB. PAM: W2PVI. NYS C.W. meets on 3615 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3510.5 and 3993 kc. (s.s.b.) at 0900

(*Continued on page 110*)

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ARIZONA
Phoenix: Southwest Electronic Devices
CALIFORNIA
Anaheim: Henry Radio, Inc.
Burlingame: Amrad Supply, Inc.
Long Beach: Scott Radio Supply Co.
Los Angeles:
Henry Radio, Inc.
Radio Products Sales, Inc.
Oakland: Elmar Electronics
Riverside: Mission Radio Ham Supplies
San Diego: Western Radio & Television Supply
San Francisco: Amrad Supply, Inc.
San Jose: Quement Industrial Electronics
Van Nuys: Valley Electronic Supply Co.
COLORADO
Denver: Radio Products Sales Co.
CONNECTICUT
New Haven: Radio Shack Corp.
Stamford: Radio Shack Corp.
West Hartford: Radio Shack Corp.
DELAWARE
Wilmington: Almo Industrial Electronics, Inc.
DISTRICT OF COLUMBIA
Washington: Electronic Wholesalers, Inc.
FLORIDA
Jacksonville: Kinkade Radio Supply, Inc.
Melbourne: Electronic Wholesalers, Inc.
Miami:
Electronic Wholesalers, Inc.
Walder Electronic Distributors
Tampa: Kinkade Radio Supply, Inc.
GEORGIA
Atlanta: Specialty Distributing Co.
ILLINOIS
Chicago:
Allied Radio Corp.
Amateur Electronic Supply
Genoa: Crawford Electronics
IOWA
Council Bluffs: World Radio Laboratories, In
INDIANA
Indianapolis:
Graham Electronics Supply, Inc.
Van Sickle Radio Supply Co.

SSB/CW/VHF Contest!

Here's a chance to get in your "two cents worth" to stimulate SSB operation on VHF frequencies . . . promote better CW on all bands . . . and win yourself a shackful of Hallicrafters equipment besides! Easy to enter, easy to win, through your own favorite distributor. He selects the local winner, who qualifies for grand prizes worth over $1,000.

HERE'S HOW YOU ENTER:

1. Simply visit your Hallicrafters distributor listed below, and see his special display of Hallicrafters amateur equipment.

2. Your distributor will furnish an entry blank. Just fill in your name, address and call; then answer this easy question in 25 words or fewer: "I would like to see more SSB and CW operation on VHF because . . ."

3. **Do not mail the entry blank**—turn it in to your distributor. He will award to a winner in his local area a Hallicrafters HA-4 transistorized electronic keyer. Entries will be judged on a basis of originality and sincerity.

4. Local winners' names and winning statements will be forwarded to Hallicrafters for entry in the national contest. A special panel of judges will select 10 semi-finalists, each of whom will be awarded their choice of an HA-2 Transverter, HA-6 Transverter, or an HT-37 Transmitter.

5. From the 10 semi-finalists, a **Grand Prize Winner** then will be selected by the panel, and he will be awarded in addition to his earlier prizes an SX-115 Receiver!

6. All entries become the property of The Hallicrafters Co. Winners' names and their statements may be published by Hallicrafters. Decisions of both local distributors' and Hallicrafters' judges shall be final.

Quality and Reliability in Communications . . .

hallicrafters

4401 W. Fifth Ave., Chicago 24, Illinois

LOUISIANA
Baton Rouge: Davis Electronics Co.
New Orleans: Radio Parts, Inc.

MARYLAND
Wheaton: Uncle George's Radio Ham Shack
Div. of Electronic Distributors

MASSACHUSETTS
Boston: Radio Shack Corp.
Braintree: Radio Shack Corp.
Saugus: Radio Shack Corp.

MICHIGAN
Detroit:
M. N. Duffy & Company
Radio Supply & Engineering Co., Inc.
Reno Radio Company
Grand Rapids: Radio Parts, Inc.

MISSOURI
Butler: Henry Radio Company
Kansas City: Burstein-Applebee Co.
St. Louis: Walter Ashe Radio Co.

NEW HAMPSHIRE
Concord: Evans Radio Co.

NEW JERSEY
Bloomfield: Variety Electronics Corp.
Camden: Almo Industrial Electronics, Inc.
Mountainside: Federated Purchaser, Inc.
Newark: Terminal-Hudson Electronics, Inc.
Paramus: Lafayette Electronics Corp.

NEW YORK
Jamaica: Harrison Radio Corp.
Mineola: Arrow Electronics, Inc.
New York:
Harrison Radio Corp.
Harvey Radio Co., Inc.
Terminal-Hudson Electronics, Inc.
Syosset: Lafayette Radio Electronics Corp.

OHIO
Cleveland: Pioneer Electronic Supply Co.
Columbus: Universal Service
Dayton: Custom Electronics, Inc.

PENNSYLVANIA
Chester: Bell Electronic Supplies
Norristown: Almo Industrial Electronics, Inc.
Philadelphia: Almo Industrial Electronics, Inc.
Pittsburgh: The Tydings Company
Reading: The George D. Barbey Company
Wyncote: Ham Buerger

RHODE ISLAND
Cranston: Radio Shack Corp.

SOUTH DAKOTA
Watertown: Burghardt Radio Supply, Inc.

TENNESSEE
Memphis: W & W Distributing Co.

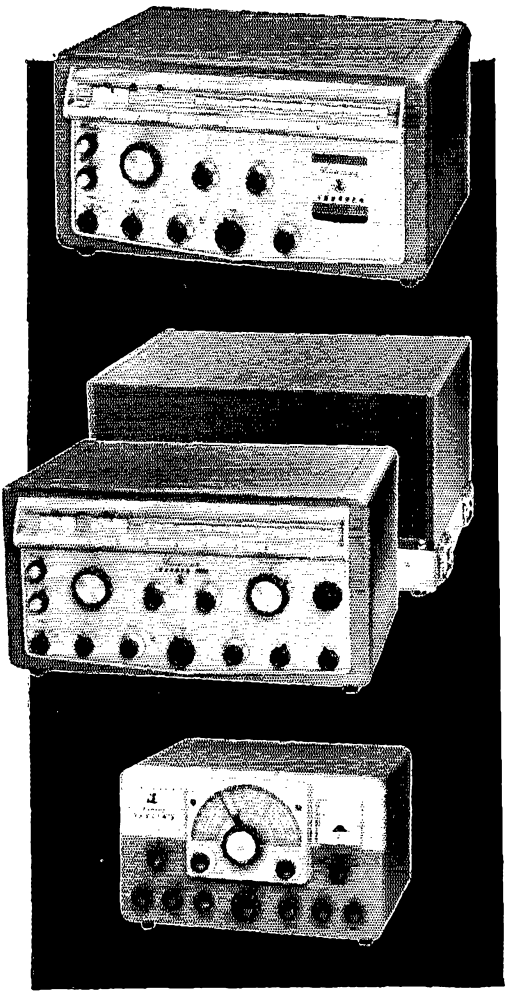
TEXAS
Dallas:
Amateur Electronics, Inc.
Crabtree's Wholesale Electronics

VIRGINIA
Norfolk: Priest Electronics, Inc.

WISCONSIN
Milwaukee: Amateur Electronic Supply

Choose your next transmitter

3 of the hottest and newest!



INVADER—More exclusive features than any other Transmitter/Exciter on the market today! Specially developed high frequency, symmetrical, multi-section band-pass crystal filter for more than 60 db sideband suppression—more than 55 db carrier suppression! Instant bandswitching 80 through 10 meters—no extra crystals to buy—no realigning necessary. Delivers solid 200 watts CW and P.E.P. SSB input; 90 watts input AM. Built-in VFO—exclusive RF controlled audio A6C and ALC (limiter type) provide greater average speech power. Wide range pi-network output circuit—extremely smooth VOX and anti-trip circuits. Fully TVI suppressed. Self-contained heavy-duty power supply. Wired and tested with tubes and crystals.

Cat. No. 240-302-2—Amateur Net $619.50

HIGH POWER CONVERSION—Take the features and performance of your "Invader" . . . add the power and flexibility of this unique Viking "Hi-Power Conversion" system . . and you're "on the air" with the "Invader 2000". Completely wired and tested, includes everything you need—no soldering necessary—complete the entire conversion in one evening.

Cat. No. 240-303-2—Amateur Net $619.50

INVADER 2000—Here are all of the fine features of the "Invader", plus the added power and flexibility of an integral linear amplifier and remote controlled power supply. Rated a solid 2000 watts P.E.P. (twice average DC) input on SSB; 1000 watts CW; and 800 watts input AM! Wide range output circuit (40 to 600 ohms adjustable). Final amplifier provides exceptionally uniform "Q". Exclusive "push-pull" cooling system. Heavy-duty multi-section power supply. Wired and tested with power supply, tubes and crystals.

Cat. No. 240-304-2—Amateur Net $1229.00

RANGER II—Now—a new version of the popular 75 watt CW or 65 watt AM "Ranger". The "Ranger II" transmitter also serves as an RF/audio exciter for high power equipment. Completely self-contained instant bandswitching 160 through 6 meters! Operates by built-in VFO or crystal control. High gain audio-timed sequence keying, TVI suppressed. Pi-network antenna load matching from 50 to 500 ohms. With tubes, less crystals.

Cat. No. 240-162-1
Viking "Ranger II" Kit—Amateur Net . . . $249.50

Cat. No. 240-162-2—Viking "Ranger II"
Wired and tested—Amateur Net $359.50

FREE
New Catalog
Write today for our newest amateur Catalog! Available now . . . contains photos, schematics and detailed specifications!

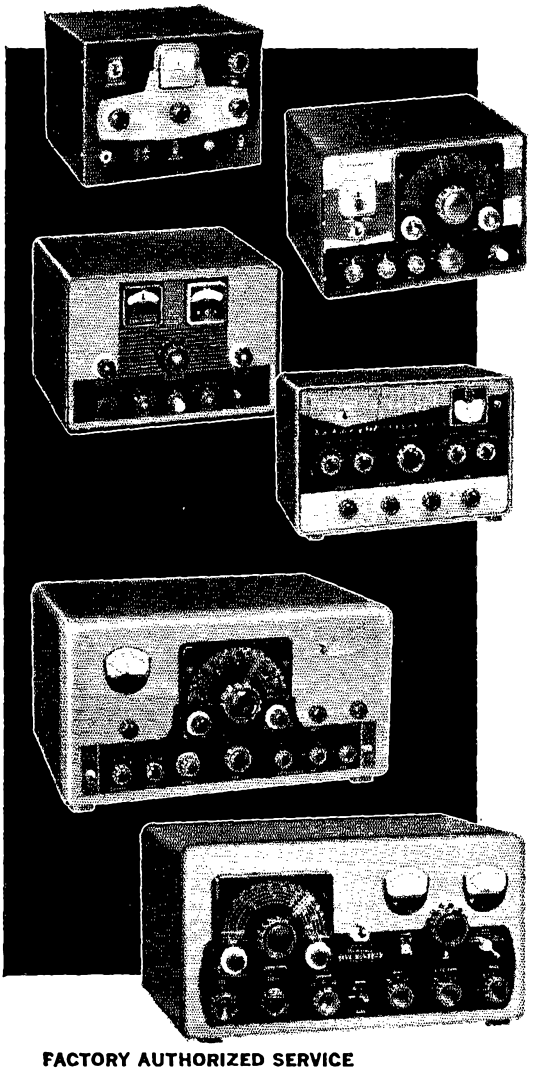
FIRST CHOICE AMONG THE NATION'S AMATEURS

Viking®

E. F. JOHNSON COMPANY • WASECA, MINNESOTA

from the VIKING line . . .

6 popular feature-packed transmitters!



ADVENTURER—Self-contained . . . 50 watts CW input . . . rugged 807 transmitting tube . . . instant bandswitching 80 through 10 meters. Crystal or external VFO control—wide range pi-network output—timed sequence keying. With tubes, less crystals.

Cat. No. 240-181-1 Kit—Amateur Net . . . $54.95

NAVIGATOR—40 watts CW input . . . also serves as a flexible VFO exciter. 6146 final amplifier tube—bandswitching 160 through 10 meters. Built-in VFO or crystal control. With tubes, less crystals.

Cat. No. 240-126-1 Kit—Amateur Net . . $149.50

Cat. No. 240-126-2
Wired and tested—Amateur Net $199.50

CHALLENGER—70 watts phone input 80 through 6; 120 watts CW input 80 through 10 . . . 85 watts CW on 6 meters. Two 6DQ6A final amplifier tubes. Crystal or external VFO control—TVI suppressed—wide range pi-network output. With tubes, less crystals.

Cat. No. 240-182-1 Kit—Amateur Net . . $114.75

Cat. No. 240-182-2
Wired and tested—Amateur Net $154.75

6N2—Rated 150 watts CW and 100 watts phone—offers instant bandswitching coverage of both 6 and 2 meters. Fully TVI suppressed—may be used with "Viking I, II", "Ranger I, II", "Valiant" or similar power supply/modulator combinations. Operates by crystal control or external VFO with 8-9 mc. output. With tubes, less crystals.

Cat. No. 240-201-1 Kit—Amateur Net . . $129.50

Cat. No. 240-201-2
Wired and tested—Amateur Net $169.50

VALIANT—275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) 200 watts phone. Instant bandswitching 160 through 10 meters—built-in VFO or crystal control. Pi-network output matches antenna loads from 50 to 600 ohms. TVI suppressed—timed sequence keying—built-in low pass audio filter—self-contained power supplies. With tubes, less crystals.

Cat. No. 240-104-1 Kit—Amateur Net . . $349.50

Cat. No. 240-104-2
Wired and tested—Amateur Net $439.50

FIVE HUNDRED—Full 600 watts CW—500 watts phone and SSB (P.E.P. with auxiliary SSB exciter). Compact RF unit designed for desk-top operation. All exciter stages ganged to VFO tuning—may also be operated by crystal control. Instant bandswitching 80 through 10 meters—TVI suppressed—high gain push-to-talk audio system. Wide range pi-network output. With tubes, less crystals.

Cat. No. 240-500-1 Kit—Amateur Net . . $749.50

Cat. No. 240-500-2
Wired and tested—Amateur Net $949.50

FACTORY AUTHORIZED SERVICE

Instead of shipping to our factory, equipment to be serviced may also be sent to:

Empire State Elect. Service
139-140 Hillside Ave.
Jamaica, New York

Park-Armature Co.
1218 Columbus Ave.
Boston 20, Mass.

HEATH AMATEUR GEAR

for a Merry Xmas

New Kits

Forty new kits have joined the Heathkit line this fall... choose from over 250 quality kits . . . the world's most complete line!

New Guarantee

We guarantee you can build any Heathkit and have it perform to factory specifications . . . now you can buy in complete confidence!

New No-Money Down Terms

Now it's even easier to buy from Heath! Any order from $25 to $600 can be paid for on Heath's time-pay plan with no down payment!

New 1962 Heathkit Catalog

It's the world's biggest kit catalog . . . 100 pages . . . complete descriptions, specifications and many schematics. It's yours FREE!

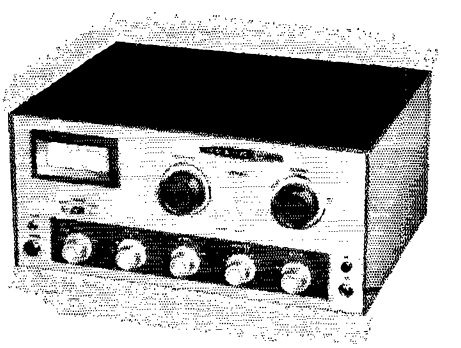
Specially-designed for CW work . . .
new novice CW TRANSMITTER KIT HX-11

An excellent transmitter for the novice or CW amateur who appreciates a clean, quality signal and real distance getting power! Features 50 watt RF power input on 80 through 10 meters, built-in low pass filter, single-knob bandswitching, switched antenna relay power and pi-network output coupling for complete operating convenience. A "tune-operate" switch allows off-the-air tuning and a large "clear view" meter indicates final grid or plate current. Easy access to crystal socket is provided by a metal pull-out cabinet plug. Power supply is built-in. Careful design and high-quality components used throughout make this kit easy to assemble and assures long, reliable and trouble-free performance for years to come. An outstanding "watts-per-dollar" value in amateur gear. 17 lbs.

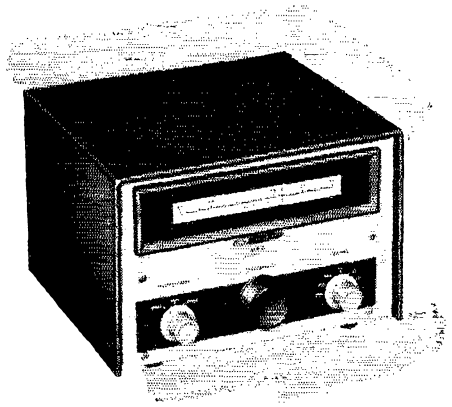
Kit HX-11... NO MONEY DOWN, $5 mo..... **$43.50**

The DX-60 Surpasses Quality and Performance of Transmitters Costing Far More!

This outstanding phone and cw transmitter offers far more in quality and performance than any other unit in its price and power class! A front panel switch selects any of four crystal positions or external VFO. Controlled carrier modulator and silicon diode power supply are built in. Single knob bandswitching for 80 through 10 meters and pi-network output coupling provide complete operating convenience. Panel meter shows final grid or plate current for easy tuning. Assembly is a marvel of simplicity with clean, rugged construction and thoughtful circuit layout. A precut, cabled wiring harness eliminates tedious wiring and the informative instructions furnished make it an ideal kit for the novice. May be run at reduced power for novice operation. Less crystals. 25 lbs.



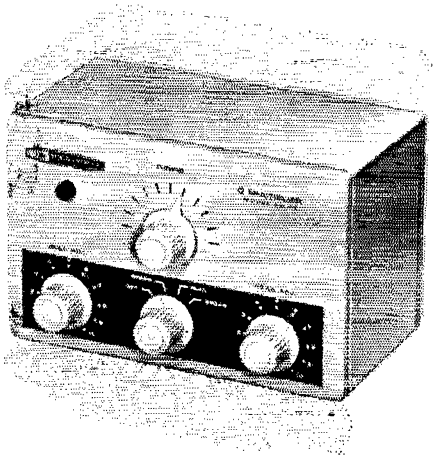
Kit DX-60... NO MONEY DOWN, $9 mo..... **$82.95**



New low cost, broad coverage
Heathkit VFO HG-10

Covers 80 through 2 meters with each band separately calibrated on a rotating drum-type slide-rule dial. Uses a series tuned Clapp oscillator with regulated plate voltage for stability and a cathode-follower output stage for load isolation. Features 28:1 vernier gear drive, and "spotting" switch for off-the-air tuning. Powered by transmitter. Styled like the Heathkit DX-60 and plugs into it directly. Easy to build. 12 lbs.

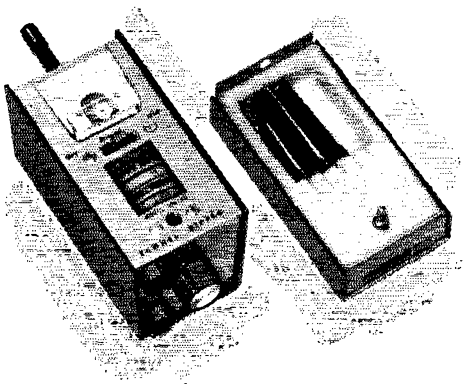
Kit HG-10...NO MONEY DOWN, $5 mo.....**$34.95**



Improve your receiver performance with this new Heathkit "Q" MULTIPLIER

May be used with any receiver having an IF frequency between 450 and 460 kc. This "electronic filter," with effective "Q" of approximately 4,000, provides either a sharply-peaked IF curve for CW, a broad peaked IF curve for AM or SSB, or a deep sharp notch for rejecting heterodynes on CW, AM and SSB. Both peak or notch positions are tunable to any point in the receiver's IF bandpass. Ideal for CW reception and heterodyne rejection on receivers or transceivers employing fixed bandwidth mechanical filters such as the Collins 75S-1. Power supply is built-in. 2 lbs.

Kit HD-11.....**$14.95**



New!... nothing else like it anywhere... the Heathkit "TUNNEL-DIPPER"... exclusive tunnel-diode oscillator!

First of its type! Performs like a "grid-dip" meter but uses a tunnel-diode oscillator and transistors—no tubes! Built-in battery supply for complete portability... use it anywhere for alignment, trouble-shooting, etc. Features color-matched coils and dial scales for easy reading; printed circuit board for easy assembly. Protective cover has storage space for coils. Enclosed vernier-driven drum-type tuning dial prevents accidental change in settings. 3 lbs.

Kit HM-10...NO MONEY DOWN, $5 mo.....**$34.95**

Free Catalog

Send For Your FREE 1962 Heathkit Catalog now! It details the complete Heathkit line of quality kits... over 250... the world's largest selection. We'll send your friends free copies too!

HEATHKIT® by Daystrom

HEATH COMPANY
Benton Harbor 9, Michigan

Please send the Free Heathkit catalog.

Name_____

Address_____

City_____ Zone____ State_____

IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has worked—with only 65 watts and a $16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California
January 31, 1959

GOTHAM
1805 Purdy Avenue
Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in its class.

I am enclosing a list of DX countries I have worked to give you an idea of what I have been tal king about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-T12TG)

OR IS K4ZRA THE NEW CHAMP?

Read his letter, and see his diagram of a typical installation and what it achieved:

2539 Christie Place
Owensboro, Kentucky

GOTHAM
Miami Beach, Florida

Gentlemen:

While I was at home last summer, I had occasion to use your GOTHAM vertical antenna on the air for about two months. I was quite amazed with the excellent performance of that inexpensive and simply installed antenna. It did everything you, K6INI, and others said it would, in spite of the generally poor band conditions during the summer months.

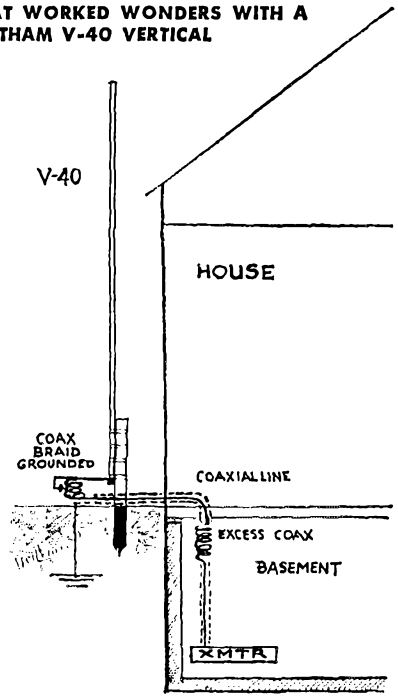
During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (Hallicrafters reboxed SX-28.)

The above mentioned contacts were made with the vertical mounted several inches off the ground, without radials, with only a simple ground connection to the coaxial shield. Later I raised the antenna up about 20 feet and installed the radials and this improved the already good signal pattern and enabled me to pick off another 12 DX countries and other DX contacts in a couple of weeks of good band conditions. In the latter part of August I used several single-band vertical and ground plane antennas and found that the single GOTHAM vertical equalled all these individual antennas.

Another attractive feature is the versatility of installation. It works high or low on ground, with or without radials,

K4ZRA's INSTALLATION

THAT WORKED WONDERS WITH A GOTHAM V-40 VERTICAL



mounted in any space. Of course I did find that the best installations were the two mentioned above, but they were fairly simple to arrange, especially the first one!

The GOTHAM vertical is also a superior receiving antenna and I would strongly urge you to recommend that it be used for receiving as well as transmitting.

I just wanted to tell you how pleased I was with the overall performance of your antenna. For an inexpensive, easy-to-install, dependable antenna that really works for both DX and "local" W/K contacts, I don't see how one could ask for more and I would certainly recommend a GOTHAM V-40 to anyone desiring these features. Good luck in 1961 with those FB antennas!

Sincerely,
Daniel F. Onley, K4ZRA

FACTS
ON THE GOTHAM
V-80 VERTICAL ANTENNA

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
- Simple assembly, quick installation.
- Withstands 75 mph windstorms.
- 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.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. ONLY $16.95.

73,
GOTHAM

DO YOU KNOW

1. YOU WILL HAVE NO DIFFICULTY INSTALLING YOUR GOTHAM VERTICAL ANTENNA IN JUST A FEW MOMENTS, REGARDLESS OF YOUR PARTICULAR PROBLEM, SO ORDER WITH CONFIDENCE EVEN IF YOU HAVE RESTRICTED SPACE OR A DIFFICULT SITUATION.
2. LOADING COIL NOT REQUIRED ON 6, 10, 15 AND 20 METERS. FOR 40, 80, AND 160 METERS, LOADING COIL TAPS ARE CHANGED MANUALLY EXCEPT IF A WIDE-RANGE PI-NETWORK OUTPUT OR AN ANTENNA TUNER IS USED; IN THIS CASE BAND CHANGING CAN BE DONE FROM THE SHACK.
3. EVERY GOTHAM ANTENNA IS SOLD ON A TEN DAY TRIAL BASIS. IF YOU ARE NOT FULLY SATISFIED, YOU MAY RETURN THE ANTENNA PREPAID FOR FULL REFUND OF THE PURCHASE PRICE. THIS IS YOUR GUARANTEE OF FULL SATISFACTION.

FILL IN AND SEND TODAY!

Airmail Order Today — We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

☐ V40 VERTICAL ANTENNA FOR 40, 20, 15, 10 AND 6 METER BANDS. ESPECIALLY SUITED FOR THE NOVICE WHO OPERATES 40 AND 15..... $14.95

☐ V80 VERTICAL ANTENNA FOR 80, 40, 20, 15, 10 AND 6 METER BANDS. MOST POPULAR OF THE VERTICALS. USED BY THOUSANDS OF NOVICES, TECHNICIANS, AND GENERAL LICENSE HAMS... $16.95

☐ V160 VERTICAL ANTENNA FOR 160, 80, 40, 20, 15, 10 AND 6 METER BANDS. SAME AS THE OTHER VERTICAL ANTENNAS, EXCEPT THAT A LARGER LOADING COIL PERMITS OPERATION ON THE 160 METER BAND ALSO..... $18.95

HOW TO ORDER. Send check or money order directly to Gotham. Immediate shipment by Railway Express, charges collect. Foreign orders accepted.

Name.....

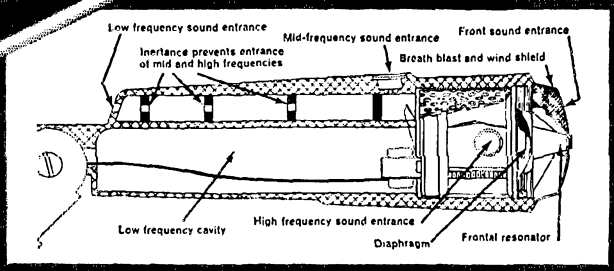
Address.....

City.....Zone.....State.....

The Least Expensive Way to Increase

Flat response penetrates QRM more effectively because it permits an actual increase in RF power output! More effective cardioid pattern, essential for SSB, cuts accidental tripping of VOX circuit!

MODEL 664



HERE'S HOW IT WORKS

Exclusive E-V Variable-D* (Variable Distance) provides three sound-cancelling entrances at different fixed distances in back of the diaphragm. These entrances, utilizing the proper acoustical impedances, combine to form an effective front-to-back spacing which varies in distance from the diaphragm inversely with frequency. The resulting phase and amplitude conditions provide a uniformly true cardioid pattern at all frequencies. **Pat. Pending*

Here's What the Top Radio Amateur Operators in the World Say About These E-V Microphones:

CX2CO "My new 664 resulted in better and more consistent QSO's."

W8KML "The 664 surpasses its claims in difficult operational environments."

ZL1HY "During QSO's . . . everyone preferred the 951."

W3JNN "I am really sold on the 664."

W8BF "I have had many unsolicited compliments since using the 729."

VQ4ERR "The performance of the 664 matches its thoroughbred appearance."

PY2CK "My 664 microphone vastly improved my SSB transmission."

Average Peak-Power and Intelligibility!

CHOOSE AN Electro-Voice® MICROPHONE

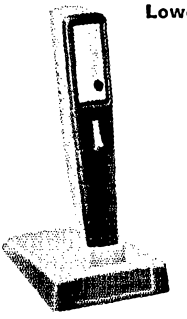
Model 664 for Highest Front-to-Back Discrimination Manufactured, Plus Peak-Free Wide-Range Response!

The effective strength of all sounds arriving at the sides of the 664 are reduced by as much as 50%, and arriving directly at the back of the microphone by as much as 90%. This uniquely effective design permits you to work at twice the distance from the microphone . . . a perfect invitation for "arm chair" QSO's—with no VOX tripping problems.

Smooth, peak-free response guarantees maximum P.E.P. Remember, a peak in response in or *out* of the voice range will limit maximum modulation and result in reduction of P.E.P. You do not have to talk with your lips on the mike. For best results, sit back and talk naturally.

Virtually indestructible Acoustalloy® diaphragm withstands high humidity, temperature extremes, corrosive effects of salt air and severe mechanical shock. Extra ruggedness means extra service, year after year.

MORE 664 FEATURES: Output—55 db. On-off switch (can be wired for relay control). 150 ohms or Hi-Z output selected at cable connector. Satin chromium finish. High-pressure die-cast case. Pop-proof filter plus magnetic shield. 90° swivel mounting. 18 ft. cable. 7 11/16 in. long (less stand coupler) by 1⅞ in. diameter. Net Weight 1 lb., 10 oz. Amateur Net, $51.00. Matching desk stand with DPDT switch. Model 419S, $9.00. Less switch. Model 419, $6.00.



MODEL 729SR

Lowest-Cost Ceramic Cardioid Available . . . Includes Every Feature Essential For SSB Operation. Flat, Smooth Response From 300 To 3,000 CPS!

Rugged enough for mobile operation, the slim, small Model 729 fits easily in your hand or slips into the desk stand or floor stand adapter provided, without any hardware adjustments. Hi-Z output -60 db. Two-tone grey, pressure die-cast and plastic construction. Shielded, 8½ ft. cable. 7¾ in. long by 1½ in. wide. Net weight 1 lb. Ceramic element unaffected by high heat, humidity. Model 729. Amateur net, $14.70. Model 729SR with relay-control switch. Amateur net, $15.90.

MODEL 951

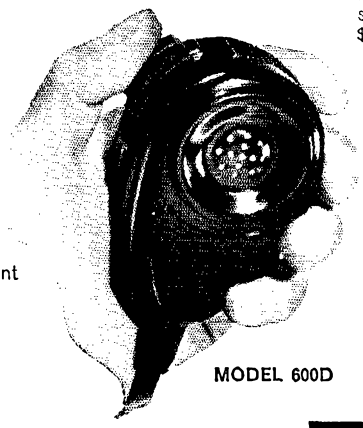
First True Crystal Cardioid With Variable-D Design. Combines High Output With Excellent Noise Rejection At Modest Cost!

Finest crystal microphone available for SSB. Variable-D design of Model 951 cuts room noise, interference from receiver speaker to a minimum. Allows greater working distance to microphone. Peak-free rising response for high intelligibility. Hi-Z output -60 db. High-pressure, die-cast finished in Metalustre grey. On-off switch. Shielded, 18 ft. cable. 5¾ in. long (less stand coupler) by 1¾ in. diameter. Net weight 1¼ lbs. Model 951 Amateur net, $32.70. Matching desk stand with DPDT switch. Model 418S, $9.00. Less switch. Model 418, $6.00.

The World's Finest Mobile Microphone. Model 600D Dynamic Widely Known As Military Types T-50 And M-105/U!

Designed for high articulation under rugged mobile conditions, the Model 600D provides all the advantages of a dynamic element with peak-free, flat response for maximum P.E.P.

High-impact case soaks up physical abuse, feels comfortable at any temperature, fits hand naturally. Extremely high output of -55 db. is ideal for mobile equipment with severe audio requirements. Available in 50, 250 ohms or Hi-Z. DPDT switch. 6 ft. coiled cord. Panel mounting bracket included. Model 600D Amateur net, $28.50.



MODEL 600D

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ON4IZ
PAØLU
YU4XZ
ZE2JH
4X4IM

• 112
K2CMN
W2JBL
W3BXG
W4YSY
K5BHV
W7JPC
W7KOF
K8BSZ
W8SDF
W9CBE
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OH2MB
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W1ORG
W1WF
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K2LBB
K2SQM
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W4DNE
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W5QIX
K5QNF
W9UTQ
KØEMK
KØMAS
VE7BW
DJ1QT
DJ2SR
DJ2XP
G3JJZ
HA5KAG
JZØHA
OK3KFE
OX3DL
SM5ATK
VE3AHU/ SU
UA9CL
UB5ND
UQ2AS
UR2AT
VK7LZ

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W1YU
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WA2EGK
WA2HUV
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G6YL
HB9TE
I1ZBS
LA6CF
PAØCF
SM5AIO
VQ2WR
YU1KA
ZB2I
6W8BF

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DM2AMG
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ON4IX
SP2LV
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UA9DT
UN1AB
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ZE5JU

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DJ2RE
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OK1ZL
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SM7AIA
YV1AD

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G3LKJ
G5FI
GC3LXK
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SM7BWZ
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UD6KAB
XZ2GM
ZL2IQ

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K5STL
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WØTDR
WØVHQ
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DL6TR
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G2CP
G3LCS
G3SD
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JAØAQ
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ZS6YB

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K4MOF
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W4ZM
W4ZMH
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W8PEI
W9YAE
WØECS
WØVKB
CR7DQ
DJ2EO
DLØBH
EP1AD
F8ZY
G2CZH
G3ANZ
G3CHJ
G3LHJ
G5JR
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JA1CB
KR6LP
LA8GF
OD5CN
OK1BI
PAØKZ
PI1MID
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SP2BE
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VS1FZ
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OK2OV
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• 102
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• 100
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VP9CX
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VE5RU
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OE3ME

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G3AAE
PY1AQT

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HB9NU

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• 205
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ZL1PV

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W3DPS
W9MKJ
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• 184
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WØGEK

• 183
W5JRF
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K8CFU

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K4SXO
W5HWX
W8NXF
W9JAV
DL1LH
DL1WP
I1ZCT
ZK1BS

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W2HQL
W2YBO
W8MXS
W9LTR

• 178
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DL7AB
OE1FF

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W4EEO
W6FHR

• 176
W2TVR
W4WSJ
W7AUS
K9ATZ
WØAIH/ VE3
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GI3NPP
ON4MS

• 175
W3EVW
YV5AIP

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W9JUV

• 173
W1ZW
W2SUC
F8XP
HB9EU
HK3LX

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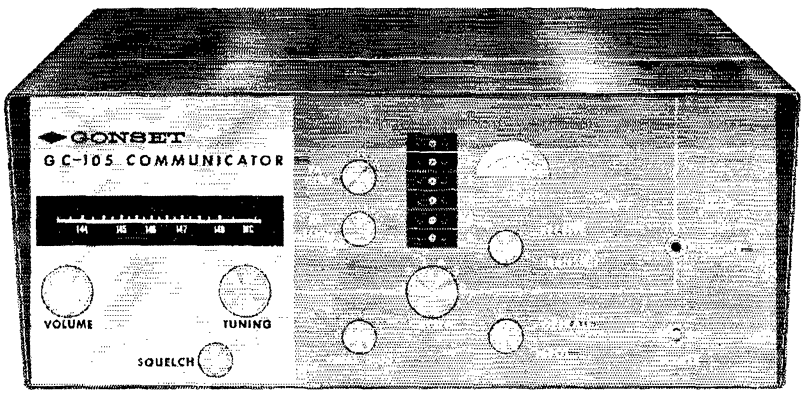
W1AUF
K2JFV
W2UTH
W5INL

(Continued on page 106)

Novices here it is! THE NEW GONSET "GOONEY BIRD" WITH MORE POWER AND VERSATILITY!



$239.50
Amateur Net

Famous for more than a generation, the new Gonset "Gooney Bird" sets even greater standards of performance. It provides a complete station, with transmitter, receiver and self-contained power supply, a new low silhouette for convenient under-dash mounting and push-to-talk. You get top performance at a moderate cost—plus built-in Gonset reliability.

The 2 meter Gonset GC-105 "Gooney Bird" offers these deluxe features:

Silicon diodes to save current drain • calibrated tunable receiver utilizes low-noise 6BZ8 RF tube in sensitive "Cascode" circuit • AVC is applied to avoid possibility of blocking by strong local signals • special gang-tuned circuits give high image rejection • dual purpose meter automatically switches from relative signal strength to relative output • increased modulation capabilities with high level clipping • all tunable circuits controlled from front panel • tune-up procedure simplified by use of broad-banded exciter stages • completely compatible with Gonset's new model 3357 VFO or 6 crystal positions available.

Input: 6/12 DC or 115 AC volt operation, power cables supplied
Output: 6 watts nominal
Dimensions: 6½" high, 15½" wide, 8" deep

See the all-new Gonset GC-105 at your Gonset Distributor NOW!

GONSET®

DIVISION OF YOUNG SPRING & WIRE CORPORATION

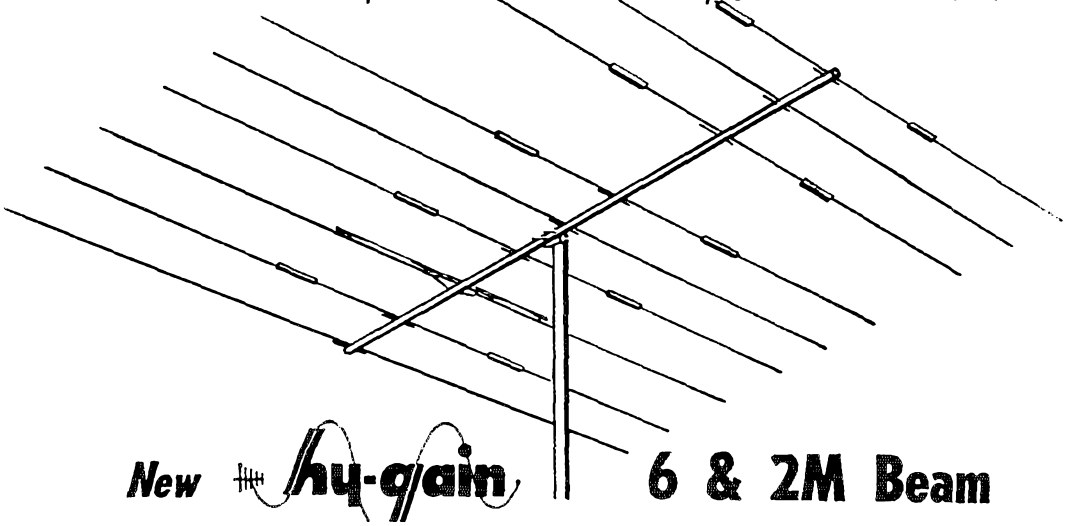
801 SOUTH MAIN STREET, BURBANK, CALIFORNIA

W5RHW	W2YYL	ZS6Z	•137	DL3BK	K1CLT	SP5XM
W7ZAS	W8UMR		W2DSU	DJ3CN	W8YBZ	VS4JT
W8WZ	PJ2AF	•148	W5FDZ	DJ3QX	WØUIM	ZE2JA
W9HPS	SM3AZI	K4CKZ	K6CQM	HI2LW	VE1NH	
VE1PQ		W5DA	HCHJ	SM5TR	VE3RE	•112
DL6EN	•159	DJ2BW	KG4AO	YS1JR	EA8BC	W1NVB
	K1CYF	GM3CIX		ZS6FU	F2MO	W3VXE
•171	F8SK	TI2OE	•136		HK4AQ	KL7BHE
W2RGV			K9EWL	•129	HR2MT	W8VVD
W3VSU	•158	•147	VE3BTI	W8GMF		WØGAI
W4BYU	W3JZY	W6SIA	DL1SD	WØEU	•120	VE7MD
W4VZU	W5ABY	W6TT	HAIJ	WØVBQ	W1QWU	DL1JW
W5URU	W9ICL	WØOBW		ZL3AB	W1SIO	LA1MB
K9ECE	TI2PI	VE1DR	•135	ZS6LW	K2IQP	
CT1MB	ZS6UR	VE3ES	W2NQR		W2MOF	•111
EA7EM		DJ3CP	CR6AU	•128	K2OEA	W1AW
G2AFQ	•157	SP8CK	F8SC	W2CGJ	W3PGB	W2ODO
	W2BRV		FS7RT	K3HN	W3YZI	K3COW
•170	K9COS	•146	OA4AO	K4EJO	W4HNW	W4GNT
W4BOC	EI3R	K2QXG	XE1CV	W8IJZ	W4SGD	W4YSY
W6CHY	F8SH	WØVAF	XW8AL	K9ALP	W5NXF	W5VWF
W9ZSZ	HIZFT	HIAM		W9LXW	W6EHN	W7LOC
DL6PC			•134	WØMAF	W8BXO	WØBMW
DL7EX	•156	•145	W1CUX	EA8CM	W9PVA	KØGZN
G2MI	W6TZD	W4ERO	K1ELS	F8PI	W9RKJ	KØMAS
VK2JZ	W9ZNY	W4NBV	W1PNR	G3HJJ	VE3BMB	WØMRJ
XE1SN		VE5GF	W3BNU	LA5ID	VE3DYB	WØYZQ
	•155	G3CCN	W8ONA		CE3WN	VE3BIF
•169	W1HGA		W9WCE	•127	F8SR	VE3CJ
K1EJO	W3JNM	•144	CT1JG	W1HRI	F9QP	VE3IR
W1LIB	K9LUI	W1QT	IT1SMO	W4VZB	OA4HK	DL1JV
W9UZC	VP6SD	K4STY	SM5DW	K8LSG	TI2IO	HA9OZ
HIRC		WØANF	9G1CW	DL1BS	ZS6AHW	HIEC
SM5RY	•154	G3NUY		HB9RB		SM5AQB
	K1SKI	YV5ANQ	•133	JA6AK	•119	VK3AXR
•167			W1AJV		K6AKS	YU2DB
W7WDM	•153	•143	K2MHC	•126	W6TNS	
VE2YU	K1DRN	W2BOK	K2ZNV	W3HUG	ZS2HX	•110
EA1GH	K5REU	W4YQB	K5GOT	W7YGN		W1ETF
OE2YL	W6HYG	W8GUZ	W9ABA	G4JZ	•118	WIMGP
VQ4KRL	W8GLK	WØLBB	W9BUJ		W1OKG	K2OPJ
	W9ILW	LA8LF	WØGAA	•125	K2BHP	W3LEZ
•166	KØMNO	ZS1DC	DJ3VM	W2QHH	W2DYC	W3OCU
W3KVB	VE3EHR		FB8BC	WØJFT	W3MVQ	W3TEC
W5RDA	F3KE	•142	IT1TAI	W9SD	W3OJW	K4ZAJ
WØPGI	F8SE	W1YXD		W9YHE	W3VQE	K6BX
F9IL	SM6SA	W3SW	•132	KØTJW	KL7PIV	K6IPV
YV5AFF		W5SFT	W2GRY	VE5JV	CE3AG	W7TGG
	•152	W7OEV	K4BCN	EA3IT	CT1GK	K8AEK
•165	W1OHJ	HITHZ	W4KKB	HITHR	LU8BAJ	W8TTN
K2FW	W2RTX	OQØPD	K5BJU	OQØDZ		W8VGQ
WØTJ	K4AJ	YV5AKP	W8SMQ	UR2RU	•117	W9IVU
VE7SB	K4LPW		VE3DMT	ZL2AHZ	W6NGA	WØAGX
DL3EA	W5KFT	•141	VE7KJ		W7GUV	VE1XY
G4JW	WØMCX	W3DYT	VK2OQ	•124	W9ZTD	VE5KG
	VE6NX	W4BBL		W1HR		CE3JE
•164	CX1AX	W4TWW	•131	W8HGA	•116	CN8EH
W2SKE	EA3GI	W9BVM	W3OGR	W8SAI	W1BFT	G3NRZ
SP7HX	EI6X	VE3BKL	W4LVV	WØBMQ	W1TYQ	HIRR
	IBRN	CX6BM	W6WNN	CX9AJ	W2DSB	KP4AVQ
•163		G3LVC	W6YK	G3MVV	W3HUV	PAØUC
W2LKW	•151	TG9AL	W7TMF	VR2AZ	K4EEH	YV5EF
W3BVL	W1GR	VQ1DX	W9DOR	VK5QR	HK3QV	
W3HCO	W3ALB		W9JEJ	ZL3IE	KT1EXO	•109
W3QMG	W5CE	•140	W9UMJ			W3ZBF
W4ASW	W7LVR	W1DBM	KØKKN	•123	•115	K1DSV
W8EKW	W8TJM	W1DGJ	VE2AFC	K4LTA	W2CCO	K6EWL
G3JNX	W8RVU	K2TAP	VE2WY	W5LTY	W4JFE	F8UM
G3KHE	K9EMG	W3ROA	CR7LU	W9CMC	W8NOH	G2DYV
	DL3RK	K4JQR	F9MD	K9CUY	VE3PV	HIBKK
•162	HIASO	W4UWC	G3JZK	W9GPI	G5OO	OZ4FA
W2QWS	HITBU	W6LHI	G5DJ	DJ3QC	HIYI	VP2DA
W2SNI	VK2DI	K9LTN	OD5AU	DL6EQ	HIZQ	YS1IM
W4DWN		WØAMR	OZ3TH	F9TV		
K4EHA	•150	WØDIB	OZ5JT	G3KKJ	•114	•108
W5PWW	W1WKO	KØRAL	PY4CH	SM5VS	W2RWE	W2GNQ
W8LAV	W1ZSU	WØSFU	PY6CN		KHIMX	K4OGT
K9EAB	K2QQQ	VE5LM		•122	K6EXO	K6DDO
W9FVU	W3BUX	CX1BY	•130	K1BEB	K8PUU	W9OYP
VE4WL	W3DJZ	DL9OH	K1BDP	W1WTF	K9GOQ	DL7HU
G3MCN	W3QD	F8VU	W1HOO	W2PEV	VE3CIO	F8BO
HICKV	K4HRG	HB9KU	K1JMV	W3LE	G5ZT	OQ5JW
	W4HRR	LU1DJU	W2ECQ	W4BQY	HIBLT	SM5UF
•161	W6BCQ		K2GSO	W4DLG	VK1RQ	ZS4UP
W1PMZ	W6TOT	•139	K2LGS	W4IUO	ZS2ND	
W1YDO	W8DUT	W1OHA	K2ZFH	W5LBI		•107
W3BIW	W8JXY	W4WM	W3AZQ	K6ERV	•113	W9TLF
W4DOU	W8OOH	CT1HF	W3QIR	W7UMJ	W1YQF	DJ3YL
W4MS	W9HMG	DL3VZ	W3UMU	W8ZNO	W3QZT	HI2ITA
W4RVL	CX2CN	G3NUG	W4PJG	W9WIO	W7GUI	KA2CB
K6MLS	F8MY		W4ZKM	VE3TW	WØZVM	KP4APW
G3JAF	ZS5PG	•138	W9CYL	F8WE	CE3RC	LU3BU
PY1FR	4X4GB	W2CPI	K9PPX	G3NAS	CX3CJ	TG9US
VR2BC		K2PIC	W9VTV	SP9RF	DJ3MM	
	•149	W9YRO	WØTGQ	ZS2AT	DL4AS	•106
•160	W7SFK	CN8EU	KØRDO		EA3HL	K6ZXW
W1FAB	WØYVV	CX2AY	VE1ADE	•121	EA7IR	W8BKO
W2HXG	HIBAF	HIKDZ	VE1OC	W2PTM	HIHU	OE6AI
W2WCY	YU1AG	OZ7BG	CE4BP	W2VAP	KR6HI	OH2RL

(Continued on page 110)

VHF DUOBANDER

4 ELEMENTS ON 6M, 18 ELEMENTS ON 2M, SINGLE FEED LINE



New hy-gain 6 & 2M Beam

The new hy-gain Model DB-62 is a single transmission line beam antenna system tor 6 and 2 meter operation. It is fed with 52 ohm coax transmission line and develops a forward gain of 8.0 db on 6 meters and 15.0 db on 2 meters.

The front to back ratio averages 15 to 20 db and SWR will remain below 1.5 to 1 on both bands.

The antenna is ruggedly constructed of 1¼" O.D. aluminum boom and 7/16" O.D. elements and is factory preassembled.

Net weight, 8.5 lbs.; boom length 10 ft.; longest element 10 ft.

Model DB-62 $32.95

HY-GAIN COMPLETE VHF LINE OF ANTENNAS

2 Meter, 5 Element. Model 25 is extremely light weight, factory pre-tuned and easy to assemble. Either coax or parallel fed. Beta match. Boom 5'4"; longest element 41-3/4". 9.0 db gain. Wt. 2 lbs. **$ 8.95**

2 Meter, 10 Element. Model 210 develops tremendous forward gain, excellent front to back. Can be rotated by any TV rotator. Coax or parallel fed. Boom 12'; longest element 41-3/4" Beta Match. 13.4 db gain. Wt. 5 lbs. **$14.95**

1¼ Meter, 11 Element. Pre-tuned folded ratio dipole for low loss 450 ohm open wire transmission lines with the Model 111. Optimum spacing and high Q element design. Boom 12'; longest element 27". 14.2 db gain. Wt. 4 lbs. **$13.95**

3/4 Meter, 13 Element. The Model 313 is specifically designed for 430 mc operation. Boom 8'; longest element 13-3/4". 16.1 db gain. Wt. 2¼ lbs. **$12.95**

hy-gain antenna products

Write for complete technical bulletin

1135 No. 22nd St.
Lincoln, Nebr.

Cesco • **Communication Products**

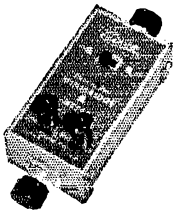
REFLECTOMETERS

CM-52, CM-75

Phase Unit CM-52-2 and Control CM-75-2

MINIBRIDGE

CM-52-2 and CM-75-2 Special



CL-52-72

STANDING WAVE REFLECTOMETERS

MODELS CM-52 AND CM-75

Employs mutual inductance and capacity coupling between linear conductors for continuous measurement of standing waves on transmission lines. For continuous line insertion 25 to 1,000 watts, at frequencies from 3 to 200 mc. Will operate on power input of 10 watts, 7 mc and up. Requires only five watts input, 25 mc and up. Line insertion loss, less than 1 db at 30 mc. Ideal for inserting into coax feed lines at antenna for visual reading in SWR while making antenna adjustments; SWR observed immediately, at all times, without adjustment of Reflectometer. No balancing adjustments, no reversing. Prevents false loading from antenna tuner, match box, pi network, etc. Reduces line reflection, making possible increased radiated power. Uses 0-100 μa meter calibrated directly in standing wave ratio and relative power. Each unit hand calibrated and perfectly balanced. Includes loading control and forward to reflected power reversing toggle switch. With 83-1R (SO-239) connectors at each end. Gray hammertone aluminum case, 3" w. x 2½" d. x 5¼" h. Shipped with key-type mounting on back and full instructions.

Cesco Model CM-52 (52-ohm coax line) or CM-75 (75-ohm coax line)—Net Each $29.95

Cesco Model CM-75 Equipped With UG-58U Connector—Net Each $34.95

MODELS CM-52-2 AND CM-75-2

Dual units identical electrically to CM-52 and CM-75 but built in two units for remote control. Comes with 10 ft. cable and plug wired to control and indicator unit. Either 52-ohm or 75-ohm phase unit may be used with control and indicator unit; permits purchasing second phase unit separately, when desired. Size, Control Unit, 3⅛" w. x 2½" x 2¾" with sloping panel; Phase Unit, 2¼" w. x 2¼" d. x 5¼" h.

Cesco Model CM-52-2 (52-ohm coax line) or CM-75-2 (75-ohm coax line)—Net Each $34.95

Cesco Model CM-75-2 Equipped With UG-58U Connector—Net Each $39.95

Cesco Model CM-52-2 or CM-75-2 Phase Unit—Less control unit. Net Each $12.95

Cesco Model CM-52-2 or CM-75-2 Special—Same as standard dual unit except with control panel for Collins grille or built-in installation. Net Each $34.95

MODEL CL-52-72 MINIBRIDGE

Resistive type unit for observing standing waves when adjusting antenna matching networks. For use on 52, 72 or 75 ohm coax lines and small amounts of RF excitation or grid dip oscillator. Requires use of external indicator, such as 0-100 μa meter (as in Simpson multi-meter). Hammertone gray aluminum case, 2½" w. x 1½" d. x 4¼" h. Complete with instructions, SWR graph and antenna tuning procedures.

Cesco Model CL-52-72—Net Each $12.95

MAKE IT A

MERRY

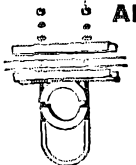
CHRISTMAS

WITH

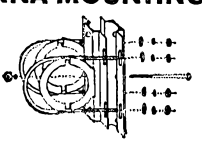
Cesco

COMMUNICATION ACCESSORIES

ANTENNA MOUNTING AND MATCHING ACCESSORIES, NOISE FILTERS



"Oxen Yoke"



Boom Mounting

Quad Mount

"OXEN YOKE" BEAM ANTENNA CLAMP

For element sizes ¾" to 1½" in diameter and booms 1½" to 3" in diameter. All components are completely interchangeable, permitting element and boom selection to your requirements. For continuous or cut elements at center; all channel lock assembly. Always specify element size and boom size when ordering. Net Each $2.29

UNIVERSAL BOOM MOUNTING

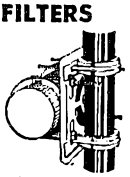
For boom sizes 1½" to 3" in diameter and 1½" or 1¼" masts. Complete mounting consists of two mast plates (1½" or 1¼"), two boom yokes, two "U" bolts. Specify mast and boom sizes when ordering. Net Each $5.95

QUAD MOUNT

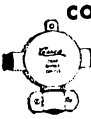
One-piece, durable, aluminum alloy cast spider for mounting quad arms to boom. Angle shaped spiders permit use of bamboo or aluminum tubing of 1" to 1¼" diameter. Clamp-type, 2" diameter hub can be adjusted after assembly. Boom drilling not required. Net Each $6.95

HEAVY DUTY UNIVERSAL BOOM MOUNTING

For water pipe or tubing mast, 2" to 3" O.D. All channel lock assembly. For single or stacked arrays. Consists of one mounting plate, four yokes and four "U" bolts. (Specify mast or pipe size when ordering.) Net.. $8.95



COAX DIPOLE DRI-FIT CONNECTOR



Ideal connector for dipole antennas. Completely moisture-proof, one-piece aluminum alloy construction. Handles power to maximum legal limits. Can be installed easily in a few minutes. For use with coaxial cables RG-8, RG-58, RG-11 or RG-59, or with 300-ohm twin lead. Has eye pull up for inverted V's. Weight, 2 oz. Net Each $2.95

GENERATOR NOISE FILTERS

Tunable filter for 6, 12 or 24 volt generators; stops noise in mobile gear caused by generator brushes. For aircraft, amateur, C-B and industrial mobile uses. Conservatively rated at 30 amps. Phenolic coil form, brass hardware and die cast mtg. bracket. Easily installed.

Cesco Model 3-30 (Standard, 3-30 mc) or **30-60** (High Frequency, 30-60 mc)—Net Each $2.95

Cesco Model 2-3 (Marine, 2-3 mc)—Net Each $5.95

448-61A

EXPORT DIVISION: Electronics Manufacturers Export Company, 127 Grace Street, Plainview, N. Y.

Amateur • Citizens Band • Industrial

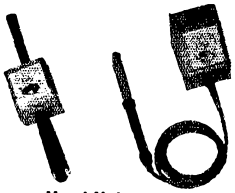
TRANSICHECK

CB-52-C

CB-52-S

FIELDOMETERS

Mobile Model MC



Hand Unit Model HCE — Lab LCE

ADAPTER

Multitester Adapter MCP

CITIZENS BAND TRANSICHEK

Test instrument, designed for use with Citizens' Band transmitters, checks transmitter power output and antenna efficiency. Can be used for resonating or tuning power output plate circuit and adjusting antenna loading capacitor to assure maximum output. Ideal for determining accuracy of 50-ohm coaxial transmission line match to the antenna. Under scale on meter indicates SWR, match or mismatch of transmission line to antenna; lower scale, graduated 1–5, indicates power output and permits observing output when adjusting antenna plate circuit and loading capacitor. Comes complete with drawings and information on applications and use. Hammertone finish, aluminum case 4⅛" h. x 2¼" w. x 1½" d.

Cesco Model CB-52-C—With coax connector. Net Each. **$19.95**
Cesco Model CB-52-S—Auto spade connector. Net Each **$18.95**

CESCO FIELDOMETERS

Wide spectrum, sensitive field strength analyzer and field measuring device works satisfactorily at 1 kc to 1000 mc radiated frequencies, without use of plug-in coils. Sensitive 0–100 μa meter withstands heavy shock without damage. Ultra-sensitive models also available. Shunt-type sensitivity control prevents off-scale readings or overload in strong fields.

MODEL MC FIELDOMETER

For mobile, amateur, police, aircraft and industrial uses. Ideal for tune-up. Indicates transmitted signal at all times. Has capacity wand, sensitivity control and μa meter. U-shaped mounting bracket fits dash at windshield rim or rear-view mirror. Pivoted case 3½" h. x 2¾" w. x 1¼" d. **$24.95**

Cesco Model MC—Net Each.....

MODELS HCE AND HCE-20 FIELDOMETERS

Portable hand unit of fixed-capacity type with 0–100 μa meter and sensitivity control on handle end. Capacity wand and components covered by screw-on 4¼" lg. plastic cover. Handle 4¼" long. Provision made for plug-in interchange for capacity wand to electrostatic, peak resonant broad-skirted wands (available on special order for any specified frequency). Case size same as Model MC. **$29.95**

Cesco Model HCE—Net Each.....
Cesco Model HCE-20—Same as above, but with ultra-sensitive 0–20 μa meter. Net Each..... **$44.95**

MODELS LCE AND LCE-20 FIELDOMETERS

Same as Model HCE, except designed for laboratory use. Indicator and sensitivity controls mount in portable, slanted meter case 3⅞" h. x 2⅞" w. x 2¾" d. Comes with corded probe four ft. long and capacity wand (convertable to electrostatic type with plug-in resonant wand available). **$29.95**

Cesco Model LCE—Net Each.....
Cesco Model LCE-20—Same as above, but with ultra-sensitive 0–20 μa meter. Net Each..... **$44.95**

MODEL MCP PROBE ADAPTER

Corded probe, capacitive-type adapter for use with any multitester with a basic movement of 0–50 or 0–100 μa. Meter must be brought to separate terminals (as found on Simpson Model 260 and similar types). **$12.95**

Cesco Model MCP—Net Each.....

PLUG-IN RESONANT WANDS

Available for any special, requested frequency. Broad skirted, peak resonant plug-in design. **$4.95**

***Cesco* Resonant Wand**—Specify frequency. Net Each....

CITIZENS BAND ANTENNAS AND ACCESSORIES

DUO-POLE GROUND PLANE ANTENNA

Delivers broad, equal, groundwave circular coverage for good communications even with low power output. Aircraft aluminum construction. Grounded quarter-wave foldback lightning safety factor. Adjustable element ring locks. Factory resonated at 27.085 or channel 11; works well over all channels with low VSWR, 1.2:1 or less. Special feedline terminals incloses in masting. Nominal base impedance, 52 ohms. Shipping carton only 68" long. Shipping Weight, 7½ lbs. **$29.97**

Cesco Duo-Pole Antenna—Net Each.....
Industrial Version, 25-175 mc, Also Available at Same Price.

C-B BEAM ANTENNAS

Factory pre-tuned beam antenna has exclusive Aeromatch for increased power output. Extruded aluminum tubing with 1¼" boom; elements have ½" dia. center sections, ⅝" dia. inserts. Elements mount either horizontally or vertically. Resonated at 27.085 mc; low SWR. Assemblies in minutes with permanently secured locking rings. Lightweight; will rotate with any TV rotator. Shipping carton only 86" long.

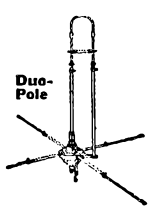
Cesco 3-Element Beam—Gain 7 db; boom 10' long. **$29.95** Shipping Weight, 8 lbs. Net Each.....
Cesco 4-Element Beam—Gain, 8 db; boom 15' long. **$39.95** Shipping Weight, 11 lbs. Net Each.....
Cesco 5-Element Beam—Gain, 9 db; boom 20' long. **$49.95** Shipping Weight, 13¼ lbs. Net Each.....

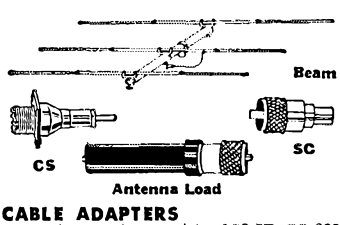
QUAD ARM KITS

Permits easy fabrication of durable, cubical quad antenna. Each arm has one 1¼" aluminum section with end swaged to 1" dia., plus one or two fiberglas telescoping sections. Stainless steel clamp holds fiberglas section to aluminum tube. Detailed instruction book supplied.

Cesco Model QB-2 Quad Arm Kit—With eight arms of one section aluminum tubing and one section fiberglas, each. **$59.95** Makes 10- and 15-meter quad antenna. Net Each.....
Cesco Model QB-3 Quad Arm Kit—Same, but with two sections of fiberglas per arm, and an epoxy resin kit for joining the fiberglas tubes. Makes 10-, 15-, and 20-meter quad or single 20-meter antenna. Net Each..... **$89.95**

SEE YOUR AMATEUR RADIO EQUIPMENT DISTRIBUTOR





CABLE ADAPTERS

Cesco Model CS—Permanent connector consists of 83-1R, SO-239 coaxial socket and auto radio type spade lug. One-piece construction. Net Each..... **$1.29**

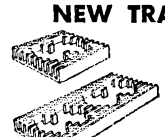
Cesco Model SC—Rugged, permanent adapter connects auto radio spade plug to coaxial socket 83-1R or SO-239. No floating pins. Net Each..... **$1.29**

PHANTOM ANTENNA LOAD

Non-inductive 52-ohm substitute antenna load has adequate power rating for any C-B transceiver in the 26–27 mc range. Ideal for testing and repairing citizens' band units. Also useable as a coaxial line terminator. **$1.49**

Cesco Phantom Antenna Load—Net Each.....

NEW TRANSISTOR HEAT SINKS



Unique method of production makes heat sinks from match plate, green sand aluminum castings which increase heat radiating efficiency with less heat sink area. Available in any size and shape by industrial specification. Circular types available for Motorola round transistors. **$1.25**

Cesco Std. 2-Cell Heat Sink—Net.
Cesco Std. 4-Cell Heat Sink—Net. **$1.95**

CONTINENTAL ELECTRONICS & SOUND COMPANY

6151 DAYTON LIBERTY ROAD — **DAYTON 18, OHIO**

OQ5FV	W6RLP	KR6JR	ZS1OE	VE3HB	W4FBZ	W9PAO
SM7BHF	W6UQQ	TG7JD	ZS1RV	HB9LF	K4ICW	KØEPE
VP6WD	KH6DLD	YV5AQS		KZ5LC	W4LJV	K9GVO
ZS5DW	W7GDS	ZC4SC	•101	OD5CT	K4MTG	KØRDP
	W9MBF		K1APQ	SM5WI	K4QWM	WØYZK
•105	VE3DCI	•102	K1INO	UQ2AN	K4SJU	VE3BSJ
W1BAB	VE6EN	K1IDW	W2GSC	VS1GQ	K4TFI	DJ2SP
W2UZF	DJ4YH	K1JNE	K2JDW	XE1JP	K4YUX	DJ2VZ
W3CLP	I1AFG	W1KVG	K2SHE	YV3DV	K4ZVA	DJ2XF
W4CGW	I1ZBS	K2GKU	W3COG	ZS6ADB	K5BHV	DL4GX
K4KTR	LA5LG	K2JMY	K4DRO	ZS6YB	K5CTR	DL6UV
W6DLY	OD5CC	K2YEL	W4ENQ		K5GOE	DL9MZ
K6HFZ	ON4WW	K4CWO	W4HOI	•100	W5LDH	EA3LA
K6UXV		W4EEU	W4NWT	K1AEY	K6HYY	EP2AG
W6VUW	•103	W4RGM	W5EFA	W1AF	W6NAT	F9KI
W7UPF	K1DPI	W5PVA	K5KYR	K1BDF	W7AQB	G5WO
W9QLX	W1ECK	W6WWQ	W5WAH	W1EJO	W7EEF	GB2SM
EI8P	K2JXY	KH6DLF	W6KUT	W1ICP	W7EUD	HS1B
DL9PV	K4PUS	K8DYX	W6NXP	W1SGA	W7QKU	JA1AAT
I1UZ	W8TTZ	K8PRA	KH6BXU	W1TBG	W8ACT	JA1BF
JA3EK	W8QHW	W8JWL	W7BOV	W1YPT	W8DJP	JA6CY
ZS6AIA	W9YMZ	WØKFA	W8QGT	W2JXH	W8DVY	KP4KD
	WØEXU	VO1BD	W8VAC	W2MAF	W8JDV	OE3NH
•104	VE5VZ	CT2AH	K9CRS	K2TDI	W8RWZ	OE6WF
W1OJR	CN8BB	DJ2IV	K9KKR	W2WJS	W9EYC	TI2RFT
K2RVL	CT1CC	GW3NMQ	K9LIX	K2YIY	W9FCV	UA9KOG
W3KDP	DJ3OJ	LA3SG	W9RH	W3ARR	W9IFJ	VQ2RB
W4AGE	DJ3WW	KR6QM	W9VNG	W3QEF	K9IUI	XE1UV
W4DNE	DL4VQ	OD5BZ	WØLBK	W3QLC	K4PFS	FQ8AE	OH3NY	KØTAJ	W3SCD	W9KFX	YV3BJ
K5AWR	G2HFC	ZL1HA	WØOBJ	W4EWI	K9KHG	ZS8I

Station Activities

(*Continued from page 93*)

Sun., TCPN 2nd call area on 3970 kc. at 1900. IPN on 3980 kc. at 1600, 2RN at 2345 and 0230 GMT on 3690 kc. The N.Y. State ARRL Convention sponsored by the Ningara Radio Club could have used more support by area hams, but the more than 300 who attended were impressed by the first-class job that was done on exhibits, program, arrangements and genuine hospitality extended to the delegates. The feature event was the presentation of a plaque to Clara Reger, W2RUF, by W1BUD for her selection as New York State's outstanding amateur. Clara has been mgr. of the NYS C.W. Net for more than a decade and her spirit and devotion to ham radio is well appreciated by all. K2KNV won the code-receiving contest. K2KLP the best QSL card, W2LF the "Grand Old Man" Award and the program included W1ICP, W2GB, WA2HPO, W2SAW, W2ICE, K2ITM, W2PFI, W2QY, W2UTH, W2OZR, W2LXE, K2HUK, W3YA and K2FG. K2AJY was convention chairman and his committee did an FB job. Don't miss the next one. Just returned from the Syracuse V.H.F. Roundup, which was the largest ever. There was over 600 in attendance including many VE3s, W1s, 3s, 4s, 8s, 9s and Øs. The tramps won the third and final leg on the W.N.Y. V.H.F. Cup. The gang includes W2ALL, K2CEH, K2HIT and W2QY. W2FEB advises that NYS C.W. is looking for outlets in all parts of the state. You are welcome to call in. K2PBU has been appointed OPS; WA2ILF and K2KWK OESs. W2MPM and WA2ANE received their NYSPTEN certificates. The RAGS had its family picnic with over 100 in attendance. W2VSP reports that every OM won a prize. Both the phone and c.w. section nets could use more outlets so they could deliver messages more conveniently. The best solution is to tie in with established v.h.f. nets or form v.h.f. nets for this purpose. We need volunteers who are willing to take traffic from the section nets and then pass it on v.h.f. nets. All interested individuals or groups, please contact the SCM. Late BPL congrats to K2GAO on June traffic (491). Traffic: (Sept.) W2OE 431, W2EZB 339, W2FEB 177, WA2CIG 150, K2QDT 147, K2SSX 121, WA2CRH 58, W2FCG 35, K2RTQ 35, K2OFU 33, WA2KQG 32, W2ZRC 29, W2PVI 27, W2RQF 24, K2RYH 15, K2KWK 14, K2PBU 14, W2QQK 12, K2EE 11, WA2KZQ 11, W2WS 8, K2HOH 7, WA2DAC 6, K2EQB 6, K2AFE 5, WA2MCC 5, W2PGA 5, K2BBJ 4, W2QCI 4, K2TDG 4, WA2KVN 3, WA2HEC 2, W2WUX 2. (June) K2GAO 491.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: KUN and NUG. The WPA Traffic Net meets Mon. through Fri. at 0000 GMT on 3585 kc. The Keystone Slow Speed Net (KSSN) meets 2330 GMT on 3585 kc. Mon. through Fri. The Indiana County ARC has been reorganized and new officers are K3HHI, pres.; FYU, vice-pres.; K3JDT, secy.; IYI, treas. The club meets the 1st and 3rd Tue. of each month. The Tri-State and Pittsburgh Semi-Annual Sideband Dinner at Monroeville was another

(*Continued on page 112*)

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success. K3CLX now is on 6 meters, KQD's daughter is now KN3QYV. The Steel City ARC reports via *Kilowatt Harmonics*: UUH has a new 15-meter beam; ZGI is attending the U. of Pittsburgh; JQJ is operating 6-meter mobile; GQJ is attending Wheeling College. K3s PCE and NHZ dropped the "N." Coke Center RC reports: K3JCM is building a quad antenna; QCP has a new 10-meter beam; K3HTR has a new 10-meter coax vertical. K3DKE is building a home-brew keyer. The Cumberland Valley ARC reports via *Valley QRM*: The club members with their mobiles aided the annual United Cerebral Palsy Campaign: W3s JKZ, ESV, ZQU, K3s BGH and MUF participated in the V.H.F. QSO Party as a club group. NEM has a new Johnson Ranger II. WRE and WRC attended the N.Y. State ARRL Convention at Buffalo. Lou was on the program and did an FB job. The Washington County ARC's new officers are UEN, pres.; K3DXV, vice-pres.; GYZ, secy.; NBR, treas.; and IDO, act. mgr. The Nittany ARC, through its "News-Letter," reports: W3s SYY, SLX and WFZ operated SYY/3 in the August World Wide V.H.F. Contest; the Centre County AREC group supplied communications between Black Moshannon Airport to University Park Airport for the Civil Air Patrol; K3OOP has her Technician Class license; during open house at HRB-Singer in State College, K3HKK displayed and operated two stations. W3s NER, NUF, NYD, RTV and WHA furnished communications for Verona Boro during Light Festival. QYG lost his beam in a recent wind storm. The Mercer County Radio Assn. has been reorganized with the following new officers: K3CFT, pres.; KWL, vice-pres.; CSA, secy.; K3IGO, program chairman. TVG and K3HOX headed the program of the Amateur Transmitters' Assn. of W. Pa. October meeting. The WPA and KSSN traffic group had a family picnic meeting at Parker Dam State Park in Clearfield County. K3KMO and W3MFB did a swell job making all the arrangements. The publication *Upchuck* was one of the outcomes of this gathering, being published by the Brasspounders Amateur Radio Fraternity under the supervision of SMV and K3KMO. Traffic: W3WRE 263, NEM 167, KUN 79, K3DKE 57, KMO 51, W3MFB 45, K3HKK 33, W3KQD 23, UGV 21, K3GQA 15, W3UHN 12, OEO 10, SMV 10, K3COT 5, CLX 4, W3GJY 2, NUG 2, K3HID 1.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME. SEC: PSP, RM: USR, PAM: RYU, EC of Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. MSG is the new QSL Bureau Manager of W9/K9-Land. He succeeds DSO, who is retiring after doing an FB job in managing the bureau for the past many years. QYW is the newly elected chairman of the W9-DXCC gang. The Argonne Radio Club has been approved as an American Radio Relay, Inc., affiliated club by the League's Executive Committee at its latest meeting. The Joliet Amateur Radio Club was very active and received many praises for its activity in helping to evacuate families when the Hickory Creek overflowed. We have received many announcements of various clubs holding code and theory classes. If you know of anyone interested in these, we suggest that the nearest radio club be contacted. K9OWQ has a new 35-ft. tower for his 6- and 2-meter antennas, and K9PBT is setting up a 75-ft. tower for a new 2-meter beam. K9KHZ is going s.s.b. with a Central Electronics 10B and a Johnson Valiant. K9OZM is c.w.ing with a new *QST*-described electronic keyer. K9ODL is the new club station of the Eisenhower High School Radio Club at Decatur. K9PKY of Moline, joined the ranks of the Silent Keys and this column sends our deepest sympathies to his family and friends. The Lane High School (Chicago) Student Council has furnished new radio equipment for the radio club's station. HOA, K9UWO and K9OSN are sporting new towers and beams. K9GCI is stationed in Germany with the call DL5DJ. The Rock Island AREC had mobiles out on a lot of bad traffic spots checking for the sheriff on Labor Day and received commendable write-ups from the press. RYU was the coordinator for this public service event. K9RHN's new QTH is Notre Dame University at South Bend. A new appointee is K9SLH as OO. The Joliet Amateur Radio Club has paid off its mortgage and is now debt-free after six years of hard work. GNU's new call is KZ. He was formerly 9KY many years ago. AHV shortly will leave W9-Land and join 7NGD to maintain the U.S. Forest Service radio gear. USR reports that the ILN had a traffic count of 454 messages in 23 sessions. The CAEN boys also had a traffic-passing of 45 messages for their initial new time. BPL awards go to K9OZM and USR. Traffic: (Sept.) K9OZM 654, W9USR 565, K9UGY 293, UOV 208, W9IDA 188, MAK 116, IMN 98, JXV 94, K9BTE 67, W9FAW 62, K9ZQT 57, OAD 44, CRT 31, W9EET 24, PRN 23, K9RAS 15, W9HPG 8,

(*Continued on page 114*)

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K9RHU 4, TVA 3, KHZ 2, QPA 2, W9SKR 2. (Aug.) K9UGY 505.

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SNQ. PAMs: K9GLL, MM and RVM. RMs: DGA, TT and VAY. Net skeds: IFN, 0800 daily and 1800 M-F on 3910 kc.; ISN (s.s.b.), 1930 daily on 3920 kc.; QIN (training), 1800 M-W-F on 3745 kc.; QIN, daily at 1900, and RFN, 0700 Sun. on 3656 kc. Hoosier V.H.F. Net information is available from K9GLL. New appointments: K9STH as EC for Laporte County, K9IQU as EC for Adams County and ENU as EC for Kosciusko County. This is my last report to the amateurs in the Indiana section and I wish to thank each one of you who made my work easier and my term of office a pleasant one. A very capable man, FWH, will have taken over by the time you read this and with your support Don will help you to keep Indiana on the top of the list. The new editor of the *Bison* is Judy Roales, RVM's daughter. K9IXD has resigned after several years of service. 8HXB has returned after ten years in the Buckeye State and has received his old call EQN. KN9FOG is making the QIN (training) and is working toward General Class. Listen on the frequencies used by the Indiana gang for information about the Hoosier "500" Award or send a stamped self-addressed envelope to K9MZV for complete rules. *Amateur radio exists as a hobby because of the service it renders.* Those making BPL: JOZ and K9RMI. Sept. Net reports: ISN 347, RFN 40, QIN 139, QIN (training) 20 Hoosier V.H.F. 126, IFN not reported. Traffic: (Sept.) W9JOZ 2914, ZYK 304, K9RMI 226, W9TT 189, VAY 179, K9OET 178, W9BUQ 152, BDG 109, SWD 97, K9IVG/9 90, W9QYQ 74, K9GLL 73, W9NZZ 73, W9GJS 53, RTH 38, K9OFG 37, HMC 36, ILK 35, HYV 33, WET 26, W9IMU 24, DOK 22, FWH 20, TQC 18, EJW 17, VYX 13, KN9FOG 12, W9DZC 11, EQN 11, K9JSI 11, W9YVS 10, K9LZN 8, W9CC 7, SNQ 7, BDP 6, K9CMG 6, DZW 6, W9YEW 5, K9ONY 3, QVT 3, IXD 2, TFJ 2, W9GUX 1. (Aug.) W9PMZ 14, K9TFJ 2, W9YDP 1.

WISCONSIN—SCM, George Woida, W9KQB—SEC: BCC. PAMs: NRP and NGT. RMs: VHP and VIK. A

(*Continued on page 118*)

WISCONSIN QSO PARTY

December 10, 1961

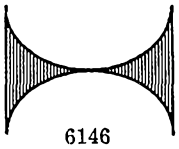
All Wisconsin amateurs are invited to take part in a QSO party, sponsored by the Milwaukee Radio Amateurs' Club in order to promote friendship and operating ability within the section.

Rules: 1) The party will begin at 1600 GMT and end at 2300 GMT Sunday, December 10. 2) All types of emission and all bands may be used, but a station may be worked only once regardless of mode or band. C.w.-to-phone operation is permitted but crossband work is not allowed. Stations are urged to work all bands from 2 through 160 meters to raise their scores. A station may compete on c.w. or phone or both, as desired. 3) The general call will be "CQ Wis." 4) Exchange consists of a QSO number, RS or RST report, county, operator's name and time of contact. 5) Logs should show times, station worked, signal reports sent and received, frequency, time emission, power input, QSO numbers sent and received, name, county. It is suggested that sheets from the ARRL Log Book be used for convenience and accuracy. Exchanges must be entered correctly. 6) *Scoring:* Count one point for such information received, for a maximum of two points per contact. Multiply the total contact points by the number of different Wisconsin counties worked for final score. Only contacts with other Wisconsin amateurs can be counted. 7) An engraved gold cup will be awarded to the highest scorer, regardless of whether that score has been made completely on c.w., phone, or is a composite of both. In addition, engraved gold cups will be awarded to the highest scorer in phone only, c.w. only, Novice and Mobile. Certificates will also be issued to 2nd and 3rd place winners in each category. These awards donated by local radio suppliers, will be presented at the Wausau Hamfest. 8) Send logs, postmarked not later than January 8, 1962, to Doug Pavek, W9FDX, 5776 N. Bel Aire Dr., Milwaukee 9, Wis.

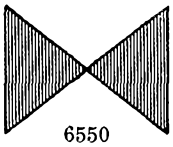
See how many Badgers you can work during the seven-hour contest period. Get on the air December 10 and meet the gang!

WHY 6550's IN THE 200V?

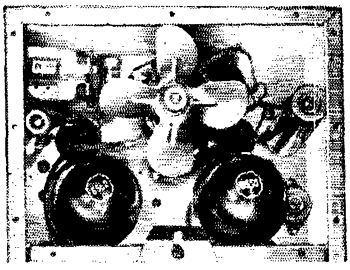
You have asked this question many times. The answer is because they are more linear than any other tube for a 100 watt output transmitter. The design objective for the 100V and 200V was to obtain 100 watts output before grid current flow. Many tube types were tried, and those that did not draw grid current prematurely suffered from excessive bias curvature. See typical patterns below: Bias curvature causes intermodulation distortion that tends to broaden the radiated signal.



6146



6550



Our observation is that most tubes primarily designed for Class C service make very poor linear amplifiers. It stands to reason that tubes designed for high fidelity audio applications will have the least amount of distortion when operating as a linear RF amplifier.

The 6550 has a CCS Plate dissipation of 35 watts, which is more than any other tube in it price class. More dissipation means more power output capability per dollar. It has short internal lead structure and a low loss base making it very suitable for Linear RF service, which was quite a surprise to the manufacturer.

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73 Wes

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Wes Schum, W9DYV

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S53A	67	SX62A	289
8R40	79	SX101	299
S107	74	SX101A	359
S85	92	HT18	47
S108	114	HT30	249
SX99	119	HT40	84
SX140	99	HT37	389
S76	114	HT32	459
SX110	132	HT32A	519
		SR34	419

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HQ170	279
HQ170C	284
HQ180	349
HQ180C	354
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NC303	359
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BPL certificate was issued to DYG. New appointees: K9SIZ and W9BCK as ECs; K9WIE as ORS; K9BSC as OBS; K9LWV as OES; LFK as OO Class IV. DPA new at Ridgeway, formerly was K1LYN at Fall River, Mass. OO GFL is teaching electronics at Green Bay Vocational School. 4VRD/9 reports a BC-610 is being used as a stand-by rig at YT. The Milwaukee Scout Club elected K9FPY as its new secretary. RQM and family, including son K9PQT, covered 6300 miles mobiling through the northern states and Canada operating phone and c.w. Equipment of the Shawano C.D. Club includes an Invader 2000 and a Communicator IV with linear for 2. QYW was elected chairman of the W9-DXCC for the 1961-62 season. K9GDF received his amateur extra-class license. K9s LWV and CJM are attending State College at Stevens Point and are active on 6 and 2 meters. RTP has resumed operations from Waterloo with a home-brew rig and an S-40A receiver. A complete new station at MWQ includes a Central Electronics 200V plus Courier and a Drake 2B receiver. Include your vote for the best *QST* article with your monthly reports. K9JVP has a new Apache rig. K9PQT has completed his 15-meter WAS. More stations will be welcomed by the Wisconsin Slow-Speed Net operating on 3535 kc. at 0030 GMT, Mon. through Fri. KQB handled traffic nightly for two weeks for the Army Reserve Unit dismantling the radar base at Two Rivers, to the home base at Cincinnati, Ohio, together with 8UPB. Director of the Great Lakes Division. Traffic: W9DYG 715, CXY 261, KQB 160, SAA 104, YT 60, K9SQV 37, GSC 33, W4VRD/9 32, K9WIE 28, W9NRP 23, MWQ 22, OTL 19, K9DOL 14, W9LFK 12, K9ZMI 11, W9APB 9, K9HDL 6, YDY 1. (Aug.) W9ZB 42.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: CAQ. PAM: KØTYY. Note the new appointments. Thanks to CDO, we have reports from the 160-Meter Goose River Net, which meets each Sun. at 9 A.M. CST on 1990 kc. August report: total check-ins 99; 2 formal and 7 informal messages handled. September report: 88 check-ins, 1 formal and 5 informal messages. The North Dakota 75-Meter Phone Net reports for September: 21 sessions, 456 total check-ins, maximum 36, minimum 6; 66 pieces of formal traffic, 52 informal with 20 relays. CAQ has finally gone s.s.b. with an HT-37. KØMHC also has an HT-37. Traffic: KØIVQ 127, ITP 41, KWY 25, RMS 22, WOCAQ 16, KØTYY 12, WØAQR 8, KØAYJ/Ø 8, GGI 8, WØHSC 8, KØTVI 8, WØMQA 6, KØKBV 4, WØOMA 4, YCL 4, KØALV 2, WØBHF 2, IHM 2.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: SCT. Section Net certificates have been awarded to WØs ACG, VTX and TLU and KØs YJF, ZBJ, KOY and UXC, who completed requirements of the evening 75-Meter AM Net. KØYVC worked all states in a recent sideband Contest. SCT announces the appointment of KØTNM as EC for Faulk and Potter Counties and of KØZBJ as EC for Coddington County. SIF has moved from Waubay to Fergus Falls, Minn. Endorsements: SCT as SEC and PAM; KØBMQ as RM and EC. KØVIZ traded his Ranger for an HT-37. KØVYY has boosted power with a new Viking 500. KNØHQD dropped the "N" with a Technician Class license. She has a new DX-35. PMA and VTX are operating with an electronic keyer. KØDUR has been appointed civil defense director for Douglas County. ZWL has reactivated her weather net for the winter. KØEEZ passed the General Class exam. Only 4 of 18 passed the code test in recent FCC examinations. Traffic: WØSCT 269, FJZ 18, KØKLH 11, DUR 8, TVJ 8, WØNWM 6, PMA 5, KØVVY 5, YJF 5, OFP 4, YVF 4, ACG 3, KØZBJ 3, BSW 2, WØNNX 2, RWM 2, KØTNM 2, YNS 2, RQY 1, TXW 1, ZQW 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles Marsh, ØALW. SEC: KØJYJ. PAMs: OPX and KØEPT. RMs: KLG and KØAKM. SEC KØJYJ spoke on emergency communications at the Lakefield Kiwanis Club. He states that C.D. Director TUS completed a radiological monitoring course in Michigan. KØAKM accepted the RM appointment for MJN. YAC is EC of the New Ulm Area, Brown County. ISJ, KØs MPG and OBP reside in Minneapolis and are attending the U. of M. NKB, U.S.N., got married while he was home on leave. KØURR has the Gonset 6-77A and 6-66B as his mobile station. WNØABU, of Lakefield, the newest MJN member has a Globe Chief transmitter and an SX-99 receiver. KØDZE also has a Globe Chief with an S-40B receiver. ORS VTG received his "Hunt The Hunters" Award. KØORK has a Collins 75A-3. KØOTH applied for ORS appointment, as did THY and KØAKM. Virginia, KØYMC, handled emergency traffic between Quito, Ecuador, and the Mayo Clinic. A nurse in Quito

(*Continued on page 120*)

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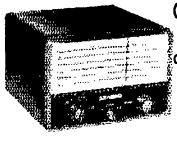

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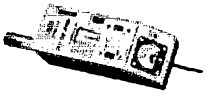

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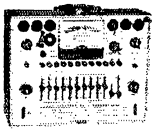

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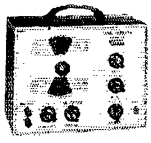

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had been bitten by a rabid monkey. KØKCJ went to work for E. F. Johnson. AGL and KØJXX have a son-in-law and daughter living in Germany. REA mobile members THY, YFH, QKJ, PML, LNE, MVF, OAV and WPK furnished communications for the Sports Car Club of America Races at the Metropolitan Stadium. MRC's *Splatter* has a new look that can well be the envy of all club bulletins. KØUWC has a new KWM-2 mobile with which he works DX. The Falls School Amateur Radio Club became affiliated with ARRL. KØVCC is the trustee for the club. We regret to inform you that 17-year-old KØCHW, of Detroit Lakes, was killed accidentally. OBSs WØs BUO, YAC and KØORK renewed their appointments. The following renewed OPS appointments: WMA, OPX, BUO, HEN, UMX and MNY. KLG and KØUKU renewed ORS appointments. Traffic: (Sept.) KØOTH 218, WØKJZ 196, KLG 125, HEN 92, KØAKM 65, QBI 65, WØUMX 57, YC 53, LST 51, KØPML 51, WØISJ 50, ALW 49, OPX 40, DQL 36, RIQ 27, KØJYJ 25, SNC 25, ORK 25, WØTHY 23, KØICG 22, VPJ 22, WØWMA 21, KØZKK 14, CJB 13, UKU 12, AYU 11, WØBUO 11, ATO 10, KØIZD 10, KYK 10, WØRQJ 10, SLD 8, KØSNG 5, WØFGP 4, KØGCH 4, IKU 4, WNØABU 3, KØISV 3, LHT 2. (Aug.) KØIKU 19.

DELTA DIVISION

ARKANSAS—SCM, Odia L. Musgrove, K5CIR—PAM: DYL. RM: K5TYW. Activity on the nets was up in September with three times as much traffic handled as in August. With all the National Guard and Reserve units being called up and the opening of Fort Chaffie, there probably will be a lot more in the months ahead. We should all make an effort to meet at least one of the traffic nets. RN5 meets on 3645 kc. at 1945, the OZK is on 3790 kc. at 1900 and the AEPN on 3885 kc. at 0600-0700 Mon.-Sat. The Fayetteville Club monitors 7280 kc. at 1200 to 1400 Mon.-Fri. for traffic. The SEARK Club elected MPV, pres.; K5CIX, vice-pres. CAM, secy.-treas. FVM is now stationed at Biloxi, Miss. K5CIR enlarged his shack so there would be more room, then the XYL moved her flowers and potted plants in, taking up most of the extra room. It is with deep regret that we announce the death of K5DLO, who was a member of the AEPN. Two new ECs are ADW and DRW. WN5AID has a new SX-110 and a DX-20. W5FVM has a new jr. operator. VQD set up his RTTY at the South Memphis Hamfest and gave the folks a good demonstration. Traffic: W5RYM 31, RIT 30, K5PMC 24, TYW 18, CIR 12, W5HPL 10, K5IPS 10, MEA 8, UEK 8, YMU 8, TQC 7, W5ZZY 6, K5ABE 5, W5ADW 5, K5GTN 5, W5DYL 4, ENP 4, TJH 2, K5YCM 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—Hurricane Carla gave the Ole Delta 75 Net a good workout. Net control and PAM GKT kept the net going throughout the big blow with a considerable exchange of traffic, especially when tornados associated with the hurricane developed and caused considerable damage throughout the state. K5ANK, K5RFG, WZR and others were net controls at different times. The New Orleans Hamfest was a great success and a good indication of what will be next year when the Delta Division Convention will be held in the big city. The supper-dance drew 125 persons with the hamfest attendance 750. K5BXX got his HT-32 going again after blowing a power transformer. JNV is about to get an HT-32 himself. K5BWZ is back at school and says there are 8 rigs and 5 mobiles on the campus. ACY busted out on sideband after a long silence. UQR made 112 contacts in 24 ARRL sections during the Sept. V.H.F. QSO Party. GHP is back on 40 meters after a lapse of 6 months. K5KLA and K5IFH gave K5QXV a birthday present by putting up a 75-meter inverted "V" for him. TKT is working all bands with his new v.f.o. K5LZA spent a lot of time during "Carla" on "WARN," a c.w. net operating nights on 7015 and days on 3795 kc. CEZ latched on to a CE-200V to join the s.s.b. boys. KN5GUR took the Conditional Class exam recently and is now sweating it out. HIIA participated actively at the N. O. Supper-Dance. K5RSG assisted K5JXH with antenna and rig difficulties. Active at Crowley C.D. Hq. during "Carla" were BAC, BMN and K5SNI. K5SNH and K5JRK maintained MARS and amateur contact with c.d. hq. The Delta Division Director as of Jan. 1, 1962 will be MUG. Congrats, Floyd. Traffic: W5CEZ 509, K5LZA 203, YHJ 88, W5MXQ 77, K5QXV 40, W5HIA 24, K5UYL 22, W5EA 6, K5BXX 5.

MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—The Jackson Club, headed up by K5GSY, put on a fine demonstration at the fair. Yours truly did a little operating portable from Little Mountain with the mobile rig. Also, I've got a rig on 2 meters. GWD reports from Virginia that he operates areo/mobile and is on 6

(Continued on page 122)

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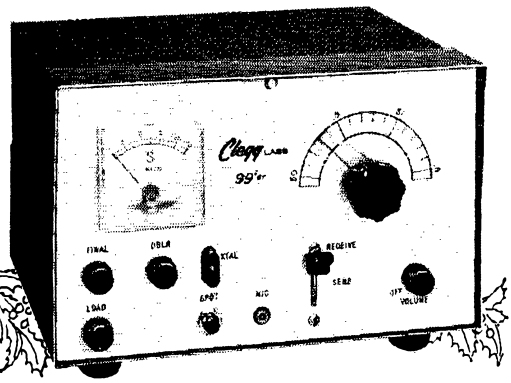

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meters occasionally. K5WSY is on from Corinth with a Viking and an SX-25. He will have 813s on soon. K5MDX made WAS during a recent sideband contest. 4WDR/5, with an Apache and an SB-10, and K5YSR report they handled traffic during Hurricane Carla. K5SQS is our new SEC. Let's pitch in and give Bill a hand and get the AREC in Mississippi going. CKY, K5JKH, PWW and RDA are new ORSs. K5RUO is back in college. Let us hear from you now and then, Ken. K5UBL reports he handled some traffic from the Laurel Fair. Traffic: K5RUO 185, QNE 108, WSY 78, W4WDR/5 23, K5MDX 5.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4OUK. RM: K4AKP. PAMs: W4UVP, W4PQP and W4VQE. W4VTS reports a picnic held with W4PJV and 17 members of the Tennessee Phone Net. W4OGG reports 20 new DX confirmations, making his total 50. The Delta Radio Club had 175 hams registered at its first hamfest. W4WBK says that transmitter hunts continue to be the major group activity for 10 and 6 meters in Memphis. K4VZL has added a cascode preamplifier to his 6-meter receiver. W4PFP is mobile, 80 through 6, with an Elmac AF-68, a PMR-8 and an M1070. New EC appointments are W4TYV, K4VIR and K4ZLC. Renewed EC: W4WBK. Reports received: ORS—K4AKP, W4VJ, W4TDW and W4TDZ; OO—W4TDW, K4RIN and W4TDZ; OES—W4YRM and K4KYL; nets—W4UVP, W4PQP and K4AKP; clubs—Chattanooga, Oak Ridge and Memphis, both Delta and Mid-South. Traffic: K4AKP 1414, W4PL 645, W4FX 179, W4PQP 83, W4VJ 80, W4UVP 73, W4OGG 60, W4TZG 40, W4PFP 34, K4AMC 25, W4UIO 16, W4JVM 7, K4LTA 6, W4TYV 6, K4VOP 4, W4TDZ 1, W4YRM 1.

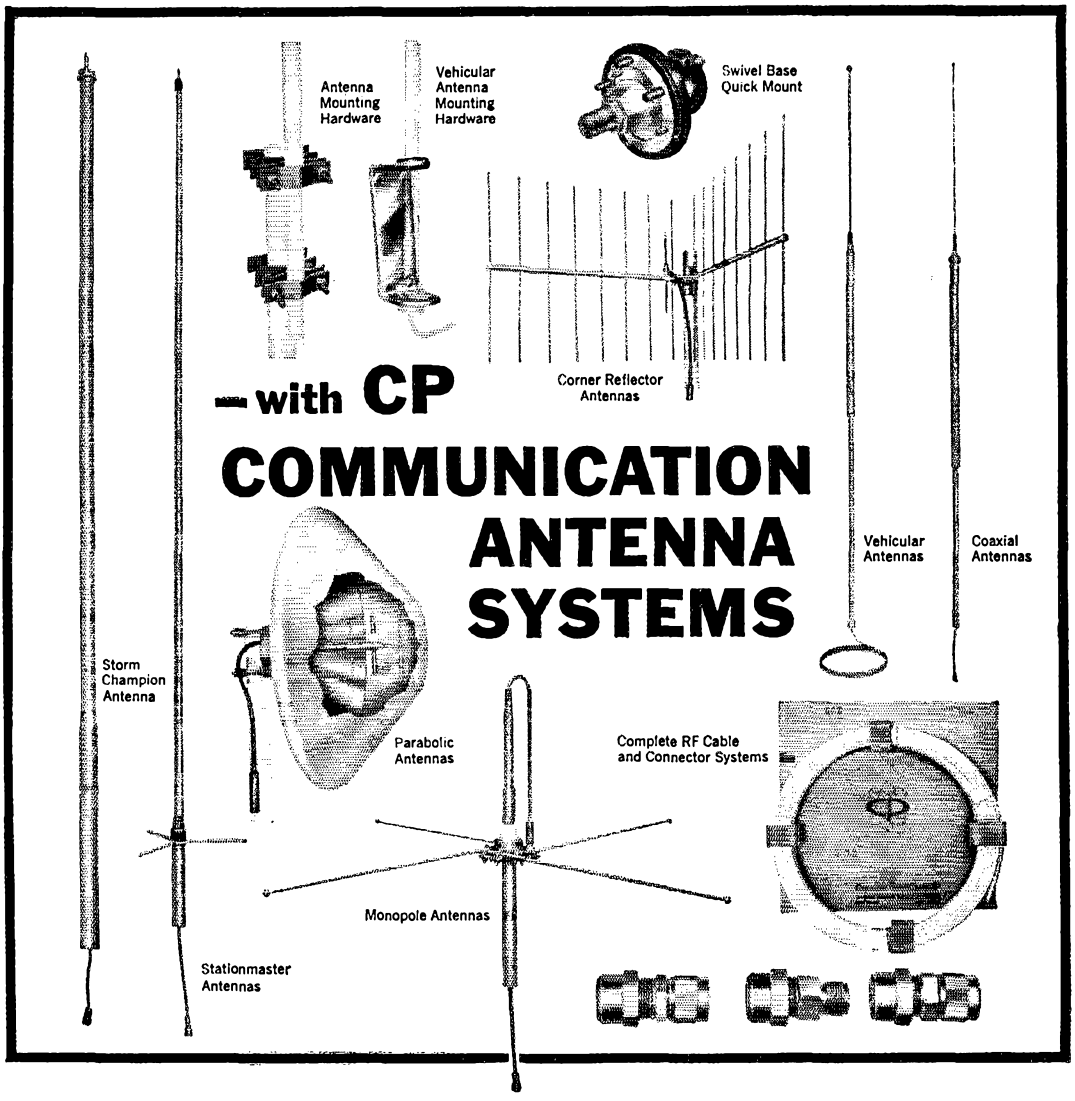
GREAT LAKES DIVISION

KENTUCKY—SCM, Elmer G. Leachman, W4BEW—Asst. SCM: W. C. Alcock, W4CDA. SEC: W4BAZ. PAM: W4SZB. RM: K4KWQ. V.H.F. PAM: K4LDA. Kentucky Novice Net: WN4AGH. New net certificates were issued to WA4AAS, K4NPZ, WN4AGF, WN4AGH and W4TRO. An OO certificate was issued to K4GSU. Welcome: Asst. SCM W4CDA made a short trip to the hospital. Before going Al visited the Wilderness Road ARC. PAM W4SZB says we need traffic on MKPM. Outlets in Paducah, Covington, Henderson, Frankfort and Bowling Green are needed. Push it, boys and girls, and come to the aid of your MKPN. How about those OSCAR teams. We need volunteers. Please contact your SCM. The Tri-State Amateur Radio Club of Ashland, Ky., has been reactivated with eighteen present. W4RHZ reports activity on 432 Mc. FB, Joe. The SCM likes your station activity reports by radio but mail by the 4th. WN4AGH reports KNN met 26 times with a traffic total of 39. Traffic: K4KWQ 146, W4BAZ 85, K4CSH 67, W4SZB 49, WN4AGH 33, W4RHZ 28, W4ZDB 28, W4MWX 26, K4VDO 25, W5CDA 24, K4TQZ 23, W4RHZ 20, W4YYI 16, K4OLT 14, W4RNF 13, W4BEW 11, W4KJP 8, K4TVC 6, W4SZL 5, W4JUI 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: ELR. RMs: SCW, EGI, QQO, FWQ and K8KMQ. PAMs: CQU, JTQ, V.H.F. PAMs: NOH and PT. Appointments: FWQ, ZHB, K8PYW and K8QLL as ORSs; K8KMQ as 8RN Asst. mgr. ECs are needed in 39 L.P. counties and in 12 U.P. counties. If interested, contact ELR, our SEC. The Grand Rapids 15th Annual Hamfest will be held Apr. 13/14, 1962, at the Pantlind Hotel. Mark your calendar. K8KMQ BPLs again. JX is back on the air. The Hillsdale ARC's *Newsletter* says that K8EZD has a new SX-101A. The Grand Rapids ARA *QRM* does not list a c.w. net. Is this a "trend"? New "Generals" are PCZ, K8s UPY, RQO, TLX, TDJ, VGZ and TYK. JYJ got a "new" Kennedy 110 receiver from K8IGQ and it works. MPD is back as OBS. The 12th Midwest YL Convention is set for Flint, May 1962. DTZ and K8UOU are writing a tech. electronics manual. K8ACQ and RTN chairmanned communications at the recent Buick Golf Tournament. RTN is starting a c.w. training net for message-handling. SPF, our former Great Lakes Division Director, is now Capt. John H. Brabb, USNR. The Saginaw Valley ARA did a great job at the county fair. K8YZO and K8SLK are building 150-watt transmitters. K7CPZ moved to Grand Ledge from Tucson. Several Lansing hams working 1296 Mc. with APX-6 rigs. OES reports were received on time from BAN, K8BGZ, NOH, K8PBA, PT and K8IFL. The Pictured Rocks RC elected K8PMD, pres.; ZDF, vice-pres.; KN8YXG, secy.-treas. Lightning damaged K8PSV's transmitter. K8QLL does OK as NCS. The Jackson Co. V.H.F. Club had ten mobiles out after a recent storm. K8GOU reports excellent OBS cooperation from the Wolverine S.S.B. Net. K8GJD works KV4AA with 2 watts. K8NHC got DUF, W. Conn. and WWCNY certificates. K8VRF, in Ontonagon is using a Ranger. The Wayne State Univ. RC elected K8HKE,

(Continued on page 124)

Certified Performance



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pres.; GKH, vice-pres.; K8LOS, secy.; K8PCP, treas. K8LZF now is on 144 Mc. K8VRF is active in the UP Net. Traffic: (Sept.) K8KMQ 240. W8OCC 141, JTQ 72, ELW 71, K8HLR 68, W8DSE 67, FWQ 62, K8EXE 58, QLL 58, W8PBO 56, AUD 44, K8IUZ 44, W8RTN 44, EU 42, EOI 41, FX 37, NOH 36, HKT 29, DSW 28, WQH 23, K8KIT 20, W8MPD 19, K8PYW 16, W8AHV 13, K8MEG 13, W8EGI 11, K8GOU 9, LZF 8, GJD 6, W8ILP 5, K8NHC 4, W8SCW 2, K8VRF 2, W8QQO 1. (Aug.) W8CQU 19.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE, SEC: HNP, RMs: BZX, DAE, VTP and K8ONQ, PAM: K8KSN, EFB and WRH received their WOLA certificates. Appointments made in September were K8s JIC and ONQ as OOs, K8PJH as OBS and K8KSN as PAM. Those who made BPL in September were DAE and UPH. The *Feedline* of the Canton ARC is another piece of art with 15 sepia pictures taken at a recent club picnic and states that KH, GAW and RNL are in the hospital: ex-MWL, now K4KXP, visited; K8PME is a new ham with a new Drake 2-B; K8BYC is mobile with a Johnson Messenger; K8KXP has TA-36; K8LBZ has a TA-33 and an HQ-170C; K8SWE has a TC-99; the club's 1962 officers are YAB, pres.; K8MZS, vice-pres.; OYV, secy.-treas.; and ADQ, HR, IKM, K8s AHI, LBZ and MZT trustees; the stork brought OHP a baby boy. Your Great Lakes Director, UPB, and your SCM attended the Findlay Hamfest where total attendance numbered about 1100 with more than 700 licensed amateurs. 220 women registered of which 44 were licensed and there were 30 Buckeye Belles with K8s PBE and WFF each winning an AF-68. K8OEX is in the Navy. Warren ARA's *Q-Match* informs us that its hamfests have grown from 30 ham registrations in 1958 to 330 in 1961, and $155.78 was cleared. The Seneca RC held a 2-meter transmitter hunt and saw color slides of *The Story of DX*. Dayton ARA's *R-F Carrier* informs us the members heard a talk about Space Communications and GIX spoke on Oscilloscopes, how they work and how to use them; HCD, LLT, MCS, NEE and WYL are operating on RTTY; K8MYJ was in the hospital. The Inter-City RC relates that ZJY was called to active duty in the Navy; K8MFZ is on 220 Mc.; ex-WXV, now K5WXZ, visited; K8GSQ is home after spending the winter in Florida; KN8CZL is a new Novice; HTO was in the hospital and K8s JPF and KRH have returned to college. K8s IQB, JSQ and RHC have new HT-37s. K8JXI has a new G-76. Springfield ARA's *Q-5* says that K8WQE underwent an operation; K8TPX has a new Finco 6&2 beam and the club elected its 1962 officers. Parma RC's *PRC Bulletin* informs us an auction was held; K8DHX vacationed in New England; K8TAU joined the Navy; the club has started its code and theory classes. LZE spoke on ham radio to the Fireside Club. The wind blew down all of K8RYU's antennas. Toledo's *Ham Shack Gossip* names Dorothy, K8WDZ, as its Ham of the Month; the stork brought a baby boy to K8CJS; Oregon City ARC's 1962 officers are K8LCW, pres.; K8LFM, vice-pres.; K8KGL, treas.; K8RSR, secy.; and K8VVV, chaplain; K8RYV received his General Class license; K8RSU has a new tower and 6-meter beam; K8LCW spent over a week in Florida; the club members were guests at the WTOL transmitter. The OH-KY-IN V.H.F. Society's *Q-Fiver* says that DQK spoke on building and testing receivers; K8s YVC and YVD mobiled through Arizona, New Mexico, Oklahoma and Texas; K8s SNU and VWA are mobile on 6 meters. Findlay RC's *The W8ET News* and the Greater Cincinnati ARA's *The Mike and Key* were received. Your Great Lakes Director, UPB, and your SCM attended the Cincinnati Stag Hamfest where about 1450 were in attendance on a hot and beautiful day. IJL won an SX-115 and K9SHG a Gonset Communicator IV. A new amateur radio association was founded in Cleveland called AREA (Amateur Radio Editors Association) with its purpose to aid the editors of ham radio club papers, to encourage radio amateurs to write and talk about their hobby, to promote better public relations between the amateurs and the general public. Its officers are AEU, pres.; BAH, executive vice-pres.; secy.-treas.; and MBI, K8NCY, W3KPJ, CTZ and WE as trustees. BAH is editor of *Ham Antenna* in Cleveland's largest newspaper the *Cleveland Plain Dealer* and I offer to lend my clipping to any Ohio club or amateur who believes he can interest his local newspaper in publishing articles on amateur radio. Traffic: (Sept.) W8UPH 999, DAE 719, K8SQK 168, W8BZX 120, K8BDZ 96, ONQ 95, AAG 61, BNL 50, RYU 46, W8CXM 32, K8RUC 29, W8LZE 20, K8MTI 18, W8AL 17, K8KSN 12, VKK 12, W8IBX 11, K8EJI 10, LUP 10, PFN 10, DDG 7, RXD 4, W8EEQ 1. (Aug.) K8PBZ 27, MTI 20, W8TXI 2, K8VIX 2, WLP 1.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy,

(*Continued on page 126*)

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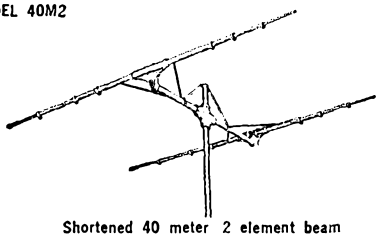

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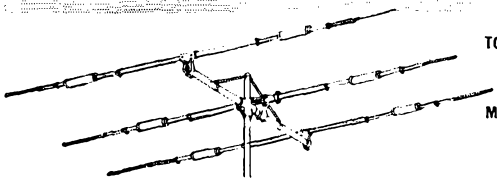

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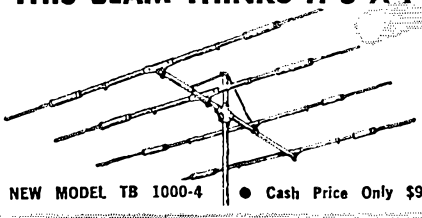

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W2EFU—SEC: W2KGC. RMs: W2PHX and K2QJL. PAM: W2IJG. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; ESS on 3590 kc. at 1800; MHT (Novice) on 3615 kc. Sat. at 1300. Appointments: WA2QEQ and K2IES as ECs; K2YJL as OO; W2THE as ORS and WA2MID as OPS. Endorsements: K2HNW as EC and OPS; W2HO and K2SJN as ECs; WA2BAH as OES. W2SZ, the RPI Club, has moved into a new building and is conducting classes for all amateur licenses. The club numbers about 25 members. K2YDO visited son K2YDD in school at Grand Rapids, Mich. K2BGU is using a 5894 final, a 6AJ4 grounded-grid converter and an eleven-element beam on 220 Mc. The Schenectady Club had a guest speaker from Sprague on "capacitors." W2ZEL/8 reports on v.h.f. activity while attending Ohio State for graduate work. K2KLD is a freshman at Notre Dame. Old-timer W2QFR is a new resident of New Rochelle. Marge, K2VXS, secy. of the Columbia University Radio Club, is on 2 meters from Mt. Vernon. WA2DST and WA2JZH are New Rochelle delegates to the Hudson Amateur Radio Council. K2SJN is alternate delegate and council director. WA2OCA is the proud possessor of a new WAS certificate. The Westchester ARA held "open house" Sept. 14 and formulated plans for increased membership and activities. Brothers at Graymoor Monastery in Garrison, WA2PCM, WA2UMG, WA2TCA and WV2RRK, entertained local hams at a picnic Sept. 30 at Graymoor. W2VP reports a new Valiant on 75 meters. K2SFY is the new N. Y. State MARS Director. WA2DAP has returned to Indiana Tech. All-band mobile (2 through 160) with Elmac is installed by K2EHI. K2OUA reports 992 points on 6 meters only during the Sept. V.H.F. Party. K2IMI was hostess at a picnic of ESS net members at Indian Lake Sept. 16. Traffic: (Sept.) WA2HGB 211, W2EFU 182, WA2ALO 128, WA2KUS 88, W2PKY 50, K2SJN 50, WA2HLH 38, WA2MID 37, K2EIU 30, K2TXP 21, K2EHI 19, K2HNW 14, W2URP 14, WA2ATC 5, K2YJL 5, K2CVG 4, K2OUA 4. (Aug.) WA2KUS 40.

NEW YORK CITY AND LONG ISLAND—SCM, George V. Cooke, jr., W2OBU—SEC: W2ADO. RM: K2UFT. PAM: W2UGF. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0015 GMT nightly; NLI (late), 3630 kc. at 0345 GMT nightly; NYC-LIPN, 3908 kc. at 2230 GMT nightly; V.H.F. Traffic Net, 145.8 Mc. at 0100 GMT Tue.-Wed.-Thurs. This column again has been written by W2TUK, pinch-hitting for the rapidly-recovering W2OBU. As you read these lines, George undoubtedly is back at the helm. He sends along many thanks for the many cards, letters and messages received during his hospitalization. BPL cards were earned by K2UAT, K2UBG, WA2GPT, W2GKZ, W2EW and K2CMJ, the latter three on originations plus deliveries. Please note that NLI now meets at 0015 GMT on all evenings. K2UBG has added a BC-221 frequency meter for OO work. K2QBW reports from M.I.T., where he will be working portable on 2 meters. Hurricane Esther took her toll of skyhooks, according to many reports. WA2TVJ has been appointed Asst. EC for the Queens 6-meter AREC which meets on 50.25 Mc. at 0100 GMT Thurs. WA2QJU reports that the Q5 Traffic Net now meets daily at 2100 GMT on 3935 kc. A Viking 6N2 and v.f.o. have replaced the home-brew rig at K2PQY. New officers of the ARS of City College, W2HJ, are W2PVQ, pres.; WA2DGW, vice-pres.; and WA2MUG, secy.-treas. W2PVQ is looking for anyone interested in 6-meter facsimile work. Ex-K2RHN now signs W2BVE from Ohio and is looking for the NYC-LI gang on 75 meters. A new DX-100 and tri-band dipole are in use at WA2BJK. WA2GJT has completed a 6-meter s.s.b. mixer and kw. linear. WA2LJT plans on assisting in Project OSCAR. In the meantime, Doc snagged 10 states on 144 Mc. with a Communicator I. WA2NWG, attending Columbia U., W2AEE, inquires if there is interest in a city-wide 10-meter traffic net. Traffic is now handled actively on most of our amateur bands except 10, 15 and 20. Ten sounds as if it might work fine. How about it? W2MDM is installing s.s.b. gear. It is with deep regret that I report the membership of K2PWH in Silent Keys. Frank, a personal friend, will be sincerely missed by his many fellow amateurs. WA2CZG is member Nr. 309 of the Certificate Hunters' Club. Officers of the newly-formed South Shore Amateur Wireless Assn. are K2VGR, pres.; K2UFT, vice-pres.; WA2VDZ, secy.; and K2UAT, treas. A 75A-4 is now in use at K2TAQ. Bud also added Ameco nuvistor converters for 6, 2 and 1¼ meters. K2JYZ has been elected YLRL "veep" for 1962, while her son, K2UNO, is "veep" of the Freeport HSRC. The Hicksville HSRC, WA2SCF, is now on the air with a DX-100 and an S-108. Club officers are WA2EER, pres.; WA2KSM, vice-pres.; WA2HKR, secy.; and WA2PCP, treas. W2HQL reports that he now signs WA6TGY from San Jose. New officers of the Mid-Island Six-Meter Net are WA2EQK, net control; WA2HCP and WA2NHL, alternates; K2YMV, secy-treas.; and WA2DUZ, act. mgr. Two-meter 417A preamps have been added at

(*Continued on page 128*)

The ideal Christmas gift for any ham

(or for his xyl!)

Season's Greetings

from the people
who make the

DRAKE 2-B RECEIVER

R. L. DRAKE COMPANY
Miamisburg, Ohio

W8CYE	*"Bob" Drake*
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KN8CPT	*"Ken" Porter*
W8VST	*"Vic" Blackwell*
KN8VHO	*Mary Townsend*
K8YDO	*"Milt" Sullivan*
W8NUQ	*"Jim" Waits*
KN8UIO	*"Pete" Drake*
K8HYD	*"Jim" Kittel*
KN8ZZL	*"Herb" Meyer*

K2SVY and WA2KSP. WA2OZV reports that a new club, the Bronx Union Y-Radio Club, is in the formative stages. Interested persons are urged to contact the program director, Bronx Union MCA. W2SEU is looking for 220-Mc. contacts on his week-end visits home from the Air Force. The very best of Season's Greetings from W2OBU and W2TUK. Traffic: (Sept.) K2UAT 846, K2UBG 684, WA2GPT 624, W2GKZ 317, W2EW 223, WA2BWO 207, K2CMJ 164, WA2EFN 148, K2UFT 131, WA2NWG 124, WA2NCE 106, WA2QAT 45, K2QBW 38, K2THY 28, W2EC 17, WA2NFI 2 15, W2LGK 9, WA2CZG 6, K2YQK 6, WA2QJU 5, K2UYW 5, WA2IKL 4, K2PQY 2, K2PHF 1, WA2RAS 1. (Aug.) WA2NCE 198, WA2NWG 109, K2PHF 44, W2DUS 30, K2QBW 26, W2EC 9.

NORTHERN NEW JERSEY—SCM, J. Sparks Remeczky, K2MFF—SEC: WA2APY. RM: K2VNL. PAM: K2SLG. V.H.F. PAM: K2KVR. Section nets: NJN daily at 0000 GMT on 3695 kc., NJPN Mon. through Sat. at 2300 GMT and Sun. at 1400 GMT on 3900 kc., N.J. 6 & 2 at 0400 GMT Thurs. and Sun. on 51.15 Mc. and at 0300 GMT Wed. and Sun. on 147.75 Mc. The NJN reports 31 sessions, attendance 386 and traffic 268. The NJPN reports 30 sessions, attendance 578 and traffic 112. The N.J. 6 & 2 Nets report 29 sessions, attendance 178 and traffic 28. New appointments: WA2BDP as OBS; WA2BNF as EC; K2HFL, WA2OLZ, WA2UGQ and WA2IGQ as OESs. K2RHN moved to Ohio and his new call is W8BVE. W2TKZ received his Extra Class license. W2COT and W2FBR and their XYLs spent two weeks at Cape Cod, Mass. W2GFR is now mobile in his new Volkswagen. The South Amboy ARA has become an ARRL affiliate. The new officers of the Tri-County RA are K2TOU, pres.; W2HDT, vice-pres.; W2FCC, secy.; WA2MTT, treas.; and W2HIA, W2HNY, W2AZL, W2LI, W2PIX, trustees. WA2GXT presented her OM, WA2GXS, with a new harmonic. WA2HRP received the WAS Award. K2AGJ has a new 30LI linear but can't put in on the air until she gets a separate a.c. line installed for it. WA2KKH received his CP-30. Your SCM received the Keystone Award. WA2BDP had his OES appointment endorsed. WA2HFI now has 5 elements on 220 Mc. and 32 elements on 144 Mc. WA2UGQ is using a water tower to give him a "backfire" antenna. The Columbia High School Electronics Club is having trouble convincing the hi-fi-enthusiasts that r.f. is more interesting than a.f. WA2CCF earned a BPL card for September traffic. The lack of club bulletins and news is reaching new highs. Club bulletins are forwarded to the *Newark Sunday News* for possible use in its ham column after your SCM is finished with them. So, let's go, gang! WA2OQP received his General Class license. New Novices in the South Amboy Area are WV2TKD, WV2UON, WV2UQB and WV2UUY. Our Section and NYC-LI note with sorrow the loss of an ARRL Member dating from '17—Mr. Wm. G. Mayer, W2NF. Traffic: (Sept.) K2UCY 186, WA2CCF 165, K2VNL 146, WA2JHQ 121, WA2APY 116, W2QNL 87, WA2EDG 83, WA2KKH 39, K2JTU 30, WA2OVK 30, WA2EQO 27, WA2IGQ 25, K2MFF 19, W2CFB 10, K2EQP 10, W2BVE 8, K2HFL 6, K2AGJ 4, W2EWZ 2, K2ZFI 2, WA2HRP 1. (Aug.) WA2APY 66.

MIDWEST DIVISION

IOWA—SCM, Dennis Burke, WØNTB—SEC: KØEXN—PAM: PZO. RM: DUA. SCA is feeling better again and is back in traffic. LCX has resigned as manager of TEN. DUA is taking Red's spot. Our sympathy to EEG who lost his mother recently. KØSVJ has gone high power on s.s.b. GQ, our Vice-Director, is vacationing in Canada where the fish are big and ferocious. KØZQT has a new tower. QVZ lost his tower and beam in the tornado. All members of the section sympathize with BDR in his great loss. PFP is our new OES and is glad to talk v.h.f. with anyone. Belle Plaine hams are organizing a club and have a fine group to start with. WNØAJJ and WNØAAO are new in this area. KØEXN, our SEC, is mighty busy. Here are his new ECs: KØGTC Cass, KØVHR (aYL), Shelby, KØSCW Clinton, KØRUF Franklin, KØVBM N.W. Iowa, KØBRE S.E. Iowa, KØIQV Jefferson and Van Buren, KØTBO Cherokee, KØDQC Poweshiek. The Iowa 160-meter boys are at it again. The Iowa 75-Meter Phone Net reports for Sept.: QNI 1429, QTC 347, sessions 26, average 13.35. Traffic: (Sept.) WØSCA 1841, LGG 1668, BDR 1034, PZO 629, DUA 482, CZ 253, KØVKT/Ø 150, WØNTB 93, LJW 58, KØBND 39, WVK 23, WØJDV 16, KØAFG 14, WUR/Ø 14, HBD 9, IHC 9, VSV 9, WØYDV 7, KØYLN 6, EVC 5, QKD 5, WØUHO 5, KØMYU 4, WØQVZ 4, KØRFT 3, EXN/Ø 2. (Aug.) KØEVC 6.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: KØIZM. RM: QGG. PAM: KØEFL. V.H.F. PAM: HAJ. Nets: KPN, 3920 kc. Mon.-Wed.-Fri. at 1245Z, Sun. at 1400Z. NCSs KØQKS, FHU, IFR, ORB;

(*Continued on page 130*)

FOUR BEAM PENTODES FOR S.S.B.

What are your plans for single-sideband? Going to build a new rig or just up-date the one you now have? Either way, you'll find a Penta beam pentode to do the job . . . from less than 200 watts input right on up to the legal limit. Both amateurs and equipment manufacturers have learned that for minimum distortion, better linearity, and greater output, Penta pentodes are superior—not just in theory, but in actual, on-the-air operation.

The key to the superior performance of the 75-watt PL-177A, the 125-watt PL-4E27A, the 400-watt PL-175A, and the 1000-watt PL-172, is the suppressor grid. The longer plate voltage swing which can be obtained at a given screen voltage is the direct result of the electron beaming due to use of the suppressor, and leads to increased efficiency and output.

If you're buying a new transmitter or amplifier rather than building, look for Penta tubes in the equipment you buy.

Write for data sheets for any or all of these well designed, rugged Penta pentodes. Ask, also, for your free copy of "Transmitting Tubes for Linear Amplifier Service," which explains in detail why pentodes are your logical choice for single-sideband use.

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PL-177A	6.0	3.3	75	96W	140W	210W	—	—
PL-4E27A	5.0	7.5	125	—	—	220W	280W	—
PL-175A	5.0	14.5	400	—	—	445W	570W	680W
PL-172	6.0	7.8	1000	—	—	1040W	1260W	1590W

*Actual power output delivered to load from typical amplifier.

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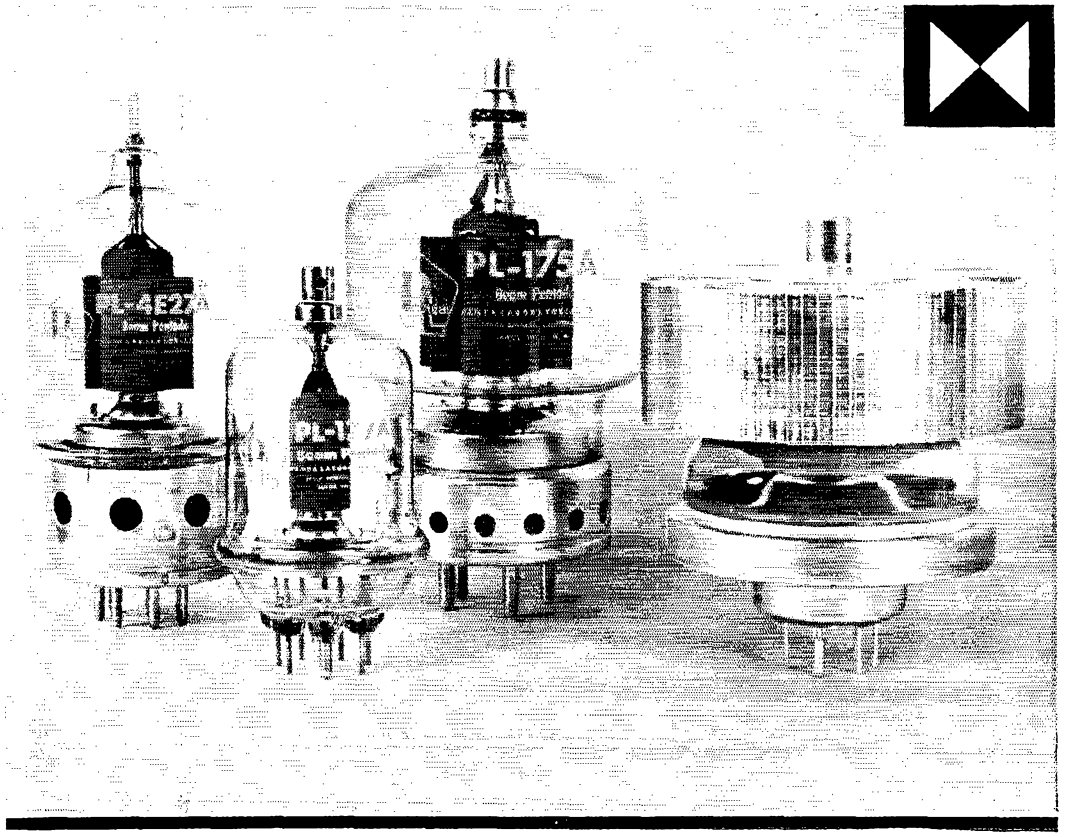


17 sessions; QNS 490, high 49, low 19, average 28.8; QTC 131, high 28, low 1, average 7.7 QKS daily on 3610 kc. at 0030Z; 30 sessions; QNS 194, high 11, low, 2 average, 6.4; QTC 164, high 18, low 0, average 5.4; NCSs KØBXF, BYV, IFR and RJF. KSN Weather Net, 3925 kc. Mon. through Fri. at 0001Z; KØEMB, mgr.; QNS 530, reports 530. Area HBN, 7280 kc., Mon. through Fri. at 1800Z; mgr. KØWNZ; NCSs KØHGI, YWT, NSB, ANF, RCB, 9TVG, 5JXB, KØLTJ and LTP; QNS 442; QTC 467. Kansas Jayhawker YL Net, 3940 kc. Tue. at 1530Z, Sun. at 2200Z; KØHEU, mgr. The Emporia Radio Club operated portable in Chase County making 165 contacts. This gives the WAK another county where no stations are located. MDI has a new four-element beam and 3-kw. generator. WNØAGG, a new licensee, has an Eico 720 and an AL-7 receiver. The Kaw Valley Radio Club, under OBO/Ø, operated again this year at the Midwest America Fair, Topeka, and handled 81 messages. UFP now is located in Topeka. Have been working him with the Mighty Mite 20 watts s.s.b. The Smoky Valley Radio Club, under FOB/Ø, operated at the Central Kansas Free Fair, Abilene, and handled quite a few messages. The Wichita Amateur Radio Club, under President KØJWS, is building up membership. At a recent meeting VBQ gave his usual good demonstration on s.s.b. and how to build Permability Tuned Oscillators. EC ZUX has been busy renewing and bringing his AREC membership up to date. Traffic: (Sept.) WØOHJ 539, FNS 270, KØBXF 147, WØBYV 103, ABJ 85, RJF 75, KØUHF 74, WØQGG 63, ORB 42, KØHVG 29, QKS 24, WØIFR 23, KØYBR 17, EFL 12, WØBSS 11, TOL 11, FDJ 9, KØVQC 9, JID 6, GQO 5, JMF 4, WØFHU 3, KØHXH 3, LPE 2, WUD 1. (Aug.) KØHFF 22, UZJ 21.

MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØLTP. Asst. SEC: KØLTJ. RMs: OUD and KØONK. PAMs: BVL, OVV and LFE (v.h.f.). Net reports: (Sept.) MEN (3885 kc. 2400 GMT, M-W-F) 13 sessions; QNI 343; QTC 122; NCSs: KØONK 4, KØMMR, VPH VNB 2 each, KØKUD, OVV 1 each. MSN (3715 kc. 2200 GMT, M-F) 22 sessions; QNI 64; QTC 87; NCSs: KNØGOB 4, KNØGFA 6, KØONK 7, KØVPH 5. MON (3580 kc. 0100 GMT, M-F) 26 sessions; QNI 146; QTC 175; NCSs: KIK 8, OUD 7, KØVPH 6, RTW 4, KØQCQ 1. SMN (3580 kc. 2200 GMT Su.) 4 sessions; QNI 14; QTC 2; NCS: OUD 4. Mo. S.S.B. (3885 kc. 2400 GMT, Tu.-Th.) 8 sessions; QNI 117; QTC 26; NCSs: OMM 6, MKJ and TPK 1 each. Appointments: KØZEI as OBS. Endorsement: KØJPJ as OO C1 I. Cancellations: KØUTX as OO C1. III and IV; IJS as ORS. KØJPL received DXCC. WAP reports QRL building Highway 71 at Grandview. The club station is moving to new quarters at Florissant. Quite a number of fellows report QRL with school again. Club stations EEE and ZLN, at Rolla and Columbia, respectively, are active and ready to handle traffic again. MCX, secy. of the O.B.P. #1 Club (St. Louis) reports the club as 100 per cent ARRL since 1924. Art also states that BOA is State Representative from his district and that ZK is active after several years absence from the amateur bands. BH is reported engaged in teaching at Mt. Grove. K5POU/Ø is attending the Missouri School for the Blind and is active on 3.5 Mc. KØAEU is reported recuperating after a siege in the hospital. KØLIQ recently made contact with K3LIQ and had W7LIQ join the contact later, making three stations with the same call letters in one QSO! K5ZEYØ is active at Ft. Leonard Wood. Traffic: KØONK 1392, LTJ 409, VPH 225, WØANT 272, OMM 141, KIK 139, MKJ 131, OUD 103, BUL 67, KØVNB 48, WØRTW 44, KNØGFA 33, KØRPH 32, WØAYB 31, BVL 26, GBJ 18, OVV 18, KØFPC 16, WØZLN 13, KØWNZ 12, PCK 11, WØPXE 9, WAP 9, K5ZEY/Ø 8, WØEPI 4.

NEBRASKA—SCM, Charles E. McNeel, WØEXP —SEC: KØTSU. The Nebraska Morning Phone Net, at 0730 on 3980 kc. daily, KØDGW is NC, reports QNI 699, QTC 158. The Nebraska Emergency Phone Net, 1230 on 3983 kc., EGQ as NC, reports QNI 711 QTC 58, 100 per cent check-in KØCGM. The Nebraska C.W. Section Net resumed operation on Sept. 1 with OKO as RM, and reports 30 sessions, QNI 161, QTC 62. The Western Nebraska Phone Net, on 3850 kc. at 0700 MST, NIK as NC, reports QNI 623, QTC 84, 100 per cent reporting KØTUH, KØAIE, KØBMQ, AHB, DVB, FJZ, GGP, NIK and RIH. The Nebraska Weather Net resumed operation Oct. 1 on 3850 kc. at 1815 MST Mon. through Fri. with KØRRL as NC. With deep regrets we report the passing to Silent Keys of IDO, No. Platte, formerly from Merna. A recent appointment is KØDGW as OBS. He will transmit Official Bulletins on the phone nets; also NYU will transmit Official Bulletins on c.w. and RTTY. Traffic: WØDDT 144, OKO 138, ZJF 114, KØDGW 84, WHX 74, RRL 63, SBD 53, WØZVJ 37, KØQVM 33, MSS 32, WØYFR 28, NIK 26, KØYDS 23, WØCIW 20, BOQ 15, NYU 13, VEA 12, KØCGM 11, WØEGQ 10, OCU 8, UOV 8, KLB 6, NNL 5, KØVTD

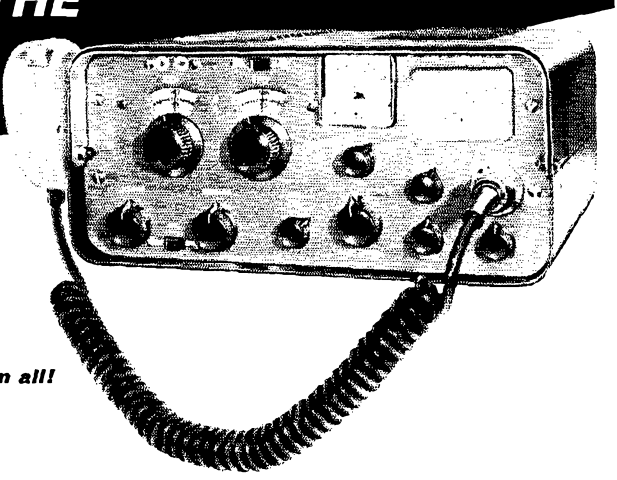
(*Continued on page 132*)

From Polytronics:

THE POWERFUL POLY-COMM "62" B, VHF TRANSCEIVER

For Novice, Technician and General

COVERS BOTH THE 6 AND 2 METER BANDS



Rugged... dependable... feature by feature the Poly-Comm "62" B outclasses them all! O.C.D.M. Approved.

The unbeatable Poly-Comm "62" B covers 250 kc either side of both bands for C.A.P. use . . . it has 18 watt power input . . . S meter doubles as tune-up meter, actually samples R.F. for maximum output . . . 100% plate modulation . . . V.F.O. or crystal control for transmit . . . built-in 115 VAC/12 VDC power supply . . . triple conversion on two, dual on six . . . (crystal controlled) . . . delayed AGC . . . all oscillators voltage regulated . . . squelch and automatic noise limiter . . . sensitivity: better than .8 microvolts on two, better than .2 on six for 10 db S/N/N ratio . . . selectivity: (6 kc @ 6 db pt.) and stability assured by all temperature compensated circuits and Hi-Q IF stages utilizing 12 tuned circuits . . . single knob bandswitching . . . sparkling modulation for solid contacts . . . complete with under-the-dash bracket and ceramic microphone.

$349.50 amateur net COMPLETE

O.C.D.M. Model "62" CD...$349.50 COMPLETE

Antennas: PCA-251: (illustrated) Whip only. 2 & 6 meter dual band antenna. Standing wave ratio 1.1 to 1 at resonance and no greater than 1.5 to 1 at any point in the band. **$13.95**
PCA-249: Same as above with cowl mounting. Complete with 15 ft. RG-58/u cable and PL/259 connectors at both ends. **$21.95**
PCA-250: Same as above with standard stud, ball mount, cable and connectors. **$23.95**

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5, DFO 4, WØHOP 4, KØKJP 4, WØLDO 4, LFJ 4, AHB 3, GGP 3, RIH 3, AFG 2, KØELU 2, UWK 2, GAT 1, KFY 1, QKW 1.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, jr., W1CHR—SEC: EOR. RM: KYQ. H.F. PAM: YBH. V.H.F. PAM: FHP. Traffic nets: CPN, Mon.-Sat. 2300Z, Sun. 1500Z on 3880 kc.; CN, daily 2345Z and 0300Z on 3640 kc.; CVN, Tue., Thurs. and Sat. 0130Z on 145.98 Mc.; CTN, 1400Z on 3640 kc. EOR, our SEC, is stimulating new AREC interest. All present ECs have been contacted regarding their local activities with gratifying results. Make yourself known to your EC and volunteer your help. If you do not know who your local EC is, contact EOR or me. If your area has no EC and feel you are capable of organizing a local group, your application would be most welcome. NJM still is conducting high-speed code practice every Mon. at 0130Z on 3637 and 7120 kc. EFW has been hard at work completing his new shack. ADW worked TYQ at HZ1AB through K1HKH. KYQ reports CN had 30 early sessions handling 265 messages for an 8.8 average and 22 late sessions with 43 messages handled for a 1.9 average. High QNI were K1s IFJ, MZM and JAD. YBH advises CPN held 30 sessions, handled 169 messages for an average of 5 and had a daily attendance average of 23. The Honor Roll for 80 per cent attendance or better lists K1s AQE, BSB, PPF, DGK and W1s DAV, YXB and LWW. K1DQV finished a new 4-125 amplifier. K1HTV is building a rig for 160 meters with a 4-250 final. K1KSH worked his 13th country on 160 meters. K1MBH is building a keyer. K1QFL is assembling a Heath "Twoer." K1NFD is now on 2 meters. K1TMT is on 7 Mc. with a DX-60. Thanks go to NFG for making the New Haven Red Cross rooms available for the traffic meeting, which was heavily attended by enthusiastic CN and CPN representatives. Reports received: OES from FYV and K1MNX; OO from K1IVR. New appointments: K1JAD as ORS. Appointments renewed: FYG, EKJ, WAZ, HGE, EXO, MHF, EJH, OS, CGD, FOA and HHR as ECs. Traffic: (Sept.) K1MZM 280, W1AW 240, KYQ 236, K1HFJ 227, W1NJM 130, RZG 117, K1GGG 97, W1OBR 69, K1JAD 67, W1NTH 65, K1AQE 59, W1LV 40, K1PPF 35, W1YBH 28, BDI 27, K1MBA 22, W1RFJ 22, K1DGK 18, PUG 14, W1QV 13, K1QCR 12, W1CHR 11, CUH 10, K1IVR 10, BSB 8, W1BNB 6, ROX 5, K1EIC 3, PKQ 2. (Aug.) W1OBR 79, NJM 49.

MAINE—SCM, Albert C. Hodson, W1BCB—SEC: GRG, PAM: K1ADY, RM: K1KSG. GPY has been called to active duty with the Navy. The PTN will miss him as RM where he carried on in the best of tradition of traffic men. K4PIK is at Kingsport, Tenn., and will be looking for Maine contacts with any old friends. K1GAX has a new s.s.b. rig. BPM has a new Hornet beam and still is after the hard DX. K1GUC has a Collins 32V-2. FC has returned to Maine and has a new TX-1. K1MDM hopes to hold classes at Togus Veterans' Center for interested patients and employees. K1MBM and K1MZB urge all who can to join MSSN to keep up with c.w. progress. K1TQI, the son-in-law of EBJ, now is in Orono. The Knox County Radio Club had a successful hamfest at Rockland Sept. 10. The PAWA has moved out of the c.d. room at Portland City Hall and at this writing is trying a location at the Portland Boys' Club. Please send any information on club activities and new hams as well as items of interest to your SCM. Items concerning station activities, new gear and awards will be appreciated. Traffic: (Sept.) K1MBM 123, MDM 37, W1ISO 32. GRG 24, K1BZD 20, OJH 18, W1GPY 13, K1DYG 6. (Aug.) W1SWX 12.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—SEC: AOG. PAM for 75: DFS. RM for 80: EAF. RM for 15: AQE. PAM for 6: AWA. RM for 20: SAD. PAM for 2: OFK. Traffic Nets: Eastern Mass. C.W., 3660 kc. Mon. through Fri. at 1900; Eastern Mass. 2 Meter, 145.8 Mc. Mon. through Fri. at 2000; Eastern Mass. (75) Phone Net, 3893 kc. daily at 1730; 6-Meter Crossband, 50.85 Mc. Mon. through Fri. at 1930. Sun. at 1000. Several areas where we need stations to check in are New Bedford, Fall River, Lowell and Cape Cod. New appointments: QDR Lexington, K1STS Sudbury, as ECs; DDV as OES; K1OJQ and K8KCO as ORSs. K8KCO is at M.I.T. JPJ is EC and RO for No. Attleboro. BNS is on 75 meters in Medfield. Heard on 2 meters: K1s GVM and OIM and KN1 QVU. K1JMT lives across the street from ALP, and is going to Northeastern U. 5GQB, Falmouth, is on 75 meters. IAE is back again in these parts. HM is a Silent Key. During Hurricane Esther most of the c.d. groups went into action. The fellows at Northeastern, KBN, were very active on 75 and 2 meters for the Boston Red Cross and had stations lined up all over the N.E. Area and had a tie-in on 2 meters with EAE in the John Hancock Bldg. GQF went to Revere mobile on 2 meters for them.

(Continued on page 134)

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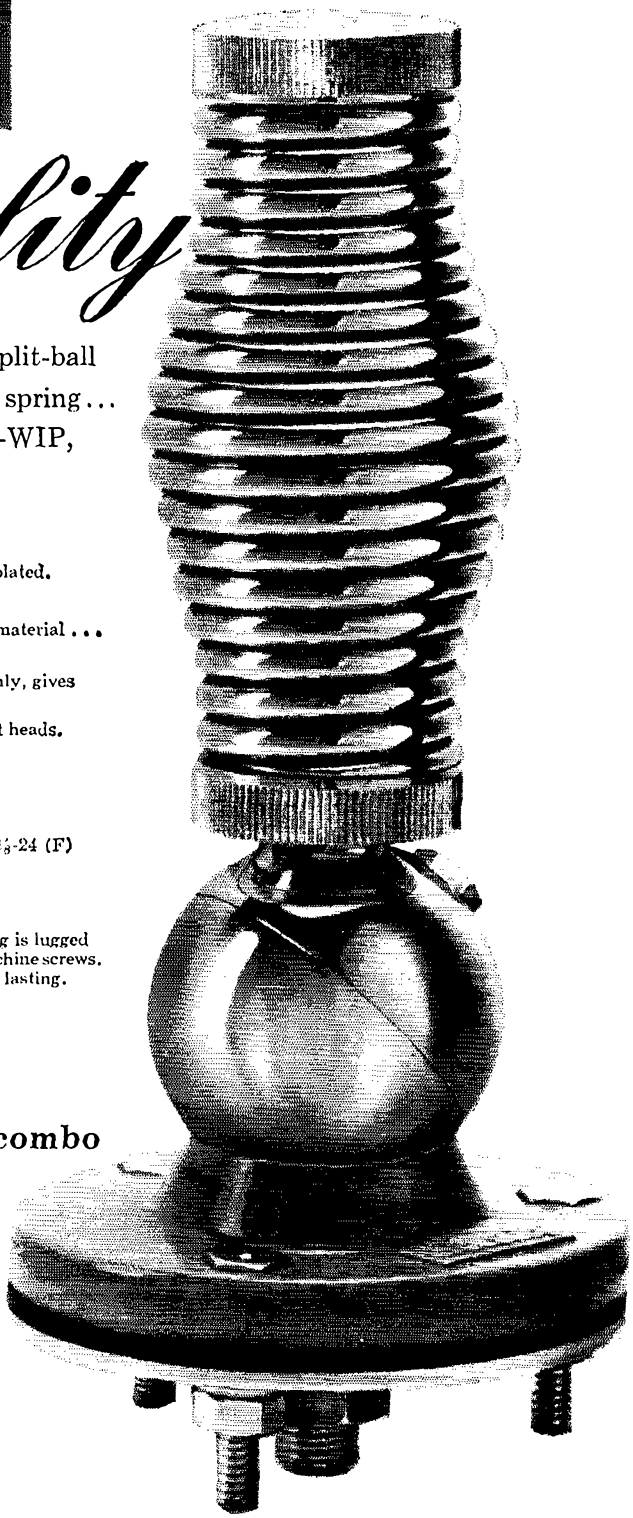

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OTN is on 2 meters. UIR is feeling better and has gone back to work. The EM2M Net had 21 sessions, 323 stations and 122 traffic. EHT says a club may be formed in Wayland. K1DRB worked K3KEO and K2GOS/3 on the band opening on 2 meters. K1AII heard VE3DIR on 2 meters and has a 4-250 amplifier on 50 Mc. KN1RZL has converter for 220 Mc. K1QWL has a G-50. KN1TDP has an HQ-100 and a Globe Scout Deluxe. KN1SWI has an HQ-170, a Challenger and a 90-ft. tower. KN1RML has an HT-40 and a SX-140. SYU has an HQ-129, a KWM-2, and an all-band antenna. QAF has an HQ-160, 800 watts on 75/80 meters. EUJ is in the Signal Corps at Ft. Monmouth as a 2nd lieutenant. K1CBL is helping out with c.d. in Burlington. WU has been busy with the garden. K1QNZ took the Tech. Class exam and dropped the "N." CBU, AJA, K1s CWS, TKV, ICJ, MON and SKP are active. OFK has a quad indoors and worked SFX on 2 meters. AHP is on the air again and feeling better. K1HTK showed FD slides to the Framingham Club. CPB has retired from work. BY is back on the air. K1s SFD and SDA passed the General Class exam. K1DRB was up on Mt. Ascutney, Vt., for the V.H.F. Party. HIL has a new Drake 2-B. AYG and K1BUR are mobile. K1CBB has a new QTH in Hingham. K1BBU went fishing up in New Brunswick. BW has a new antenna. MRQ is on for contests only. The Milton Radio Club held an auction. OTZ spoke on his new code system. The No. Attleboro c.d. group took the Red Cross first aid course. K1QLB is on 6 meters. Frank Roberts spoke on the NC-190 at the QRA meeting. AOG was in Maine for a week. Appointments endorsed: WU, K1BUF and EAE as ORSs; AUQ as OO; K1BUF as OBS; EAE as RM for 80-meter c.w.; AOG as SEC: JSM Waltham, MD Hingham and DPO Chatham, as ECs; JSM and K1KCG as OESs. K1DIO is back from a trip to Northern N.Y. BVP, a new ensign in the Coast Guard, is in Cleveland, Ohio. BB is getting ready for the 160-Meter DX Tests. KN1QQQ is on 40-meter c.w. OHA is in the Navy. DXCC: FQA has 223, ACB 243, Quincy C.D. now has a communication van. The T-9 Radio Club met at TJP's QTH. K1KKS is going to Tufts U. EM75PN had 30 sessions, 436 check-ins, 216 traffic. K1LJK worked 35 countries in September and has a new 10-30 scope. K1QNZ is Tech. Class. 5GQB/1 has a new G-76 mobile. The 6 Meter Cross-Band Net had 304 for 20 sessions, traffic 161. New on 6 meters: K1s NXN, JOQ and MAK. K1s OCD and GKA are new NCSs and LLX is back again. UVB has a new QTH free of QRN. K1JIM is a Silent Key. PTR tried 160 for the first time since '41. KZW, Westwood, has been endorsed as EC. Traffic: (Sept.) W1AWA 371, K1DGI 268, W1EMG 193, K1GNR 161, AII 133, BUF 110, W1DFS 109, EAE 100, PEX 56, OFK 55, ZSS 39, DOM 37, W5GQB/1 28, K1QNQ 22, DIO 17, GKA 17, W1AOG 15, SIV 15, VYS 15, FJJ 14, K1QNZ 12, CMS 11, OJQ 9, W1AUQ 8, GTX 6, BB 4. (Aug.) K1AII 103, LCQ 8, QOJ 2.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: W1BYH/K1APR. RM: K1IJV. PAM: W1DXS. WWA/MM took an active part in a rescue at sea on Sept. 23. K1PIL has a new Viking Ranger. The West. Mass. traffic nets, both c.w. and phone, seem to have hit bottom, but as Jean, our RM, says, "There is only one way to go from there and that is up." With your help, the "up" will come sooner! K1GCV is at Clarkson College in Potsdam, N. Y. K1DAJ is back at Cornell after the summer vacation. K1CAU is off to the Air Force. K1TNX, of Uxbridge, is active on 6 meters. Gene Leger, KN1RQS, of 14 Norman Street, Springfield (no telephone), is willing to conduct code classes at his home. New officers of the Berkshire County Amateur Radio Association are K1MRP, pres.; K1CTL, vice-pres.; GTO, secy.; K1BUM, treas. KN1SBW has a new HQ-170 and a DX-60. K1JGW has an Apache and an SX-11. It looks as though Holly Nuttall, COI, is getting back into the DX game. Early experiences of old-timers AMS, IW, AZW and BKG were highlights of a recent meeting of the BCARA. Westfield C.D. is conducting weekly code classes with an average attendance of approximately 20. Traffic: (Sept.) W1LDE 430, K1IJV 97, W1BVR 85, YXB 60, K1LBB 54, DAJ 9, PIL 5, W1DVW 2. (Aug.) W1YXB 46.

NEW HAMPSHIRE—SCM, Ellis F. Miller, W1IIQ—SEC: K1GQK. PAM: KVG. RM: K1ITS. The GSPN meets Mon. through Fri. at 2400 and Sun. at 1430 on 3842 kc. The CNEN meets Mon. through Sat. at 1145 on 3842 kc. The NHN meets Mon. through Sat. at 2330 on 3685 kc. Endorsements: PFU as ORS. Excellent weather prevailed for the first annual meeting of the CNEN, held at Pleasant Lake, Elkins, N.H. with 29 licensed hams and their families, representing the states of New Hampshire, Maine, New York, Massachusetts and Connecticut. The meeting held on Sept. 9 and 10 was ably assisted by host K1KRX, with music by K1IVJ and a magic show by JNZ. An FB time was had by all. The

(Continued on page 136)

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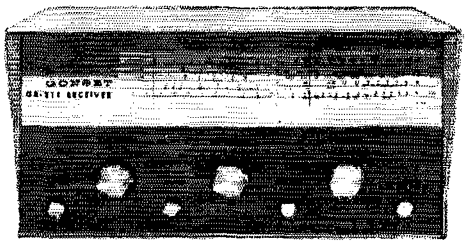

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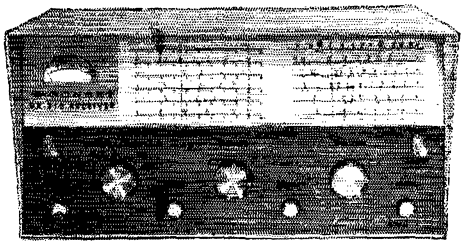

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first period award of the GSPN John W. Singleton Trophy was won by TA, high scorer for the past three months. Runners-up are K1GQH, CUE, MKA and K1CFX. Congrats, Ray, on an outstanding job. Competition seems to be getting keener for ensuing periods. Under the able tutelage of K1BCS, Franklin has a new and active Novice, KN1LTMD, who operates in the 3.7-Mc. band. K1HK, now at the University of N.H., has some new gear but can't use it much because of study schedules. Traffic: W1TA 106, QGU 84, CUE 35, PFU 22, IIQ 18, AGM 16, K1BCS 12, W1JNC 12.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PAZ, RM: SMU, PAM: TXL. RISPN reports 30 sessions, 323 QNI, 53 traffic. New appointments are SIK and K1KDI as OOs, K1NEF as ORS. The NCRC of Newport reports that K1RCP was elected pres. and TXL vice-pres. in a recent election. JFF will be instructor in code and theory. The W1AQ Club of Rumford reports that YUT and K1SYM were elected to membership. K1LDK was appointed acting secy. The club has issued WRI certificate No. 12 to BPM. During the month of February an Exhibition of Radio Equipment Old and New will be held at the Old Slater Mill in Pawtucket. An R.I. QSO Party is being planned by the AQ Club during the exhibition. SMU is now mobile on 2 meters. K1NEF now operates only weekends as he is back in school. During the hurricane emergency K1GRC reported 17 mobiles operating on 50.83 Mc. TXL originated 63 pieces of traffic and SYE, the NCRC station, was thanked by the mayor of Newport for work during the storm. K1DUH has modified his "Sixer" for mobile work. Traffic: (Sept.) W1SMU 287, TXL 178, K1NEF 78, PZY 52, GRC 45, DZX 37, AAV 16, DUH 13, W1WED 9, K1GRA 8, LSA 8, PNI 7, JOD 6. (Aug.) K1GRA 18.

VERMONT—SCM, Miss Harriett Proctor, W1EIB—SEC: K1DQB, PAM: HRG, RM: KRV. The Wind Hams RC in Bellows Falls has started code and theory classes. K1KQC has returned to Dartmouth. Activity on 6 meters is high in the southern part of the state. New officers of the Burlington ARC are K1CEJ, pres.; K1BVH/1, secy.; HRG, treas.; WPY, KN1QLO and Roy Clark, trustees. VSA is custodian of the trailer and its equipment. The SCM would like to have a postal card from amateurs willing to make a sked to give Vermont contacts and ragchews to out-of-state amateurs. Please let me know the bands you work and the times you could be on the air. I receive many requests.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—The Gem State Net meets on 3580 kc. at 0300Z Mon. through Sat. The Bingham County AREC meets for c.w. practice Mon., Wed. and Fri. on 3990 kc. at 1330Z. FARM Net members elected EEQ manager and K7NDX net control. Our sympathy goes to the family and friends of K7CZV, who became a Silent Key Oct. 2 as the result of an auto accident. New KN7s are QKV, QDT and PZF. RPB finally got his General Class ticket. BZJ and BDX are back on the air after a long silence. The Magic Valley Memorial Hospital is negotiating with radio club members for emergency communications. The Pocatello Club has started Novice training classes. Visitors to the SCM's ham shack were HMQ, the SEC of Washington, and his XYL, WHV, OAH, of Idaho Falls, monitors 145-6 Mc. every evening and invites travelers to call. JSY was pictured on the cover of Sept. *QST*. FARM Net Traffic: 56. Traffic: K7HLR 133, KBY 43, W7GGV 19, VQC 18, EEQ 13, DWE 6.

MONTANA—SCM, Ray Woods, W7SFK—SEC: BOZ. PAM: YHS. RM: K7AEZ. The MPN meets on 3910 kc. at 1800 hours M-W-F; the MSN T-T-S at 1830 hours on 3530 kc. Friends of K7LGX regret to hear that he is now a Silent Key. K7EWZ has moved to Whitefish from Plains, Mont. IGQ, of Stemple Pass, is now in Lincoln, Mont. BOZ, SFK and K7AJQ drove to Spokane to attend the regional conference of SCMs and SECs with CPY, Regional Director, officiating. SFK and TGG made a trip through Eastern Montana with many pleasant visits with amateurs in that area. RZY has a big bobcat added to his game animal collection. NPV still is working on missile radio. TGG will be the 7th district chairman for the YLRL as of Jan. 1, '62. CTI is heard from the Missoula Area now. A lot of interest is being noted here in Montana in RTTY. A new ham in the Butte Area is KØVKY/7. New calls in Billings are KNs QLO, QLP, QLQ, QLR, QLS and QLT. JAU is leaving for the service. Good luck, Weldon. There are lots of 2-meter rigs in Billings. K7OGF is working on a super antenna system and is working DX on 75 meters with it. Traffic: K7EWZ/7 27, OGF 9.

OREGON—SCM, Everett H. France, W7AJN—Appointment: K7JVN as OPS. Certificate endorsements

(*Continued on page 138*)

great response

Naturally. This smart ham is using a University Model 70. It's dynamic! Now his QSO's are more frequent with better quality. You'd be surprised at the compliments he gets. He's also improved his SSB transmissions . . . found the perfect budget-minded way to increase peak power and intelligibility. And he doesn't have to swallow this microphone to be heard. All he does is sit back, relax and speak normally. The Model 70 does the rest. Why not let it do the same for you. Comes complete with integral 15-foot 3-conductor shielded cable, Model SA10 slide-on stand adapter and cloth carrying bag. Check the 'specs'. No other dynamic of its type can match the great Model 70! Only $29.95*

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Frequency Response: 50-14,000 cps (which extends to a usable limit in the 18,000 cycle region). *Impedance:* 30/50; 20,000 ohms. *Output Level:* 30/50 ohms: —50 db/1 mw/10 dynes/cm^2; —143 db EIA sensitivity rating; 20,000 ohms into high impedance input; 28 mv/10 dynes/cm^2. *Hum Reference:* —120 db/.001 gauss. *Dimensions:* 1-5/32" maximum diameter, 6" maximum length. *Shipping Weight:* 2¼ lbs. *Finish:* Acrylic silver-gray and non-reflecting black.

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went to K7DVK as OES, ZFH and MTW as ORS, AJN as ORS and OBS. K7AXF has appointed K7HBA as the new Assistant EC for Northern Coos County. K7BZP is now on the air with a new Apache transmitter. Word is out that EFR is going mobile. On Aug. 29 RVN acted as communications coordinator for a mountain rescue team during a search. K7CBA assisted with mobile up to the mountain. ZB, BSY, 1SO, UHL, WKP, YKY, K7HIZ and K7PDY helped in the relay and assisted in maintaining a clear frequency and ALG reports "Operation Rescue" was a success. The Oregon State Net had 21 sessions with a check-in total of 172 and a traffic total of 46. BRAT awards went to MTW, ZFH and K7IWD. K7CLL is returning to law school and amateur activities will be less. Traffic: W7BDU 215, K7AXF 115, KBK 86, IWD 71, W7ZFH 45, MTW 28, DEM 19, AJN 10, K7CLL 2.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—SEC: HMQ. RM: AIB. PAM: LFA. New officers of the Cascade Radio Club, Inc., are UGK, pres.; K7DKV, vice-pres.; K7ILM, secy.; K7MBA, treas. Trustees are PTX, BLX, PRY, UVI and PQS. New hams in the Enumclaw Area are K7s GHZ and QKP and KN7s PZQ and PEL. AXT says he will be mobile again in the near future. GIP lost his antenna in the unseasonable storm of Sept. 1. Also K7CWO lost his vertical in a windstorm in Kennewick. The Spokane Club is proceeding ahead with getting the emergency truck together. EBU received his 2nd-class telephone license and now is studying for 1st-class. K7CHH received DUF/1 from France and raised his beam to 40 feet. New officers of the Columbia Basin Net, which meets on 3960 kc. at 1930 PST, are K7JZT, net mgr., ZCE, secy.-treas.; CJA, HRK and WCW, directors. If anyone is desirous of an "Admiral" certificate, contact K7JZT for information. RGL will start the Official Bulletin transmissions on 6-meter c.w. very soon now. The Radio Club of Tacoma (DK) has set its Annual Loggers Contest for 1400 PST Feb. 17 to 1400 PST Feb. 18, 1962. Five new General Class licensees appear in the DK Club. They are K7s CZF, AYZ, LXE, AMJ and NKZ. KIE, formerly of Olympia, is reported now in the Spokane Area. IPZ retired from Naval Services as Chief Petty Officer. EMX is attending night school classes. UZB is QRL writing an article on the old-timers of the Evergreen 50 and Up Net. K7EVN is hard at work on a new Shawnee kit. The Boeing Amateur Radio Society started its Novice classes on Oct. 9 with four instructors. Classes will be held Mon. and Thurs. at 1930 to 2100. The DP gang was QRL lining up the Halloween Patrol for Walla Walla. EIU sends in a good traffic report again. K7MGD is the new EC for Garfield County. KN7PIY is sporting a new NC-300. KN7PII is going for his General Class license. OIV is mobiling on 10 meters. The VARC had a record of 438.347 to contend with at the Western Washington Fair at Puyallup. HMQ and WHV are back from a visit to Colorado and the Walla Walla Picnic. SLB was in and out of the Army in one week (some kind of a record we think). JJK is in the last semester at U. of W. MCU and MPH assisted the Fire and Police Departments in Elma on the way home from a vacation on the Coast with walkie-talkie and mobile rigs. TOU is blocking receivers with a Johnson 500. PGY and HMQ attended the Director's and SCM's meeting in Spokane. PSP has a new Heath Cheyenne. YFO has his 5-kw. generator now in operation. A new amateur in the Richland Area is K7KSF, the XYL of K7KSE. NNF is trouble-shooting his sick Viking. One hundred and twenty-five attended the Skagit Bar-B-Q on Sept. 16. AIB installed a noise silencer in the HQ-170. VPW will be on RTTY soon. Traffic: W7BA 1029, DZX 809, IEU 347, QLH 286, GYF 87, APS 83, ACA 74, OEB 63, AMC 53, KZ 28, IST 20, GIP 15, AIB 5. K7CWO 3.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—CNG is going RTTY. JDI has returned to Reno after his hitch in the Army. ZT has a new above-ground fallout shelter. SKP has a kilowatt going. PC has been getting the c.d. communications bus station, HPP, in shape. YKC is the new EC for the Las Vegas Area. HJ's appointment as SEC has been renewed for another year. Thanks for a fine job, Ray. PWE has been transferred to California. VIU and KOI have been checking up on their QSL cards towards the USA-CA Award. VIU is rebuilding his final. K7JUW is settled in Connecticut. BJB is now in radio service with the State Highway Department. HRW reports scoring about 4000 points in the June V.H.F. Contest. Two new hams in the Reno Area are K7LPN and KN7NMG. KN7OYJ has taken the Conditional Class exam. 6EBW got Nevada Achievement Award No. 76. Traffic: W7PBV 5, VIU 4.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—Asst. SCM, Ed. Turner, W6NVO. SEC:

(Continued on page 140)

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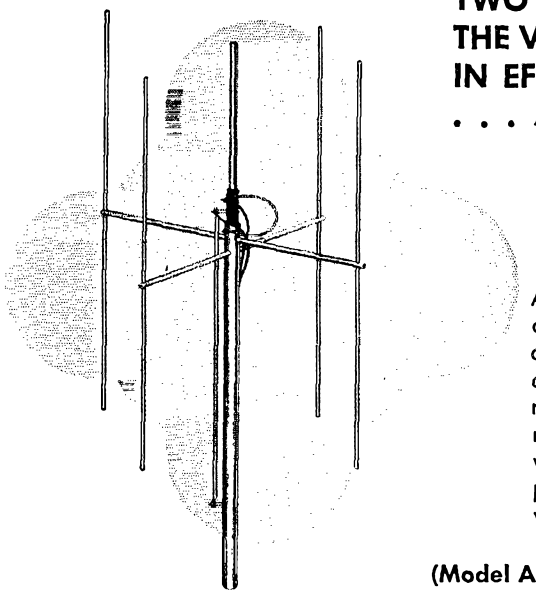

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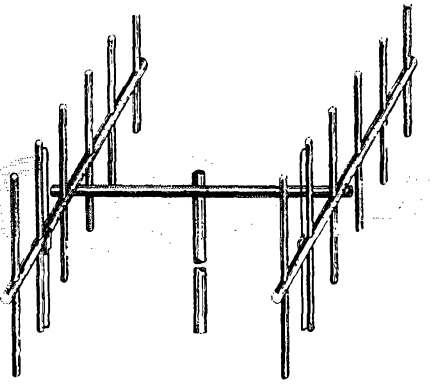

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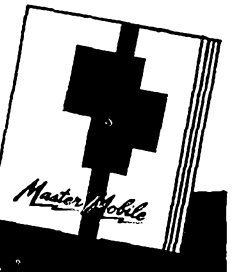

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W6ZRJ, PAM: W6ZLO, RM: K6KCB, W6DEF, EC, reports QRL a new job at United AL but he still found time to do a bang-up organizing job for Redwood City SET. W6AVJ, the son of W6FON, OPS, was married in Hawaii Oct. 14 and will live in Sunnyvale. Both he and the new XYL work for Varian. K6MTX, ORS, has a new 75A-4. K6MZN, OO Class I, is back in harness after an appendectomy. W6AUC, ORS, maintains regular skeds with Hawaii as well as with his brother, W4EXV, in Virginia. Your SCM got to Frank Quement's breakfast too late to find many hungry hounds who had come and gone. Saw K6TEH, OPS, admiring a Polycomm 62B just like the one he's installing. K6YKG, ORS, was full of pancakes and modest of his role in handling the Santa Clara County Fair exhibit for the SCCARA. WA6CBQ, prexy of the MBRC, discussed ways and means of taming a nuvistor preamp. The Foothills ARS plans a "Giant Auction" for its November meeting. Several clubs have started Novice classes. The SCCARA opens W6UW at Red Cross in San Jose Tue. from 7:30 to 9:30 with a code and theory class planned to run through December. Monterey amateurs give instruction at the Presidio, WA6ORC/AD6ORC, Tue. and Fri. nights 7:00 to 8:30. Initial interest is so great the courses probably will be repeated later. Traffic: (Sept.) K6KCB 749, K6DYX 234, WA6OLQ 233, W6AIT 207, WA6HZM 199, K6GZ 173, W6FON 68, W6DEF 56, K6ZCR 47, W6HC 45, W6AUC 36, WA6EIC 19, W6YBV 18, K6BBF 8,K6VQK 8, K6EQE 3, K6MTX 2. (Aug.) W6HC 7. (July) W6HC 56. (June) W6HC 42.

EAST BAY—SCM, B. W. Southwell, W6OJW—SEC: WA6HYU. ECs: K6VXK, W6FAR, W6WAH and K6HTJ. WA6MHJ is the new EC for the Richmond Area. The Oakland Radio Club is trying to bring its WACC Award files up to date. If you hold a certificate with any of the following numbers, please send information to ORC, 906 Fallon Street, Red Cross Bldg., Oakland, Calif. Certificate numbers needed are 2 through 7, 9 through 12, 14 through 17, and 19 through 23. Thanks. K6KLY wants anyone to write him on forming a net on 223.45 or 224.1 Mc. The ORC held its Old Timers Nite on Sept. 1 with a big turnout. Pacific Union College is forming a radio club. K6SZA and WA6BPU are new members of the LARKS. The LARKS have four new 2-meter Communicators IV. W6TYM is the new TVI chairman for the LARK. The Livermore Club visited the FCC field monitoring station there. K6GK is QRL on a trip to Washington, Oregon and Idaho. The EBARC saw a movie on communications at its Sept. meeting. NCN is going great guns and is looking for members in Berkeley, Alameda, San Leandro, San Lorenzo and Oakland. If interested, please contact WA6LVX. WA6FBS and WA6BXC worked portable from Yosemite but were unable to hear the Bay Area. K6AUD and W6UTX have gone into the hi-fi repair business. WA6KCZ is looking for South America and Africa for his WAC. WA6NPC is QRL portable 7. WA6BBJ has a DX score of 101/68. WA6KUN is now a chief in Uncle Sam's Navy. K6YQG is in the Air Force. WA6NFW is playing in a small band. WV6RQS, a new member of the HARC, will be on the air soon. Here's a new YL for you YLCC certificate hunters. WA6IMC is going to Cal-Poly School in San Louis Obispo. Keep the reports coming. Traffic: (Sept.) WA6LVX 343. (Aug.) K6GK 132.

SAN FRANCISCO—SCM, Wilbur E. Bachman. W6BIP—SEC: W6ZKF. The S.F. Radio Club at its October meeting elected W6UDL, pres.; K6IMP, vice-pres.; WA6LYA, secy.; and W6FAX, treas. The new board consists of WA6DEV, WA6DTQ, W6VYC, W6FDU, W6PBA and W6CTH. W6GGC will represent the club in the Central Calif. Radio Council. The BAYLARC group took part in the meeting. W6BDE, Esther Given, told how the "YLRL" originated and also wrote a song suitable for ham radio gals and the gang sang along with fun for all. Movies of the club picnic had been taken in color at the park and everyone enjoyed the surprise showing of movies they were unaware were being taken by W6AHH. K6NCG, the Treasure Island Radio Club, has moved to the northwest corner of the Island and lists a new phone number, Exbrook 2-3931 local 2385. Northern California Net Manager WA6LVA, with Asst. Manager WA6OLQ, sent in a report. W6DEF will be civil defense advisor. WA6BXV is busy relaying traffic to some of the East Bay cities. WA6MDL is up north and taking care of the Eureka Area. Outlets are still needed in Del Norte, Humboldt, Mendocina and Sonoma Counties. Please help out by checking in on 3635 kc. at 0300Z daily. The newly-appointed SEC, W6KZF, suggests that all groups organize an AREC group and get a net on the air for regular drills in case of emergency and also let the local disaster officials (Red Cross, C.D., Police and Sheriffs, etc.) know so that they can be made aware of your net and how you can help out. Try to get a station from your net on 3900 kc. at 10:30 A.M. for the AREC Net. W6FVF was the

(*Continued on page 142*)

DOC AULWURM, W6BBC, maintains contact with other Raytheon field engineers and headquarters staff personnel from his Piedmont, California home.

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first to find the hidden station in the recent 29ers hunt. Join the fellows mobile on Twin Peaks at 8 P.M., the 1st Thurs. of each month. Frequency is 29 Mc. W6BIP and W6SY, with K6DJC, comprised the last hidden station. Red Cross station W6CXO (W6JWF, trustee) and W6MLK (W6GGC, trustee) were active in the SET Drill. K6SRZ is attending college in the East. W6OPL is proud of his new membership in "I.R.E." Also congratulations to Fred on receiving a plaque from the Tamalpais Radio Club. W6JXK has moved from S.F. to Daly City. K6OHJ was out of the hospital and attended the recent S.F. meeting. K6ANP and W6GGC's YL Ramona have picked Jan. 13 as the big day and already have bought a new QTH in Marin County. It must be a good DX spot for Len's c.w. hobby. K6HYW also will marry a nurse, Connie Pomeroy, on Feb. 11. Best of luck to the happy four. Rae is well known to all the gang in the Pacific Division as she traveled to all the hamfests and conventions with her dad, especially while he was SCM of San Francisco. The CCRC meeting was held at the Red Cross Bldg. with the HAMS as host. The main topic was EC work. All clubs also listed coming club activities. If all the clubs in this section would be kind enough to send in club news this report could hold more interest to all. *Please help send in news.* W6QMO is one of a team for "Project OSCAR". W6PHS received a 5-year pin at "Eimac." Traffic: W6QMO 248, K6JFY 114, W6GGC 32, W6GHI 8, W6MLK 5.

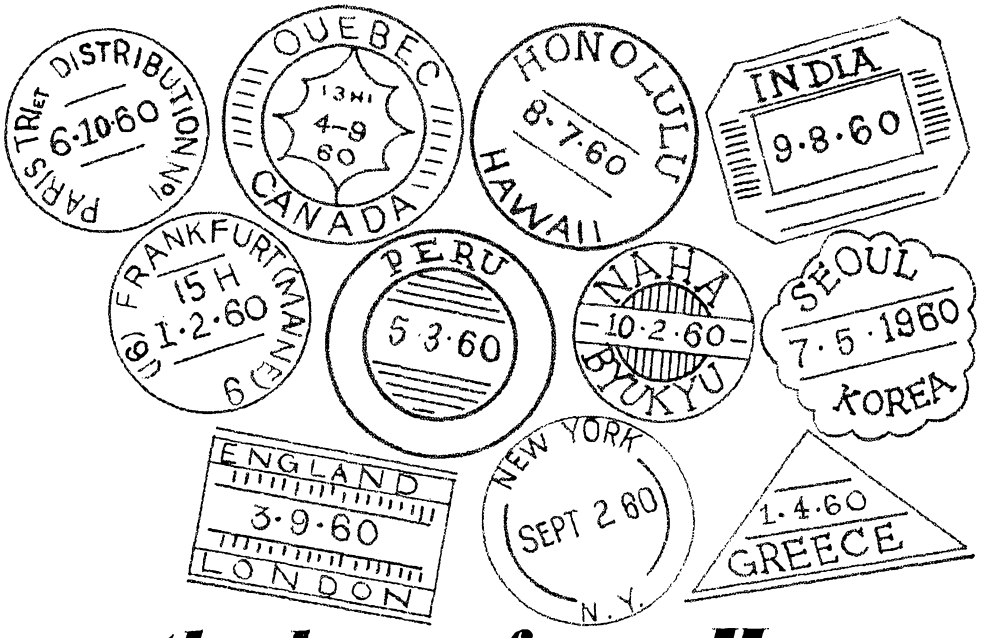
SACRAMENTO VALLEY—SCM, George R. Hudson, W6BTY—SEC: W6IKV. ECs: K6BNB, K6GOT and K6BYS. OBSs: W6AF, WA6CJU, W6WGO and K6HHD. PAM: W6GQS. OOs: W6WLI, W6GDO, K6ER, W6ZJW and K6EIL. ORSs: W6WGO and W6CEI. OES: W6PIV. OPSs: W6WGO, K6EIL, W6PIV, W6GQS, WA6PVT and WA6OXK. WA6OXK has been elected prexy of the Enterprise High School Radio Club in Redding. The club meets the 1st and 3rd Mon. during the school year with WA6JZZ as vice-pres. and has 4 Conditionals, 1 Novice and 5 SWLs as charter members. WA6PVT, temporarily off the air because of transmitter trouble, has managed to work 17 states and 12 DX countries using a new 10-15-meter beam. W6AF had an eyeball QSO with Vice-Director W6ZF and reports DX on 20 meters is fair to good. W6ZJW missed the FMT because of the failure of measuring equipment. Prexy W6WGO, MTN, advises the net is going FB and handled SET traffic. Sacramento Area 2-meter mobile group hidden transmitter hunts have been drawing big crowds. Anyone interested in joining, please contact WA6MMO, W6RXG or W5DWL/6 for details. Contact K6KDU or WA6MMO for information on the new 6-meter t.m. net being organized. Here is a message from your SEC: The AREC now has members registered in all but 4 of the 20 counties in the section and we know there must be members in 3 of these whose registrations are not in our file! The crying need is for more AREC members and an EC in each and every county of this section. How about taking an EC appointment for your county? Please contact K6IKV for openings. The downtown SARC had W6WGO as guest speaker. His topic was "TVI Committee as a Club Project." Traffic: W6WGO 40, WA6PVT 22.

SAN JOAQUIN VALLEY—SCM, Ralph Sarovan, W6JPU—W6HYR has a new KWM-2. WA6DRH is on 6 and 2 meters with a Seneca. K6ZCD has installed in his car a G76 transceiver, and is on 40- and 80-meter a.m. mobile. W6BVM and W6BYH still are operating out of the old airport tower and have 285 countries confirmed. W6ARI is back on the DX bands again. W6BRP is on s.s.b. with an HT-32 and is building up a final using a 4-1000. W6EFV is chasing DX with 285 countries confirmed. W6HT is moving into a new house trailer. W6ZEK is active on 40-80 meters. K6OGX won one of the 6-meter hunts that the c.d. gang holds every Monday night at 8 P.M. W6ZKH is the new net manager of the Tulare Radio Club, which meets at 10 A.M. on 3895 kc. WA6FFS is the new net manager of the SJVN. W6CUA and W6WGZ are regular check-ins on the SJVN. The new officers of the Madera Radio Club are K6KLV, pres.; W6BWM, vice-pres.; K6MSX, secy. The Madera Radio Club furnished radio communications for the Old Timers Day Parade using a walky-talkie, 2 mobiles and a base station. The Madera Radio Club will sponsor the SJVN Picnic to be held Aug. 12, 1962, at Bass Lake. The SJVN had 579 check-ins, traffic of 118 and 26 sessions. K6ROU, K6CPQ, and W6ADB are regulars on the SJN Net m the S.J.V. section. W6ARE says that 2-meter activity is picking up. I would like to take this opportunity to wish every one of you a Very Merry Christmas. Traffic: (Sept.) K6ROU 119, W6ARE 31, W6EFB 20, W6ADB 19, K6OLN 6, (Aug.) W6ARE 28.

ROANOKE DIVISION

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE. RM: W4PED. PAM: K4KCO.

(Continued on page 144)



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W1DBN/4, of Greenville, is active in promoting interest in the "Deep Freeze 62 Aeronautical Mobile Award," which lasts through December. At the Rock Hill Oct. 7 meeting six clubs in the state joined together in formation of "The S. C. Amateur Radio Council." See next issue of *SCARAB* for details. W4GQV announces that he will not be a candidate for SCM after his present term ends and that all nominations for his successor must be in by Dec. 11. Those taking part in the Sept. V.H.F. QSO Party were W4CPX, W4DEN, W4HQC, W4OYP, W4TLC, K4JQY and W4VIW. Analysis of FD operations are incomplete but indications are that the Spartanburg ARC and W4TWW had the best operations. In the section meeting held in Rock Hill Oct. 7 ARRL reports were given by the SCM, the RM, K4JVV, manager of the S.S.B. Net, W4CE, State Radio Officer, and W4MWH, Roanoke Division Director. K4FNX is running 15 watts from Hampton Institute where he is a sophomore. Traffic: K4ZHV 222, K4BRP 144, K4UOH 119, W4PED 112, W4HDR 84, W4AKC 73, K4OCU 30, K4HJK 27, K4AVU 26, W4CHD 16, W4TWW 14, K4HDX 13, K4KIT 7.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—Asst. SCM, H. J. Hopkins, W4SHJ. Your SCM, W4QDY, reports from KG4-Land that his time there is growing shorter and he is looking forward to his return near the end of the year. New ECs are W4OID, K4CZO, K4JYL and K4RUQ. Newly-appointed ORSs include W4CGE, W4LRN and W4WBC. Plan ahead for the Roanoke Division Convention to be held in Roanoke in May, 1962. The PVRC lineup is now W3GRF, pres.; W4ZM, vice-pres. and act. mgr.; W3IPO, secy.; and K4ORQ, treas. K4ORQ, incidentally, is recently back from Iran where he held EP1AB and was instrumental in getting ham radio reinstated. The Virginia Century Club, composed of a group of real DX hounds in the Norfolk Area, is now ARRL affiliated. At the high school in Lawrenceville, the QRV Radio Club is again active. W4CVO continues his usual globe-hopping and W4ZM anticipates some of the same. W4JSJ is now at KR6DO and reports the DX is wonderful but bemoans the lack of W/K4 signals. Look for him on 14,175-kc. a.m. and in the 14-Mc. c.w. portions. Rats, not bats, in K4MXE's belfry bugged him by chewing up the coax. Tabby cleared up the trouble, however. VPN has been hearing some KP4 and Cuban stations. W4BGP sports a new kw. linear. W4APM is trying various antennas to build up his DX count. W4JZZ and W4RUJ are cooperating on 6- and 2-meter projects. K4FMJ is very happy with new equipment including a 60-ft. tower and a Drake 2-B. The VA-CWC Award is off to a flying start, says W4JUJ. W4CGE qualified for a medallion with his third BPL. Traffic: (Sept.) W4PFC 359, W4DLA 290, W4CGE 171, K4MXF 158, W4NVX 158, K4FSS 119, W4LK 103, W4RHA 69, W4SHJ 58, W4BGP 56, W4TE 47, K4YZT 42, K4KNP 33, W4OOL 32, K4DCN 22, K4QIY 22, K4AL 21, W4IA 21, W4LRN 19, K4BAY 17, W4CVO 13, W4WBC 7, W4JUJ 4, W4KFC 4, W4OWV 3, K4IAN 2, W4BZE 1, W4KX 1. (Aug.) W4PFC 742, K4PQV 81, K4QIY 15, W4BZE 8, K4FMJ 7, W4IA 3. (July) K4QIY 17, W4IA 13. (June) K4QIY 23.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM—New officers of the Blennerhassett Radio Club are K8JLW, pres.; K8YBR, vice-pres.; K8PCF, secy.; K8YGZ, act. mgr. K8CSG resigned as EC for Kanawha County as he was called back into service. K8TNY and K8UQY are active on the WVN C.W. Net. K8MIH won the W/VE Contest for the West Va. section. The Opequon Radio Society of Martinsburg elected John McCord, K8KZR, to the State Radio Council and George Folk, K8QYG, to serve on the Centennial Committee. K8JLF has returned from Germany and has his antennas ready for winter traffic. K8MYU is a new ORS and is active in traffic nets. K8MMZ is attending Marshall U. ORS, OPS, OBS and OO appointments are open for those interested. WHQ has a new tower and beam for 14-Mc. DX work. K4PRQ and K8LOU are new members of the Worked All Counties in West Va. West Va. C.W. Net NSCs would like to have more activity on the net, which meets at 1900 on 3570 kc. Traffic: K8MYU 115, W8NYH 48, K8LOU 30, HID 21, JLF 14, W8JM 3, K8MMZ 3.

(*Continued on page 146*)

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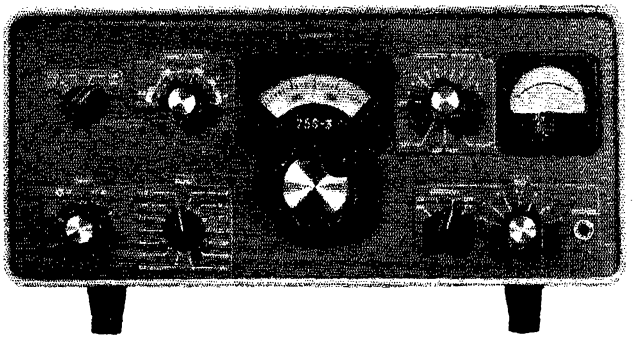

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ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: SIN. PAMs: CXW and LJR. RM: FEO. OBSs: KØDCC and KØEPD. K7MFF/Ø, of Littleton, is a newly-appointed ORS. WWJ is the latest Canary Award applicant (DRC). SIN reports there is a new Denver Area Training Net in Denver. The net meets Mon. and Wed. at 2100 MST on 29,640 kc. The PARA held a ham gear sale Oct. 2 to raise money to buy a club transmitter and took in nearly one hundred dollars. The largest Colorado all-ham family was completed in late September when Betsy, age 8, was licensed as WNØAHD and Mary, age 14, was licensed as EPM. They are the daughters of Colorado SCM Don Middleton, who has two older daughters who are licensed. The XYL is VLS, mother is KØJJJ and brother is 6PWT. NVF is away at school again with the FAA. WWD made the BPL. Congratulations to the Western Slope Club on its FB Ham Picnic held Sept. 17 with 53 hams present. KØWWD made the BPL. Traffic: KØWWD 806, WØBES 407, KØD 101, K7MFF/Ø 80, KØDCW 72, EVG 57, ZSQ 22, WGC 18, WØENA 5, KØWWJ 4, WØSIN 1.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: John H. Sampson, jr., 7OCX. SEC: K7BLR. RM: OCX, K7HFV has been appointed EC for Salt Lake County. He has been very active with the AREC and has been NCS on the 2-Meter AREC Net. BAJ participated in the recent Frequency Measuring Test and the W/VE Contest. VTD has earned the net certificate on BUN. K7s GKW and GOG, in Lewiston, have heard Salt Lake and Ogden stations on 2 meters. GOG is planning more elaborate equipment and better antennas so he should be able to hear Ogden and Salt Lake more often. OCX, QWH, VEO and K7BGU earned BRAT Awards for work on BUN. OCX also made it on TWN. The Ogden ARC had a good simulated emergency communication exercise. Civil defense officials and newspaper reporters thought it was tops. TWN has moved to 3570 kc. VEO has been called to active duty with the National Guard and will be missed on BUN. SCM comment: It would be nice to have ten more OCXs in the section. Traffic: W7OCX 91, QWH 6.

NEW MEXICO—SCM, Newell F. Greene, K5IQL—Asst. SCM: Carl W. Franz, 5ZHN. SEC: BQC. PAM: ZU. V.H.F. PAM: FPB. The Breakfast Club meets Mon. through Sat. at 0700 MST on 3838 kc. NMEPN meets Sun. at 1730 and Tue. and Thurs. at 1800 on the same frequency. Portable groups were active during September. CK, LEF and K5UYF made 350 QSOs from the Four Corners site. On Sept. 23 a RACES net was set up on 145.44 Mc. at six sites from Grants to Moriarty and Sandia Crest. The Las Cruces Club joined with Sun City in collecting seventeen tons of food for flood victims after "Carla." Los Alamos has 25 enrollees in its code and theory class. Twelve RACES licenses have been received there. The Certificate Hunters Club will sponsor the 3rd Annual N.M. QSO Party, originated by the Sandia Base ARC. Traffic: (Sept.) W5ZHN 174, PDO 64, UBW 54. (Aug.) W5ZHN 539.

WYOMING—SCM, Lial D. Branson, W7AMU—The Pony Express Net meets Sun. at 0800 MST on 3920 kc. The YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. PVN has a new sideband rig on with a nice signal. ONK went from Novice to Conditional Class with a new transmitter. HDS is doing a nice job on the RACES roll call every night. K7IAY is NCS for the RACES Phone Net on 3920 kc. every night in the week. HH has a new Collins complete outfit, c.w., a.m. and sideband. The Casper Radio Club runs code instruction classes every Tue. evening. Traffic: W7HDS 51, BHH 29, AMU 16, K7KLE 15, AHO 6, AAW 5, W7HH 5, TZK 4, 7CQL 3, K7CQX 3, ONK 3, W7BKL 2, K7ION 2, W7YWW 2.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4AOZ—SEC: K4JDA. RM: K4YUD. PAMs: K4BTO and K4PFM. New appointments: K4LNA as ORS, W4OXU reports new Generals in Springville are K4BRZ, K4NUW, WA4BSE and WA4BQI; Novices are WN4BYC and WN4CPF. New officers of the Springville ARC are K4NUW, pres.; W4HSU, vice-pres.; K4WSK, secy.; WA4BSE, treas. New hams in Huntsville are W4FFZ/4, W4PKQ/4 and W6PXV 4. K4WSS, EC, reports the Marshall County AREC members met in Albertville on Sept. 22 to make plans for emergency operations. W4RTQ was appointed Asst. EC and will set up a local 6-meter net. K4WSS also reports on a new c.w. class in Albertville, Mon. through Fri. Contact him for details. K4KJD has a new 32S-1. K4PFM is Sat. NCS for TCPN. WN4BDW passed the General Class exam and has a new HQ-180.

(Continued on page 148)

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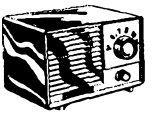

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CITY & STATE _____

W4BMM, EC, reports Cullman County participated in the SET. The smallest city in Alabama, population 67, Ethelsville, has three hams, K4TDJ, K4PIIH and K4DQL. K4RIL reports from the Tri-Cities: K4KHC moved to Florida; K4ZBX is the new secy.-treas. of the Muscle Shoals ARC; K4LGF is in the hopsital; W4ZSH moved to Pennsylvania; WN4BSX and WN4BUM, the daughter and XYL of W4VWG, have passed the Conditional Class exam. W4CIU is putting the finishing touches on a new shack. K4WWP operates Eico 720, 730, SX-100, mostly on c.w. W4PKA, EC, prepared for the Oct. 7-8 SET by holding two practice runs Sept. 16 and 30, using 6 and 75 meters with mobile and fixed stations, the emphasis being placed on correct message-handling. The Decatur ARC participated in the "Tennessee Valley Exposition" by operating a booth at the fair and originated 165 messages. Stations participating: W4PKA, W4FQQ, K4WHW, W4EHP, K4ROP, K4PND and K4WHV. AENT certificates were issued to K4FQG, K4FTC and K4PIII. W4OQG reports K4WVD and K4ZYO are Alternate NCSs for AENT. W4OQG, AENT mgr., invites stations who cannot meet AENP to pass their traffic on AENT on 3965 kc. at 1630 CST as they have regular liaisons to AENP. K4OIV reports the Bessemer ARC's new call is W4BZG. New officers of the Bessemer ARC are K4HNO, pres.; W4EFF, comm. mgr.; K4JSP, treas.; K4OIV, secy. W4EFF was instructor of a radio class at the Bessemer club room and three received their calls, WA4AZC, WA4AWZ and WA4CLL. We regret the passing to Silent Keys of W4ECK. Congrats to K4FYR, the new mgr. of AENS. He invites all Madison County hams to check in to AENS each Sun. on 3825 kc. at 1330 CST. W4UAR, OES, is participating in the OSCAR project. He requests that all amateurs in Calhoun County interested in RACES, contact WA4AEP, e.d. director for Calhoun County. K4YUD, AENB mgr., reports a new daytime c.w. traffic net, 4RDN, on 7125 kc. at 0900 CST (1500Z). All Alabama stations are invited to participate. *Six-Meter News*: K4HPX, the XYL of K4HAG, was selected as "Sears Citizen of the Year" by the Birmingham District. K4UMD, AENO mgr., welcomes to AENO, WA4BXU and K4RWW. K4UMD is awaiting his General Class ticket. W4CIU now has plate modulator in his 6-meter rig. K4DJR is NCS on AENO Fri. nights. W4UAR reports RACES Officers for Calhoun County are W4LEO as Radio Service Officer and W4GBP as Communications Officer. *Notice*: After Dec. 14, address all correspondence and reports to your new SCM, who is listed on page 6 of *QST*. Traffic: (Sept.) K4YUD 159, K4PFM 141, K4WHW 104, K4WSH 70, K4AOZ 58, K4DJJ 48, K4PIII 45, W4RLG 44, K4FTC 43, K4GXS 26, W4MI 23, W4OKQ 19, K4PBY 18, W4WHW 17, K4BFT 14, K4BTO 13, K4YTT 13, W4DS 11, K4KJD 10, K4ZNI 10, K4JDA 9, K4RIL 7, K4TDJ 6, K4KDE 5, W4OXU 5, W4TOI 5, W4CIU 4, K4WVD 4, WN4BDW 3, W4YRO 3, K4DGH 2, K4DJR 2, K4UMD 2, K4WSK 2, K4WSS 1, K4ZYO 1. (Aug.) K4PBY 21, K4WIF 20, K4WWP 14.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH—SEC: W4IYT. RM: K4KDN. RM RTTY: W4EHU. PAMs: 40 W4SDR, 75 K4LCF, V.H.F, W4RMU S.S.B. W4CNZ, K4ZNC, sorry you dropped traffic. Same for W4EAT, who will be greatly missed. W4EXM is in Daytona Beach. He was KR6AM on Okinawa. K4MTP now is official weather station No. 2411. K6SXX/4 is a welcome addition to our traffic gang. W4HWM is back with traffic. K4RNS still is getting certificates, with WEM (Worked Editors Monitor) the latest. K4ZIF has a Public Service Award from ARRL for service during "Donna." Just because the doughnut man was late W4AYD doesn't come by any more. W4CKB made over 800 QSOs from HK1QQ while on vacation. W4SGY and K4ILB are ready for anything, emergency work, v.h.f, and high frequencies on s.s.b., a.m. or c.w. If you don't have report cards, send me a hamgram for some. If you find I made a mistake, let me know about it. If anything gripes you, fellows, drop me a line and let's talk it over. Traffic: (Sept.) K4SJH 732, K4KGB 687, W4TUB 607, WN4BMC 370, K4LCF 228, WN4AKU 216, W4DVR 205, W8LDU/4 178, K4RDX 152, K4BY 143, K4KDN 124, K4COO 120, W4CNZ 109, K4DBT 105, W4TRS 89, K4ENW 84, W4FE 82, W4ARV 80, W4IYT 71, K4ILB 60, W4AKB 58, K4AKQ 58, W4EAT 55, K4YLX 53, W4ZAK 53, K4AX 52, K4LVE 52, W4TRU 44, W4HTH 40, K4YSN 38, K4VSA 37, K4MTP 36, K4JZU 35, K4YOQ 34, W4WPD 33, K4GBS 31, K4ANR 30, K6SXX/4 30, W4BKC 29, W4IWM 27, K4JZX 26, WN4AZZ 25, W4CWD 24, K4BOO 23, K4JWM 22, K4YSP 20, W4AZJ 19, W4BBZ 19, W4DDW 19, W4SGY 18, K4DAX 17, K4GUE 17, W4LMT 17, W4LSA 17, K4RNS 17, K4JJZ 14, K4MZR 14, K4OZS 14, W4VCX 14, W4DPD 13, K4ZIF 12, W4AYD 11, W4DKJ 11, W4TAS 11, K4YPN 11, W4NGR 10, K4VGD 8, K4DAD/4 7, K4EHY 6, W4GOG 6, K4GSD 6, K4RNG 6, W4BWR 5, W4DQS 4, W4DSH 4, K4LWZ 3, WN4BGL 2, W4LML 1, W4SVB 1. (Aug.) W4EHW 161, K4BSS/4 118, W4FPC 93, W4WPD

(*Continued on page 150*)

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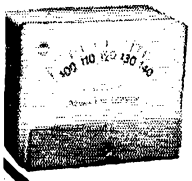
R.C.A. POWER LINE MONITOR



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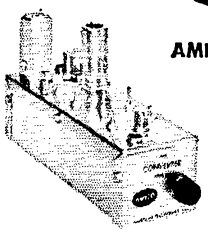

Choice of separate models for 50, 144 or 220 mc bands. Output frequency easily changed for present and future requirements. Three RCA 6CW4 Nuvistors used, two as RF amps, one as mixer with 6J6 oscillator. Noise figure: 2.5 db for 50 mc model, 3.0 db for 144 mc, and 4.0 db for 220 mc model. Image, spurious and IF rejection better than 70 db. Power required: 100-150 V @ 30 ma, 6.3 V @ 1 amp.

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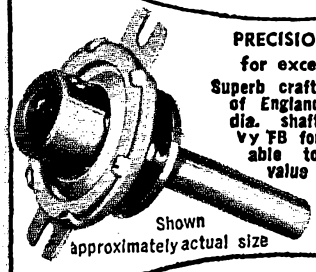
for exceptionally fine tuning



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Amateur Net $1.50 ea.
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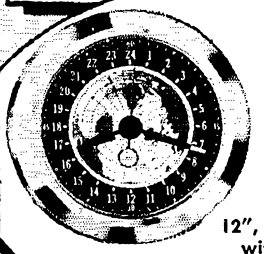

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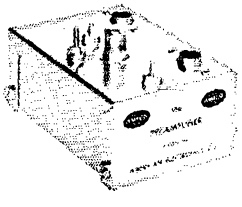

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SEASON'S GREETINGS

52, K4BHL 31, K4BZS 22, W4SGY 20, W4NLX 16, K4YOQ 16, K4VNA 14, K4GUE 13, K4QQE 13, K4PPX 12, K4ZNC 6, K4ZIF 5, W4SVB 3, KN4NTA 2.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: W4MLE. PAM: W4WEB. RM: K4UBR. The Section AREC Net has been reinstated, meeting Sat. at 2200Z on 3845 kc. with W4MLE as NCS. All ECs and other LOs are urged to check in. Madison: W4WMA is converting an ART-13. Perry: W4KQP has several prospective Novices in the school radio club. Tallahassee: W4RKH gave a talk on 10-meter ground-wave work at the monthly club meeting. Activity on 29,560 kc. is booming, with 10 stations active and more coming on. W4MLE and W4SEC have 24-hour monitors. W4WGR has moved to Crawfordville; he and W4IAP will form the nucleus of an AREC unit in Wakulla County. The TARC is sponsoring a code and theory class; the instructor is K4YPI. Panama City: K4CNY has moved to a new QTH and will be working for BPL again. Through the e.d., Bay County hams have obtained twelve 2-meter transceivers for local coverage. The frequency will be 145.2 Mc. Gulf County is expected to obtain similar equipment soon. Fort Walton: W4ZGS, W4PLK, W4SKK and others are experimenting with 220- and 432-Mc. gear. Pensacola: The V.H.F. Club is busy with Sports Car Races. The PARC held an FB fishfry at its new club house. New hams are WA4ALH, WN4CLD, WN4CLH and WN4CWD. W4GRO and K4QOJ are going to RTTY; W4UCY is putting up a windmill tower. Traffic: (Sept.) K4JDW 77, W4WEB 68, K4LOL 43, K4VND 41, K4PMT 40. (Aug.) K4UBR 156, K4CNY 123, K4BDF 36, K4ZMV 8. (July) K4CNY 141. (June) K4CNY 149.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: W4PMJ. PAMs: W4LXE and W4ACH. RM: W4DDY. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs., 0800 on Sun. GSN meets Mon. through Sun. on 3595 kc. at 1900 EST and 2200 EST with W4DDY as NC. The 75-Meter Mobile Net meets each Sun. on 3995 kc. at 1700 EST with W4LG as NC. The GPYL Net meets each Thurs. on 7260 kc. at 0900 EST with K4ZZS as NC. The Atlanta Ten-Meter Phone Net meets each Sun. on 29.6 Mc. at 2200 EST with W4BGE as net mgr. The Ga. S.S.B. Net meets Mon. through Fri. on 3972 kc. at 2000 EST with K4RHB as net mgr. The Atlanta Radio Club Phone Net meets each Sun. on 21.36 Mc. at 2100 EST with W4DOC as NC. W4PIM has a Viking Valiant. Join the boys on 40 meters in their new net that meets on 7125 kc. daily at 1000 EST. K4LFR is going on 220 Mc. The August boys sure put on a swell hamfest and all the gang had a swell time. Yours truly hopes that Santa Claus brings everyone a new receiver and transmitter. Traffic: W4DDY 169, K4BVD 57, W4PIM 56, K4BAI 54, W4HYW 42, K4VTH 3.

WEST INDIES—SCM, William Werner, KP4DJ—C.D. Radio Officer: MC, KP4 QSL Mgr. Congratulations to Technicians SV and APR on obtaining General Class and to WP4AXO, who is now KP4. SV celebrated with a new 100V s.s.b. exciter. APR is the new editor of PRARC's *Ground Wave*. DJ is amateur radio representative on the Red Cross Disaster Committee. MC is preparing a RACES plan. AMG acquired a B&W 5100 and is having fun on 20-meter phone. MO is getting out on 40 meters with a new Gotham vertical and AOO is using the same. AQK has a new Heath Warrior and is assembling an SB-10 to go with the Heath Apache. The PRARC Local QSO Contest, with c.w. and phone on different week ends, brought out at least 20 "c.w." operators Sept. 23-24. DJ worked 13 of them. AXC is believed to have the highest phone contest score with 53 contacts, all on 50 Mc. HK5GZ and TI2NA gave the phone contestants an extra thrill during a short 50-Mc. band opening. The PRARC meetings the first Tue. of every other month starting Nov. 3 at Civil Defense Hq. in Rio Piedras. DV is back on with a Johnson Invader and the old reliable 80-meter antenna and has a 10-kw. emergency power plant at home and another at his office! VP2KS uses the Heath DX-40 and v.f.o. on 7 Mc. from St. Kitts. New Novices on 3725 kc. are WP4BAF, BBI, BBN and BCZ. PJ is working lots of DX with a new Gonset 100-101, a Hornet Tribander and a Drake 2B when not mobiling with the "Sixer." ATV's 80- and 40-meter dipoles help his 813 put out a big signal while waiting for the Hornet triband beam. ATV transmitted the hurricane advisory direct from the USWB to the 80-meter C.D. Net. AOV wiggles a mean lug from Ponce. KQQHF is now KP4BCA at Ft. Buchanan. AAA is now with U.S. Customs. NCS CK says his 6-meter Civil Defense Net averages 22 stations reporting each Mon. at 8 P.M. on 50.5 Mc. CL says she has worked 88 countries on 20-meter s.s.b. in six weeks, among them VP5BH/5 at Cayman Island on 14,307 kc. 400 also worked VP5BH/5 at Cayman Island on 14,307 kc. A00 also worked son of AFE and grandson of WT. WT has a new 32V-2 which she uses on 20 meters handling traffic to Venezuela, Panama, Nicaragua, Haiti and the U.S. for students of

(Continued on page 152)

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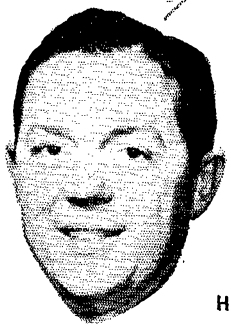
"CALL ME for Personal Service"



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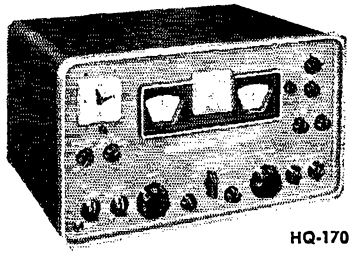

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the U. of Mayaguez. WT appeared on a 30-minute interview of TV channel 3 where the "Grandmother of KP4-Land" also gave a demonstration of traffic-handling by contacting AFK and AFE on 6 meters using AZU's equipment. Her title stems from 20 years as an SWL and having 5 grandchildren (she now has fifteen) when she became a KP4. DL has moved to his new house in Mayaquez. The Antilles Emergency Weather Net and the 40-Meter C.D. Net were activated because of floods caused by Hurricane Frances. AFL is confined to home using crutches after a leg operation. AWH is on 40 and 75 meters in the evenings working stateside, and experimenting with the plate modulation of the Cheyenne transmitter and long-wire antennas for these bands. AXO helped WP4BCZ pass the exam and was his first QSO. NCS TIN advises the 80-Meter C.D. Net now meets Tue. at 5:30 P.M. AST on 3810 kc. Stations reporting regularly are WT, ASK, ATV, ATY, AMK, AWH, AXO and VP2OE. MARS meets at 6 P.M. Mon.-Wed.-Fri. The Official ARRL appointments of AAA, ABN and CO3RC have been cancelled because of inactivity. ACF received the WPR-25 Award for 50 Mc. WPR25, WPR50, WPR75, WPR100 for h.f. and WPR-N-10 and WPR-N-20 for Novice contacts. Traffic: (Sept.) KP4WT 166, AWH 4. (July) KP4AWH 2.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD —Club officers of the Canal Zone Amateur Radio Assn. met with officers of the Liga Panamena De Radio Aficionados. The primary concern of the meeting was to get closer cooperation between the clubs on matters of mutual interest. The Liga expressed interest in setting up a c.d. net. At present the Panama Phone Net operates Sun. mornings on 7080 kc. and we pointed out that the Canal Zone amateurs could not use phone below 7150 kc. The groundwork for this net is being worked out by the Liga with a view towards Canal Zone amateurs participating. The Liga expressed sincere interest in Senator Barry Goldwater's Bill S-2361, particularly since some of the Panama amateurs are at present attending college in the U.S. The Liga also discussed the possibility of trying to extend amateur radio privileges for persons using the Pan-American Highway and the Trans-Isthmian Highway. At the present time mobile operation is forbidden in the Republic of Panama except for certain licenses issued years ago during an interest in C.D. Net activities. The CZARA sent a letter to Senator Goldwater approving Bill S-2361 and urged its members to contact their own senators to approve this Bill. The Crossroads Amateur Club reported the start of new code classes. BG has moved to the Pacific side. FG is new activities manager for the club. KR is finishing off his work on his RTTY setup. KA, RM, EJ and HK are back after Stateside vacations. HQ is back on the air after replacing a defective plate switch. BL finally raised his 10-, 15- and 20-meter beams. FM has his 10- and 15-meter beams up also. HX now is using a tri-bander beam with his HT-32. TD hopes to have his 20-meter quad up soon. Traffic: KZ5JW 137, TF 52, OB 47, TD 21, OA 14, CD 12, HF 11, KR 10, AD 9, HR 3, FG 2.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—Asst. SCM: Lyle G. Farrell, W6KGC. RMs: W6RHG, WA6ROF and K6LVR. PAMs: W6ORS and K6PZM. The following stations earned BPL August traffic: W6WPF, K6EPT, W6GYH and WA6JDB. Congrats, fellows! W6GYH is in there swinging after a bout in the hospital. K6UYK has a new Heath "Twoer" on the air. WA6DWP is taking a night course in electronics at Citrus College. K6YVN reports MCAN-7 membership is growing very fast. WA6CKR is putting a G-76 in the station wagon for mobile operation. K6COP attended the S.S.B. Convention and is now hard at it at Cal. Poly. W6ORS has a boat and is expected to be /MM! WA6ROF has a new Ford Falcon Futura and is busy with Project OSCAR. WA6OUK, WA6HTK, W6NAA, WA6BFC, W6WAW and the rest of the EC gang were busy getting lined up for the SET. WA6HUO had a nice trip to Lake Tahoe and has a new G-63. W6WNR is keeping skeds with W8MPD, who also is a high school physics teacher!

(*Continued on page 154*)

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THE LAFAYETTE HE-30

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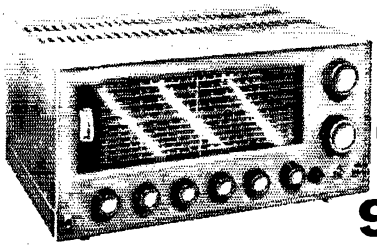

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Sensitivity is 1.0 microvolt for 10 db, Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER. TUBES: 6BA6—RF Amp, 6BE6 Mixer, 6BE6 OSC., 6AV6 Q-Multiplier—BFO, 2-6BA6 IF Amp., 6AV6 Det-AF Amp. ANL, 6AQ5-Audio output, 5Y3 Rectifier.

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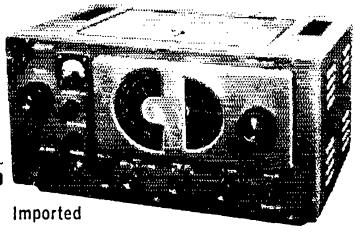

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The Communications Receiver that meets every amateur need—available in easy-to-assemble kit form. Signal to noise ratio is 10 db at 3.5 MC with 1.25 microvolt signal. Selectivity is —60 db at 10 kc, Image reflection is —40 db at 3 MC. Tubes: 3—6BD6, 2—6BE6, 2—6AV6, 1—6AR5, 1—5Y3.

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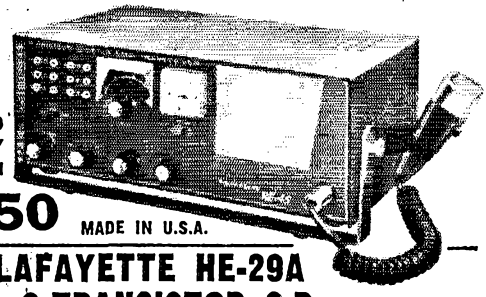

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W6FB has returned from 3 months in DU-Land visiting old friends. WA6KUA has a new HT-37, an SX-100 and a Hy-Gain vertical. W6EBK is net manager of the San Gabriel Valley V.H.F. RAFT Net. K6LTO has a new KWM-2 in the car. New officers of the San Gabriel Valley Radio Club are W6QYY, pres.; K6KIU, 1st. vice-pres.; W6GVU, 2nd. vice-pres.; WA6LGZ, secy.; W6BRO, treas. Support your section nets: On phone, the SoCal Six Net on 50.4 Mc. at 0300 GMT daily; on c.w., the Southern California Net on 3600 kc. at 0300 GMT daily. Traffic: (Sept.) W6WPF 843, K6EPT 715, W6GYH 703, WA6JDB 510, WA6ROF 345, K6OZJ 311, WA6KQN 251, W6ENB 204, WA6BCZ 129, WA6QFC 110, K6YVN 93, WA6OUK 89, WA6JOC 88, W6BHG 71, W6USY 64, K6HOV 58, WA6GRG 46, WA6CKR 26, WA6MFH 25, K7ACG/6 20, W6NKR 16, WA6KAW 14, W6VOZ 8, W6JQB 5, WA6DWP 1. (Aug.) WA6BCZ 189, K6PZM 84.

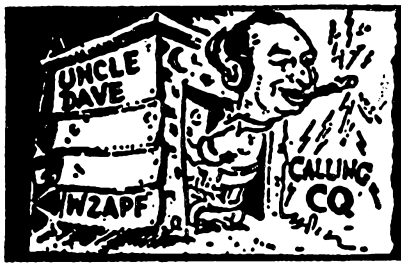
ARIZONA—SCM, Kenneth P. Cole, W7QZH—Asst. SCM/SEC: George Mezey, K7NIY. PAM: OIF. RM: LND. The Copper State Net meets at 1930 MST Mon. through Fri.; the Grand Canyon Net Sun. at 0800 on 7210 kc.; the Tucson AREC Net Wed. at 1900 on 3880 kc. We wish to congratulate the Catalina Radio Club of Tucson, Ariz. With a 53 per cent ARRL membership, they have submitted the necessary papers and should be an affiliated ARRL Club soon. A 2-meter ragchewing net is being sponsored by the Old Pueblo Radio Club. Tune in any Wed. night at 2000 hours. At a meeting of the Arizona Amateur Radio Club the following members were elected to the Board of Directors: CS, pres.; OIF, CEH, WFY, MAE, K7BXT, K7MSD and KN7PLO. A c.w. net was set up recently by LND, RM for the State of Arizona. It meets Mon., Wed. and Fri. at 1900 MST on 3515 kc. The establishment of this net was publicized throughout the state. To say that your SCM was disappointed in the turnout is the understatement of the year. Participation was extremely poor. We will continue to net for another 90 days, and ask that all the amateurs in the State of Arizona check in. Let's make this c.w. net a success. UVR is on the air with a new mobile rig. New call: K7QWR, formerly F7BM. Roy recently moved to Scottsdale, Ariz., from the French Riviera. Traffic: W7LND 212, K7AWT 4.

SAN DIEGO—SCM, Don Stansifer, W6LRU—Your SCM would like to thank all ARRL members in the section for the recent interest in the first election for SCM in this section for years. Your vote to have me as SCM for another two-year period is appreciated, and all possible will be done to make this the best two years in this section. W6JH had major surgery in October and is now home recovered and working DX. WA6BUX is up to 106 countries worked. W6ZVQ, contest champion, has been in W5-Land for some months on company business. Welcome back to the section to W6UWL, OO, who is now in Orange. K6RPD is a police cadet attending college, and K6YFA is a member of the reserve police in San Diego. K6LKD and WA6CDD are both QRL with college. Ex-K6BEC is now K1SAW. K6RCK, OES in Santa Ana, reports his XYL, K6RYP, had surgery and is now home. Convention progress for the division convention to be held at Disneyland next summer is progressing on schedule, with a "Queen" contest held recently which was a success, per chairman K6LJA. The North Shores Club of San Diego is now ARRL affiliated. Congratulations, K6ENX, in Escondido, broke over the magic number and has now worked 301 countries. The October meeting of the San Diego DX Club was held at the home of W6EPZ. W6CHV is now on s.s.b. with a home-built exciter and a pair of 813s, and his country total is up to 280 confirmed. K6BHM, now at San Diego State College, finds time to work DX, and is up to 184 worked. Traffic: (Sept.) W6YDK 3105, W6IAB 2908, K6BPI 2407, W6EOT 956, WA6CDD 245, K6LKD 173. (Aug.) W6YDK 3246.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, 5NFO. SEC: K5AEX. PAM: AYN. RM: LR. ACK has been forced to resign as net manager of the NTX because of the activation of a National Guard Unit of which he is a member. Jay is to be commended for the fine job he has done in the short time he has been net manager. EUY, club station of the Arlington State College ARC, is proud of a certificate of affiliation dated 1935 and signed by the late Hiram Percy Maxim. The club's new officers are K5LLA, pres.; K5HTM, vice-pres.; KN5LDQ, secy.; K5RAV, treas. The club received much praise from the president of the college for its assistance in coordination of registration by setting up 6-meter communication between the school offices. Hurricane Carla furnished plenty of opportunity for the hams in this area to demonstrate their ability to handle traffic in an emergency. The ama-

(Continued on page 156)



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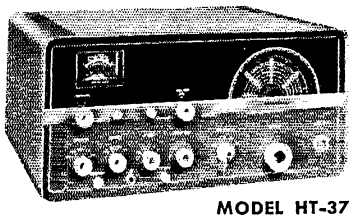

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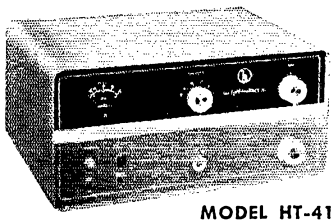

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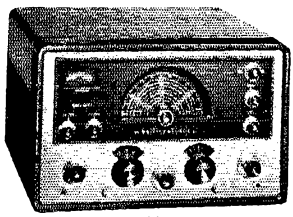

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This is a new triple-conversion heterodyne type communication receiver. Combines highest accuracy, stability, sensitivity; linear tuning, constant tuning rate, built-in 100 Kc crystal calibrator, sensitivity less than 1 microvolt, selectable side bands, image rejection better than 60 db; band gain equalization, audio inverse feedback, and many other features. Covers nine 500 Kc segments.

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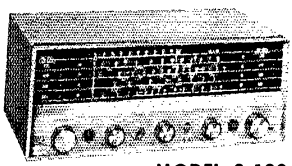
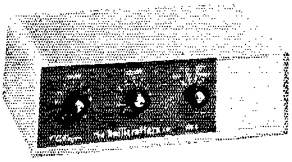


MODEL S-120

Covers broadcast band 550–1600 kc. plus three short-wave bands 1600 kc–30 Mc. Slide rule bandspread dial, separate bandspread tuning condenser; band selector, main tuning, bandspread tuning; standby-receive, B.F.O./selectivity, AC on/off. vol.; 50/60 cycle AC/DC.....**$69.95**



HA-4 "T. O. Keyer"

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tours were complimented very highly by the Governor of Texas for their fine work during the emergency. Many hams operated their stations continuously for 36 hours. K5VWJ was given time off (with pay) and operated her station 65 hours handling emergency and welfare traffic. THI has installed an Auto Call on 29.640 Mc. and will answer all calls with the 1-2-3-4 1000-cycle tones at 2 second intervals. Larry also advises he has two complete stations capable of operating simultaneously plus a local radiotelephone in his car. Ham Day at the Dallas State Fair of Texas, Oct. 8, was another great success. More than 200 hams and their families attended. Traffic: (Sept.) W5GY 610, BKH 188, SMK 154, K5LBG 130, RAV 96, VWJ 66, SNK 53, AVX 47, PXV 29, W5CUI 22, GNF 15, LGY 8, K5RNM 7, BAJ 4. (Aug.) W5SMK 131, K5RAV 107, W5LR 62, AYX 14.

OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—SEC: K5KTW. We regret to announce the resignation of MFX as manager of the Oklahoma Phone Emergency Net. Cecil has been mighty faithful and put in a lot of work on this net for six years. Thanks, Cecil, from all of us. K5PDM, EC for Seminole County, was the guest of the whole school system at Wewoka. J.W. is really doing the advertising. The SCM met with the Edmond Radio Society on Sept. 8 and was awarded an EARS certificate by that club. We also met with the Kay County Club and the Enid Club. The Kay County boys entertained us all with a fine picnic. K5OHU is the new secretary of the Oklahoma Central V.H.F. Club. K5DLO has become a Silent Key. Our sympathy and blessing to his family. Oklahoma has some fine nets. The c.w. nets, OLZ and SSZ, both meet on 3682.5 kc. at 1900 and 2130 CST, respectively. The phone nets are on 3850 kc. at 1800 CST and 7235 kc. at 1220 CST. We need some higher-power stations, who will become regular members of the net and then take responsibility as NCS when requested by the PAM. Traffic: (Sept.) K5MBK 111, W5DRZ 103, K5JGZ 99, AUX 80, OCX 61, W5FWW 57, CCK 35, K5IBZ 33, W5JXM 20, MFX 19, CCV 17, K5JOA 16, OOV 16, DMS 15, W5JCY 15, UYQ 15, K5CBG 12, W5PNG 12, K5VYD 12, W5WDD 10, K5ZCJ 9, JIJ 7, VNJ 7, BNQ 6, EZM 4, W5EHC 3, K5HQE 3, W5WAF 3. (June) W5ORH/5 1495.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: AIR. I am sorry that I missed the column last month but about that time everyone was boarding up for Hurricane Carla, and since that time everyone has been trying to get his antennas back up. Winds ranged from 100 miles per hour in Corpus Christi to 172 miles per hour at Pt. Lavaca. Needless to say the amateurs did a wonderful job before, during and after the hurricane passed. There were two stations in Pt. Lavaca that stayed on even with the 173-mile winds. Victoria and Edna, also almost in the center, stayed with their communications. So many stations participated, it would be impossible to list all of them, and about all we can say is thanks, fellows and gals, for a job well done. The emergency nets really paid off regardless of what some few in Southern Texas think of them. Incidentally, I didn't hear them on trying to help. Our deepest sympathy to AQK and BKH on the loss of their son. QKF, AIR and QEM visited the El Paso Amateur Radio Club. I am still looking for a station in Goliad, Jim Hogg and Kenedy Counties for the RACES program. Traffic: (Sept.) W5AIR 403, K5WIC 213, W5FCX 39, K5JFP 12. (Aug.) K5ABV 327, MXO 111, JFP 76, MWC 20, W5AIR 16.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WR—Asst. SCMs: A.E.W. Street, VE1EK, and H. C. Hillyard, VO1CZ. SEC: BL. Newly-elected officers of the NSARA include ABU, pres.; RT and BC, vice-pres.; XP, secy.-treas. RT was awarded the Doucette Memorial Trophy for the greatest contribution to amateur radio, in his formation of the Maritime Weather Net and the Old Timers' Net. BQL/SV reports from Rafah, Egypt, that he is prepared to handle traffic for the section. QT/W9 is looking for VE1 contacts. Owen's present location is Madison, Wisc. GY (ex-3ASZ) is back in the section and active from Coverdale. Ex-WO1EX is now VE1AX

(*Continued on page 158*)

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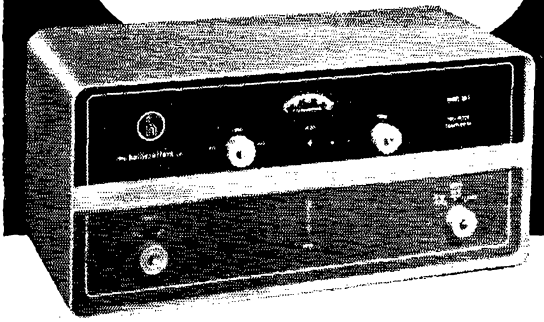

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Come on in and see the new HA-6, and all the other fine equipment on display here. Bring along your old gear, for my tops-'em-all deal. I guarantee you'll go home happy. (If you can't come in, please drop me a line.) Thanks. 73, *Bil Harrison*, W2AVA

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and located at Dartmouth. Ex-VO1FE now resides at Spryfield. Additional transfers to Dartmouth include VE1AAM, from Amherst, and ex-VE8SA, from the DEW Line. FD has been active on 75-meter phone. QV has been transferred to St. John's and will be signing with a VO1 call shortly. PQ and family have returned from a holiday near Salt Lake City. PW spent the summer on course in Norfolk, Va. WL reports excellent results with a home-built electronic keyer (ref. Sept. *QST*). Traffic: VE1OM 16, ADH 3.

ONTARIO—SCM, Richard W. Roberts, VE3NG—A combination effort of the Nortown and Scarboro Radio Clubs in a hidden transmitter hunt was successful. The winners were AIB, HE and DAR, (mobiles). XF has a new beam. DPO was on the East Coast for a vacation. The Grey Bruce Net is in full swing again. We correct our former report. CYL is not the key man for the Ontario DX Assn. DVA, is pres.; BWY, vice-pres.; BQP, secy.-treas. The Elliott Lake ARC is quite active. APD is s.s.b. ABE is firing a DX-100. EBT is not far behind with a home-brew. CZG and DSZ are hit on the phone bands. FG, from the Soo, was a visitor to the Lake. BQI is back on the air from the Niagara District. BZJ is now in Milton. Ex-GH, Ingraham Peacock, will return to the airwaves soon. BKL has close to 100 certificates from all over the world. BKF is back in Dunneville. Members of the Northshore ARC visited CFTO recently and the Kingston ARC was on CKWS-TV for a half-hour show. Those interviewed during the show were CAH, ATL, CKG and AXK. On the Thanksgiving week end the club provided communications for a sports car rally. The Ontario ARRL Convention at Windsor was one of the finest. ARRL officials were numerous. Seen there were 2BE, ARRL Vice-Pres.; CJ, Canadian Division Director; W3YA, Atlantic Division Director; NG, Ontario SCM; AML, Ontario PAM; CNB, Windsor Area EC. The First Cornwall Hamfest was a huge success. Over 150 guests from Ontario, Quebec and Northern New York State were present. BD has a new vertical antenna on 75 meters. Heard each afternoon en route from their offices on 75-meter mobile are BWO, NG, DTO, CO, AL (ex-BLL), ADD, YD, DRF and DAR, all in the Toronto Area. ADK is in Ottawa. BPL is back on 75-meter phone. ECO also is in Ottawa. AAW and AEJ are both on s.s.b. The Hamilton ARC is holding its Annual Ladies Dance at the Royal Hamilton Yacht Club Nov. 24. EMF has departed from Ontario on a trip around the world. She expects to visit hams in all countries and is beginning in Japan, and then on through South East Asia. Traffic: VE3NG 96, CYR 86, BAQ 84, CFR 76, DPO 75, BJR 59, AML 24, RN 17, DWN 15, EHL 11, DU 9, CE 5, ABG 3.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—With deepest regret we learned of the sudden passing of SG. Bill was a real ham; helpful, friendly and loved by all. 21 Mc., despite vagaries, is popular. UZ, NK, ANJ and AFX are busy on this band. Project OSCAR has stirred up interest among the v.h.f. boys. UQ, AIO, FF and others are ready when launching occurs. AUU and brother AUV went DXing for the big ones via rod and line but skip must have been wrong as results were poor. JE, AGM and DR had better luck but CI beat them all. LA1SH/MM received a rousing welcome when landing at Quebec City. TJ is putting up a TA-33 on a 40-ft. mast. WW is running for Canadian Division Director, and BK for Vice-Director. Locals enjoyed the Annual VE/W Contest. EC reports a new ham at Nicolet, BJZ, Rev. Francis Zeman. The CJO elected ABE, pres.; AWR, 1st vice-pres.; AJV, 2nd vice-pres.; BJY, secy.; AOI, treas.; BJV, tech. asst.; ATL, dir. Meetings are held as previously. RO is active on 75- and 10-meter phone. PS is experimenting with 75-meter QRP phone. ABE is QRL work. BEZ is at Torbay, Newfoundland with the RCAF. AGJ/2 is on from Val Morin. AVC enjoys hamming at Morin Heights. AWK was mobile VE1 while at Edmunston, N.B. VR is ex-AHZ. His melodious voice is heard on 75 meters, mobile and fixed. ABZ is building a new boat. WO2QB is back home and signs VE2QB again. CA moved to a new "Shack" in St. Lambert. ALF, Dorion, uses a DX-100. BBT is helpful to budding hams. Members of the MECC are assisting in Sport Car rallies. WA finally succumbed to "unintelligible" speech. Traffic: VE2AGM 54, DR 47, EC 37, BG 25.

ALBERTA—SCM, Harry Harrold VE6TG—SEC: FS, PAM: PV, EC: IU Southern Alta. OO: HM, OBS: HM, ORS: WG, OES: DB. So far the Southern Alberta Emergency Corps is progressing very nicely. Keep it up, boys. GH returned from a trip down Honolulu way where hospitality is fabulous. He says that it is the place to go for a holiday. If any of you have friends or relatives in the Armed Forces in Egypt and would like to contact them, look for VE3BQL/SU Rafah, Egypt. He works 20, 15 and 10 meters. So, fellows, if you hear him give a shout. Another month has gone by and no clubs have been heard from. What's the matter, fellows?

(*Continued on page 160*)

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How about a line from any of you. Traffic: VE6HM 108, FS 10, AEN 6, BL 4, TG 4, PZ 3, SF 3, SS 1.

BRITISH COLUMBIA—SCM, H. E. Savage, VE7FB—Our lady operators are on the increase. BFO, Loma, is on 40 and 20 meters with a DX-100. BBB, Eva, is active on all bands and is a real dog for traffic-handling. BDH, Vera, of Kamloops, is being heard. SH, Edna, has been heard. Now let's hear AUF, ACH AOV and those other licensed gals who are hiding from us. AAF is top c.d. winner with AC in fifth place in Canada. The V.H.F. Contest was a great event for the VARC, which placed high in Canada. ACM is the gardener to put all to shame and still finds time to be on the air. JQ has taken up the broom in place of traffic and he likes curling. AMW is the new president of the VARC. The Royal City Club enjoyed a visit to DOT Monitor Station. It seems there are only *four* active clubs in B. C. Thanks to Terrace, Royal City, Nanaimo and Vancouver for their help. OM must admit he is getting old; we see his OTC certificate. EH worked two JAs on 80 meters. It is nice to hear that amateurs still build from scratch. BDP has a double conversion receiver. BHE a v.f.o. for DX. BEV and others are preparing for the winter DX. The present schedule for nets in B. C., as confirmed by the RM: BCEREC, 3755 kc. 1800 PST Mon. through Sat., AIG net mgr.; BCSN, 3700 kc. 1830 PST daily, QQ net mgr.; BCEN, 3650 kc. 1900 and 2200 PST daily, BAZ net mgr.; KN7, 3565 kc. 1945 and 2100 PST daily, W7BDU, net mgr.; NN, 3780 kc. 1930 PST daily, AGK, net mgr, QQ, net mgr.; reports the British Columbia Slow-Speed Net, on 3700 kc. is looking for KL7s to complete its northern coverage. Traffic: VE7AAF 146, BDP 87, BGE 71, BAZ 36, BFK 27, AQD 14, BBB 14, BEV 9, AMW 7, JQ 5, DH 1.

MANITOBA—SCM, M. S. Watson, VE4JY—The following hold ARRL appointments dated April 1, 1961: AN Portage La Prairie, as OBS. TL, Winnipeg, as EC. RR, Winnipeg, as PAM. JW, Bousejour, as OO. IM, Winnipeg, as ORS. Manitoba Net Control Stations: Sun. EF, Mon. MN, Tue. GB, Wed. FI, Thurs. AK, Fri. IW, Sat. JY. Forty-four stations are on the call list in Manitoba. 5 in Saskatchewan, 3 in Ontario. In the July CD Party IM attained 50,400 points (c.w.). RR, of the Forestry Dept., The Pas, has been promoted and transferred to Winnipeg. Congratulations. IW and HS and several of the Brandon boys have taken up v.h.f. Traffic: VE4QD 10, AN 6, EF 5, JY 5, FK 3, PW 3, BG 2, JF 2.

A Combination, etc.

(Continued from page 42)

and calibrate the wavemeter. You'll find there is enough output from a grid-dip meter to give you plenty of meter deflection when you tune to the correct spot. If you want, you can make up a small chart or dial to fit under the mounting nut on C_1 and calibrate the dial in megacycles, starting at the lowest frequency and working up through the bands.

You'll find when using the Monimatch on 80 meters with Novice powers (75 watts) that it will be impossible to obtain a full-scale reading in the forward direction. With a 500-μa. meter you'll have about half scale. However, this is enough to make your adjustments for matching. On all the other bands you'll have to decrease the sensitivity of the circuit with R_3. You can obtain full-scale readings on 80 meters if you go to a 100-μa. meter movement, but these meters are usually quite expensive. You could check the surplus market for such meters. QST

Correspondence

(Continued from page 82)

experimentation, the end result desired is precisely reliable communications. The question is, will lowering the maximum permissable power increase communications reliability?

Obviously, with decreased power levels, signal strengths over long distances decrease, so no reliability is gained. But the QRP boys say QRM would be decreased. Not so! There are several forms of QRM, the worst of which is hetrodyne action, and it is obvious that *a reduction in* power does not change the situation at all. For instance, if two one-k.w. amateurs a.m. hetrodyne each other, the signal power to hetrodyne power (or readability of the signal to readability of the hetrodyne) might be assigned a percentage "A". Then, if both stations reduced power to one hundred watts, *the ratio would still be "A"*, and no advantage would be gained. This same general argument holds for all modes of emission.

Nothing is to be gained by power reduction unless power is reduced to the point that two stations, widely separated in distance, may use the same channel at the same time. But this defeats the reliable communications idea. Hence, the only ways to obtain more reliable communications are (1) widen the amateur bands, (2) make sure all a.m. stations have, at most, a 6-kc. band-width, (3) allow only those s.s.b. stations to operate which can prove that their distortion products are at least 30 db. below signal level, (4) remove all the clicks, chirps, and modulated c.w. notes from the bands.

If anything, more reliable communications could be obtained by increasing, not decreasing, present power levels, not only because an increase would mean higher signal strengths, but also because the present QRP operators would be less tempted to use an already occupied channel where they should not be trying to operate anyway. How about giving the Extra Class a 10-kw. limit? — *Gary B. Jordan, W4GTKT, Downey, Calif.*

OO COMMENT

¶ A few moments ago I completed my monthly activity report to Tom Hedges, the MDD SCM, and as usual there were several letters and cards sent me by recipients of OO reports which I also enclosed. These letters all have one thing in common; without exception, so far, the writer has been appreciative of the efforts by OOs and has thanked me for letting him know of the condition which attracted my attention. A comment made by a number of fellows is that, like BO, "even your best friend won't tell you" if your note is sub-standard or operating in a manner likely to bring a "pink ticket" from the FCC.

The point I'd like to make is that most fellows welcome an honest report and would prefer to get it first hand from an OO rather than a notice from FCC. Would it be possible for ARRL to campaign with a simple slogan for honest reports? "Make a ham a friend with an honest report." I enjoy my OO work but it would be nice if all the fellows would report in a manner likely to put us out of business. How about giving it a try? I'm sure the nearly four hundred I've notified this year would rather have heard it first-hand. — *Louis A. Robertson, W3ZAQ, Edgewood, Maryland.*

POWDER PUFF DERBY

¶ I am writing to you to express the appreciation of the Western Washington Chapter of the Ninety-Nines, Inc., for the help given us this past summer by Ray Stekly, W7GRM, of Seattle. It was only through Ray's efforts that we were able to keep informed on the progress of three pilots from our Chapter who were flying in the Powder Puff Derby — popular name for the annual All-Women Transcontinental Air Race.

The weather conditions which existed during the time the race was being flown not only made flying conditions the worst to be experienced in many years for the entrants, but even caused postponement of the race finish deadline two separate times. During these delays, when the entrants were forced to wait for better weather for two and even three days at a time, there was a virtual blackout of news; radio and press coverage was reserved for news of winners, it seemed. It was only through the contacts that Ray made with hams across the country that we were able to learn

(Continued on page 164)

where our pilots were . . . — *Marian Owen, Chairman Ninety Nines, Inc., Seattle, Washington.*

SK W3EWW

Lloyd S. Quinn, W3EWW, FCC Radio Engineer at Baltimore, died in September and was buried in Arlington National Cemetery. Lloyd heard De Forest's early radiotelephone experiments in New York, and was the radio operator on the *SS Ontario* when the first ship-to-shore installation was inaugurated by the predecessor of Bell Telephone Company Laboratories. He is also known as the man who in effect operated the first police radio system when he borrowed a captured Telefunken transmitter from his friend the admiral at Norfolk, Virginia, and used it to maintain communications with the radio operator on a mutinous ship in the harbor directing assistance to the vessel. This was in 1919. Lloyd was also known for his valuable contribution to the war effort in the Alaskan area when he, acting under Army sponsorship, assisted in mimicking a Japanese station thereby misleading Japanese forces which were proceeding to an attack upon Alaska.

I regret the passing of Lloyd, who was a very ardent ham and still better Federal official. — *Frank M. Kratokvil, W3BA, FEMB, Federal Communications Commission, Washington, D. C.*

World Above 50 Mc.

(*Continued from page 71*)

of the good conditions by working W9ASX, K9LOF, W9TEJ, W9GFO 9, K4GZS, K9TCM, K9JIR, K9ODG 9, W9HUV, W9FRU, W9AGV and W8LZY over a period of two hours. Adah is using a drooping ground-plane antenna. One of the "badly wanted" states, Maine, comes through with a few words from Don, K1INL, who sez that there several fairly good two-meter openings during the month of September particularly around September 8-10 and 22-23, when Southern New England and VE1s were coming in at his location in Sanford. On September 13 K7IIKD in Wyoming worked WØENC at Rapid City, South Dakota, on 144-Mc. s.s.b., a distance of 223 miles. Seems that just about everyone on 144 Mc. took advantage of the end of the month conditions: WA2EMA also reports an inversion of October 1 and 2 when he worked W3ARA, Maryland; K4SCD, Virginia; W4VVE, Virginia; s.s.b. to s.s.b.—K1CRN, Rhode Island; W3LML, Delaware. Bill also noted the aurora of October 1 when he heard stations mostly toward W1, W9 and W4 areas. Nightly skeds are held by WA2EMA on 145.22, both stations s.s.b. Joe Hauptly, K3CNN, now running 150 watts on two-meter phone, sez that the first three weeks of September were exceptionally good for ground wave.

Clubs and Nets

The Connecticut Mobileers are holding their first annual contest, on two meters only, in conjunction with ARRL VHF Sweepstakes, January 6 and 7, 1962. This contest is open to any two-meter operator who is registered as a Mobileer as of the day preceding the contest. The contest will be run under ARRL rules. Persons wishing to enter the contest should send duplicate logs to ARRL and the Mobileers. Certificates will be awarded to all Mobileer entrants, with prizes going to the three top scorers. In case of ties, winner will be the one with the least operating time during the contest. Logs for the Mobileers contest should be sent to K1JOY, R.F.D. 2, Farmington, Connecticut, within two weeks after the contest. Full details of the V.H.F. Sweepstakes are on page 21 of this issue.

50 Mc.

A quick note from G3LTF in Essex, England, is most interesting in that he reports a contact on 50 Mc. [? — *Ed.*] with SM3ANR in North Sweden during the Perseids. The distance is 1002 miles as accurately as possible.

Another quickie — KL7FLC, now being operated by W1JJD and W1FVY, worked VE8BY, VE8CM and KL7-AUV on the night of October 11.

The following seems interesting enough to us to quote rather than to take out bits and pieces and think you'll feel the same way about it. From Glen Marshall, VE8CM: "From reading past issues of *QST* and the v.h.f. column, I find that many v.h.f. men were wondering whether any-

(*Continued on page 166*)

thing is being done in the northwest on the six-meter band. For the information of hams on the outside, 6-meter interest is building up in Whitehorse slowly but surely. There are presently three of us with 50-Mc. rigs and some in the process of being built. VE8EW and VE8AT both have small power stations along with myself, although VE8AT is U.S. for a time." "Present plans for my station include a higher power than the present c.w. rig, approximately 300 watts. The antenna is a Hi-Gain, 5 element Due to the rig being set up in the shop, I am able to monitor 50.04 eight hours of the day plus most nights at midnight local time. It is the main purpose of this letter to report that KL7FLC was heard on the band at 1225 A.M. on October 1, 1961. RST was 5-7-9 but no contact was made. At this time it was noted that a thick sheet of aurora was covering the sky northwest of here. The only other outside contact I have made so far was with VE8BY in Yellowknife on August 26 at 11:25 P.M. from the top of Canyon Mountain, running 15 watts c.w. and 10 watts phone. The QSO lasted for about ¾ of an hour. Along with having to watch the band at this location, constant lookout was kept for prowling bears, part of the station equipment during this portable operation was a high power rifle for safety, instead of fuses. Hope that a few of the fellows will point their beams around this way once in a while." You'd be amazed, Glen, if you knew just how many do turn their beams your way, particularly if conditions are the least bit unusual.

Word comes through Mike, K2LZF, that VE2IM and VE3CAU are both operating 144 Mc. at the present time; VE2IM is running a kw. and was last seen on 144.185; VE3CAU, near Ottawa, on 144.140. An interesting letter received from Joe, K9SGD, reports the aurora of September 30 and what he heard in Sparta, Illinois. On that night Joe worked seven states (nothing new) with quite a few stations coming through on A-1; a few of the better signals were W8NSH, W8QXO, W8GGH, W9FHS, K9AQP, W9IXF, W9EGH, K9UIF, W0UBA and W2ZRG. Opening lasted for about an hour and thirty minutes. (The above on 144 Mc.) Joe hopes to be on s.s.b. on 144 Mc. before Christmas. A few stations heard on 50 Mc. by K0UDZ during the auroral session of September 30 were K8MMM, K0SBV, W7VDZ, K8RUD and W4COB. Gene heard quite a few others at his QTH in Rapid City, South Dakota, topping it all off with VE8BY, heard but not worked. Seems that this was one of the many times that a ham wishes for a recorder, but no such luck, just as no luck with aurora contacts for Gene. Ground wave once again has been good on 50 Mc. and Larry, K3ADS, says that stations at a distance from 150 to 250 miles are being heard almost every night, with stations at a distance of 250 to 400 miles being heard about once a week. W3ZRR says that sporadic *E* was in occasionally during the month of September but ground wave has been excellent extending from New England to Virginia. In Massapequa, New York, August, K2PQY, also noted the ground wave conditions were better than normal during September, hearing Eastern Pennsylvania, Delaware, Rhode Island, Massachusetts, Maine and New Hampshire all on ground wave. During the VHF QSO party the band opened for August to Alabama, Nebraska, Kansas and Missouri. In Wichita, Kansas, K0GIC, Dot, noted 50-Mc. openings on September 9, 11, 17 and 19, with the openings lasting anywhere from five minutes to three hours and the band in and out several times during the longer times. Word from Boise, Idaho, and Keith Armstrong, takes us back through several months of operating to "give us the word" from Idaho. Keith sez that he has worked 43 states in 270 contacts this year compared to a total of 26 states for the two years prior to this one. At Keith's QTH the band is quite frequently open to 6-land but as usual the QRM is bad in the phone portion; he sez a sneaky but effective method of preventing this is to QSY to c.w. Among his many contacts, Keith talked to Ike, VE7AQQ, on August 7, with signals running very strong for two hours. Another solution to QRM difficulties has presented itself to Keith and we may all start looking for him during openings on s.s.b. His transmitter is running 17 watts out, but he has accumulated the parts for a 4-400A final. One contact in particular stands out at the Idaho QTH; on July 2 Keith gave out with a "CQ" on an apparently dead band, and was answered by W1OAK in Vermont, the only signal on the band. (What a haul for someone, if they'd only been listening in. Imagine, Idaho and Vermont, all at one blow!) W4ZBR in Winter Haven, Florida, noted only three openings on 50 Mc. during the month of September. First on September 9 when the band

(Continued on page 168)

was open to KP4 for about an hour and a half; the second and third on September 17 for about an hour, to W2 and W3 lands, with a second opening that day, about an hour to W1, 2, 3, 4, 8, 9, Ø. The September 17 opening was also recorded by Jerry, W4UAR, in Anniston, Alabama, who worked Illinois, Ohio and Iowa during that opening. Activity only fair in his area during September sez Jerry.

Roanoke, Virginia, represented this month by K4UMK, Bob, is one of the many to mention the exceptional ground wave conditions on 50 Mc. during September. Bob worked W4LWX in Jonesboro, Tennessee, K1MCS/4 in Norfolk, Va., W3NG, Cheverly, Maryland, and K4OBE in Hampton, Virginia, all on ground wave. Very best for this year occurred on September 10 and 11, for Bob. He mentions that he would like to have s.s.b. contacts on 50 Mc. with anyone who thinks he can work into the Roanoke area. (How do you know unless you try?) He's running 1 kw. a.m. — 1.5–1.8 kw. p.e.p., s.s.b., and using a long-john antenna. Stations to be heard almost nightly in that area are K4KZX, W4MWD, K4IEA, K4VBZ, K4YDC and W4ZEY. New Jersey "emits" through Dave, WA2UGQ, who heard Florida with La.. on September 12. On turning his beam north Dave heard many New England stations including K1TGI, W1BU, K1ISR and a number of others including Maine and Vermont. Other than this opening Dave sez the six-meter gang is waiting for another "July, 1961" when the DX was stupendous from 6-land. One of the few letters received from the YL segment of v.h.f., from Dora Hasek, K8NUF, of Cleveland, Ohio, tells us that on July 2 her OM, Don, K8NUE, K8WPW and K8TOL all worked YV5BS in Caracus, Venezuela, and all have confirmation of the contact. This is the first word received that YV5BS had made contacts in this country and we're now wondering what other areas worked him. Let us know, fellas! Although we wish we were psychic, we just aren't, and neither can we foretell the appearance of DX on the band, nor can we tell you later if no one tells us. QST

IARU News

(*Continued from page 48*)

Pakistan: Box 4074, Karachi
Panama, Republic of: L.P.R.A., P.O. Box 1622, Panama
Paraguay: R.C.P., P.O. Box 512, Asuncion
Papua: VK9 QSL Officer, P.O. Box 204, Port Moresby
Peru: R.C.P., Box 538, Lima
Philippine Islands: P.A.R.A. QSL Bureau, 67 Espana Extension St., Quezon City
Poland: PZK QSL Bureau, P.O. Box 320, Warsaw 10
Portugal: Rua de D. Pedro V., 7-4°, Lisbon
Roumania: Central Radioclub, P.O. Box 95, Bucharest
Salvador: YS1O, Apartado 329, San Salvador
Singapore: QSL Manager, P.O. Box 777
South Africa: S.A.R.L., P.O. Box 3037, Cape Town
Southern Rhodesia: R.S.S.R., Box 2377, Salisbury
Spain: U.R.E., P.O. Box 220, Madrid
St. Vincent: VP2SA, Kingstown
Sweden: Sveriges Sandare Amatorer, Enskede 7
Switzerland: U.S.K.A., Sursee
Syria: P.O. Box 35, Damascus
Trinidad: John A. Hoford, VP4TT, Box 554, Port-of-Spain
Tunisia: Francois DeVichi, 5 Rue Can Robert, Tunis
Uganda: P.O. Box 1803, Kampala
Uruguay: R.C.U., P.O. Box 37, Montevideo
U.S.S.R.: Central Radio Club, Postbox N-88, Moscow
Venezuela: R.C.V., P.O. Box 2285, Caracas
Virgin Islands: Richard Spenceley, KV4AA, Box 403, Charlotte Amalie, St. Thomas
Wake Island: T. D. Musson, P.O. Box 127
Yugoslavia: S.R.J., P.O. Box 48, Belgrade

Space Communication

(*Continued from page 26*)

pled quad-helix array mounted on a special pedestal. Besides the expense of such a device, which for fixed baselines is really not too great, there remains one difficulty: The system, even in the best commercial practice, is simply too in-

(*Continued on page 170*)

accurate and imprecise. Development on these devices has a long way to go.

With present technology, at least, there is no suitable electronic tracking system available for amateur use or construction. There may still be a way out, however. You will recall that the finder and interpreter are separate functions. It is finding the satellite position which is causing so much difficulty. Why not, therefore, arrange to have the use of governmental or commercial tracking equipment to accomplish this for us? This may be a difficult thing to negotiate but it is no more difficult than is getting an amateur-band satellite up in the first place.[11] If we can do the latter, we should have little difficulty with the former. Once we have secured this, a suitable method might be to broadcast continuous data on satellite position, such as by giving latitude, longitude, and altitude on a real-time telemetered basis. This information could then be fed into an interpreter at the amateur station, converting it into the azimuth and elevation needed to drive the antenna by means of an analog computer circuit. Such a system, while not cheap, is at least financially within the reach of many of today's amateurs.

Until the development of a workable amateur tracking system, about the only thing that can be done is to broaden the antenna beam by reducing the antenna gain, thereby reducing the s.n.r. as well as the tracking difficulty, and make up for the lost antenna gain somewhere else in the system. Designers of active-repeater systems requiring tracking say that the system gain introduced by equipment on board the satellite will compensate for this loss in antenna gain. While this is true, especially at the lower frequencies, we must not stop there. Inasmuch as a high s.n.r. is always a desirable goal, work on tracking improvements must continue as long as the need for tracking exists, so as to enable the highest-gain antennas to be employed. QST

[11] It has recently come to the author's attention that some amateur stations, notably the multi-operator venture led by W3DD, already have direct teletype links to Government tracking facilities.

Qualifications for Radio Amateurs

(Continued from page 16)

and YL's nylons; and depreciation on the paint job.

He must be able to stick his neck out with a scientific buck-and-wing regarding TVI complaints, and to pull it back before it is chopped off. He must be a consummate liar (as opposed to an inveterate liar of the DX, modulation, or home-brew beam variety), a monologist, and a purveyor of antenna formulae and performances, commercial equipment specifications, and prices of store-boughten components. He must be infallible on mob psychology, s.w.r., keying, women, propagation (atmospheric, that is), home-brew construction, v.h.f., and DX status, and make his DXCC logs acceptable the first time they are submitted.

He must possess Scotch thrift, Irish capacity,

(Continued on page 172)

the inscrutableness of the Orient, American good humor, and antacid tablets. Finally, he must possess the inexhaustible curiosity for the view from the next hill, the knowledge of the experts, and the gear behind any front panel.

And, if when dead, his greatness should be suitably recognized and commemorated by a statue, he should be of the type of rugged individual whose likeness would never be placed next to Washington who never told a lie; nor to Lincoln who was "honest Abe." It should be placed, if anywhere, next to a statue of Columbus who, after all, was never quite sure of where he was going, did not realize he had arrived when he got there, didn't know what he had discovered when he left, and made the entire trip on borrowed money. QST

DX King McSnood

(*Continued from page 67*)

gency men were as inferior to DX kings like himself as the slave in the market place is to the Sultan of Ufnia.)

"I see by your face, Joe McSnood," The Old Man continued, "that you are aware that you have transgressed all the provisions of the Amateur's Code. Have you anything to say for yourself?"

McSnood tried to speak, to beg for mercy, but his voice failed him. The confident, brash DX King McSnood of fifteen minutes before had disintegrated into a quivering mass of human jelly.

"Since you have no defense," resumed The Old Man, "nothing remains but to carry out the automatic DX-hog sentence." He raised the terrible Wouff Hong and released it. Joe tried to scream, but before he could open his mouth, the Wouff Hong struck with splintering force and again everything went black. Then McSnood heard a voice in his ear crying, "Joe! Joe!" He thought it must surely be Old Nick come to imprison him in the chamber of ten-thousand heterodynes, but he opened his eyes and discovered that it was his XYL, bending over him as he lay on the floor of the shack.

By some miracle, the Wouff Hong had not destroyed McSnood, but had only stunned him. Joe checked his rig and discovered that, unbelievably, the lightning had merely blown a few capacitors.

That night before he went to sleep, the DX King thought long and deeply of the awful fate he had escaped and of the years of lidmanship which had brought The Old Man to judge him. He made up his mind. Tomorrow he would trade in his rig on a much smaller one. He would buy a car so that he could take his beloved wife and children on jaunts in the country. He would always arrive at work on time and would never leave his office with unfinished business on his desk.

A new life was in the offing for DX King McSnood. His wife would be proud of him. His

(*Continued on page 174*)

neighbors would no longer turn their heads when they passed his home. Promotion at the office would now be only a matter of time. And so a deep and peaceful slumber came to McSnood.

The next morning he gave a final listen over the band with his faithful old 1000K receiver, and stumbled across AC8DX operating from a remote rock right smack in the middle of the Indian ocean. Old McSnood began to tremble and itch, and after perhaps 0.002 milliseconds of hesitation, he flipped the transmitter on and began to call. He tried every operating trick he knew. He called up, he called down, he called short, he called long. Finally, long after he should have been at the office, he gave up. No doubt about it — that final tube was soft and had to be replaced.

As he punched the time clock a bit later (much *too* late, said the office manager), his mind was occupied with high finance but not the high finance associated with his job.

"If I can get $30 for her old sewing machine and $20 for the ice box, and they allow me $50 on the old tube, where can I get the other $20?"

QST

Technical Correspondence

(*Continued from page 64*)

K5UIJ submitted a very neat idea which proposed substituting the time-base generator with a hybrid type which assures a unity mark space. The circuit consists of a unijunction transistor relaxation oscillator driving a flip-flop as described in G.E. literature. Price reductions on the 2N1671 unijunction transistor plus the fact that the two mark space trimmer pots are unnecessary, and only one timing capacitor and pot are needed make this hybrid multivibrator cost less than the original circuit.

Recapitulating the calls mentioned, and adding a few, the valuable long-distance assistance in this project from W2QYW, K3MTW, W6MCC-7, K5UIJ, G2BB, W6KMK, W4IEI, W5AZB, and W6SRY has been sincerely appreciated.

— *Alvin F. Kanda, KOMHU*

K5CBZ

(*Continued from page 65*)

During hurricane Carla, Billy was provided with a portable power unit by Bill Price, W5SIL, assisted by K5SCR. The power unit was put into use when commercial power failed, and enabled the respirator and the amateur station to be operated continuously during the emergency. Many important welfare and emergency messages were handled by the station during this time.

All able-bodied persons who aspire to be amateurs but think they just can't learn enough to pass the exam can look at the accomplishments of K5CBZ and become inspired. Persons with similar handicaps can take heart and realize that the pleasures of amateur radio are available to anyone who has an earnest desire and the help of friend and family.

Look for K5CBZ on the air. He will be operating from his iron lung and would like to talk to *you*.

QST

Quist Quiz

We could only find six hams meeting the requirements for last month's Quist Quiz. For two of them, $x = 36.4$; for another two $x = 21.8$; and for the last pair $x = 52.5$.

Boat Races

(*Continued from page 27*)

coverage and made a flying trip to Clarksburg Sunday morning when W6LRS's transmitter gave up the ghost. Many others provided moral support and assistance during the process of debugging the repeater in the weeks prior to the race.

In this way two hobbies, boating and amateur radio, complemented each other to provide services not otherwise available. QST

Red Polka Dot

(*Continued from page 36*)

you're getting jam on the knobs. Marge, he needs a change. Good boy. Don't want to hurt your nice Christmas present. Better let Daddy —. Marge, I'll set your mike over here out of the way. It might fall off the desk."

"John, give me that mike."

"Be careful, don't throw it or pull it or drop it. I have it plugged into the Pulverizer."

"Good. Give me my mike and turn on the Pulverizer. And turn on that Red Polka Dot Paralyzer, too. I want to say something."

"Say something? Don't get mad now, and don't drop my — ahhhh, your mike. The whole family can use it — what do you want to —"

"Is that box lit up?"

"Yes."

"Is Susie's clothes line pointed in the right direction?"

"Yes, but do be careful. The whole world is listening!"

"Good, because I just want to say — to all radio widows — MERRY CHRISTMAS!"

QST

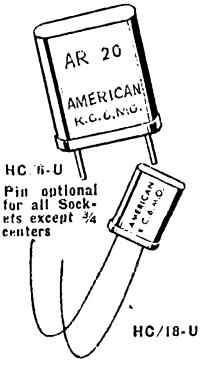
Strays

A 15-year-old lad near St. Louis who had built a transmitter-less broadcast station to compete in a school science fair later tried it out with a transmitter. It covered a radius of 20 miles with resultant complaints. Upon being warned about unlicensed operation, he promptly reported that he had dismantled the station and signed himself, "Engineer No-Longer-In-Charge."

—•••—

The reciprocal licensing bill S.2361 needs *your* support. Full details on pages 9 and 73 of October *QST*.

* TWO-WAY * COMMUNICATION CRYSTALS



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American specializes in two-way communications. Frequency correlation data for G.E., Motorola, R.C.A., Collins, Globe, Johnson, Lear, Narco, Hallicrafters, Link, Gonset, Heath, Bendix, Aerotron, U.S. Gov't, and many other companies. *Include postage with order.*

FREQUENCY RANGE	CALIBRATION TOLERANCE	PRICE
3000 KC to 9999 KC	.002%	$3.50
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2001 KC to 2999 KC	.002%	$4.00
50 MC to 60 MC	.0025%	$5.00
1000 KC to 2000 KC	.002%	$7.50

Write for quantity discounts —

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I can give you personal service on helping you select better gear per dollar for your operating pleasure. Over 30 years' experience. Big trades, easy terms. Used bargains.

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Gene Van Sickle, W9KJF, *Owner*
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On the northeast side of
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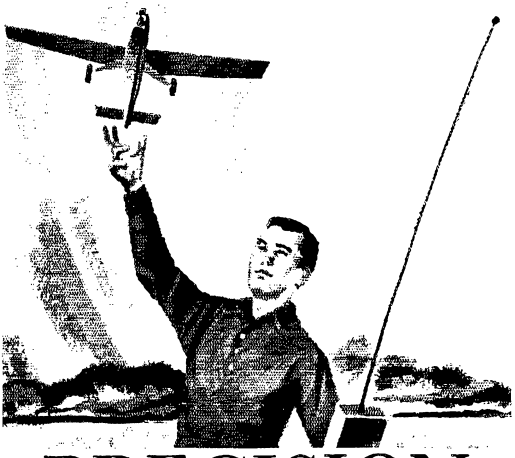

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Transmitter using flashlight batteries provides reliable remote control of model planes. Burgess Batteries deliver long-lasting, dependable power because they are precision made under exacting quality control. Exclusive chrome protection guarantees freshness.

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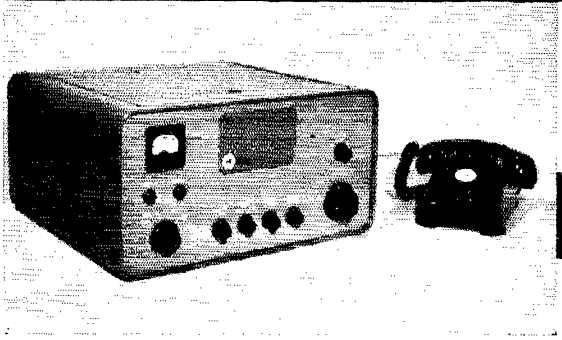
FREEPORT, ILLINOIS NIAGARA FALLS, CAN.

SINGLE SIDEBAND TRANSCEIVER MODEL SB-6F



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- OIL EXPLORATION
- MINING
- GOV'T NETWORKS
- CIVIL DEFENSE
- LUMBERING
- PLANTATIONS

WRITE FOR DETAILS

SPECIFICATIONS	
SIZE: 9½ X 18 X 17	125 WATTS P.E.P.
WT.: 50 POUNDS	AM AS WELL AS SSB
SIX CHANNELS	1.6 TO 16 MC

R F COMMUNICATIONS ASSOC. INC.
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HAM-ADS

(1) Advertising shall pertain to products and services which are related to amateur radio.
(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters. Ham-ads signed only with a box number without identifying signature cannot be accepted.
(3) The Ham-Ad rate is 35¢ per word, except as noted in paragraph (6) below.
(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**
(5) Closing date for Ham Ads is the 20th of the second month preceding publication date.
(6) **A special rate of 10¢ per word will apply to advertising which, in our judgment, is obviously noncommercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 10¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 35¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.
(7) **Because error is more easily avoided, it is requested copy, signature and address be printed plainly on one side of paper only. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**
(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

MOTOROLA used FM communications equipment bought and sold. W5BCO, Ralph Hicks, Box 6097, Tulsa, Okla.

RECEIVERS: Repaired and aligned by competent engineers using factory standard instruments. Factory service at reasonable prices on Collins, Hallicrafters, Hammarlund, Gonset, National, Harvey-Wells. Our 25th year. 90 day guarantee. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test", Novice, $1.50; General $1.75; Extra, $2.00. We pay the postage, Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

TRIGGER. Cash paid for ham equipment. 7361 W. North Ave., River Forest, Ill. PR 1-8616, Chicago #TU 9-6429.

TOROIDS: Uncased 88 Mhy, like new, Dollar each. Five/$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif.

WANTED: Cash for surplus tech manuals, one or one hundred. State condition and equipment type. W4FXO, Box 2513, Norfolk, Va.

WANTED: Commercially-built transceivers and QST for any months of 1922, 1923, 1939 and 1940. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

SOUTHERN California: Transmitters and receivers repaired, aligned, Bandwidth, frequency, harmonics measured. Used ham gear bought, sold, traded, Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. KEllog 8-0500.

WANTED: All types of aircraft or ground radios. 17L, 618S, 388, 390, 18S, 51V, 51X2 units. Especially any item made by Collins Radio whatsoever. Also large type tubes and test equipments. For fast action write Ted Dames, W2KUW, 308 Hickory, Arlington, N.J.

SAN Francisco and vicinity: Receivers repaired and realigned. Factory methods. Special problems invited, any equipment. Associated Electronics, 58 South P Street, Livermore, Calif. Skipper, W6KF.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system, $50; 12 volt 50 amp system, $50; 12 volt 60 amp system, $60; 12 volt 100 amp syst, $100. Guaranteed no ex-police car units. Herbert A. Zimmermann, Jr. K2PAT, 1907 Coney Island Ave., Brooklyn 30, N.Y. Tel. DEwey 6-7388.

WANTED: Military or Industrial laboratory test equipment. Electronicraft. Box 399, Mt. Kisco, N.Y.

WANT 1925 and earlier ham and broadcast gear for personal collection. W4AA, Wayne Nelson, Concord, N.C.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase W8RP. Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmany 8-8262.

HAM TV Equipment bought, sold, traded. Al Denson, W1BYX, Rockville, Conn.

SELL 2 mf, G-E capacitors, 4000V DC. $5.00 or 2 for $9.00. Guaranteed. Dawson, 5740 Woodrow Avenue, Detroit 10, Mich.

OUTSTANDING QSLS. Largest variety samples 20¢ (refunded). "Religious" QSL samples (with bible verses). 10¢ Sakkers, W8DED, Holland, Mich.

C. FRITZ for QSLs that guarantee better DX returns! Samples 75¢ deductible. Box 1684, Scottsdale, Ariz. (formerly of Joliet, Ill.)

QSLS. Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 for 200 and get surprise of your life. 48-hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS. Kromekote 2 & 3 colors, attractive, distinctive, different. Ball point pen with order. Samples 10¢. K2VOB Press, 62 Midland Blvd., Maplewood, N. J.

QSL-SWL-WPE. Finest. Since 1946. Largest assortment. Priced right. Send 10¢ for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md.

QSLS "Brownie." W3CJI, 3110 Lehigh, Allentown, Penna. Samples, 10¢; with catalogue, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, Box 375 M.O., Toledo, 1, Ohio.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Samples, 10¢

SUPERIOR QSLS, samples 10¢. Ham Specialties, Box 3023, Bellaire, Texas

CREATIVE QSL Cards. Personal attention given. Free samples and catalog. Bob Wilkins, Jr., Box 1064, Atascadero, Calif.

QSLS. 3-color glossy, 100—$4.50. Rutgers VariTyping Service, 7 Fairfield Rd., Somerset, N.J.

QSLS-SWLS, 100 2-color glossy, $3.00; QSO file cards, $1.00 per 100. Samples, 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

PICTURE QSLs. Cards of your shack, home, etc., Made from your photograph. 1000, $13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

QSLS, 300 for $3.95. Samples 10¢. W9SKR, "George" Vesely, Rte. 21, 100 Wilson Road, Ingleside, Ill.

QSLS, SWLs, XYL-OMs (sample assortment approximately 93¢) covering designing, planning, printing, arranging, mailing; eye-catching, comic, sedate, fantabulous, DX-attracting, prototypal, snazzy, unparagoned cards (Wow!). Rogers, KØAAB, 961 Arcade St., St. Paul 6, Minn.

QSLS-SWLS. Samples free. W4BKT Press, 123 Main, McKenzie, Tenn.

1½" Call QSLs (2 sides printed), 100, $2.75; sample free. Gariepy, 2624 Kroemer, Ft. Wayne, Ind.

QSLS, Samples free. Phillips, W7HRG, 1708 Bridge St., The Dalles, Oregon.

QSLS, Samples dime, Rubber stamps: name, call and address $1.35. Harry Sims, 3227 Missouri Ave., St. Louis 18, Mo.

QSLS: samples, 25¢ (refundable). Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif.

QSLS, $2.50 and up. Samples 10¢. RBL Print M.R. 12, Phillipsburg, N.J.

QSLS, Free Samples. W7HZ Press, Wines, Box 183, Springfield, Oregon.

QSLS, SWL's that are different, colored, embossed card stock, and "Kromekote". Samples 10¢. Home Print, 2416 Elmo, Hamilton, Ohio.

DON'T Buy QSLS-SWLs until you see my free samples. Bolles, 7701 Tisdale, Austin, Texas.

QSLS-SWLS Free Samples, David Spicer, 4615 Rosedale, Austin 5, Texas.

RUBBER Stamps, $1.00. Call and Address. Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N. J.

QSL's 100 glossy 4 color $3.70 Postpaid. Samples 10¢, or send 25 for large assortment and free "Danger, High Voltage" sign. Dick, W8VXK, Rt. 1, Gladwin, Michigan.

EYEBALL QSO cards. Exquisitely distinctive. Samples, 10¢. 1,000 $5.00. Call Signs. Box 933, Aurora, Ill.

HUNDRED QSLS: 80¢. Samples, dime. Meininger, Jesup, Iowa.

RUBBER Stamps for hams, sample impressions, W9UNY, Hamm, 542 North 93, Milwaukee, Wis.

FAST Service, send stamp for QSL samples. K2 Press, Box 52, Westbury, N.Y.

QSLS. Samples, dime. Printer, Corwith, Iowa.

QUALITY QSLs! New designs, samples 10¢. Giant 25¢. Savory, 172 Roosevelt Rd., Weymouth, Mass.

QSL Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

QSLS, New, different. Dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSLS: Large variety of styles, cartoons, colors. Samples 25¢ (deductible). Paul Levin, K2MTT, 1460 Carroll St., Brooklyn 13, N.Y.

YLRL Specials, OM's, reasonable, nice designs, samples dime. W2DJH Press, Warrensburg, N.Y.

CERTIFIED QSLS-SWLS, unique designs, speedy service. Catalog 25¢ (refundable) Certified Printing, Box 1023, Whittier, Calif.

CANADIANS! QSLS in fluorescent colors, by silk screen process. Free samples. Martin, 314 Delatre St., Woodstock, Ont.P., Canada.

CANADIANS: Selling KWM-1 complete, with DX adaptor, noise blanker, AC and DC pwr. supplies, all in excint oprtg. condx. $1000. Contact: Martin Rosenthal, VE3MR, 543 Yonge St., Toronto 5, Ont., Can.

CANADIANS! Complete Elmac mobile installation from michr microphone to antenna, now in use, $250.00. G. E. Morden, VE3CIX, 41 Barringham Dr., Oakville, Ont., Canada.

CANADIAN Used, surplus and new gear. Giant catalog, 25¢. Low prices, thousands of items. ETCO, Box 741, Montreal, P.Q., Canada.

CANADIANS: New National NC-300 won at Windsor Convention Sept. 30th in Windsor now. In college and need money. $369.00 or best offer, what's yours? All letters answered. Ron Monahan, K8IOS, 1012 Nottingham Road, Grosse Pointe 30, Michigan.

CANADIANS: Viking Adventurer, excellent, $55; Adventurer screen modulator, $7.00; Viking low-pass, $10; adjustable Master Mobile coil, 10-40 meters, never used, $10. VE3AOE, 1128 Upper James, Hamilton, Ont., Canada.

CANADIANS: Heath DX-20, $30; VF-1, $15; Knight crystal calibrator, $9.00. Andy Woodsworth, RR #7, Victoria, B.C. Canada.

BETTER Than anything you have seen: Craftsman-built British communication receivers. Eddystone Mod. 888A for ham band only; other models for general coverage from $115 to $1270. Spec sheets from Maurice, VE3CZG, Top Television Service, Ltd., Elliot Lake, Ont., Canada.

COLLINS 30S1 linear amplifier. Used less than twenty (20) hours, perfect in every respect. For quick sale will sacrifice, in orig. carton, $875. F.o.b. Nashville. James O. Pugh, W4GXX, 409 Donelson Pk., Nashville 14, Tenn.

HAMS Vicinity Arcadia, Calif. Sold place S.O.S. for trade F.O.B. backyard at 123 Santa Cruz Rd., Arcadia. One new, creosoted and painted fully rigged 70 ft. cedar pole on or before Feb. 1962 for one 60 ft. crank-up tower f.o.b. as is. Clear easy access to pole. Write R. S. Cole at 216½ 43rd St., Manhattan Beach, Calif.

SSBers! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering good SSB operating; promoting advancement of SSB equipment; and disseminating SSB technical information. Read "The Sidebander", official publication of the SSBARA. Dues $3.00 yearly. Write for membership application sample "Sideband-er", to SBARA Membership, 1385 Richmond Court, East Meadow, N. Y.

CHICAGOLAND Amateurs! Factory authorized service for Hallicrafters, Hammarlund, Globe, Gonset. Service all amateur equipment to factory standards. Heights Electronics, Inc., 1145 Halstead St., Chicago Heights, Ill. Tel. SKyline 5-4056.

KWS-1, $900. SP-600, $200. W2ADD.

SELL: Johnson Thunderbolt $425.00; HT32, $425.00; SX101 revr., $225. All in new condx. Will sell complete station w/accessories. Write for details. K2SJJ/8, 4058 Herman Ave., S.W., Grand Rapids 8, Mich.

KWS-1. This fine rig guaranteed to have seen very limited use (60-80 hrs), just returned from factory for alignment, etc. Absolute perfect, $995. Sry, cannot ship. 1960 factory-wired Johnson ranger, $225.00; NC-300, $195; B&W 73 ohm Matchmaster, $19. Set of 8, brand new, 20 meter traps, specially made by W3DZZ for 20-40 meter beam (1⅝" tubing), $28.00. Bob Sommerfelt, K2GXI, 120 Yorktown, Buffalo 26, N.Y.

COMPUTER Amplifiers for parts, less tubes, 4" x 5" x 15" case, with handle, $4, Box 7, Cambridge 39, Mass.

SURPLUS Westinghouse transmitter, good for cool Kilowatt. See page 156 July QST. Price reduced to $200. W2IWV.

TELREX Tri-band TB7E, 20-15-10 beam. Has been assembled but never put up. Moving to new QTH. Will sacrifice. Best offer. W1ICW, 39 Florentine Gardens, Springfield 8, Mass.

CASH For your gear! We buy, trade and sell. We stock Hammarlund, Hallicrafters, National, Johnson, RME, Hy-Gain, Mosley and many other lines of ham gear. Ask for used equipment list. H & H Electronic Supply Inc., 506-510 Kishwaukee St., Rockford, Ill.

WANTED: QSTs for personal collection: January through September, 1916. W1CUT, Box 1, West Hartford 7, Conn.

SP-600 JX26 Hammarlund revr. 54-54 Mc., $295.00; SP-600 JX-17, $395; HRO-60, $299.00; 75S2, $499.00; Collins 51J2, 51J3, R390A, etc. Teletype Kleinschmidt printers, RTTY converters, Alltronics-Howard Co., P.O. Box 19, Boston 1, Mass. Tel Richmond 2-0048.

WANTED: 6 to 12, 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

CHANGE Xtal frequency, etch, safe method; everything needed: ammonium bi-floride, containers, holder, instructions. Guaranteed, $1.00 postpaid. Ham Kits, Box 175, Cranford, N.J.

SELLING Out: Collins "S" Line, 1½ years old, perfect, $750.00. TVI suppressed 813s amplifier 1 KW P.E.P., $150; WE357A amplifier, 1½ Kw P.E.P., $35.00; (spare tubes for both) one 2 Kw pwr. supply, $50; Ham-M, $60; good 20M cubical quad, $25.00; folding tower, $25.00. Other misc. gear and spare parts, no junk. First buyer has option to take all for $995.00. F.o.b. No dickering! Peace Dale, R.I. W1ALJ.

MOVING: Must sell Vesto 61 ft. tower, bearings, plus all fittings, $200 f.o.b. Telrex 10-meter, #10M-3A beam, $35.00, 15 meter, #153A, $50, 20-meter #503A, $65.00, all include 100 ft. or more RG8/U; Johnson #138-112-51 rotator with limit switches and over 100 ft. control cable, $200; PA400 SSB 400 watt linear, $75. W1RMS, 198 Euclid Ave., Waterbury, Conn.

VALIANT, factory-wired, first certified check or m.o. for $275. You pay shipping. Four unused 417A, $5.00 ea. K9QIE, 707 Linden, Wilmette, Ill. Tel. AL-1-7537.

WANTED: 4-400A tubes. Prefer New York-Long Island area. K2EGI.

SELL: Mohawk and Apache. In exc. condx. $475.00. Bob Snicer, 217 Osborn Road, Albany, N.Y.

MOON-BOUNCERS, APX-6 transceivers in excellent condition, complete with all tubes, no missing or broken parts. Join the crowd on 1215mc this winter, and start bouncing those signals. Good sets like ours are scarce, price $18.50 with schematic, shipping weight 45 lbs. Tech manuals, new original maintenance books, APR-1 $7.50, APR-4 $7.50, ARC-1 $9.50, ARC-2 $8.50, ARC-3 $8.50, ARC-5 VHF $8.50, ART-13 $12.50, ART-26 $8.00, BC-342 $8.50, BC-348 (specify model) $8.50, BC-779 $6.00, BC-221 $6.50, TS, TM, RTTY manuals in stock, send requirements, free catalog, Bill Slep Company, Drawer 178Q, Ellenton, Florida.

FOR Sale: SX-71, $100; Valiant, $290; Deluxe Vibroplex, $12; TS-175/U freq. meter 85 to 1000 Mc., $90; Solar capacitor bridge, $16; Heath audio generator, $18; xtal standard 1 Mc., 100 kc., 10 kc., $30; Supreme RETMA TV generator, $90; 6 volt battery charger, $5; meters, $2.00 each, 500 ua. zero-center, 150 ua, 1.5 Ma., ½ ARF, 1½ ARF, 400 cycle freq. meter; 10 temperature switches, contacts close at 32 deg. and 100 deg., $3.00. W6EHZ, ST 9-1532 14543½ Dickens St., Sherman Oaks, Calif.

FOR Sale: My entire station consisting of SX101A, Mark III, HT-32, Johnson Thunderbolt, all in like new condx, on the air, for $995.00. J. W. Knoche, 7206 Atlantic Blvd., Jax 11, Fla.

COMPLETE Rig: HT-37, Drake 2A, spkr, extra xtals, 50 ft. layout layover tower TR2 10-15 meter quad, 40M, dipole, 80M., dipole coax, Dow-Key relay, desk console all like new $695.00. Sry, cannot ship. Will sked. K9TKB.

FOR Sale: 75A4 with reduction knob, 500 cycle filter, $500; HT32, $400; beautiful homebrew TO key, $50; D-104 mike and coax relay; LW-51 and power supply PTT, 6 meter converter with Nuvistor preamp, mike, $95. W4YUU, 1214 Cherterton Ave., Orlando, Fla.

WANTED: 6 Kc. filter for 75A4. W2DTE.

SELL Highest offer: 455 kc. input, Panoramic adaptor BC-1031-A, in use now. RTTY Model 15 printer, ten hours use since major overhaul and lubrication. like new, in original shipping case. Heathkit VOX Model VX-1. K0MWM, 4504 W. 36th St., Minneapolis 16, Minn.

FREE—Electronic parts, tubes catalog—free. New RCA, G-E tubes, etc 60/10 25% discount off list. More on some types. New resistors, condensers, transformers, flybacks, yokes, etc. at fractions of original cost. New: phonograph needles, 70% or more off list prices. And more, much more! Arcturus Electronics Corp., Dept. QST 502-22nd St., Union City, N.J.

LOOK! Only $250 to go Sideband. Eldico 100SB (100 W SSB), it's A-OK: S101, new, save $100.00; 10B, $119.50; 20A-1, $169.50; good Johnson gear, Ranger, $169.50 or Viking II, $159.00. W4JSH, P.P. Box 1212, Lexington, Ky.

VHF Men! Brand new Clegg 99'er, $115. 28 Mc. to 50 Mc. transmitting heterodyne exciter, $35 and complete 50 Mc. phasing-type SSB exciter, $50, both less power supply. Hallicrafters HT-30, fine condition, $250.00. K2ITP, Taylor Lane, Riverton, N.J.

SELL: HRO-50T, in top condx, AA, B, C, D coils, $175.00. W. J. Tancig, K9MYZ, Beecher, Ill.

FOR Sale: Hammarlund HQ-110, with matching speaker. In new condx. First reasonable offer takes it. John Huft, 252 Villa Vista, Sterling, Colorado.

SELL: HQ-100 with clock, 110V coax relay, best offer. K6GIW, 7808 Gainford St., Downey, Calif.

FOR Sale: Polar relays Type 255A mint condx, $2.00 postpaid, two for $3.50. Bernard Feissle, WØZKN, 1061 Gabriel Dr., St. Louis 37, Mo.

KWM-1 for sale, in excint condx, like-new, never mobile, $495. F.o.b. K4OXZ, 230 Beverly St., Titusville, Fla.

KWM-2 and 516F2 power supply in excint condx, $1000. K1EJZ, Don Fantozzi, 55 Smith St., Torrington, Conn.

FOR Sale: Harvey Radio 100T transmitter, 130 watt 75-10 meters A.M. fone or c.w. with Meissner signal shifter VFO, $90, complete if you come and get it. Charles Walcott, W1SYV, 9 Hemlock Rd., Cambridge, Mass.

BEGINNERS: Code bothering you? Now learned in one hour. New method. Quick approach towards ham ticket. Used in Armed Services, Ham Radio, Scouting. "Ketchum's Hour Code Course" $1.00 postpaid. Guaranteed. Oaks Ketchum, 10125 Elora Vista, Bellflower, Calif.

SELL: CE-A Slicer, w/AP1, in exc. condx, $60.00. K8IVJ, 1454 Lake Blvd., St. Joseph, Mich.

COLLINS 75S-1, like new, $375.00; Gonset Communicator IV, 2 meters with stacked mobile helicals, $275.00. John Ashton, W1WNY, 12 Top O'Hill Rd., Darien, Conn. DAvis 5-2125

FOR Sale: DX-40, $49.00; RME-435OA, $149.00; VF-1, $10. K9IZF, H-Z Box 639, West Lafayette, Ind.

JOHNSON Navigator for sale, $125.00. Steve Eyer, W9KXZ, 106 E. Daniel, Champaign, Ill.

SALE: 1 Kilowatt 813s, GG final complete with pwr. supply. K8KWF, 2292 Vandekarr Rd., Owosso, Mich.

SELL: SX-42, $65; 500 watt all-band xmttr, $75. Trades will be considered. WA2OHD, Marlton, N.J.

SELL like-new, Collins 32S-1, 75S1, with AC supply and spkr, $895. Will ship prepaid. W2FNF, Mike Rosenberg, 35 Strawberry Lane, Roslyn Heights, N.Y. Tel. MAyfair 1-4798

GONSET G-76 transceiver, matching DC power supply, PTT microphone, spkr, Webster Bandspanner antenna, spare final, just 4 months old. In excellent condx with latest factory modifications, $435.00. Unused matching AC supply with warranty card, $125.00. Benjamin, K1SLZ, Box 284, Lexington, Mass.

FOR Sale: Viking "2" and Health VF-1 VFO, in exc. condx, $175. Lester Rodman, W2IOW, 68 Greenwood Drive, Babylon, L.I., N.Y. Tel. JUniper 6-7978.

WANTED: HRO-60 revr coil sets in gud condx: E,F,G,H and J. Any or all. W7QER, Aberdeen, Washington. Phone LE 2-2000, Ken McCaw.

SETTLEMENT Estate K4YQV: spotless Collins 75A4 receiver, ser. number 5586, complete with Collins matching spkr and instruction manual, $550. Also, Hallicrafters HT-32A in mint condx, complete with D-104 mike and instruction manual, $550. Both units $1000 F.o.b. Greensboro, N.C. W4NWW, 112 Beverly Place, Greensboro, N.C.

PRICED To sell: TA-33 Jr., Alliance U-98 rotator, 50-ft. telescoping mast, 100 ft. RG-58/U, 100 ft. four cond. cable, all unused. Worth $118, first $84.50 takes all. WA2OKO, Montclair, N.J. Tel. PIlgrim 6-1459.

WANTED: Collins SC-101 station control unit and F455CO8 filter for 75A3 serial above 1300. State price and condx. Palmer, K3MTW, Smethport, Penna.

KWM-1, perfect, no scratches, never mobile: $495.00. Will ship F.o.b. Lexington, Ky. G. L. Ryan, 2001 St. Michael, W8ERW/4.

FOR Sale: Heath DX-20, $30; Heath AR-2, $12. WA2LMP, 321 Sunset Blvd., Wyckoff, N.J.

FOR Sale: KWM-2 with latest modifications: 10D mike and AC pwr. supply, condx; perfect! $1000. Also have Morrow mobile rig complete, MB560 and MBR5 combination with mic and Band Spanner, 12 volt supply, $250.00. Easily ship either one. John C. Phares, K5WYJ, 255 East Church St., Beaumont, Texas.

OOPS! Error in my last month's ad: Used 4-1000A, $30.00. D. Mitchell, R1 B59, Winnebago, Ill.

FOR Sale: Collins equipment has been unpacked and used to work 207 countries and is still in excellent condition. 75A-4 receiver, KWM-2 receiver-transmitter, 312B5 station control, 516F2 power supply. R. C. Littler, W8JRG, 640 Snowhill, Springfield, Ohio. Tel. 322-8722.

SELL: HQ-170 excellent condition. Make offer. Globe 6NZ FW, in mint condx, $69.00 Sry, no shipping! Peter Miller, Tel. 75-8-4992, Chandler Drive, Prospect, Conn.

KWM-2 noise blanker AC and DC supplies mobile mounting tray. James E. Farner, 6541 Briley, Ft. Worth 18, Texas.

SELL: Western Electric Mercury wetted relays for electonic keyers, Number D168479, $3.50 each. Hack Treadwell, K4DKJ, 3289 Hallwood Circle, Macon, Ga.

HALLICRAFTERS SR40 rcvr, in gud condx, Mitchel Sosis, 64-14 174 St., Flushing 65, N.Y.

FOR Sale: Gonset GSB-100, $250.00 F.o.b. Or GSB-100 and HQ-160 rcvr, $450.00 F.o.b. Shipped in original cartons. Look like new. Reason: lost interest. J. Harmon, W5DVY, P.O. Box 865, Ft. Walton Beach, Fla.

FOR Sale: Johnson Ranger, in gud condx, $155.00. WA6NSF, 4510 Pinafore St., Los Angeles, Calif.

BARGAIN If XYL permits you to install mobile! Cheyenne and Comanche professionally wired lab tested. 115 VAC and 12V DC supplies. Master Mobile all-bandcoil, stainless base, mounting and whip, Micro Z-match, remote Master Matcher with field strength meter. Cost over $375 not counting kit wiring. All brand new. Express collect for $250.00. Will include good Lecce-Neville alternator, rectifier, regulator. H. Carlson K7MSI., Carpenter, Wyoming.

ALUMINUM For every ham need. Write to Dick's, 62 Cherry Ave., Tiffin, Ohio, for list of tubing, angle, channel, castings, plain and perforated sheet, and complete beam kits.

TWO Meter FM pair of Raytheon two-way units on 145.35 Mc, $38.00 each A. C. pwr. supplies included. Frank Sepic, W9GKS, 10111 West Melvina, Milwaukee 22, Wis.

SELL: Viking II with push-to-talk and Johnson VFO, $200: Communicator III (2 meters) with 6 crystals, $230.00. Both for $395. Top condition. B. Friedman, W2FNX, 11 Garfield Ave., Clifton, N.J.

GLOBE 680 and HQ110C for G50 late model with double conversion rcvr. Harmon, K5TLB, 714 N. Birmingham Place, Tulsa, Okla.

CENTRAL 10-B, 458 VFO, Drake 2A and 2AQ. All factory wired and tested, in gud condx. Mail an offer. K8SPR, 168 Westwood Ave., Akron 2, Ohio.

SELL: Viking Ranger FWT 64029, $165; Matchbox 25023, $20; Heath Mohican receiver GCW1A with AC supply, $100; 3-element 15 mtr. beam, $15.00; AR22 rotator with control unit A, $15.00; Millen 90672 bridge, $30.00; Grid dip meter 90651 with coils, $45.00; new G4ZU Birdcage 2040 antenna with mast, $50.00. Will pack in original containers. Prices firm f.o.b. Oak Park, Ill. H. J. Wahlberg, W9RZZ, 1022 No. Taylor Ave.

HQ-145 w/clock and calibrator, $190.00. No shipping, sry. K1MUN, Joe Phillips, 4 Naples Ave., E. Norwalk, Conn.

SELL Eico 720 emttr, $65; Eico 730 mod., $40.00; Globe 755A VFO, $45.00. All like new. K8RCU/9, Gary Hultman, 5000 N. Snaulding Ave., Chicago 25, Ill.

HEATH Mobile Twins with UT1 power supply. Like new, no scratches, $250.00. NC-109 with speaker, $110. Will ship. Jerry Holmes, 6621 Broadmoor S E, Caledonia, Michigan. W8BWT.

JOHNSON Viking Ranger, National NC-98, speaker, bug, extras. Stechel, Massapequa, L.I., N.Y. Tel. LI 1-9340.

OHIO Hams! Selling complete station: DX-100, $150.00; S-85, $90; 32 ft. self-supporting tower, Hy-Gain 20 mtr. beam, AR-22 rotor, 150 ft. RG/8 and control wire, $115.00; KW plate supply 2350v, .6a—$65; 6 ft. Bud relay rack, $30; 3-6C21 tubes equiv. to 1000-T, $25 each. All plus smaller gear $500. Richard C. Shelar, 5471 Norquest Blvd., Youngstown 9, Ohio.

PHILADELPHIA: Oscilloscope, $35.00; DX-20, $30; VFO, $25.00; GDM, $15.00. CE 6-0550.

FOR Sale: HQ-129X from original owner, $125.00. F.o.b. Write W4MDO.

FOR Sale: Heathkit RX1 $250.00; TX1, $225.00; Instructograph $40.00; Viking Matchbox, $50.00. Urgently need cash. Will sacrifice for $500.00. Terms possible. K9QGS.

SELL: Johnson Valiant, $315; Elmac PMR-6A with 6 volt pwr. supply, Johnson whip load 6 and base spring, $75. Want HT32A or HT37. Ronald Phoenix, East Jackson St. Rd., Macomb, Ill.

COLLINS KWM-1 complete, 12VDC and 110AC power supplies, mobile mount all cables, noise blanker, actual use only four months. Exc. condx; $695. Also: new condx SX-110, $115.00. Cash F.o.b. W2ZLD, Irv Fishelberg, 2606 Atlantic Ave., Longport, N.J.

NEW Tarzian silicon rectifiers S-5017, $8; S-5018, $8; S-5019, $12; all three, $25.00 postpaid. Unopened Knight kit, Z-52 SWR bridge, $4.00 postpaid. New RCA tubes 4-6146, 2-1614, 2-6L6GB, all eight, $18 postpaid. One new PR 1000Kc xtal and eleven slightly used Z-2 PR xtals; 40M all multiply to ten phone, $15 the lot, postpaid Telex HTW2 Twinset almost new, $5.00 postpaid. W5HSO, Box 307, Belen, N.M.

WANTED: QSTs before 1923 and CQ May 1945. Have QST 1931 to 1956 and CQ 1946 to 1956 at 25¢ each. W2HO, Rte. 2, Box 156, Monroe, N.Y.

MAGNECORD PT6-BAH Binaural mechanism in custom case, with PT6-M two-motor spooling mechanism for 10½" reels, cables and tech. data. No amplifier. Like new, $295.00. W2LAH, Box 42, Setauket, L.I., N.Y.

HQ-129X rec. w/spkr, in gud condx, $100: Viking I w/relay, excl. condx, $135.00. Want Hi-Fi gear or camera equip. Write Denis Scottron, Storm King School, Cornwall-On-Hudson, N.Y.

FOR Sale: DX-40, $49.00. In gud condx. Clayton, 4236 W. 36th, Cleveland 9, Ohio.

WANTED: Johnson Viking Kilowatt desk, power-amplifier, and matching swivel chair. W5KBB, 1714 S. Midwest Blvd., Midwest City 10, Okla.

KWM-1, DC adaptor with seven crystals, AC supply, $650.00; DC supply and rack, $140.00, Console with wattmeter, $75.00—all for $820. W2KOY, East Meadow, N.Y.

SELL: KWS-1, perfect, $895; 75A3, like new, $35. Will throw in several boxes of usable parts, transformers, tubes, coils, etc. Lamb, 1219 Yardley Road, Morrisville, Penna.

SELL: Late model 75A4 and 32V3, both like new condx, also 1 kilowatt transmitter, W1LMP, 8¼ Summit Ave., Salem, Mass.

LONG Island Tube Headquarters. We stock more than 1000 types of tubes. Surplus and recent production at maximum discounts. Maritime International, 199 Front St., Hempstead, L.I., N.Y. Tel. IV 5-2040.

HAMMARLUND SP-600 JX-14 in immaculate condx, recently factory reconditioned, manuals included, all accessories and speaker. Will pay freight. N. E. Leon, Price $385.00. 4069 S. Pacific Highway, Medford, Oregon.

HOT R-100 receiver with xtal calibrator, speaker. Excellent condition. First reasonable offer gets it. K1OTP, Cutler Road, Greenwich, Conn.

MERRY Xmas and a Happy New Year from WOCVU. Congratulations to HKØTU, winner of WOCVU Plaque Award for 200th Country Two-Way SSB.

75A4 and HT-32A, both perfect, $950 cash for both. Cannot ship, sry. Lechenger, *W5IHL, 1520 Milford St., Houston 6*, Texas.

FOR Sale: HQ-170C, perfect, best offer. K5IPK, 2224 47th, Los Alamos, N.M.

GONSET II 12v, 2-meters w/3 xtals, 5-el. beam mobile antenna and xtal mike. $125.00. W1ZPG, 187 Garden St., Cranston, R.I.

COLLINS F-455/JO5 and F-455-Y21 mechanical filters new, no reasonable offer refused. H. Smith, 276 West 117 Street, N.Y.C.

SELL: KW Matchbox with dir. coupler and indicator. Need space in Trailer: $100. K8CKW, Athens, Ohio.

FOR Sale: Collins 75A4, serial 5213, in mint condx; HT32, like new. Will not separate: $825.00. Joseph DiLiberti, K2IQZ, 206 Central Ave., Murray Hill, New Jersey.

BAND-Switching, 200 watt AM/CW transmitter with VF-1 and Variac controlled, ½ KW pwr. supply, $125.00. Matchmaster 52 ohm, $20. W2ASF, 13 Sunnybrook Rd., Bronxville 8, N.Y.

ATJ Television cameras, dual power supply and tripod. One iconoscope camera and one image orthicon camera. Manuals, all cables, jeep, and extra 5820. Modified to standard sweep, $225.00 or best offer. W3DTN.

340 Issues of QST going back through 1926. Also have pair of 813's and 614's plus numerous other items, such as meters, oil-filled capacitors, SX-71 rcvr, etc. Local deal preferred. W2IIB, Ackerly, 14 North Ocean Ave., Farmingville, L.I., N.Y. Phone No. SElden 2-3473.

DRAKE 2A with noise limiter, best offer over $215.00. Lafayette 6 m. transceiver with Heath modification for 8 Mc. xtals, including 5 xtals, 6 volt mobile and 110 ac. supplies. $60. WA2FSD, 11 Burbury Lane, Great Neck, N.Y. Tel. 516 HU 2-2737.

FOR Sale: Heath Mohawk receiver, in exc. condx. $245.00 F.o.b. New Orleans, W5BLE, 1427 Louisiana Ave., New Orleans, La.

SURPLUS! Have Collins 32 RA8, $25; PE-110C for BC669, $15.00; power supply, A-34, $20; size 5 synchros, $4.00; Meissner Signal Shifter, $20.00; tubes Eimac 304TL, 250T and TL 100TH. All with instrux books and gud condx except Collins needs repair. F.o.b. La Mesa, Calif. W6WIE, 6920 Adams Ave., La Mesa, Calif. Write!

WANTED: 75A4, late serial, filters, mint condx, all replies acknowledged. K8NQT, 1830 Toepfer Road, Akron 12, Ohio.

SSB Transmitter, Eldico 100A with kilowatt final; pair 4X150A, 6 meters, built-in micromatch, low pass filter, TR switch, Variac, speaker, complete station control unit, 1500VDC at 500 ma. A fabulous unit at a fabulous price, $535.00 picked up. Jarav, 36 Flower Lane, Roslyn Heights, L.I., N.Y.

HOUSECLEANING: Surplus gear, homebrew gear, power supplies, technical magazines, books, old TV and radios, components, tubes, etc. Some give away, you pay only shipping charges. Stamped envelope for list. John Kinzer, 107 Evergreen Ave., Springfield, N.J.

OLD QSTS. 1922-1949. What offers? VE7WO.

SELL Eico 720 transmitter, $60: Eico 730 modulator, $40.00; SX-110 receiver, $110.00. Perfect condx. WA2KCM, 1079 Astor Ave., N.Y.C. OL 4-6298.

OKINAWA. HRO-60, in excellent condition. Coils A,B,C,D, 1.6 Mc. to 30 Mc. Minor modification, coax antenna connector. Export crate, $300.00. F.o.b. Going mobile. KR6AC.

A-1 reconditioned equipment. On approval. Trades. Terms. Hallicrafters S-85 $79.00. SX-99 $99.00. SX-100 $199.00. SX-111 $199.00. SX-101A $299.00. HT-32, HT-37: Hammarlund HQ-100 $129.00, HQ-129 $129.00, HQ-110 $179.00, HQ-145 $199.00, HQ-150 $199.00. HQ-160 $259.00, HQ-170 $289.00; National NC-270 $179.00, NC-183D $199.00, HRO-60 $345.00; Gonset G-50 $229.00; Central 20A $149.00, Viking II $159.00, Valiant $279.00, Thunderbolt linear $299.00. Collins 75S-1, 32S-1, 32V-1, 32V-3, 75A-4, KWM-2; Elmac, Globe, Gonset, Heath, Johnson, RME, other items. List free. Henry Radio Company, Butler, Missouri.

FOR Sale: 75A3 3.1 filter, gud condx, $325.00; HT-32, mint condx $400.00 or your best offer. Dan Piece, KØQCT, 1930 Ave., Kearney, Nebr.

BRAND New Eddystone dial, $12.50. W8QBR, 2036—25th, Detroit, Mich.

SELL: DX-40, VF-1, 540-A, D-104C push-to-talk mike, relays, manuals, $110 or your best offer. Hugh Hanna, P.O. Box 2269, State College, Miss.

BBB to MB. Below the Broadcast Band to Moon Bounce! We sell our "surplus surplus" at bargain prices. We bid on selected Government surplus for clients and get some we don't want. Receivers—transceivers—test equipment, etc. Interesting items for experimenters. List free. Ariel Electronics, Box 1257, Sag Harbor, N.Y.

SELL BC-453 200-500 Kc. receiver, $10 plus postage. W6BLZ, 528 Colima, La Jolla, Calif.

RME, VHF-126 converter, like new, $150.00; Telrex 11-el. 6-meter beam, model 6M-1136, $50.00; HT-37, year old, new condition, KØSBS, Omaha, Nebr.

RF Amplifier with power supply. Linear grounded grid using two 4-1000A tubes. Covers 3-24 Mc. pi-network output using vacuum variable capacitors. High voltage is variable from 0-6000 volts. Entire unit is mounted in two 6 ft. enclosed relay racks. $675. R. White, 945 Contra Costa Drive, El Cerrito, Calif.

SELLING: Heathkit "Twoer", ground plane, halo, crystals, best offer each or all. Ostrowitz, WA2RWJ, 94-11 60th Ave., Queens 73, L.I., N.Y. HA 4-8189.

HT32, with manual, in original carton. Used 50 hours. $450.00. R. L. Martin, W5URG, 1212 Briarwood, Arlington, Texas.

PACEMAKER, latest production, all factory modifications, $179.50; 6 meter Communicator II 12-110 volts with crystal and microphone, $99.50; Central 10B, $89.50; P&H 600A 6 meter transmitting converter, $27.50; Heath SWR Bridge, $9.50; Tecraft TR20/220, 220 Mc. transmitter, $34.50. "Grid", W4GJO, Box 1294, Sarasota, Florida.

WANTED: Technical manual for BC474-A. Karl Kalbfleisch, W1YXB, Northboro, Mass.

SELL: Gonset II 6V and 110V, $140; National NC-240D receiver, $120; both in excellent condition. Stamp for list of transistors, tubes, components and surplus gear. K1GEJ, Mountain Road, Rte. 2, Ridgefield, Conn.

WANTED: Plate xfrmr to deliver 2500 volts at least 500 Ma. CCS out of choke input filter. Write price, weight, size and condition. Roddick, 5105 East Sunset, Yakima, Wash.

TWO Meter Communicator III, $185.00; Gonset Super Six mobile converter/clipper, $30.00. Both excellent condition with manuals and schematics. K6TVO, STate 5-8196. Van Nuys, Calif.

HPM-200. Sell at bargain. W2ZMG.

COMPLETE Station for sale: Johnson 500 FW mint condx, low-loss filter, Micromatch SWB, SX100 receiver with spkr, RME Preselector, 40 ft. tower, ham rotator and 3-element Tribander, Thunderbird beam. On the air at the present time. $1,000 for all. Call CY 5-5564, 12 Fenwood Place, Yardley, Penna. W3ARR.

BEST Offer takes: two BC645 transceivers in orig. cartons with conversion data; PE103 unused; two BC611 handi-talkies, 3885 Kc., as is; Gonset 3-30 converter; other parts and gear. Write for list. Art Vandervoort, W2DGG, Bloomingdale, N.J.

VHF-1, $135.00. GC-1-A, $95. Excint condx. Allan Gouker, K8RFC, Box 324, Baroda, Mich.

FOR Sale: Heathkit mutual conductance tube tester, Model TT-1, professionally wired, with manuals, orig. carton, new condition, $95.00. Also Mon-Key, $10. C. Nevel, 184 County Highway 39, Southampton, N.Y. Phone 516-AT 3-0581.

VIKING Ranger, factory-wired time sequence keying excellent, $175.00. W6GVP, 6225 Melvin, Reseda, Calif.

FOR Sale: Ranger, $150; HQ-110, $150; HQ-110, $150; Matchbox, $30; 4 track stereo tape deck Heath Model TR-1D, $130 complete (this costs $169.50 as kit). All perfect. K1OEP, Vilar Kelly, Sleepy Hollow Rd., New Canaan, Conn.

WANT Any repairable receivers. W. I. Barry, Box 403, RCAS-BMEWS Project, APO 23, NYC.

1946 HT-9, FB condx, make me an offer. Ken, K5YAL, Melvin, Texas.

SALE: DX-100, $150; SX-99 with Heath Q-multiplier and R-46A spkr, $120; relay racks, 70 in. panel height, 19 in. panel width, 115VAC fan and on rollers, $21.00; same as above without fan or rollers, $15; 9 in. panel, height, $4; will not ship. K4SVH, 108 Victor Dr., Bristol, Tenn.

SELL Or trade for tape deck: excellent condx Knight R-100, Heath AT-1, 150 watt amplifier, Handbook keyer, QSTs, tubes, and parts. Roger Philips, 1418 Melody, Fullerton, Calif.

SELL: BC-221-T freq. meter, $50; BC604 trans, new, $12; receiver Navy RDZ 1, new, $35; Telecom transistor, P.S. new $25; V-M #714 tape recorder, $110. M. H. Klapp, 17 Kenosha St., Albany 9, N.Y.

LICENSE Renewal Reminder Service. Biggest bargain in amateur history brings renewal reminder sixty days before your ticket expires. Register now! Attach 25 cents to QSL card, print dat e license expires, address envelope Reminder, Standish, Box 1461, Evanston, Ill.

FOR Sale: 75A4 serial #5474 with Collins speaker and KWS1 serial #156, latest modification Collins factory, with power supply. All $1,300 cash or certified check. Will not sell separately. This outfit is in excellent condition. I used it until approximately September 1st. I will deliver by car 100 miles radius of Augusta, Ga., or by private plane 500 miles of Augusta, you meet plane and pick up at airport. Reason for selling: have two similar outfits. J. C. Hagler, Jr., W4SS, 2424 McDowell St., Augusta, Ga. Tel. Area code 404 PA 2-7781 during business hours. Re 3-4678 before 10 PM EST.

WANTED: Hammarlund Super Pro or BC-779 receiver complete with power supply. Must be in excellent operating condition. Will pay cash. A. J. Karnie, 73 McMurray Rd., Richland, Washington.

SW3, Vintage 1931 National regenerative receiver with power supply, 4 sets coils, general coverage 80 bandspread 40, general coverage 20 and 1 set near 160. Working and in gud condx. Firm $35.00 F.o.b. Paul E. Miller, W9REW, RR #2 RD 114, Roanoke, Ind.

SELL Or trade: unused Telrex TM-30 Monarch "Tri-Band" 4-el. on 10 & 15; 3-el. on 20. Cost $328.00. Sell for $290 or will trade for commercial transmitter. 32V3, Globe 300, etc. No kit types: 35 ft. Rohn No. 6 tower for $30.00. f.o.b. Rome, N.Y. Melvin Crain, Floyd Road, Mounted Rte., Rome, N.Y.

CLUB Needs revr, xmtter, etc. Must be cheap. Samkofsky, 201 Eastern Pkway, Brooklyn, N.Y.

GLOBE-Scout, 680-A (wired), $65; Hallicrafters S-107, $65; both $110. H. Edward Pearce, Box 172, Hendrix College, Conway, Arkansas.

COLLINS S-line station, complete w/30S-1, 2 Kw. amplifier, $1895. Also 30S-1, $995 f.o.b. my QTH. WA2FMC.

PREMIUM Quality used equipment, over 1,000 units, reconditioned with trial plan and full 90-day guarantee. Terms available. Write for free lists and top trade-in offer on your present equipment. World Radio Laboratories, Box 919, Council Bluffs, Iowa.

TRADE Drake 2A 100 Kc xtal calibrator 2AQ spkr., Q-Multiplier in mint condx, W2EWL, SSB transmitter, 100 watts with p.s. Want 2-meter station. K2JEV.

TRANSFORMERS custom design chokes, modulation plate also rewinding. Havill Manufacturing Co., 9007 Avalon, Los Angeles, Calif.

GLOBE Champion 350, like new, 350-watt c.w., 280 watts AM. Cost $495. FW. Sell for $325.00. Will deliver reasonable mileage. Lyman Eden, W11DS, 88 Laurel Lane, Lunenburg, Mass.

MULTIPLEX Adapter, circuit board, 5 coils, sockets and complete instructions. $15.00. Stoner, Box 7388-Q, Alta Loma, Calif.

SELL Highest offer: 455 Kc input, Panoramic adapter BC-1031-A, in use now. RTTY model 15 printer, ten hours use since a major overhaul and lubrication. Like new, in original shipping case. Heathkit VOX model VX-1. KØMWM, 4504 W. 36th St., Minneapolis 16, Minn.

FOR Sale: 200V Thunderbolt and SX-101A. Will sell separately. Make me an offer. All inquiries answered. John Hipp, 6 Summit St., New Milford, Conn. Tel. ELgin 4-8154.

FOR Sale: 75A4 serial #5722 100V Central Electronics Serial #148, $950. Sry, no shipping. Package deal only. WØKUL, 13352 Wyola Rd., Hopkins, Minn.

TRADE 300 Ma. 1250 V Stancor xfrmr, 6V battery charger. Want ham receiver. WØWXN, Larrabee, Iowa.

WANTED: 4-1000A tube and socket. Bob Turner, W3RBW, Box 258, Accokeek, Md.

SELL: Communicator III and linear for six meters. Both for $250.00. K2USW, 602 Avenue T, Brooklyn 23, N.Y.

COLLINS Receiver 75A-4, spkr, and manual. In exc. condx. $575.00. Kenneth Engstrom, W5CUM, 833 Oak Forest Dr., Dallas 32, Texas.

WANTED: Bliley SMC100 crystal unit. R. Hallenbeck, 11 Ridgecrest Ave., Latham, N.Y.

SELL: New tubes: 2 4-65A, at $6; 2 6F4 at $3; 814, $8; 4X150A, $10; 250TH, $10; 6161, $30; 5876, $5; 810, $5; 2-10C, $6; 4B32's, 3C24's, 2C39A's, 860, 808, GL446B. Make an offer. Transformers: 2-870VCT, 250Ma.; 1-6.5V, 12A at $5. Greg Pfister, Pres. S.M.H.S.A.R.C., K2OLC, 51 Clapham, Manhasset, N.Y.

WANTED: Good 4-1000A, prefer pick-up deal. K2EGI, 5 Stratford Pl., Babylon, L.I., N.Y.

WANTED: Code practice tapes for TG-34 keyer. Charles Hyde, R.D. 2, Ballston Spa, N.Y.

FOR Sale: BC221, $60; GE sideband selector YRS1, $50. Measurements 78C signal generator, $40; Dumont 304H 'scope, $50; new PE101C Dynamotor, $6; new ART13 modulation transformer, $6.50; all F.o.b. W2MPP, Gordon Gregory, 21 Roosevelt Ave., Westwood, N.J.

XMTTR Compact, complete Sonar SRT-120P w/VFO, 10-80, 120w. c. w., 90w. fone. First $100 or best offer. Mobile converter Morrow 5BR with noise limiter, 10-80, $40 or best offer. Mobile xmttr, Babcock MT-5B 10-80, 35w., $55 or best. All gud condx w/manuals, K2CTK, 843 Jefferson St., Woodmere, N.Y. Tel. FR 1-0587

SELL Apache $235.00, SB10, $75, both $300, excint condx; BC610F, excint condx. Built-in speech amp., spare tubes, coils, TU's 160-80-40-20, $300; HQ110 w/mod. A slicer, $175. Swap SSB. Van. KØMNY, Rte. 3, Osakis, Minn.

WANTED: Model 19 metal teletype table, model 14 non-typing reperforator. Also TM 11-2201, 2210, 2236, 2238. Must be reasonably priced. W4NZY, 119 North Birchwood Ave., Louisville 6, Ky.

ELMAC AF67, Gonset converter pwr. supply, $165; Apache TX1 $235.00, SX101-3 spkr., $250.00 L.N. equipment. Wanted: KWMZ G76 & accessories. W2CE, 55 E. Bedell, Freeport, N.Y.

HT-33 KW linear, $250.00, like brand new. W2QZQ, Chapel Gate Lane, Glen Head P.O., N.Y.

FOR Sale: Viking II, $130; HQ-129X, $95. K1KBM, Box 52-B, RFD No. 1, East Haddam, Conn.

TRIBANDER, 3 el. (10-15-20 M.) never used, too large for my QTH. Will trade or swap. Want tape recorder or what have you? Will pay cash difference. Prefer local deal. WA2LOT.

SELL/Trade HFS rec., S-77, 2-mtr. Communicator converted to 6, plus other equipment. Want: SX73 or other gud revr. WØCNG, Box 4275, KHS, Colorado Springs, Colorado.

APACHE and SB-10 wanted. Schulz, 4655 Broadway, Gary, Ind.

WANTED: Commercial or surplus aviation and ground transmitters, receivers, test sets, 18S, 17L, 51R, 618S, GRC, PRC, ARN14, MN85, Bendix Collins, others. RITCO, Box 156, Annandale Va.

FOR Sale: Prop pitch motor, 24VDC, 38 pounds, $24.00; pair 813, $8.00; Heath balun, $7.00; TH4 Triband beam, $70; 40 ft., crankover aluminum tower, $65.00; U-98 rotator and automatic control, $15.00; 3 B&W 500 watt coils, $5.00, 10 traps and Tribander instrux, $10. U pay postage. K4UJT, 301 Bayside Road, Lake Worth, Fla.

FOR Sale: Complete 6 meter station: LW-51, $50; power supply, $30; Tecraft converter, 14 to 18 Mc., I.F. w/pwr .supply, $40; S-76 double conversion Hallicrafters receiver, $65; National 6 and 2-meter VFO, $37.00 and 4-element Telrex beam, $15. W2POU. Dick, 408 West High St., Glassboro, N.J.

COLLINS KWM-2 like new, with original carton: $910.00. Al Mandel, WA2BKT.

TELETYPE Model 14 TD, gud condx, perfect opertn, $75, or trade for Model 14 non-typing reperforator. Trade PE-110-B for Harvey-Wells TBS-50-C or D. Baser, 344 South Franck Ave., Louisville 6, Ky.

SELL: Kilowatt Thordarson modulation transformer 11000/9000 ratio, $13.00. F.o.b. Riverside, Mich. or swap for 1600 v. 300 Ma. pwr. xfrmr. Manning, Box 563.

WANTED: 52 ohm Johnson low-pass filter and D-104 mike without push-to-talk. KISCO, 44 Parkway Cres., Milton 86, Mass.

WANTED: 500V 500 Ma. transformer. Sell BC348Q with hexternal 110V. $55.00. Bradley, Box 762, Warren, Ohio.

HEATH Apache, $225.00 Heath Comanchee, $115 In exc. condx. Will deliver within 200 miles. W80ZW Byrd Drive, Columbus 19, Ohio.

OSTS of late W2GXC, 1930 to date. Best offer. W2CKO.

WANTED: 516E-1, 12VDC power supply for Collins KWM-1. State lowest price, condition, W4SPK/1, 54 Bald Mountain Drive, Bangor, Me.

FOR Sale: Hammarlund SP-600 JX with spkr, xtal calibr., excltn condx, $325.00; 6 meter Communicator III, w/mike, whip and Gonset 50W VHF pwr. amplif., like new condx, $200. A. R. King, W9EUQ, 808 Ridgely Bldg. Springfield, Ill.

HIGHLY Effective home study review for FCC Commercial Phone exams. Free literature. Wallace Cook, Box 10634, Jackson, Miss.

COLLINS 50S-125 watts phone, $60; BC221 with power supply, $50; pair 4-125As, $25.00; 5G selsyns, $15.00 pr. K5ZGR/8. James Buck, 3200 Darbyshire, Columbus 21, Ohio.

CRYSTALS Airmailed: SSB, MARS, Novice, Net, CD, etc., Custom finished FT-243 .01% any kilocycle 3500 to 8600 $1.49. (10 or more same frequency FT-243 99¢) 1707 to 20.000 $1.95. 20.001 to 30.000 $2.25. Overtones above 10 mc. Fundamental 10 to 13 mc. $2.95. Add 50¢ each for .005%. Add 65¢ for HC-6/u hermetics. OST packaged crystals: "SSB Package" June 1958: Sectionalized Receiver, October 1961; Either set (5 FT-243) $9.95, hermetics $13.95. Matched filter "SSB Package" $7.95. Multiband Receiver, February 1961, $17.95. Other project crystals, write. Airmailing 9¢ per crystal, surface 5¢. Crystals since 1933. C-W Crystals, Box 2065-Q, El Monte, Calif.

SELL: HQ-160 receiver. Perf. condx. Not a blemish on it. $250.00. W5BQ, 4906 Bon Aire Drive, Monroe, La.

NOVICES: Knight VFO, $20; Eico modulator $35.00, AR3/cab, $20 or best offers. Excellent condx. KØWWV, 309 DHH, Houghton, Mich.

HEATHKIT Mohican receiver with electric power, $90; you pay shipping. WØBTU, 1185 East Bates Parkway, Englewood, Colorado.

SELL: Transmitter power supply, delivers (1) 800 volts 300 mils (2) 300 volts, 250 mils (3), 90 volts bias. Standard rack panel and chassis construction with control switches and pilot lights: $35.00. Thiede, W2EC, 169 Buckingham Rd., West Hempstead, L.I., N.Y.

GOOD VHF 152A, $45.00 f.o.b. Aiken, S.C. Also back issues of QST and CQ. Rev. James Baker, Box 938.

COLLINS KWS-1, 75A-4, both in excint condx: SSB-CW-AM, best ham station ever built. Original cost, $2750. Your cost now $1450.00 including spare set 4X250's. May be used as commercial communications station. W4NDB/6, 3410 Loma View Dr., Altadena, Calif.

TUBES: 4CX250B, $13; 4-125A, $9.00; 4X150A, $5.00; 4-65A, $6.50; 829B, $5.00; 3C24, $5.00. KØRHO, 1834 Jefferson St., St. Paul 5, Minn.

HQ-110, like new, no scratches, Dampp-Chaser, original carton and instructions, $175.00. K3CSV, 1316 Faxon Circle, Williamsport, Penna. Phone 326-5553.

SELL: Eldico SSB 1000F 2000 watts P.E.P. Practically new, used ten hours. 4CX300A final tubes, $375 or best offer. Louis Fischman, 7 East 42nd St., New York 17, N.Y.

SELL HQ-100 (125) also Johnson 6&2 converter. WA2HRF, 124 Audley St., Kew Gardens 18, N.Y.

NATIONAL Selecto-O-Ject, gud condx, $15.00; also Ham Kit dummy load 200 watts, $5.00. W2GRA, 11 Harlow Cr., Fairlawn, N.J.

FOR Sale: SW59 receiver covering .54-34 Mc. Complete with S-meter, in exc. condx, $28.00. Write: Tom Judson, WV2TMH, Hyde St., Whitney Point, N.Y.

R-390 surplus receiver needed for parts. Send description and condition and price. Or will trade Gonset G66B and G77A and 6-12-110 volt supplies for good operating R-388 or R-390. L. W. Holmes, WØMDL, 2913 2nd Ave. South, Minneapolis 8, Minn.

RAK-7 receiver, 15-600 Kc power supply, Navy spkr instruction book, 70 Lb. steel chest, unopened, spare parts. Best offer. W2LD, James M. Bowden, 9 Orchard Way, Boonton, N.J.

FRANCISCANS need receiver; testing equipment. Gift or nominal fee. Send C. o. d. for shipping costs. KNSAUC, Our Lady of Carey Seminary, Carey, Ohio.

FOR Sale: Good Heathkit AR-3 with cabinet, $30. John Granger, 8706, 25 NE, Seattle 15, Wash.

COLLINS 32V1, perfect condition. Less than 25 hours' use since reconditioning: $155.. Also HQ-129X, $60. Need the money for college. John Minette, St. Thomas Seminary, Kenmore, Washington.

UHF'ERS! Have 200 ft. gas line coax 1⅝" dia., 20 ft. lengths with flange connectors. Attenuation: 0.2 db. 100 mc, 0.5 db 400 mc. Normally $6 per ft. yours for $2.25 per foot. Call or write K9PSX.

PORTABLE Sideband station 20-75 meters, custombuilt by W2-EWL, $150.00. Sry, no shipping. K2EN, 31 Jervis Rd., Yonkers, N.Y. Tel. YOnkers 3-7187 evenings.

ELDICO SSB-100F latest model. Finest SSB, AM and CW xmttr available. Covers entire phone and CW portions of each band 10 thru 80 meters, with full 100 watts output. Sufficient power to work anywhere. Extremely stable. Adjustable pi-net output matches linears or antennas. Crystal filter gives beautiful potent sharp clean signal with maximum suppression and exc. audio. Built-in 'scope. Finest professional construction for long life, trouble-free operation in every mode. Now on air, perfect condition, looks and works like brand new. Will ship with manual. Cost $795. Sell to best reasonable offer. C. Brooner, P.O. Box 261, Morton, Ill.

SELL: Gonset Communicator IV with 6 xtrals, almost new, $250.00; kilowatt grounded grid power amplifiers with or without power amplifiers with or without power supply, $150 and up. Send for details. W6HHN, 3467 Rambow, Palo Alto, Calif.

XMAS Special: BC-221 (1), $50.00; BC-221 (AK) modulated, $65.00; TS-175/U 80-1000 Mcs. modulated, $65.00; Each complete with precision power supplies, original calibration, and instruction books. W2LSB/8, H. A. Dennis, 98 East Juniper Drive, Fairborn, Ohio.

FOR Sale: Elmac AF67, $109; PMR-7A, $99; both perfect, in new boxes, including Handbooks, power plugs, etc. Heliwhip 80-meter 6 ft. whip $10.00, 10 meter 4 ft. $8.00; KW filter $5.00. Al Cookson, K2LHP, 30 Highland Dr., North Caldwell, N.J.

OSTS Wanted for years 1915 to 1922. Sell Eddystone 888A recvr, new, $400. Elmac 4-125A's, new, $10. 404A's and 417A's, new, $6.00 each. W2DYU, 36 New Lawn Ave., Kearny, N.J.

SELL: Station, test equipment, tubes, parts, dime for postage brings 7 p. list. Edwin Elbert, WA2DEK, 554 Webster, New Rochelle, N.Y.

FFR Tuning drawers wanted, such as FFRD-5,6,7 and 8. John Longley, W2ANB, Slingerlands, N.Y.

75A3, excellent condx, 3 Kc fil., $325.00. Warren Nissen, Ashokan, N.Y.

GONSET G-76 100w. transceiver, AC pwr. supply, only used a few hours. Works perfectly. In original cartons, books, cables, no shipping, sry. No terms. $375.00 cash. K9CQB, 2536 West 12th St., Anderson, Ind.

SELL: X-101 and/or Gonset Communicator III for 2 meters. Make offer. William Weiher, K9OUD, 1623 Manchester Ave., Westchester, Ill.

MINIATURE Sealed plate relays, 9000 ohm, SPDT, fits std. 7-pin miniature tube socket. $1.00 Ppd. K7OPF, Howard, Box 228, Douglas, Arizona.

SALE: Going SSB. AF-67 with 12v and 115VAC (M1470) supply, PMR6A rcvr with supply. Best offer over $240.00 takes it. Need R390A rcvr. W2FRU, 26 Croton St., Ossining, N.Y. PH:WI 1-6763.

FOR Sale: Viking Valiant in fine condx. Used little $325.00. Delivery within 300 miles. K9GOM, Box 542, Edgerton, Ohio.

SELL: Meissner 150B transmitter complete with oscillator. Also HRO National receiver with Central Electronics sideband slicer; DX-100 with reflected power and antenna impedance meters and Electronic switch. Best offer. R. Russell, 814 Bath Ave., Niagara Falls, N.Y.

WANT: Very good HRO-50TH, 32V-1, state condition and lowest price. Sam Thompson, 1003 N.E. Couch, Portland, Oregon.

FOR Sale: Millen grid dipper 90651 with 7 standard coils and 4 low frequency coils, $55; 6198a, Vidicon, $25; table lamp custom built around image orthicon tube, beautiful for TV exec office or ham shack: $30. Wells Chapin, 942 Arden Lane, Birmingham, Michigan.

FOR Sale: Hammarlund 129X, perf. condx, $100; TB-3 Hornet 3-element KW beam, $40; brand new wired Heath Warrior Linear Amplifier, $250. W4IXJ, Cy Broder, 1307 Delaware Ave., Ft. Pierce, Fla.

COLLEGE: New HX-500, SSB Hammarlund, used less than 1 hour, $575. Will ship c.o.d. K8RPE, Turner, 239 Marview Ave., Vandalia, Ohio.

VIKING Valiant, in new condx, never used: $320.00. Local sale is preferred. Lee Mattis, 548 Arch St., Royersford, Penna.

100 Kc calibrators complete with crystal, only $8.95. Bliley 100 Kc. xtal, only $4.00. Communications Accessories, Box 642, Cedar Rapids, Iowa.

AF-67, custom AC supply, $125.00; BC-348-R, $40.00; 60 watt modulator, $30; BC-696-A, fine on 80 c.w., $12.00; BC-458-A, modified for 20 c.w., $8.00; 6V Carter Gen-E-Motor, 500V, 200 Ma. outp, $15, plus shipping. C. Beasley, 1110 Harrison, Madison, Wis.

SELL: Ranger, $165.00; Thunderbolt, $375; both factory wired, excellent, original owner. W2IVF, 39 Seventeenth Ave., East Paterson, N.J.

MUST Sacrifice SX-100 and R-46B spkr. Guaranteed in mint condx, only $150.00; also Dow-Key coax relay, $10; Johnson filter, $10; 100 ft. of RG-8/U, $10; and AR-22 rotator, and 100 ft. cable, $20. Charles P. Brooks, 2268 Shannondale Dr., Libertyville, Ill.

SALE: DX-100 in A-1 condx, $150.00. W2AUF, 8426 87th St., Woodhaven 21, N.Y.

FOR Sale: SP-44 Panadapter, HT-31 linear, Super Pro, 400SX, AF-67, PMR7 plus pwr. supplies; Millen VFO, final, secondary freq. standard and others. Prefer cash offers but will consider some trades. J. B. Forman, P.O. Box 1032, Grand Central Station, N.Y. 17, N.Y.

COLLINS KWS-1. This transmitter has been very little used, in like new condx, $1075. K5YPG, Fred Davis, 1735 North Acadian, Baton Rouge, La.

SX-101A, in like new condx, sell $265.00. D. Robertson, Building 911, Brookhaven National Laboratory, Upton, L.I., N.Y. Tel. YAphank 4-6262, Ext. 507.

SELLING Entire station: HT-32, SX-88, ART-13, w/ac. pwr. supply, LA-1, Hallicrafters Panadapter, Hy-Gain 10-meter beam. All in perf. working order. Contact: Yager, K7NLI, 1701 E. 1st St., Tucson, Ariz.

"HORSE-TRADER" Ed Moory plays 'Santa Claus' to the Hams. Reconditioned used KWM-2, $859; HT-37, $319; Drake, 2-B, $209; 200-V, $629; 20-A, $149; N-C-300, $175; 75S-1, $359; 32S-1, $479; 30L-1, $439; GSB-101, $239; in warranty Johnson Thunderbolt, $389; Perfect 75A-4, $499; 100-V, $489; Johnson Viking Valiant, $279; GSB-100 SSB exciter, $279; HT-32B demonstrater in warranty, $509; Globe King phone and c.w. transmitter, $75. In stock, immediate delivery, 75S-3's, 30L-1's, SX-115, HT-41, also Mosley CM-1 receiver. Terms: cash and no trades. "Ed Moory" Wholesale Radio, Box 506, DeWitt, Ark. Phone WHitney 6-2820.

NEED Expenses for college. For sale: Complete station RME-45 receiver and DX-100 transmitter plus many extras. $200.00. J. Sorrentino, 900 Orange Ave., Cranford, N.J. K2ZHK.

FOR SALE: G-76 transceiver with matching A.C. supply, $390. W1BIH, Box 1, Torrington, Conn.

FOR Sale: HT-33A, latest factory modifications to HT33B electrical circuit. New PL-172. Best offer over $400. Collins S/Line 75S1, 32S1, 312-B4, 516F2. Latest factory modifications, all for $975. All above like new, in spotless condition. W5NKE, 3809 Lakeview Rd., North Little Rock, Ark.

SELLING OUT, everything goes. SX-99 and other receivers; transmitters (mobile and ARC-5); HV power supply; tape recorder; parts and much more. Write for prices and complete list to Bob Spargo, 25 Walkley Road, West Hartford 7, Conn.

WANTED: 4-1000A tube and socket. Bob Turner, W3RBW, Box 258, Accokeek, Md.

PROCEEDINGS Of the I.R.E. 1918 through 1948. Most volumes complete. Will sell any copy or copies. Excellent price on entire lot. (Mrs.) Miriam Knapp, W1ZIM, 191 Beechwood Road, West Hartford 7, Conn. Tel. JAckson 3-7560.

WANTED: Signal generator below 100 Kc; V.T.V.M. 6 meter transmitter; 12th Edition Radio Handbook or schematic for Mallory inductuner; signal tracer; sell or trade RBL-4 receiver (15-600 Kc.). George Lindemulder, 2585 Knapp St., Grand Rapids, Michigan.

75A4 for sale. Latest production. 312A-2 control and speaker. Instruction Manuals. Will sell complete or as separate units. Will ship anywhere. John E. Magnusson, WØAGD, Waseca, Minn.

LOWEST Prices. Factory fresh sealed cartons. Central Electronics, CDR, Dow-Key, Drake, Electro-Voice, Gonset, Gotham, Hallicrafters, Hy-Gain, E. F. Johnson, Mosley, P & H Electronics, Telrex. Self-addressed stamped envelope for lowest quotation on your needs. Gonset G-33 brand new factory sealed cartons, $75.00. Brand new PL-172 and socket, $125.00. Used, perfect Ranger, $150.00; Valiant, $275.00; SX-110, $125.00; SX-100, $180.00; DX-40, $50.00; Sonar-120, $50.00; Adventurer, $35.00. H D H Sales Co., P. O. Box 73, Rowayton, Conn.

SELL: Johnson 500 P.W., $550.00; Rohn tower, 66 ft., $95.00; DB-22-A, $30.00; Hy-Gain roto-brake, only $25.00. Prefer local sale. K6RTC, 470 Commercial Ave., So. San Francisco, Calif.

FOR Sale: HRO50T with coils A,B,C,D, AA,AC,AD, spkr, xtal calibr., HT-32, Johnson Courier 500 watt amp. Sell all for $800 or make offer for individual units. IRE Proceedings 1957 thru 1960. Make offer. Wells Chapin, 942 Arden Lane, Birmingham, Mich.

SELL: Separately or package deal: SX-25 receiver; Stancor ST-202, all-band 100-watt xmtr fone/c.w.; Heath VFO with power supply; 10-meter mobile rig with built-in vibrator supply (RCA); PE-103 generator with all cables, 10-meter Gonset converter. All equipment in excint wkg. condx. No reasonable offer refused. Make cash offer, I need cash. Toney Summa, W3RUK, 90 Byrer Ave., Uniontown, Penna.

SELL: 75A4, ser. No. 5806. Mint condx, best offer. W1SMI, 74 Hoyt Ave., Lowell, Mass.

FOR Sale: Heath SB10 Sideband adapter, best offer over $70. Gracning, W9KHS, Tremont, Ill.

RELAYS: Leach 12VDC, $2.00; Advance 115VAC, $2.00; Allied 12VDC, $2.00, Clare 12VDC, $1.00; Kurman 12VDC, $1.00. All new, unused. L. H. Carver, W4HIW, 2759 Rainbow Rd., Jacksonville 17, Fla.

SELL: Gonset 3-30 mobile converter and noise limiter, both $25.00. W2IP, 486 East 5th St., Mt. Vernon, N.Y.

FOR Sale: Complete ham station: Heath Apache, NC-173 w/spkr; Gotham verticle antenna, SWR bridge, heavy duty rotor, doublet antennas. Make an offer. Rev. William Tammen, WØAMB, Reading, Minnesota.

SALE: Johnson TR switch, $18, fone FL 20088, J. Bright, 131 Nugent St., New Hyde Park, L.I., N. Y.

XYL would like to park car in garage. Most equipment very good, unmodified. Questions write: General Radio, 869A pulse generator, $25.00; 720A frequency meter (10-3000 Mc.), $85; Heath, Pawnee HW-20, $175.00; Mohican GC-1A, $85; Comanche MR-1, $85; Cheyenne MT-1, $80; HP-10 supply, $28; 0-11 5" oscilloscope, $30. Large converted prop pitch rotor, $24.00; Bud 6 ft. Deluxe rack cabinet (ship disassembled), $22.00; Motorola 30-D 2 mtr. FM mobile transmitter, $14.00; 52.525 Mc. FM walkie-talkie (22 tube), $45.00; RCA 4 kw. plate transformer, $25.00. 892R tube, $25.00. Jim Trout, W8GGK, RFD 1, Box 724, Stevensville, Mich.

SELL: Used 200V, $639, like new. Organs & Electronics, Lockport, Ill.

SELL: Heathkit Comanche mobile receiver, in excint condx, $100.00. W2YCS, Ridgewood, N.J.

FOR Sale: HQ-180, like new, $285; Mosley V4-6 vertical, $15.00; Viking Adventurer, $20.00. Paul Spitzlay, B'klyn, N.Y. Tel. ES 5-7561. Good package deal.

SELL Complete VHF station. Almost new 6 and 2 meter Gonset Communicator IV's with latest Gonset VFO. $580.00. Sam Koff, Box 463, Great Neck, N.Y. Phone HU 2-4498.

HQ-110C, in excint condx. Highest offer. KN1ONF, 41 No. Quaker Lane, W. Hartford, Conn.

Index of Advertisers

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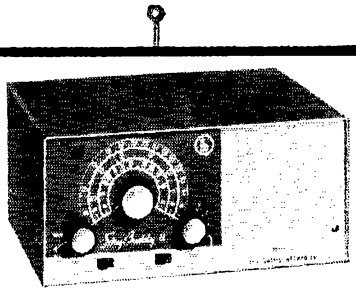
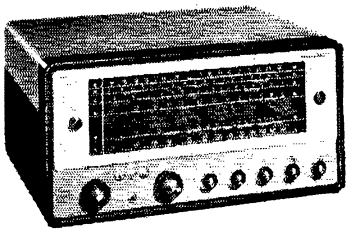
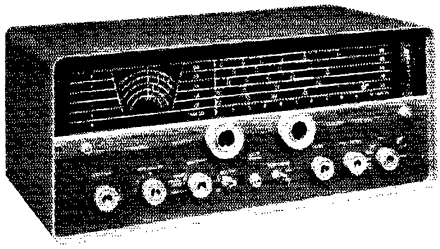


S-119K Sky Buddy Receiver Kit—$39.95. S-119 (factory wired and tested) $49.95. Standard broadcast. Two short wave bands (2-5.5 Mc. and 5.7-16.4 Mc.). Superheterodyne circuit. Transformer-type power supply.

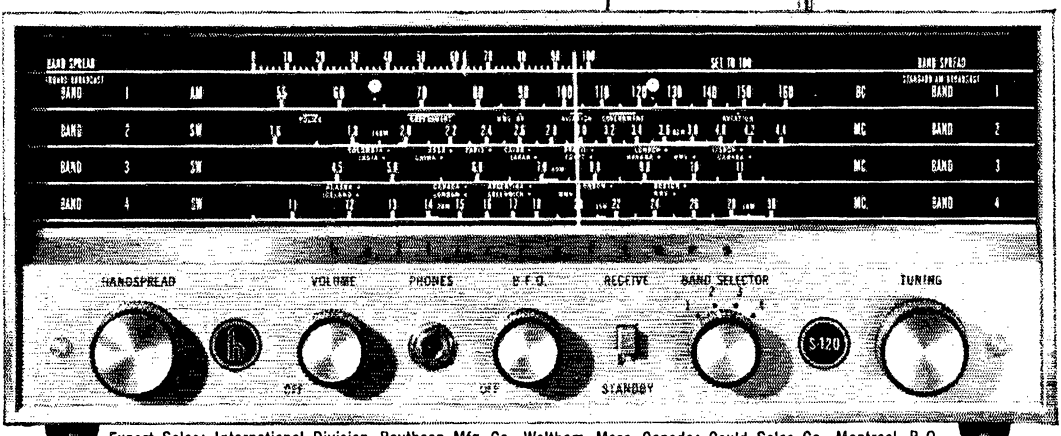


SX-62A Receiver—$395.00. Standard and FM broadcast. Three short wave bands (1.62 Mc-109 Mc). Excellent audio. Slide rule dial. Single tuning control. Automatic noise limiter. Uses R-48 speaker. ($19.95)



SX-110 Receiver—$169.95. Standard broadcast. Three short wave bands (1550 kc-34 Mc). Slide rule electrical bandspread dial. Built-in "S" meter, antenna trimmer, crystal filter. Uses R-48 speaker ($19.95).

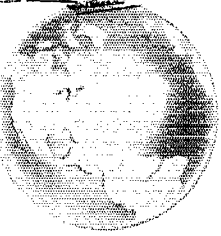
S-120 Receiver—$69.95. Standard broadcast plus three short wave bands (1650 kc-31 Mc). Three-way antenna system. Slide rule electrical bandspread dial. B.F.O./selectivity control.



Export Sales: International Division, Raytheon Mfg. Co., Waltham, Mass. Canada: Gould Sales Co., Montreal, P.Q.

Holiday Greetings

to all our Ham Friends
the world over
from the **ALLIED** *Ham Shack—*



W9WHF
Jim Sommerville
(Ham Division Manager)

W9VHI
Don Kobiljak
(Trades & Tech Help—Mail or Phone)

W9BHD
Joe Huffman
(Ham Shack)

K9LOK
John Chass
(Ham Shack)

W9HLA
Joe Gizzi
(Ham Shack)

W9QBB
Tasker Day
(Ham Shack)

In Milwaukee
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K9BDF	Jason Thomas
W9BUD	Larry Blostein
KØBYU/9	Charles Kaiser
K9BYU	Marty Barone
W9CCW	Rudy Ackermann
K9CDJ	Joel Bolker
KØCNR/9	Don Harris
W9DCB	Milton Fojtik
W9ECC	Bob Gumm
K9EIL	Don Saxon
W9ENK	Bob Patejunas
W9EXQ	Bob Stone
W9FUD	Ron Brust
KN9GQU	John Fehlandt
K9GSB	Norman Eastman
K9GXK	Jack Wolfson
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W9VOB	Burt Fischel
W9VVI	Gerry Marsh
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W9WOV	George Bercos
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W9ZJU	Doc Towler
KN9ZWK	Emmett Paschke

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ANTENNAS AND TRANSMISSION LINES

AUDIO-FREQUENCY EQUIPMENT AND DESIGN

BEGINNER AND NOVICE

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DXPEDITIONS

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REGULATIONS

SINGLE SIDEBAND

TRANSISTORS

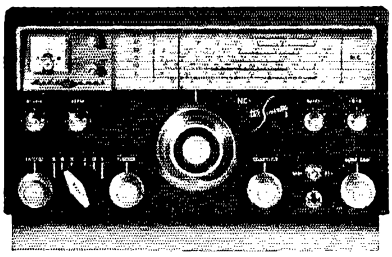
TRANSMITTERS

TRANSMITTING

TVI

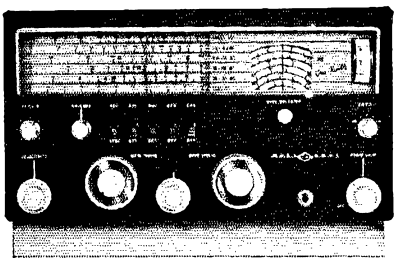
V.H.F. AND MICROWAVES

1



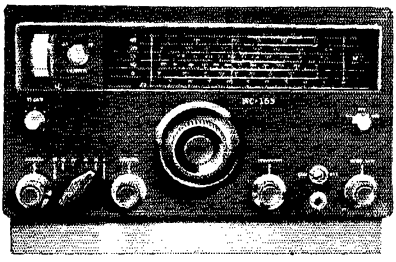
NC-270

2



NC-190

3



NC-155

NATIONAL'S TRIO OF PACE-SETTERS

Here are the three new receivers that are already setting the pace for the industry—Each offering you more solid performance in its price area than you will believe . . . until you tune one. We invite you to try all three—then select the one that best suits your requirements.

NC-270...

Precision double-conversion 80 through 6 meter amateur receiver featuring rock-like stability and unchallenged VHF performance. Five degrees of variable IF selectivity, including selectable SSB with product detector, 1.0 uv sensitivity, 60 db deep T-notch filter, built-in 100 KC calibrator, crystal-controlled 2nd converter. More features than any other receiver in its price range. **$279.95 am. net.**

NC-190...

The 540 KC—30 MC general coverage receiver that tunes like a ham-band-only unit. 1.0 microvolt sensitivity, double conversion with five main tuning ranges, 5.0 KC, 3.0 KC, and 600 cycle variable IF selectivity, full SSB/CW AGC and product detector, 60:1 bandspread vernier drive and National's exclusive dial selector, providing instant choice of calibrated amateur or foreign broadcast bands. **$219.95 am. net.**

NC-155...

National's newest—A double conversion 80 through 6 meter ham-band-only receiver offering superb performance completely out of proportion with its price. With its basic design derived from the famous NC-270, the NC-155 features 5.0 KC, 3.0 KC and 600 cycle variable IF selectivity, full SSB/CW AGC and product detector, and a velvet 60:1 dial drive that makes SSB signals as easy to tune as AM. 1.0 microvolt sensitivity on 6 meters, too! **$199.95 am. net.**

NATIONAL RADIO COMPANY, INC. MELROSE 76, MASS.

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FM

RTTY

CW

Operating Modes May Come and Go
...But The Message Will Stay Forever

TV

SSB

AM

Photo of Antique Rotary Spark Gap courtesy of ARRL

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A Bright New Year

from the Gang at the RCA Electron Tube Division

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The Most Trusted Name in Electronics