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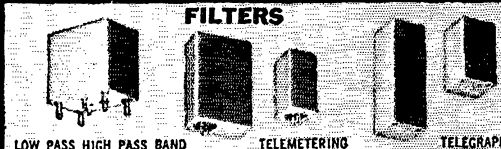

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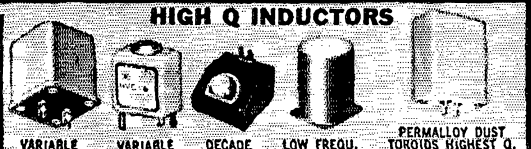

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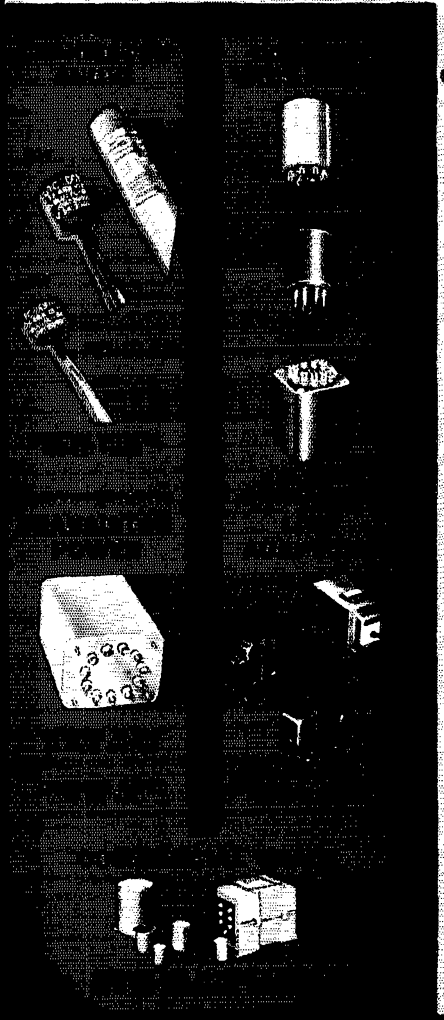

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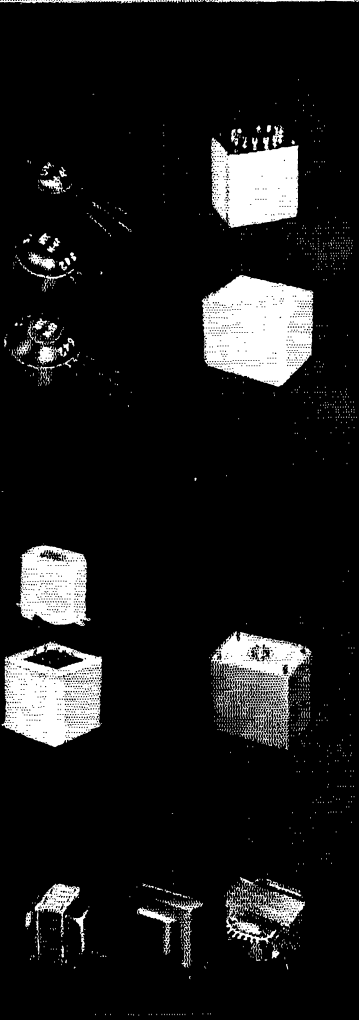

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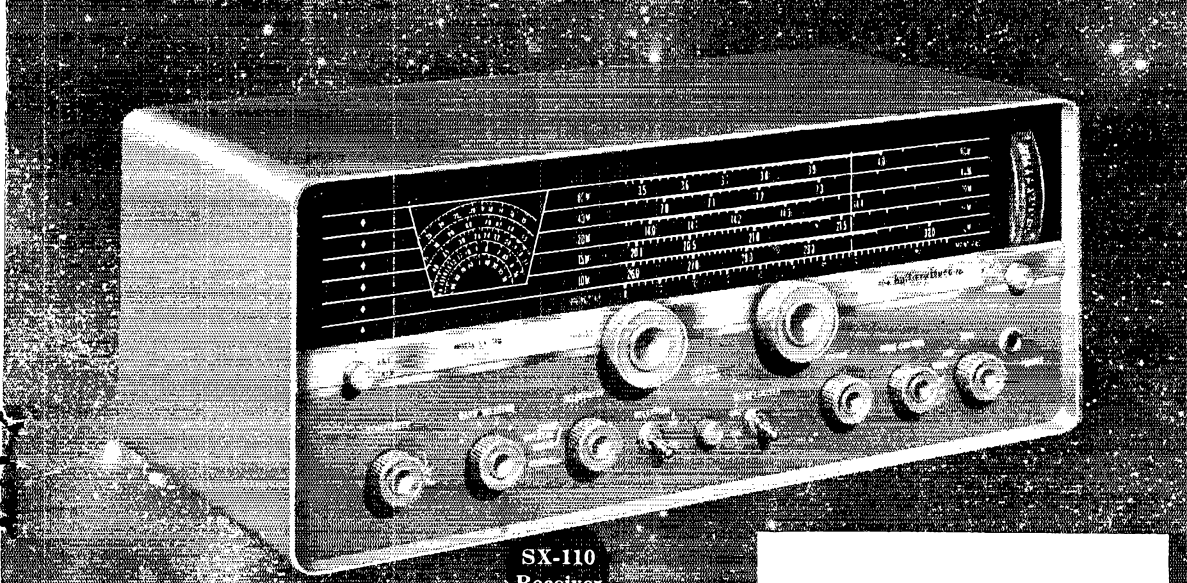

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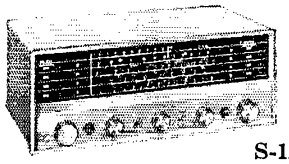
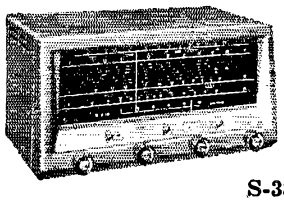
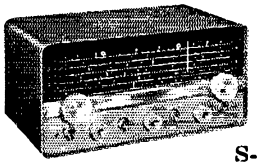


S-120



S-38E



S-107

SX-110 Receiver. Advanced features and design make the SX-110 an exceptional value for the radio amateur and short wave enthusiast alike. Standard broadcast plus three short wave bands (540 kc-34 mc). Slide rule bandspread dial, calibrated for ham and citizens' bands; built-in "S" Meter, antenna trimmer, crystal filter. Seven tubes plus rectifier.

S-108 Receiver. (not shown) Exceptional value and performance. Same as SX-110 in frequency coverages but without "S" Meter, antenna trimmer and crystal filter. Built-in speaker.

S-107 Receiver. Outstanding new styling and impressive features. Standard broadcast plus four short wave bands—unusually wide coverage (540 kc-34 mc and 48-54.5 mc). Separate bandspread and logging scale; slide rule dial; phono jack and headset tips. Seven tubes plus rectifier.

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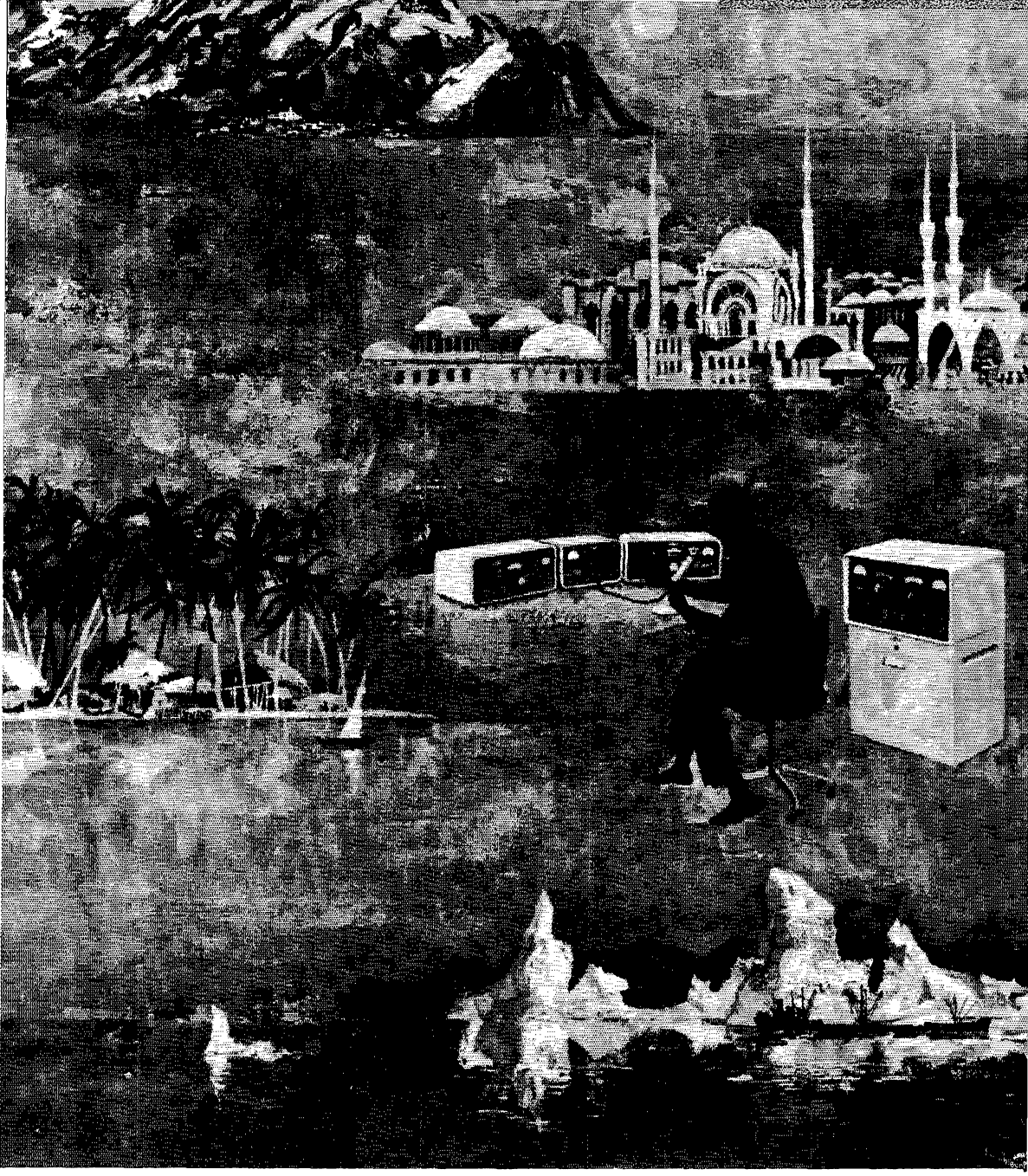

Night falls and you are alone in your ham shack. With just a touch of your fingers and a turn of a dial your call of goodwill spreads afar. It surges beyond the Baltic and the Sulu, over the Pyrenees and the Andes, across the Sahara and the Mojave. Your message penetrates curtains of iron and bamboo; it transcends blinds of prejudice and nationalism. And from Collins Radio Company go the best wishes of this season to you and to all your fellow members in the world-wide fraternity of amateur radio operators.

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QST

DECEMBER 1960

VOLUME XLIV • NUMBER 12

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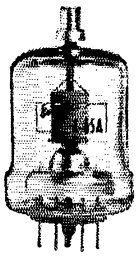
—CONTENTS—

EIMAC FIRST... for all band transmission

CW SSB AM

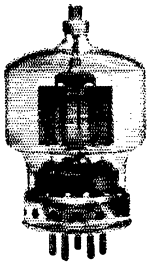


4-65A

4-65A Radial-Beam Power Tetrode

Smallest of the Eimac internal-anode tetrodes, the 4-65A has a plate-dissipation rating of 65 watts and is ideal for deluxe mobile as well as fixed-station service.

	CW	AM	SSB
Plate Voltage	3000v	2500v	3000v
Driving Power	1.7w	2.6w	0
Input Power	345w	275w	195w



4-400A

4-400A Radial-Beam Power Tetrode

Ideal for high power amateur rigs, it will easily handle a kilowatt per tube in CW, AM or SSB application. Forced-air cooling is required.

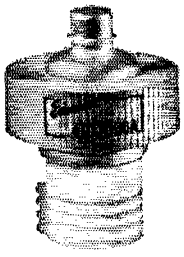
	CW	AM	SSB
Plate Voltage	3000v	3650v	4000v
Driving Power	6w	4w	0
Input Power	1000w	1000w	1000w

4E27A/5-125B

4E27A/5-125B Radial-Beam Power Pentode

The Eimac 4E27A/5-125B is intended for use as a modulator, oscillator or amplifier. The driving-power requirement is very low, and neutralization problems are simplified or eliminated entirely.

	CW	AM	SSB
Plate Voltage	3000v	2500v	4000v
Driving Power	1w	2w	0
Input Power	500w	380w	360w



4CX1000A

4CX1000A Ceramic Power Tetrode

Specifically designed for SSB operation, the ceramic-metal 4CX1000A Class AB, linear-amplifier tube achieves maximum rated output power with zero grid drive.

	SSB
Plate Voltage	3000v
Driving Power	0
Input Power	2700w

4CX250B Ceramic Power Tetrode

A compact, rugged tube unilaterally interchangeable in nearly all cases with the famous 4X150A, with the advantages of higher power and easier cooling.

	CW	AM	SSB
Plate Voltage	2000v	1500v	2000v
Driving Power	2.8w	2.1w	0
Input Power	500w	300w	500w

4-125A Radial-Beam Power Tetrode

The versatile tube that made screen grid transmitting tubes popular. This favorite for commercial, military and amateur use is radiation cooled.

	CW	AM	SSB
Plate Voltage	3000v	2500v	3000v
Driving Power	2.5w	3.3w	0
Input Power	500w	380w	315w

4-250A Radial-Beam Power Tetrode

A high power output tube with low driving requirements. A pair of Eimac 4-250A's easily handle a kilowatt input in AM, CW or SSB service.

	CW	AM	SSB
Plate Voltage	3000v	3000v	4000v
Driving Power	6w	3.2w	0
Input Power	1000w	675w	660w

4CX300A Ceramic Power Tetrode

A new ceramic-metal high power tetrode designed for rugged service. Will withstand heavy shock and vibration and operate with envelope temperatures to 250° Centigrade.

	CW	AM	SSB
Plate Voltage	2500v	1500v	2500v
Driving Power	2.8w	2.1w	0
Input Power	625w	300w	625w

Information on these popular tubes for amateur applications is available from our Amateur Service Department.

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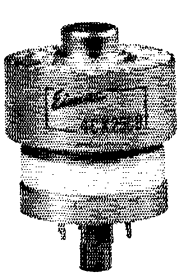
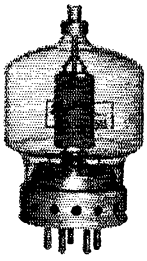
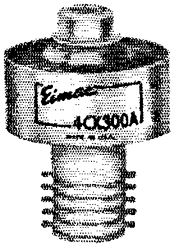


4CX250B

4-125A



4-250A



4CX300A

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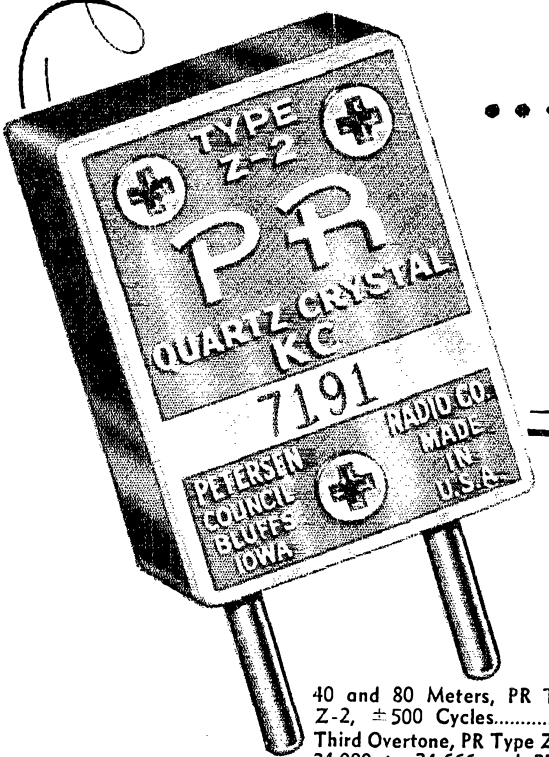

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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the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

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

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

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

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HARRY M. ENGWICHT W6HC
770 Chapman, San Jose 26, Calif.
Vice-Director: Ronald G. Martin W6ZF
1573 Baywood Lane, Napa, Calif.

Roanoke Division

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

Rocky Mountain Division

CLAUDE M. MAER, JR. . . . . WØIC
485 Race St., Denver 6, Colo.
Vice-Director: John H. Sampson, jr W7OCX
3618 Mount Ogden Drive, Ogden, Utah

Southeastern Division

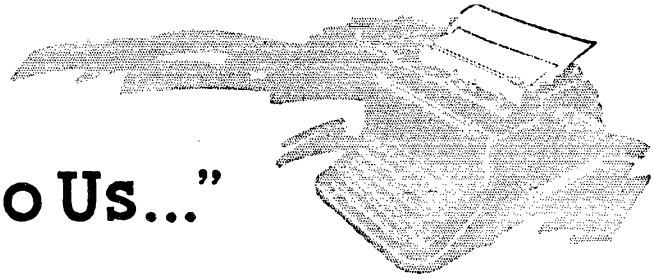
JAMES P. BORN, JR. W4ZD
25 First Ave., N.E., Atlanta 17, Ga.
Vice-Director: Thomas M. Moss W4HYW
P.O. Box 644, Municipal Airport Branch,
Atlanta 20, Ga.

Southwestern Division

RAYMOND E. MEYERS W6MLZ
717 Anderson Way, San Gabriel, Calif.
Vice-Director: Virgil Talbott W6GTE
1175 Longhill Way, Monterey Park, Calif.

West Gulf Division

GRADY A. PAYNE W5ETA
5103 Linden St., Bellaire, Texas
Vice-Director: Robert D. Reed W5KY
4339 S. Peoria, Tulsa 5, Okla.

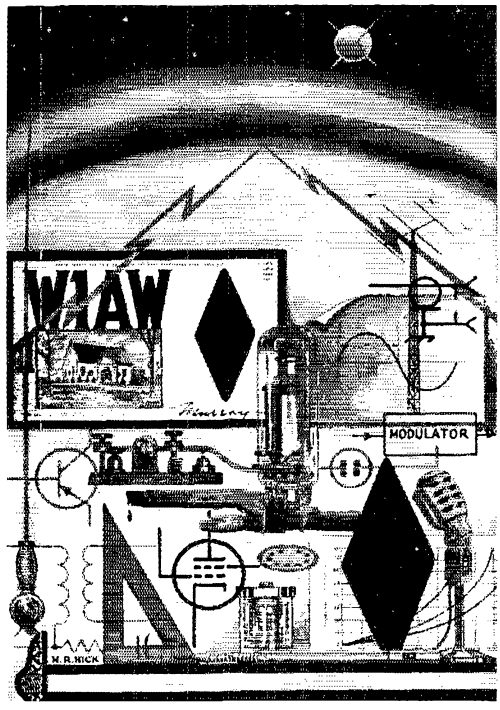


"It Seems to Us..."

OUR COVER, OUR ANNIVERSARY

We wear several hats — IARU Secretary, League Secretary, Editor of *QST*, and General Manager of the League — and this column frequently reflects the varied facets of the multiple job. But this month we speak strictly — and with pride — as *QST*'s Editor.

QST is now forty-five years old, the only radio magazine published with just one purpose for such a long period of time. Our cover this month depicts our aim, to bring all the news of amateur radio to all the amateurs. The satellite symbolizes the new and exciting days ahead of us. Radio bolts bouncing off an ionized cloud remind us of the quantity and quality of amateur experimentation through the years, perhaps most notable in the field of propagation. Schematic symbols tell of *QST*'s firsts in design for ham gear. A QSL card from W1AW recalls our co-founder and first president, Hiram Percy Maxim, while also symbolizing the helping hand extended to newcomers. News of operating activities can always be found in depth in *QST*, symbolized by the basic tools of our trade, the mike and key. The drafting aids express the precision *QST* strives for in all its technical material, while the beam, mobile whip and loading coil, the tube and transistor hint at the wide scope of *QST* coverage.



The traditions of forty-five years also are depicted here — The League emblem, the Wouff-Hong (neither quite as old as *QST*, though), and, one might add, the tradition of covers drawn by Harry Hick, whose first *QST* cover appeared in May, 1916.

It is easy to take for granted something which has been established as long as *QST*, but let's flip back through 45 years of *QST* pages and see how the Editor (and then half-owner), Clarence D. Tuska, felt about his first issue:

> "After considering the matter for several months, it has finally been decided to issue regularly some kind of a bulletin to League members. . . . The difficulty has always been how to pay for it. The members did not order the new List of Stations book and License Certificates as fast as they ought to have, and the officers had to go down in their own pockets to pay the bills. . . . After obtaining the views of several members and thinking it over, the President [Maxim] and Secretary [Tuska] finally decided to risk a few more dollars on a different plan . . . a magazine, which the membership would be willing to support. . . . After much hard work, the President and Secretary out of their own pockets have produced *QST* Nr. 1. . . . They hope to follow it each month with a new one. . . ."

And follow it, they did. Tuska and Maxim published the magazine regularly from December, 1915 until September, 1917, when Tuska enlisted. Post-war, the League took over *QST* officially, resuming publication with the June, 1919, issue, and members have gotten a copy every month since. And with the help of thousands of amateurs, *QST* has gotten bigger and better all that time. QST

Strays

W9BRD and/or his family, inveterate Chicago apartment dwellers, lived happily in one of three flats at 1517 Fargo Ave. from 1935 through 1950. This summer, a decade later, a piece of "How's DX?" correspondence was forwarded from the Fargo Avenue address accompanied by a note from K9BDK: "This must be for you, OM. I found it kicking around the vestibule of the building I live in."

—•••—

An item in the weekly newspaper of the Springfield, Mass., Technical High School read "W1GCR . . . is also planning a modulator that will allow transmission without the use of a microphone."

—•••—

W6DIE has a gimmick — "Surplus-of-the-Month Club." You sign up with him for a nominal fee, and each month you receive some piece of surplus gear that he has accumulated in his travels. Contact him at 833 7th Avenue, Sacramento 18, California, if this intrigues you. He'll send you the dope.

—•••—

One of the calls you'll hear on the air these days is KN0CJB. He's the grandson of the late K. B. Warner, W1EH, who was secretary and general manager of ARRL until his death in 1948.

—•••—

K5RAB is attempting to compile a list of all optometrists who are hams. Send all the details on yourself and your station to K5RAB at Box 609, Garland, Texas.

—•••—

You think ham radio is getting complicated? Admiral Jaap, USN, pointed out in a recent speech that a light cruiser of World War II carried about 300 pieces of electronic equipment on board, while the same type of ship today, converted to a guided-missile cruiser, carries more than 1200 pieces of electronic gear.

—•••—

Speaking of the Navy, a new Naval Communications Division has been formed in the New York City area and is meeting regularly. It has an interesting assignment, and if you are an amateur and a Naval Reservist or if you are an amateur with your military obligation still ahead of you, this would be a good unit for you to investigate. Obviously, you should live in the New York City area. Contact W2KGO, 15 Foxhurst Lane, Manhasset, who is the commanding officer.

—•••—

Said the Halo to the Cubical Quad,
"We're both an ungainly pair:
But I'd rather be round, cool and hep,
Than like you — you square!"
— *K8ERZ*

—•••—

The International Ham Hop Club is looking for members. This is an exchange deal to help cut down the cost of overseas travel. Members volunteer to provide meals and lodging for other members, on a reciprocal basis. For further information you should write to Bryan Fogerty, EI6X, Hillcrest, Plassy Av., Corbally, Limerick, Ireland.

—•••—

Perhaps DU1RC *wasn't* first on a motor scooter. Along comes W1KCR to say that he operated mobile from a Vespa in 1957.

—•••—

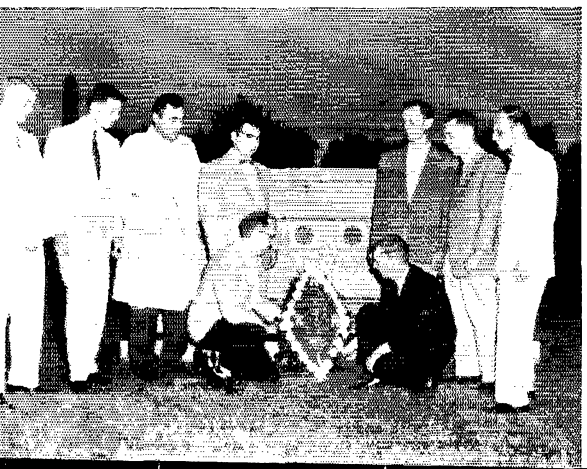
Ever try using counterweights on the halyards to your flat-top antenna, to keep it taut despite shrinkage, expansion, and the like? The Navy is using some on the antennas of its new megawatt station in Maine — there are 36 of them and each weighs 200 tons!

—•••—

A census enumerator out in Idaho had a bit of trouble getting to one of the families who lived up on a remote mountain peak, servicing a TV station's relay equipment. It seems that there was a ham in this family (although the census enumerator didn't give out the call letters) and so the Idaho SCM (W7GGV) stepped in and provided the necessary communication. This saved the census enumerator about a 6-mile walk!

—•••—

A flotilla of 18 yachts left Bermuda this summer, bound for Sweden. W2ZXM (remember the *Flying Enterprise?*) was aboard one of the yachts, complete with sideband gear, and was able to maintain communication with either Europe or North America all the way across. His was the only vessel that could do so, the result being that he handled plenty of traffic.



On June 21 The Antietam Radio Association of Hagerstown, Maryland, placed a wreath on the grave of Hiram Percy Maxim, founder of the American Radio Relay League. The wreath was in the shape of the League emblem, being made up of red and white carnations and with the letters and symbols in gold. Present at the ceremony were, left to right, standing, K3HPG, KN3MBV, W3LQP, W3VAM, W3EPV, W3OYX and W3AMX. Kneeling, W3LII and W3EHA, vice-president and president of the Antietam Radio Association.

Radioteletype Reception by Tone Conversion

A Complete Converter Including Monitor and A.F.S.K. Oscillator

BY JAMES L. McCOY,* WØLQV/AFØLQV

This high-performance tone converter is all that's needed between receiver output and teletype machine for both f.s.k. and a.f.s.k. reception. The circuit diagrams aren't small, but there's nothing in them that should frighten even a newcomer to RTTY. An oscilloscope-type monitor, audio frequency shift keyer and power supply are all included. Together with the author's i.f. converter article in *QST* for January, this makes a fine exposition of the methods of radioteletype conversion.

THERE are two commonly-used methods for receiving radioteletype signals. One is to detect the frequency shift at the receiver i.f. The other makes use of the two audio tones created by beating the receiver b.f.o. against the shifting carrier.

Tone conversion has two advantages over i.f. conversion: Audio filters having a band pass of only 200 or 300 c.p.s. can be used to reduce interference more effectively than the band pass of the i.f. system. The tone method can also be used for reception of modulated signals with audio frequency-shift keying (a.f.s.k.) as is authorized on the v.h.f. bands.

This article will discuss the operation and construction of one type of tone converter as well as accessory circuits such as a tuning oscilloscope and a two-tone generator for a.f.s.k. transmission. Two frequencies have been standardized on for tone conversion. These are 2125 c.p.s. for "mark" and 2975 c.p.s. for "space," and will be the frequencies referred to when the terms mark and space are used.

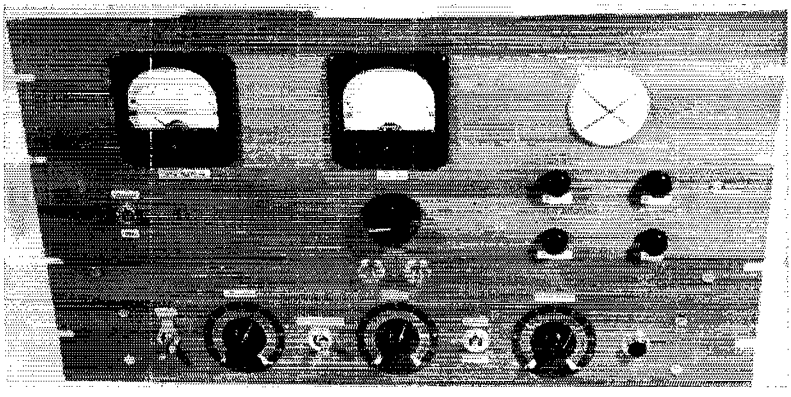
Operation

Fig. 1 is a schematic diagram of the tone converter proper. Mark and space signals coupled from the receiver through line-to-line transformer T_1 are separated by band-pass filters FL_2 and FL_3. Each filter has a 200-c.p.s. bandwidth centered on its particular frequency and an impedance of 600 ohms.[1] The filter inputs are paralleled. This does not disturb the match because the impedance of either filter is quite high at the center frequency of the other, and only one tone is present at a time. Potentiometer R_1 is used to take off part of the incoming signal for the tuning scope of Fig. 3.

* 4844 Booth, Shawnee Mission, Kansas.

[1] These filters can be obtained from William Gates, 15183 Encanto Drive, Sherman Oaks, Calif., for $25.00 per pair, f.o.b. Los Angeles.

Front view of the tone-conversion unit. The meter on the left indicates keyer plate current, and below it is the TUNE/OPERATE switch. The meter and control for setting the keying loop current are in the center of the panel, and the two glass domes immediately below are for the NE-51 neon triggers. To the right is the 902A cathode-ray tube used for monitoring. Below the c.r.t. face are the vertical and horizontal centering knobs, and below them are the intensity and focus controls. From left to right across the bottom of the panel are the power switch, the THRESHOLD control which sets the neon firing voltage, the FSK/AFSK switch which transfers the keying loop between an external f.s.k. exciter and the built-in audio frequency-shift keyer, the BALANCE control for setting the relative amplitudes of the mark and space pulses going to the trigger driver, a FORWARD/REVERSE switch to reverse the operation of the detector for signals using the higher frequency on mark, the monitor SCOPE LEVEL control, and a pilot lamp.



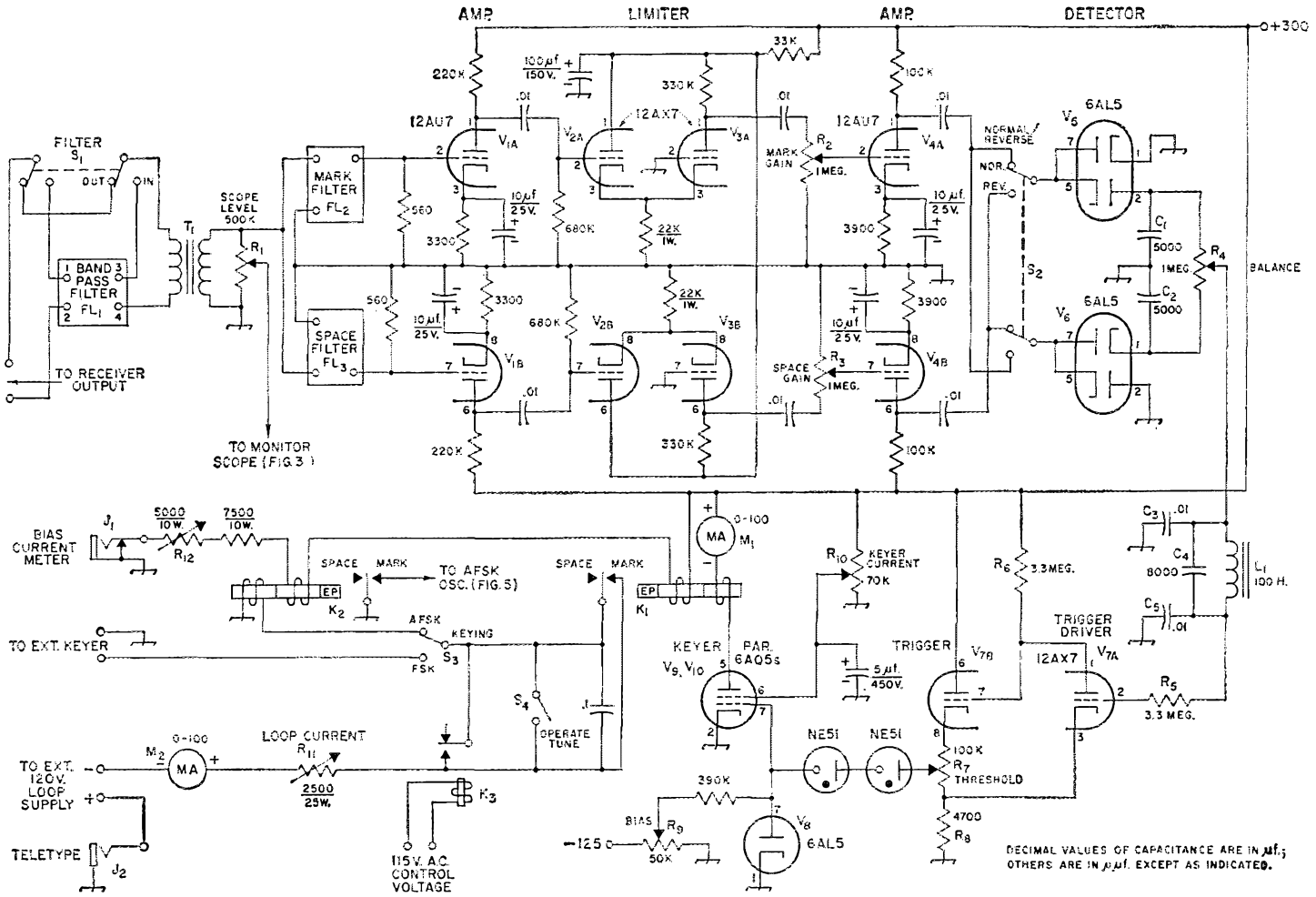


Fig. 1—Circuit of the basic tone converter. Resistances are in ohms; resistors are ½-watt composition except as indicated. Capacitors marked with polarity are electrolytic; others can be either paper or ceramic.

C_1, C_2—0.005-μf. disk ceramic.
C_3, C_5—0.01-μf. paper.
C_4—0.008-μf. paper.
FL_1—See Fig. 2.
FL_2, FL_3—See text.
J_1—Closed-circuit jack.
J_2—Open-circuit jack.
K_1, K_2—Polarized relay (Sigma 7AOZ-160T or equivalent).
K_3—S.p.s.t. relay, 115-volt a.c. coil.
L_1—100-hy. choke (original taken from BC-733, Stancor C-2301 usable).
M_1, M_2—0-100 d.c. milliammeter.
R_1—0.5 megohm composition control, audio taper.
R_2, R_3—1-megohm composition control, audio taper.
R_4—1-megohm composition control, linear taper.
R_5, R_6—3.3 megohms, ½ watt.
R_7—0.1 megohm composition control, linear taper.
R_8—4700 ohms, ½ watt.
R_9—50,000-ohm composition control, linear taper.
R_{10}—70,000-ohm wire-wound control, linear taper.
R_{11}—2500-ohm, 25-watt adjustable.
R_{12}—5000-ohm, 10-watt adjustable.
S_1, S_2—D.p.d.t. toggle.
S_3—S.p.d.t. toggle.
S_4—S.p.s.t. toggle.
T_1—Line-to-line transformer (Stancor A-4350).

FL_1, a band-pass filter with cut-off frequencies of 2000 and 3100 c.p.s., can be switched in ahead of the tone filters by throwing S_1. This filter is only used under extremely noisy conditions to provide better rejection of random signals.

The separated tones are applied to two separate but identical channels starting off with amplifier stages V_{1A} and V_{1B}, the two sections of a 12AU7. Then each signal is clipped to a level of about 7 volts in cathode-coupled limiter stages V_2 and V_3, two 12AX7s. Then come equalizing controls, R_2 and R_3, which are used to compensate for any unequal response in the above stages or the receiver audio section.

After additional amplification in V_4, another 12AU7, the tones are rectified by voltage-doubling detectors, V_5 and V_6, two 6AL5s. C_1 and C_2 bypass the audio components. On mark about 80 volts negative is applied to the upper end of balance control R_4, and on space about 80 volts positive is applied to the lower end of R_4. Throwing S_2 reverses the action for any signals which use the higher frequency for mark instead of space.

The arm of R_4 connects to a low-pass filter made up of L_1, C_3, C_4 and C_5. This filter cuts off at about 140 c.p.s. and helps to remove noise and keying transients. From the filter the signal passes through isolating resistor R_5 to the grid of trigger driver V_{7A}. This 12AX7 section is directly coupled to V_{7B}, the trigger stage. When a negative mark pulse appears on the grid of V_{7A}, plate current to that stage is cut off, and the plate voltage rises to the supply value. Since the plate of V_{7A} is connected to the grid of V_{7B}, the latter

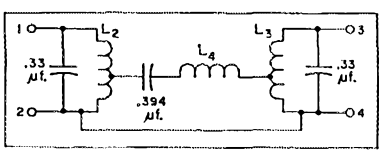
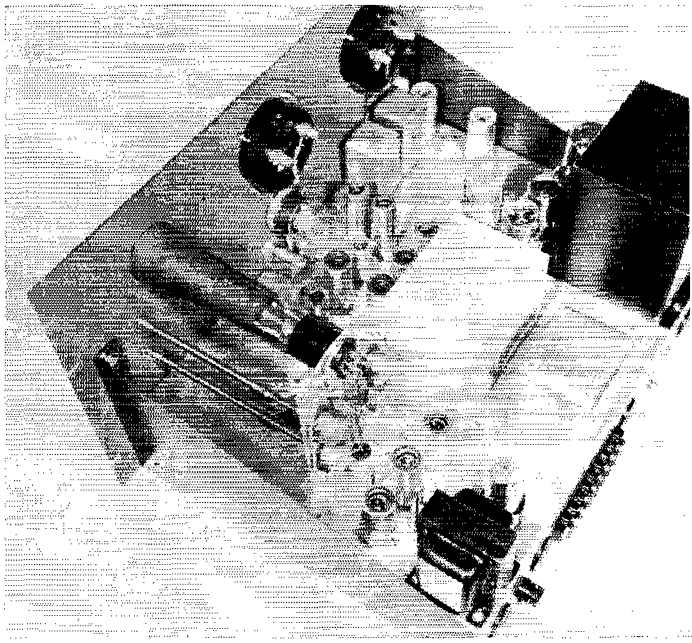


Fig. 2—Schematic of the band-pass filter marked FL_1 in Fig. 1. Capacitors are molded paper and should be within 5 per cent of the values shown.

L_2, L_3—12.3 mh.; 272 turns No. 24 Formvar on toroidal form with ¾-inch mean diameter, tapped 68 t. from bottom end. (May be wound 4-filar; see text.)

L_4—10.3 mh.; 248 turns No. 24 Formvar on toroidal form with ¾-inch mean diameter.



The 902A c.r.t. and the centering, intensity and focusing potentiometers are all mounted on an aluminum bracket fastened to the chassis. The three scope amplifier tubes are toward the rear of the chassis. The high-voltage supply for the c.r.t. is in the bottom corner. Band-pass filter FL_1 is housed in the aluminum shield can in the center of the chassis near the back. In front of FL_1 are the hermetically-sealed Gates mark and space filters, and the tone converter tubes are grouped between these filters and the neon sockets on the panel. The polarized keying relays are near the upper corner of the chassis along the panel edge. The two tubes next to them are the a.s.f.k. oscillator and amplifier. Main power transformer T_3 is in the right corner, and the 80-μf. filter capacitor and regulator and rectifier tubes are lined up in front of it.

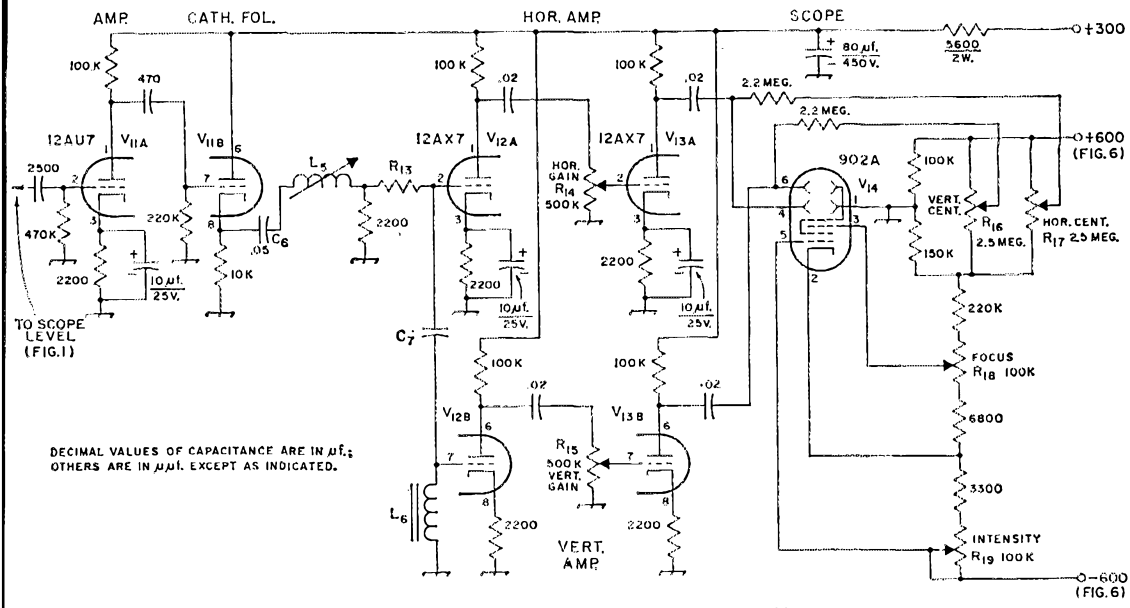


Fig. 3—Circuit of the monitoring oscilloscope. Resistances are in ohms; resistors are ½-watt composition except as indicated. Capacitors with polarity marked are electrolytic; others are ceramic except as specified.

C_6—0.05-µf. molded paper.
C_7—About 0.03-µf. mica (to resonate with L_6 at 2550 c.p.s.).
L_5—120-mh. TV width control (similar to Miller 6324).
L_6—100 to 500-mh. toroid (to resonate with C_6 at 2550 c.p.s. similar to UTC MQA-7).
R_{13}—About 4700 ohms, ½ watt (see text).
R_{14}, R_{15}—0.5-megohm composition control, audio taper.
R_{16}, R_{17}—2.5-megohm composition control, linear taper.
R_{18}, R_{16}—0.1-megohm composition control, linear taper.

will conduct and there will be a large voltage drop across cathode resistors R_7 and R_8. Therefore, the two NE-51 neon lamps will fire through the 6AL5 diode, V_8. R_7 is a threshold control and is set so that the neons show a normal orange glow under these conditions. Positive space pulses cause the trigger driver plate current to increase until all but about 2 volts of the supply voltage appears across plate load resistor R_6. The reduced positive voltage on the grid of V_{7B} decreases its plate current and extinguishes the neons.

Two 6AQ5 keyer tubes, V_9 and V_{10}, are paralleled to handle a current of 60 ma. R_9 is used to set the negative grid bias to a value above cutoff (about 45 volts) when the neon lamps are not conducting (space). During mark pulses the neons fire, and the bias voltage is neutralized; then the 6AQ5s conduct, operating polar relay K_1. The plate current of the keyer tubes is metered by M_1 and adjusted to 60 ma. with screen-voltage control R_{10}.

The mark contacts of K_1 are connected in series with a 60-ma. local loop. With S_3 in the AFSK position as shown, this loop consists of loop current adjustment R_{11} and meter M_2, an external 120-volt d.c. supply, the teletype selector magnet circuit (connected through J_2) and the keying coil of AFSK polar relay K_2. Relay K_3 is used to short the mark contacts of K_1 during transmitting periods so that there will be no possibility of a circuit interruption causing erroneous keying. The mark contacts can also be shorted with OPERATE-TUNE switch S_4.

The converter was designed to be compatible with an f.s.k. exciter requiring 60 ma. for its keying circuit, and S_3 transfers the 60-ma. loop current from the a.f.s.k. relay to a pair of terminals provided for the exciter. Bias current of 30 ma. for both polar relays is taken from the 300-volt plate supply; the current is measured with a meter plugged into J_1 and adjusted with R_{12}.

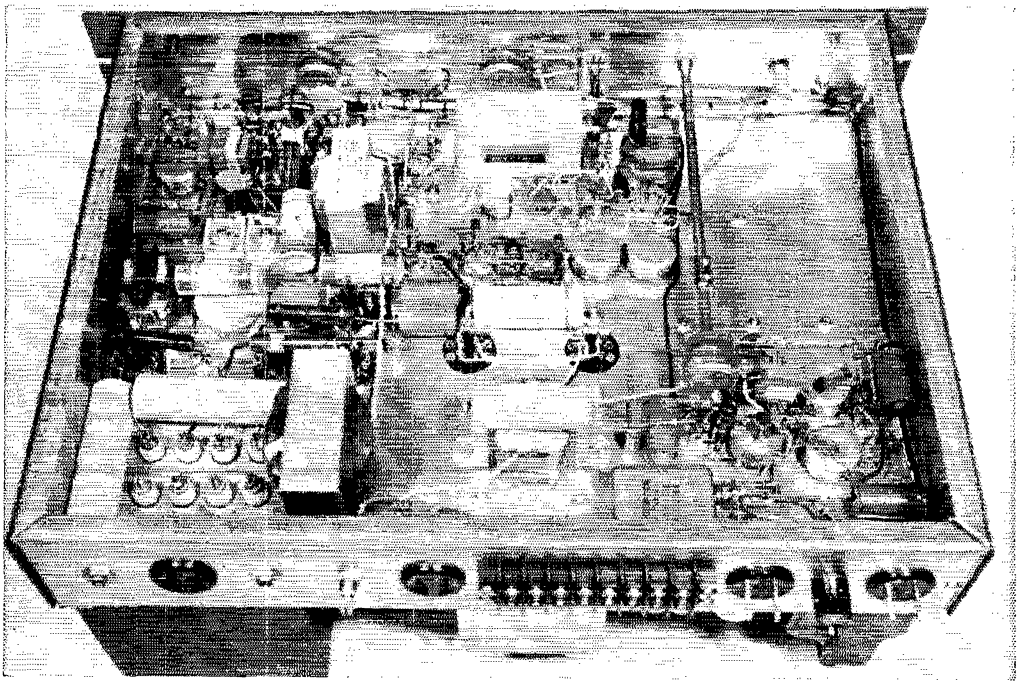
Monitor Scope

Since the converter operates with two audio frequencies which must be held within a few cycles tolerance, it is quite desirable to have some method of monitoring these frequencies. About the best method the writer has found is the c.r.t. display circuit designed by WØIIZR [2] and modified for use in this converter.

Fig. 3 is a diagram of the monitor. The heart of the unit is the phase-shift circuit consisting of R_{13}, C_7 and L_6 in series. C_7 and L_6 are resonated at 2550 c.p.s., halfway between the mark and space frequencies of 2125 and 2975 c.p.s., respectively. The voltage across C_7 and L_6 is amplified by 12AX7 sections V_{12A} and V_{13A} and applied to the horizontal deflection plates of the 902A c.r.t., V_{14}. The voltage across L_6 is amplified by V_{12B} and V_{13B} and applied to the vertical deflection plates.

The trace displayed on V_{14} depends on the frequency or frequencies fed to R_{13}. At the res-

[2] Meyer, "F.S.K. Tuning Indicator," *CQ*, May, 1956.



Some parts in this bottom view can be identified by comparison with the top view. The a.f.s.k. oscillator and amplifier components are in the upper left. The oscillator inductance, L_7, is the dark object between gain control R_{21} on the left and the line-to-line transformer. Resonating capacitors C_7 and C_9 are just below L_7 in this view. Farther toward the back of the chassis are shorting relay K_3 and the controls for setting keyer-tube screen voltage and grid bias. Filter capacitors C_{11} and C_{12} and choke L_8 are mounted underneath the power transformer. The switch for FL_1 is just visible to the right of L_8, and input transformer T_1 is mounted between the terminals of FL_1 and the mark and space filters. Toward the front of the chassis is the converter section, where much of the wiring is done to ground and high voltage bus wires running between tie points. The metal can between the converter tubes and the panel is low-pass filter inductor, L_1. The extension shaft to the right connects the SCOPE LEVEL control, R_1, with its panel knob. The monitor scope amplifiers and power supply are in the lower right-hand corner. From left to right along the rear apron are J_2, the jack for connecting the teletype printer; a 115-volt accessory socket; bias current jack J_{11}; bias current adjustment R_{12}; and another accessory socket. Then comes a terminal strip for making connections to the receiver output, the f.s.k. keyer, the 120-volt loop supply, and modulator of a v.h.f. transmitter for a.f.s.k. Finally, there are male a.c. connectors for the power supply and control relay, K_3 and the power-supply fuse.

onant frequency, 2550 c.p.s., the voltage across the C_7L_6 combination is very small compared with that across L_6, and the trace is a vertical line. At higher frequencies the horizontal signal is larger than the vertical one, and both are in phase. The resulting trace is a line that slopes up to the right. The horizontal signal also increases at frequencies below 2550 c.p.s. but is 180 degrees out of phase with the vertical signal. For these frequencies the trace will be a line sloping up to the left. The relative gains of the horizontal and vertical amplifiers can be adjusted so that the mark and space frequencies produce the arms of a perfect 90-degree "X" on the c.r.t. face. So adjusted and calibrated, the scope will disclose several things about the incoming signal as shown in Fig. 4.

Mark and space signals from voltage divider R_1 in Fig. 1 are amplified in V_{11A}, one section of a 12AU7. Follower stage V_{11B} cathode-couples the tones to series-tuned circuit C_6L_5 resonant at about 2200 c.p.s. This provides slight peaking at the mark frequency and compensates for the lower Q of the phase-shift network at 2125 c.p.s.

R_{14} and R_{15} are used to adjust the gains of the horizontal and vertical amplifiers. Since much less gain is required in the vertical channel, the cath-

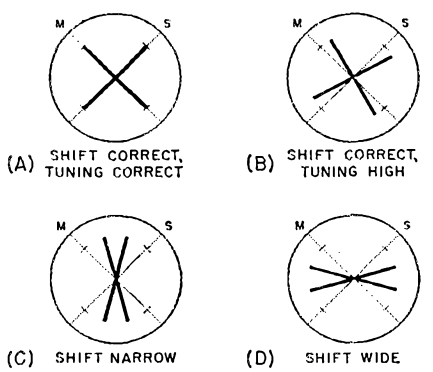


Fig. 4—Patterns observed on the monitor scope. Horizontal and vertical gain controls should be set so that mark and space signals of correct frequency and spacing will produce a perfect 90-degree "X" as in (A). (B), (C) and (D) show the effects of incorrect tuning and frequency shift.

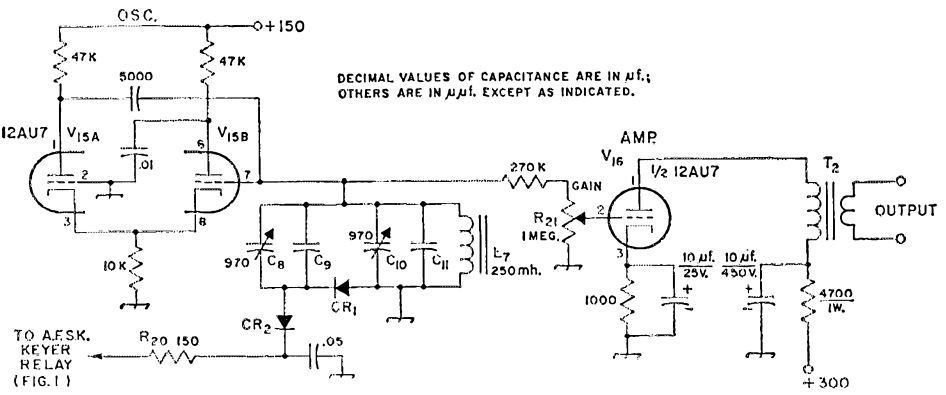


Fig. 5—Circuit of the a.f.s.k. oscillator section. T_2 feeds the carbon microphone input of a v.h.f. transmitter. Resistances are in ohms; resistors are ½-watt composition except as indicated. Capacitors with polarity marked are electrolytic; except for the 5000-μμf. capacitor which is mica; others are ceramic except as specified below.

C_8, C_{10}—970-μμf. mica trimmer.

C_9—About 0.0128-μf. mica (as required to resonate with C_8-C_{10}-C_{11}-L_7 at 2125 c.p.s.).

C_{11}—About 0.01-μf. mica (as required to resonate with C_{10}-L_7 at 2975 c.p.s.).

CR_1, CR_2—1N34 or equivalent.

L_7—100-300-mh. (250 mh. toroid similar to UTC MQE-9 used in original).

R_{20}—150 ohms, ½ watt.

R_{21}—1-megohm composition control, audio taper.

T_2—Tube-to-line transformer (Stancor A-3250).

odes of V_{12B} and V_{13B} are left unbypassed as shown.

A conventional voltage-divider circuit is used to obtain centering, focusing and intensity potentials for the 902A.

Audio Frequency-Shift Oscillator

A.f.s.k. operation on the v.h.f. bands requires an audio oscillator for producing the mark and space tones. Such an oscillator was incorporated on the converter chassis. The circuit, shown in Fig. 5, is a slight modification of one used by W2JTP.[3]

V_{15}, a 12AU7, functions as a cathode-coupled, diode-keyed oscillator. The diodes, CR_1 and CR_2, are in turn controlled by polar relay K_2 in the loop circuit. On mark, K_2 grounds the lead from R_{20}, and on space, this lead is left open. In the latter condition there is no d.c. path through CR_1 and CR_2, and they do not conduct. The diodes then appear as small capacitors of about 1 μμf., and the frequency of oscillation is determined essentially by the $C_{10}C_{11}L_7$ parallel combination. C_{10} tunes the combination to the space frequency. When R_{20} is grounded, rectification of the audio voltage across CR_1 causes a current to flow through CR_1, CR_2 and R_{20}. The resistance of CR_1 drops to a low value, and C_8 and C_9 are effectively paralleled with $C_{10}C_{11}L_7$. Trimmer C_8 adjusts this new combination to resonance at the mark frequency.

Oscillator output is coupled through gain control R_{21} to the grid of amplifier stage V_{16}, one section of a 12AU7. T_2 matches the output of this amplifier to a 500-ohm line which can be connected directly to most carbon microphone input circuits.

Power Supply

The built-in power supply, diagrammed in Fig. 6, provides all necessary voltages for the converter, scope and a.f.s.k. oscillator. T_3 supplies 150 volts regulated for the oscillator and 300 volts regulated for the remaining stages through full-wave rectifier V_{17}, a capacitor-input filter and regulators V_{18} and V_{19}. A half-wave rectifier, V_{20}, connected to one end of the secondary of T_3, is used to get 125 volts of negative bias for the keyer tubes.

T_4 and half-wave rectifier V_{21} supply 600 volts for the c.r.t. The 6.3-volt winding on T_4 takes care of the 902A heater, which must be ungrounded because of the high negative voltage on the cathode.

Accessory sockets J_4 and J_5 can be used for auxiliary equipment and are controlled by power switch S_5.

Construction Notes

The converter and its associated circuits are built on a 17 × 13 × 3-inch chassis with a 19 × 10½-inch panel for standard rack mounting. The locations of most components can be discovered from the photographs and their captions. Since only audio frequencies are involved, layout is not critical.

Toroids L_2 and L_3 are tapped ¼ of the way from one end, so it may be easier to wind these coils 4-filar. To do this, start with four wires and wind them together around the core. Each wire then becomes ¼ of the coil if properly connected to the others. Take one of the wire ends that went

[3] Kretzman, "W2JTP A.F.S.K. Oscillator," *The Radio Amateur's RTTY Handbook*, 1957. This circuit originated with Bernstein, who used it for r.f. keying; see "Some Notes on Frequency-Shifting Crystal Oscillators," *QST*, July, 1953.

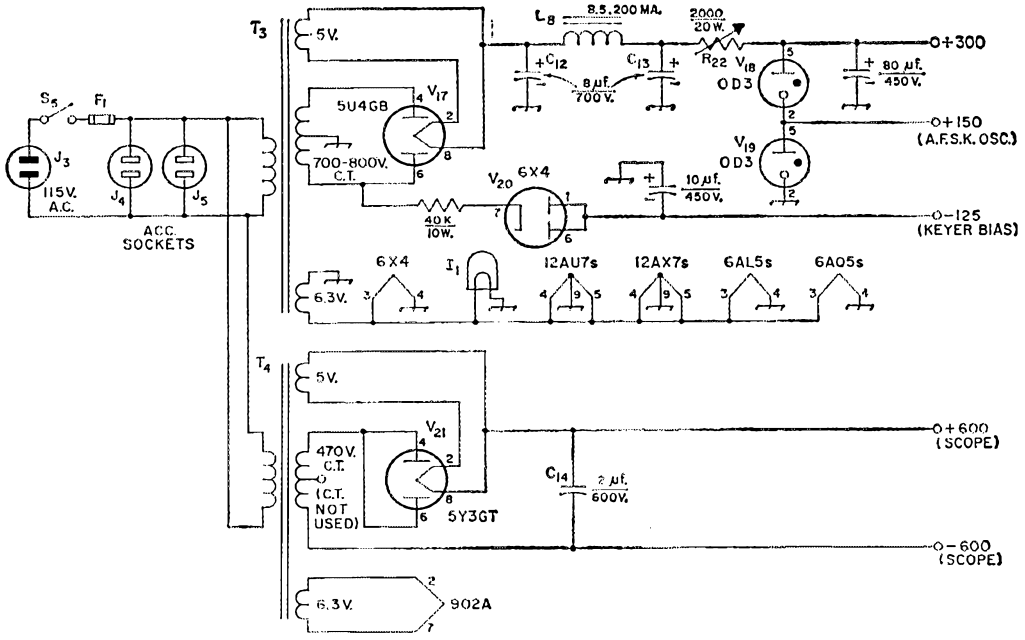


Fig. 6—Power-supply section. Resistances in ohms; resistors are wire-wound; capacitors are electrolytic except as specified

C_{12}, C_{13}—8-µf. 700-volt electrolytic (Aerovox 07B110).
C_{14}—2-µf. 600-volt bathtub (Aerovox P30ZN).
F_1—Fuse (rating determined by accessory load).
I_1—6.3-volt pilot lamp.
J_3—115-volt male connector, chassis mounting (Amphenol 61-M).
J_4, J_5—115-volt female connector, chassis mounting (Amphenol 61-F).
L_8—Filter choke, 8.5 henries at 200 ma. (Stancor C-1721)
R_{22}—2000-ohm, 20-watt adjustable.
S_5—S.p.s.t. toggle.
T_3—Power transformer, 800 volts c.t.; 200 ma.; 5 volts, 3 amp.; 6.3 volts, 5 amp. (Stancor PC-8412 suggested).
T_4—Power transformer, 470 volts c.t., 40 ma.; 5 volts, 2 amp.; 6.3 volts, 2 amp. (Stancor PC-8401).

on the core first as the bottom end of the coil. Connect the other end of that wire to the starting end of a second wire; this is the tap point. Now connect the other end of the second wire to the starting end of a third wire and the other end of the third wire to the starting end of the fourth wire. The other end of the fourth wire will be the top of the coil.

It is recommended that an audio generator and oscilloscope be used to get the tuned circuits of the monitor scope and a.f.s.k. oscillator properly adjusted. The oscilloscope should also be used to check pulse shaping in the tone converter.

The value of R_{13} determines the band-pass characteristics of the C_7L_6 resonant circuit in the monitor. If the trace obtained at 2550 c.p.s. is much larger than those at the mark and space frequencies, then the value of R_{13} is too small.

The toroid or coil used for L_7 in the a.f.s.k. oscillator should not have too high a Q or the frequency shift during shorter pulses will be incomplete. QST

Strays

Two reports of stolen equipment this month.

Sometime during the evening of October 7 K1MOQ's car was broken into and his Collins KWM-2 and its mobile mount were stolen. The power supply, however, was not touched. The KWM-2 was Serial No. 484, and on its cabinet was a plaque with the call letters K1MOQ/W8-IWK. K1MOQ is offering a $100 reward for information leading to the recovery of this rig. If you can help, contact police lieutenant Rourke, Brookline, Mass.

While WA2CJL was attending the Syracuse VHF Roundup, someone broke into his car and stole his 6-meter Communicator III, Model No. 3136, Serial No. B. 2256. A reward of $50 is offered for information leading to the recovery of this unit. Contact either WA2CJL or the Rochester Amateur Radio Association, Box 1388, Rochester, N. Y.

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Elsewhere in this issue we report on a QSO from ground to ferris wheel. Well, now it seems that K4TRY, K4YEI, and K4VIU did it too.

A Cathode-Ray Transmitter Monitor

Incorporating the Most Needed Features for Amateur Operation

BY R. WADE CAYWOOD,* W1KRD

THE cathode-ray monitor to be described will display either the r.f. envelope or the trapezoidal monitoring pattern of single-sideband or amplitude-modulated transmitters. It will show linearity or nonlinearity in Class B r.f. amplifiers, parasitic oscillation, neutralization, and r.f. output. The cathode ray beam responds instantly and provides information that moving coil meters can never provide. In addition, it gives a continuous complete picture of the overall performance of the transmitter — and we can all understand pictures.

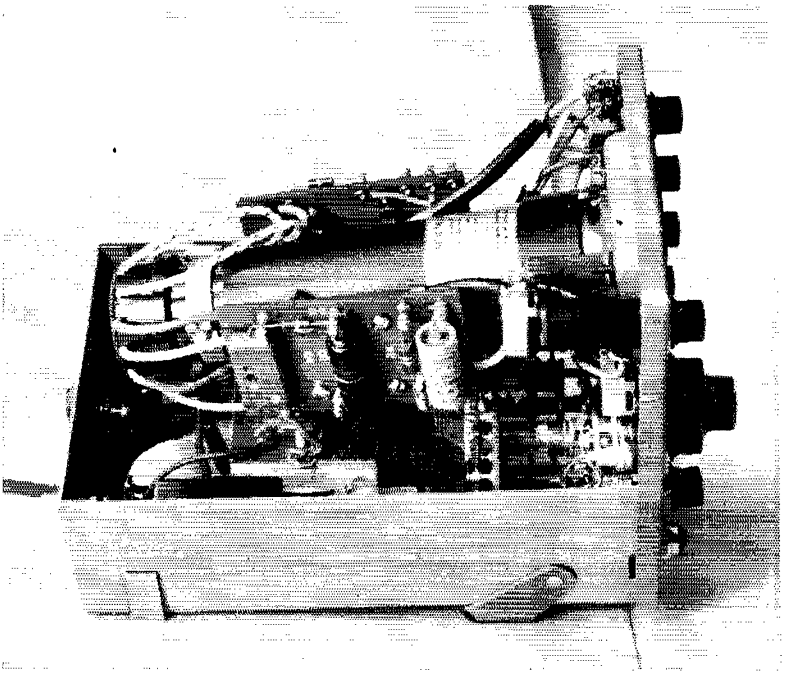
The monitor shown here was designed to remedy the annoyances and shortcomings of oscilloscope lash-ups, which have had a habit of growing like Topsy: external tuned circuits hung on the input terminals, the wrong sweep, uncompensated phase shift, no blanking so that the tube became burned or — even worse — the intensity turned down so that the scope does not fulfill its function of monitoring, and so on. Nevertheless, Fig. 1 shows that the circuit is relatively simple and straightforward.

The circuit that is the subject of this article was designed solely for the purpose of checking and monitoring amateur transmitters. It incorporates a number of features — such as tuned ham-band r.f. input, send-receive blanking, and audio phase correction — that are not found in scopes built for general measurement work.

The heart of the monitor is the 2BP1 two-inch cathode-ray tube. Experiment with one-inch tubes, two-inch round and rectangular tubes, and three-inch round and rectangular tubes showed the two-inch round tube to be the best choice for the job. The two-inch round tube provided an entirely adequate display of envelope, trapezoid,

* Chief Engineer, James Millen Mfg. Co., Inc., 150 Exchange St., Malden 48, Mass.

This is a manufactured version of the circuit, and although its mechanical construction could not be duplicated with ordinary home-workshop facilities, it illustrates some features that are desirable in any scope layout. One is the magnetic shield, which in this case is a type (such as the Millen 80042) that serves as a support for the cathode-ray tube and includes a base clamp for secure positioning. A molded bezel supports the face of the tube and dresses up the panel. Another feature is the mounting of the intensity control, which is at high voltage with respect to the chassis; it is on an insulated extension coupling (Millen 39023) as shown in the near corner of the panel. The principal constructional point is that a really effective magnetic shield should be used so that magnetic fields from the power transformer will not influence the beam.



and bow-tie patterns. The one-inch display seemed inadequate. The rectangular tubes were fine for envelope display but the vertical height proved inadequate for trapezoidal and bow-tie monitoring. The three-inch round tube provided good display but was no longer compact.

Two-inch tubes are fairly insensitive, particularly when the accelerating voltage is high enough to give a bright, sharp trace. However, in this monitor lack of sensitivity proved to be no problem. In fact, with the link-coupled tuned circuits feeding the deflection plates, the monitor is so sensitive that a grid-dip meter coupled to the pickup loop provides usable vertical deflection. The horizontal deflection voltage for the envelope display is easily provided by the 115-volt 60-cycle power source.

Power Supply

The over-all power-supply voltage is slightly over 1000 volts d.c., but since the maximum current drain is only 1¼ ma. the power transformer can be quite small. The most economical way to get this voltage is to use a replacement-type power transformer rated at 700 to 750 volts total secondary voltage. Such a transformer will have the 6.3-volt winding for the 2BP1 heater and will also have a 5-volt winding that can be used for the rectifier, which may be a 2X2A, 5R4GY, or other tube having sufficient voltage rating (some tubes may require dropping the heater voltage to the rated value). Selenium rectifiers may be used instead of a tube, six of the ordinary 130-volt type being required in series to stand a.c. voltages of this order. However, the smallest current rating available can be used, so the cost does not greatly exceed that of a tube rectifier.

An *R-C* filter is used to smooth the half-wave rectified d.c. so that the remaining peak-to-peak ripple is only about 0.35 per cent. R_{14} is used to limit the charging current of C_7 and thus protect the rectifiers. The filter capacitors are rated at 1500 volts d.c. working because the peak voltage is quite substantial.

All d.c. voltages are taken from the series divider made up of R_1, R_2, R_3, R_4, R_5, R_6, R_{11} and R_{12}. This divider is directly across the output of the filter system. A high-resistance bleeder, $R_{16}R_{17}$, is also used, for reasons of safety. The bleeder uses two resistors so that the voltage across any one resistor will not be excessive.

A separate 6.3-volt filament transformer is used to operate the beam blanking relay and pilot light, because the 6.3-volt winding that supplies the 2BP1 heater is several hundred volts above chassis. The separate transformer avoids the possibility of voltage breakdown in the relay.

Balanced deflection and balanced centering are not required for the 2BP1 tube. This greatly simplifies the circuit and construction. If tubes other than the 2BP1 are used, it is quite likely that keystone distortion (greater deflection sensitivity at one side of the tube than at the other) will result.

The intensity control is at a very high negative potential with respect to the chassis and must be insulated from it. Although the current available may not be enough to cause death, contact with the high voltage can be very painful. Use caution!

Vertical Deflection Circuit

Low-voltage r.f. can be picked up by means of a small single-turn coil loosely coupled to the transmitter output circuit, the antenna matching circuit or any other convenient point. If a multiple outlet box is used in the feed line, one outlet jack can have a small loop across it. The pickup loop can be connected through a convenient length of small coaxial cable to the terminals marked "r.f. input." One wafer of S_1, the band switch, selects the link coil coupled to the desired tuned circuit, and the other two wafers of S_1 select the coil to be placed in the tuned circuit.

The relatively high r.f. voltage developed across the tuned circuit is coupled to the c.r. tube vertical deflection plates through a blocking capacitor, C_4, so the coil will not short-circuit the d.c. centering voltage. R_9 and C_2 make up a filter network to prevent the r.f. from going back to the centering-voltage supply.

Horizontal Deflection Circuit

For trapezoidal or bow-tie display, audio voltage from the output of the transmitter modulator must be supplied to the audio input terminals. $C_{10}R_{18}R_{19}$ is a phase-shift network for precise audio phase correction. The phase-corrected audio is applied to the "width" control, R_{13}, through S_2. The output of the width control goes to the horizontal deflection plates through C_5. An audio filter network, C_3R_{10}, prevents the audio from getting to the centering supply.

For envelope display the horizontal sweep voltage, applied to the width control through S_2, is a 60-cycle sine wave taken from the 115-volt line.

Blanking

The blanking bias is developed across R_{12}. When the relay is closed, R_{12} is shorted out and the normal bias developed across R_{11} and R_1 fixes the trace intensity. The relay may be operated either by the transmitter send-receive relay or by the "beam" switch, S_4. When the beam switch is on, the relay is closed and the transmitter switch can no longer control. A cable should be run from the blanking terminals to an extra set of contacts on the transmit/receive relay. This method of blanking is positive and requires no careful adjustment of anything. It would be easy to rectify a little of the r.f. voltage to provide the blanking but this requires careful adjustment of the r.f. level. The relay was quite inexpensive and seemed a good investment in reliability.

Installation

Three cables connect the monitor to the transmitter. The one which connects to the r.f. input terminals should be a small-diameter coaxial cable with a single-turn loop coupled to the

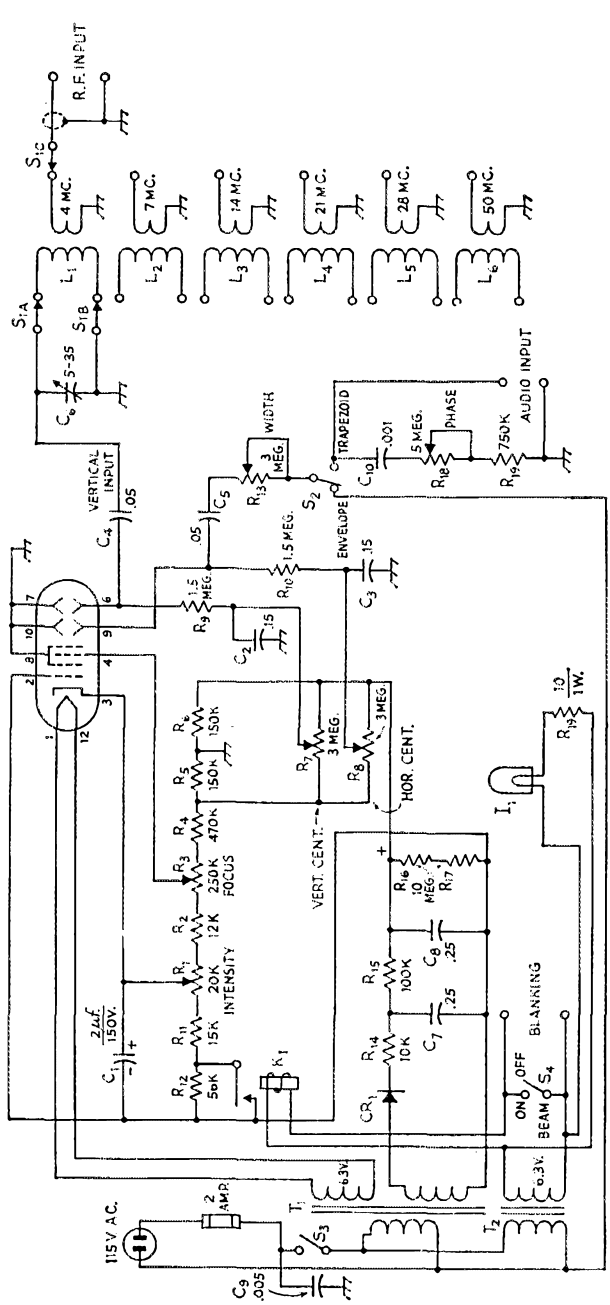


Fig. 1—Circuit diagram of the cathode-ray monitor. Unless otherwise indicated, resistances are in ohms, fixed resistors are ½-watt composition; decimal values of capacitance are in $\mu f.$, others in $\mu\mu f.$

C_1—Electrolytic.
C_2, C_3, C_4, C_5—400-volt paper.
C_6—35-$\mu\mu f.$ midget variable (Millen 20035).
C_7, C_8—1500-volt oil-filled paper.
C_9—Mica.
C_{10}—Disk ceramic.
CR_1—See text.
I_1—No. 44 dial lamp (0.25 amp.).
K_1—S.p.s.t., 6.3-volt a.c. coil (Potter-Brumfield CA3A).
L_1—90 turns No. 34 enam., close-wound. Link 3 turns No. 28 enam.
L_2—45 turns No. 28 enam., close-wound. Link 3 turns same.
L_3—17 turns No. 28 enam., close-wound. Link 3 turns same.
L_4—8 turns No. 28 enam., close-wound. Link 2 turns same.
L_5—5 turns No. 28 enam., close-wound. Link 2 turns same.
L_6—2 turns No. 28 enam., spaced ⅛ inch. Link 1 turn No. 28.
All coils wound on ½-inch diam. polystyrene forms (Millen 47001) with link at top. Upper end of tuned winding connects to chassis ground.
R_1, R_3, R_7, R_8, R_{13}, R_{15}—Carbon control, linear taper.
S_1—Phenolic rotary, 3 sections, 3 poles, 6 positions, nonshorting.
S_2—S.p.d.t. toggle.
S_3, S_4—S.p.s.t. toggle.
T_1—See text.
T_2—6.3-volt filament transformer, 1.2 amp.

transmitter r.f. output, as already described.

The cable which feeds audio into the monitor should be connected to the audio *output* of the transmitter. On an a.m. rig it may be necessary to install a high-resistance voltage divider across the secondary of the modulation transformer.[1] The coupling capacitor should have a high enough d.c. rating to withstand the peak voltage on the secondary of the modulation transformer — this is about twice the plate-voltage supply to the final r.f. amplifier. Some modulators have a built-in divider to supply audio to a monitor. It is important to connect to the *output* of the audio system rather than to some other point in the modulator.

On a single-sideband rig of the phase-shift type, the audio should be picked up at the input to the audio phase-shift network. On a filter rig the audio should be picked up at the input to the balanced modulator.

If the audio level at the pickup point in the s.s.b. transmitter is too low to provide adequate display width, it will be necessary to use addi-

[1] See chapters on radiotelephony and speech equipment, *The Radio Amateur's Handbook.*

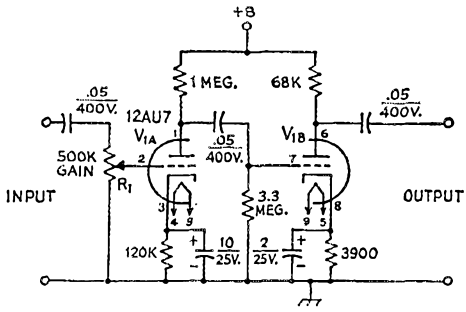


Fig. 2—Audio preamplifier for use with low-level modulators. Unless otherwise indicated, resistances are in ohms, fixed resistors are ½-watt composition; capacitances are in μf.; capacitors with polarities marked are electrolytic, others are paper. Power requirements are 2.6 ma. at 315 volts d.c. and 0.3 amp. at 6.3 volts a.c.

R_1—Carbon control, audio taper.

tional amplification. Fig. 2 shows a circuit which can provide full horizontal deflection without distortion with an input of 0.6 volt r.m.s. It is essential that there be an input gain control, R_1, in the amplifier, to avoid overdriving the grid of the first triode section. This amplifier requires only 2.6 ma. at 315 volts d.c. and heater voltage of 6.3 volts a.c. at 0.3 amp. It can be tucked into the transmitter or into a corner of the monitor oscilloscope. In most applications it will be possible to take the required power from the transmitter.

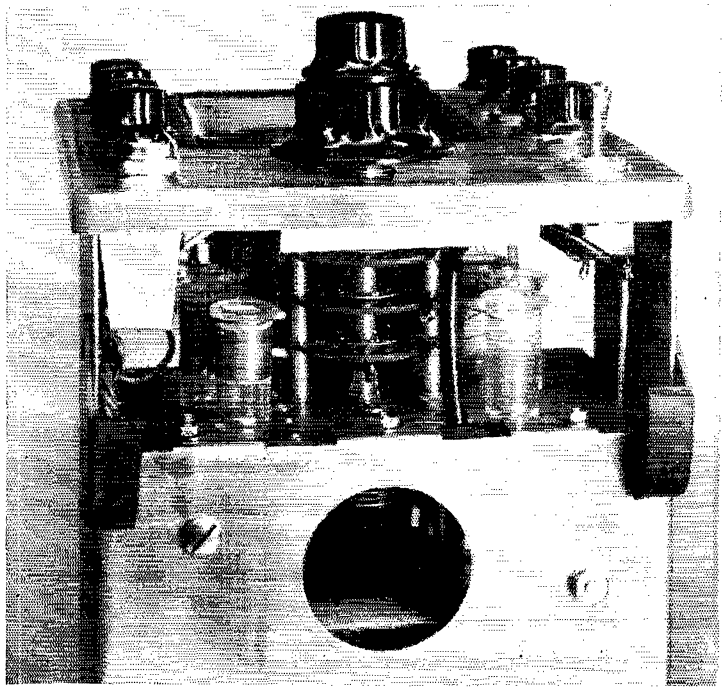
If only envelope display is required, no connection need be made to the audio terminals on the monitor. For monitoring purposes, the envelope display is adequate, but the trapezoidal and bow-tie displays divulge more information about linearity.

The cable to the blanking terminals should connect to a pair of contacts on the send/receive switch (or relay) or the VOX relay. The contacts should close when the transmitter is on.

Checking and Trouble Shooting

The monitor is relatively simple and probably will work properly immediately on completion. In a circuit which contains six potentiometers, it is often possible to have one or more wired so that it functions backward, but this is easily remedied. The d.c. supply voltage may be checked with a d.c. v.t.v.m. Since the voltage will exceed 1000 volts, it may be necessary to connect a resistor (10 megohms, ½ watt, will do) in series to put the reading on scale; it is then necessary to determine the multiplying factor by measuring a voltage which is between 500 and 1000 volts, first without the multiplier and then with it. If the power-supply voltage is significantly under 1000 volts, the wiring should be checked. Do not attempt to measure the voltage with a low-resistance voltmeter as it will draw enough current to cause considerable voltage drop in R_{15}.

With the transmitter off but with S_4 closed and S_2 at "trapezoid," a small bright spot should appear on the face of the cathode-ray tube when R_1 is turned clockwise. Adjust R_1 so the spot is not too bright and then adjust R_3 for the smallest (sharpest focus) spot. If no spot appears, set R_1 full clockwise and set R_3, R_7 and R_8 at about half scale. If all is well, a spot will appear, but if not, check the voltage between chassis and either end of R_9. It should be possible to set this voltage to zero by adjustment of R_7. If there is still no spot, check the voltage between chassis and either



The coils for the tuned circuits are mounted in a circle around the band switch. Input links connect to the r.f. terminals on the rear of the chassis through a length of coax. The leads from the tuned-circuit coils to the deflection plates should be kept reasonably short.

An interesting space-saving feature here is the use of a switch with concentric shafts, the inner one being used to operate the tuning capacitor.

end of R_{10}; it should be possible to set this voltage to zero by adjustment of R_8. If there is still no spot, check to be certain that R_{12} is shorted out by the relay. Once a focused spot is on the face of the tube, it should be possible to blank it out by turning R_1 counterclockwise.

Next, set S_2 to "envelope." The spot should become a line. It may be necessary to advance R_1 slightly clockwise. If no line, set R_{13} to about half scale and try reversing the polarity of the power cord. If there is still no line, check the wiring of C_9, S_2, R_{13} and C_5.

With a line on the face of the tube it should be possible to control its length by R_{13} and its sharpness by R_3.

If the line is not horizontal, note approximately how much rotation of the tube is required to make it so, *shut off* the monitor and rotate the tube; then turn the monitor on and get exactly the right position, being very careful to touch only the socket and not the wiring. Shut off the monitor again and secure the tube without allowing it to rotate. Proper alignment of the trace will result when the tube locating pin is at about 11 o'clock, viewed from the front.

Clockwise rotation of R_8 should move the line to the right and clockwise rotation of R_7 should move it up. If both directions are backward, the tube is upside down. If only one direction is wrong, check the wiring of the centering control and the deflection plates.

Operation

With S_2 on "envelope," set the monitor band switch, S_1, to the desired band and turn on the transmitter. With an unmodulated a.m. transmitter or an s.s.b. transmitter with single-tone modulation, adjustment of C_6, the monitor tuning capacitor, should produce a smooth rectangular raster whose height can be controlled by the tuning knob. With no modulation on an s.s.b. transmitter only a horizontal line should appear if the carrier suppression is adequate. If the height of the raster cannot be controlled satisfactorily, it may be necessary to adjust the position of the pickup loop at the transmitter. If the raster appears at one end of the capacitor range, the circuit is not tuning properly; note the position of the capacitor rotor and make the required alteration in the coil. If no raster appears, check the cable, pickup loop, and the wiring of S_1 and the coil in use.

After a satisfactory raster is on the tube face, apply a test tone to the a.m. transmitter. Since the horizontal sweep on the monitor is 60 cycles, the frequency of the test tone must be very close to some harmonic of 60 cycles to give a recognizable envelope pattern. At 100 per cent modulation the down peaks thin just to points. If these points become lines, the transmitter is overmodulated and splatter is resulting. Adjust the tuning control for convenient height of the peaks, and mark the height when there is 100 per cent sine-wave modulation. Regardless of meter indications, this point represents 100 per cent upward modulation.

In the case of an s.s.b. transmitter, a two-tone test signal must be used. Adjust the transmitter audio level so that there is no flattening at the peaks.

The tuning control on the monitor need not be adjusted for maximum height; it is necessary only that the height be sufficient for convenient viewing.

With S_2 in the "trapezoid" position, single-tone modulation on an a.m. transmitter should cause a trapezoid to appear on the monitor tube. If not, check the wiring of S_2 and the audio connections at the transmitter. When the trapezoid becomes a triangle, 100 per cent modulation is indicated. Overmodulation will put a horizontal spike at the point of the triangle. If the top and bottom of the trapezoid are elliptical instead of straight lines, adjust the phase control, R_{18}, so that a single sharply-focused trapezoid is displayed. If it is not possible to set the phase control properly or if it does not function at all, check the wiring of C_{10} and R_{18}. If R_{13} cannot adjust the trapezoid width properly, adjust the voltage divider at the modulator.

After completing the performance check, turn the beam switch to "off" so the scope pattern will appear only when the transmitter is on.

Applications

Since the monitor is quite sensitive, it may be used as a neutralization indicator. Use the envelope display. Remove the plate and screen voltage from the stage to be neutralized, and couple the monitor pickup loop fairly tightly to the plate circuit of the stage to be neutralized. Apply excitation and tune both the plate circuit of the transmitter and the monitor for maximum raster height. Adjust the neutralization control for minimum raster while keeping the plate circuit tuned for maximum raster. This method of neutralization indication is considerably more sensitive and simpler than using meters.

The linearity of a modulated r.f. stage is best studied by the trapezoidal display. At 100 per cent modulation, the sides of the triangle should be straight lines. Leveling off at the top indicates flattening of the peaks. In a.m. this is usually an indication of insufficient r.f. excitation or of insufficient modulator power. In the case of an s.s.b. linear amplifier, such flattening indicates either overexcitation or poor driver regulation. The flat-topped envelope corresponds to this flattened triangle display.

With an s.s.b. linear amplifier, a two-tone test signal should result in a straight-sided symmetrical display with no discontinuity at the point of crossover. This is true whether the envelope or double trapezoid display is used. Excessive bias will result in a narrow envelope with discontinuities at crossover. Too much drive or incorrect loading will cause a fat rounded envelope.

Parasitic oscillations usually cause drastic discontinuities in the smooth patterns which should result from sine-wave modulation. Al-

(Continued on page 190)

Substituting Transmission Line Sections for Lumped-Constant Traps

BY WILLIAM J. LATTIN,* W4JRW

Multiband Antennas Using Decoupling Stubs

Since W4JRW obtained a patent on this multi-frequency antenna system nearly ten years ago we can't call it "new," but at least it should be welcome news to those seeking a simple way to get good radiation on several bands. Shorted ¼-wavelength stubs provide r.f. insulation and also serve as part of the antenna.

SINCE amateurs usually desire to operate on more than one band, several methods have been devised to use a single antenna on several bands. The earliest arrangements employed various combinations of feeder lengths, antenna lengths, and series or parallel tuning of the coupling circuit. Later on, the use of parallel-tuned "traps" with lumped constants which act as insulators at a particular frequency was invented.[1] A practical arrangement of this system for amateur use was developed [2] and is in rather wide use.

It is well known that the parallel-tuned circuit and quarter-wavelength shorted stub of Fig. 1 are very similar electrically. Both configurations show a high impedance across points A and B. However, if a stub is connected to an antenna in this manner it does not act as an insulator but rather as a phase changer. The collinear antenna uses such stubs to operate a series of half-wave sections in phase.

There is a different connection possible for the stub, that is from A to C, which will result in insulator action or decoupling in an antenna.[3] For instance, shorted stubs a quarter wavelength long at 28 Mc. can be attached to the ends of a 28-Mc. dipole as in Fig. 2. The 28-Mc. dipole is effectively isolated or decoupled from the balance of the antenna which can be made long enough to resonate at 14, 7 or 3.5 Mc. If another pair of stubs is added for 14 Mc., there will be isolation at both 28 and 14 Mc., and a 10–20–40-meter or 10–20–80-meter antenna can be made.

The stubs can be made of open-wire line, Twin-Lead, or coax. Their lengths can be found from the formula

$$Length\ (\text{feet}) = \frac{246 \times Velocity\ Factor}{Frequency\ (\text{Mc.})}$$

The over-all length of an antenna containing decoupling stubs will be somewhat less than the figure given by the usual formula for a half-wavelength dipole — *Length* (feet) = 468/*Frequency* (Mc.). For instance, an antenna for 10 and 20 meters must be 29 feet, 10 inches long for resonance at the lower frequency, whereas the formula gives a length of 33 feet.

If open line with a velocity factor of nearly unity is used for the stubs, the over-all length of a two-band antenna would be nearly a full

* Box 44, Owensboro, Kentucky.

[1] Morgan, "A Multifrequency Tuned Antenna System," *Electronics*, August, 1940.

[2] Buchanan, "The Multimatch Antenna System," *QST*, March, 1955.

[3] Lattin, Patent No. 2,535,298.

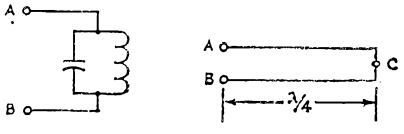


Fig. 1—A parallel-tuned circuit has a high impedance at its resonant frequency, and so does a ¼-wavelength shorted transmission line.

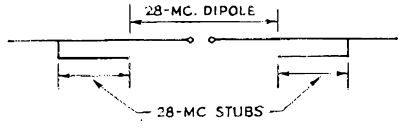


Fig. 2—A two-band antenna for 28 Mc. and some lower frequency. The center portion is an ordinary 10-meter dipole. The shorted stubs are ¼ wavelength long at 28 Mc. and look like an open circuit at that frequency when connected to the dipole as shown. Extensions on the ends of the stubs can be used to resonate the antenna at any frequency less than half of 28 Mc.

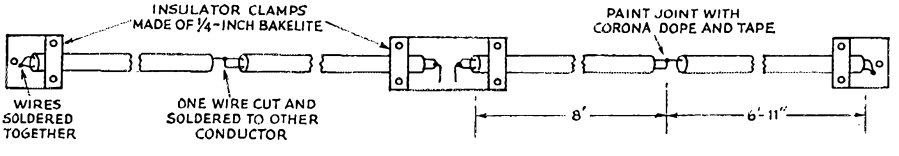


Fig. 3—Construction and dimensions of an antenna for 10 and 20 meters using 300-ohm tubular Twin-Lead for both the dipole and stubs. Either a 50- or 75-ohm transmission line can be connected at the center of the dipole.

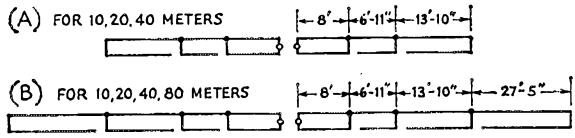


Fig. 4—Dimensions of stub-decoupled antennas for 10, 20 and 40 meters and 10, 20, 40 and 80 meters made of tubular Twin-Lead. Either antenna can also be used on 15 meters where the 40-meter section is ¾ wavelength long.

free-space wavelength at the higher frequency and the whole antenna would resonate at something *less* than half that frequency. Very fortunately, the velocity factor of 300-ohm tubular Twin-Lead (0.8) gives such lengths for the stubs that, in most cases, adding the stub makes the antenna resonate at just half the original frequency.

Fig. 3 shows how tubular Twin-Lead can be used for the antenna itself as well as the stubs and includes dimensions for 10- and 20-meter operation. The foam-filled type of Twin-Lead is recommended to keep out moisture. Lengths for three- and four-band antennas using the same construction are given in Fig. 4. Fig. 5 indicates the standing-wave ratios observed across various bands when these antennas were fed with 50-ohm coax.

The antenna of Fig. 6 can be used when only 40- and 80-meter operation is desired. Since the 40-meter portion is not made up of stubs it must be longer than the antenna of Fig. 4A. However, the isolating stubs must still be ¼ wavelength long (allowing for velocity factor), and the whole antenna would resonate at a frequency below 3.5 Mc. if the stubs were simply added to the ends of the 7-Mc. dipole. To get around this, the dipole is shortened until the whole antenna tunes to 80 meters. Then resonance at 40 meters is restored by adding extra lengths of wire at the stub junctions. These wires are short and can just hang down from the antenna as shown.

Any of the antennas which will operate on 40 meters can be used on 15 meters as the 40-meter stubs will be approximately ¾ wavelength long and will provide decoupling. The result is equivalent to operating a 7-Mc. dipole at three times its resonant frequency, and we have found the s.w.r. is usually not lower than 3 to 6 when using 40-meter antennas of any type on 15 meters [4].

[4] Theoretically, a center-fed antenna working on its third harmonic shouldn't be more than about 50 per cent higher in resistance than on the fundamental. One would expect an s.w.r. on the order of 2 to 1 rather than such high figures. — *Ed.*

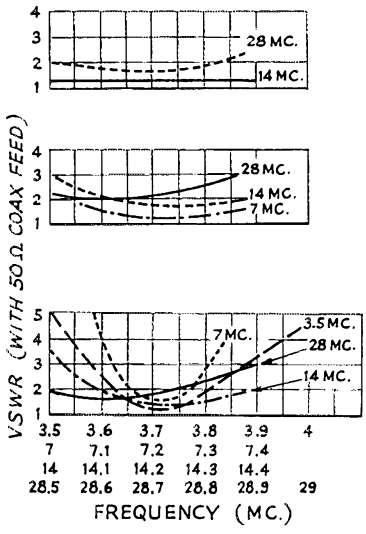


Fig. 5—From top to bottom, s.w.r. characteristics of the antennas shown in Figs. 3, 4A and 4B. A 50-ohm coaxial transmission line was used, and the measurements were made with a Micromatch.

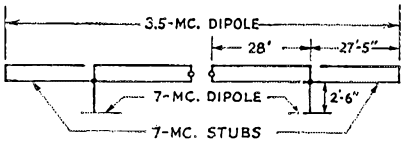


Fig. 6—A stub-decoupled antenna for 40 and 80 meters. In this case wires must be hung from the ends of the 40-meter dipole to resonate the antenna in that band.

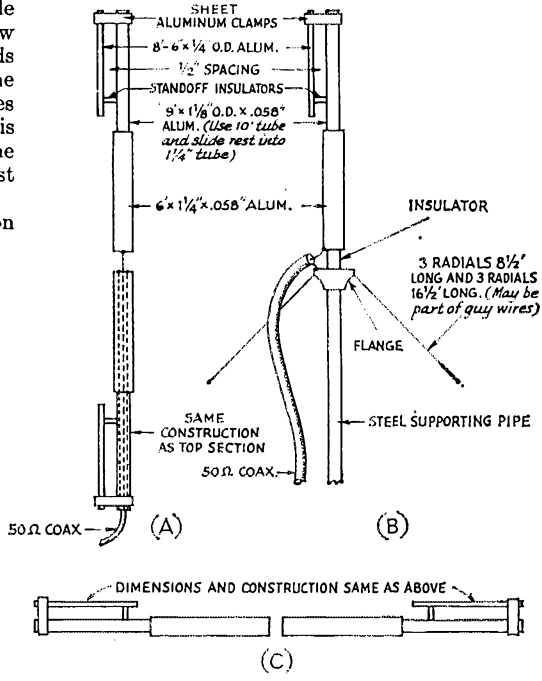


Fig. 7—Dimensions and suggested construction for coaxial, ground-plane and tubing dipole antennas for 10 and 20 meters. The arrangement in A might be mounted with standoff insulators attached to the 1¼-inch sections near the center of the antenna. The dipole in C could be closed at the center and fed with a gamma or "T"-matching system. Similarly-constructed parasitic elements could be added to make a multiband beam.

The power rating of the antenna will depend on the insulation at the stub junctions. These junctions can be painted with corona dope and covered with vinyl tape. It has been our experience over several years that the insulation will not break down with a kilowatt-input transmitter, 100 per cent modulated, except when wet or very damp. In this case, the input should be reduced to perhaps 500 watts unless special precautions have been taken to seal up the junctions at the open ends of the stub. Of course, on the lowest band for which the antenna is designed the stubs do not have voltage across them and will not be subject to breakdown or flashover. The high voltage across the open end of a stub occurs only at the resonant frequency of that stub.

Fig. 7 shows the construction of several 10- and 20-meter antennas which have been built and the dimensions required for resonance in these bands. The spacing between the rods forming the shorted stubs is not critical — the same lengths were obtained with 1-inch instead of ½-inch spacing. Insulators should be made of low-loss material. Reflectors and directors for a multiband beam could be made up the same way. QST

My Salvation!

BY BERNARD J. COVNER,* K1IOX, ex-W8AWD, ex-W8IDI

GETTING back into hamdom after an 18-year absence presented an unanticipated problem of major proportions — where to locate the rig? The notion of a clean, dry basement retreat was nipped in the bud by two children who complained they had lost their father, and an XYL who was allergic to microphone chit-chat that permeated the bedroom floor (directly above the rig) in the wee small hours.

Every possible location (à la W9BRD's recent scholarly discourse) was tried out mentally, only to be rejected for failure to satisfy one criterion or other. Sympathetic to the problem, and not wanting to limit the progress of ham radio, the XYL granted temporary use of the dining room, pending solution of this knotty problem. This deal was warm, dry, paved with wall-to-wall carpeting, accessible, sociable, and — in contrast with my boyhood experiences in the early '30s — an unheard-of luxury!

*75 Barrett Ave., Stamford, Conn.

The move patched up relations rapidly, but then reality began to "close in." With a group of 10 for dinner there is a limit to the containment capacity of even the best-made girdles. And who likes the rig turned on inadvertently (and illegally) by milady's posterior as she takes her place at the table. Further, despite the current craze in "science," some guests were so uncultured as to consider a ham rig "not pretty."

What to do? Trade in the bulky equipment for a tiny transceiver of equal power? Too expensive! Built-in customized cabinet? Too much money, and would it look right even then?

Just prior to giving up, the solution shown in the photo was conceived. An internal portable! No company, king in the dining room. Guests for dinner, disconnect coax and a.c. plugs and in 4 minutes the complete rig is safely hidden in the den (without blocking the childrens' view of TV).

Any ham who has set foot inside a factory will recognize "my salvation" as an ordinary portable tool stand stocked by mill supply houses. This one comes knocked down, has three 24" × 36" tray-type shelves, legs punched for adjustable shelf heights, and 5" rubber caster wheels. Sells for about $30. Keys, beam indicator, and speaker rest on a simple wooden platform whose top surface is at a comfortable operating height for c.w. The bottom shelf is large enough to house certain linears, and presently serves as a convenient and socially acceptable catch-all. How many hams can get away with having tools, soldering iron, instruction books, odd bits of wire, and so on, in the dining room? QST

There are nearly as many different attitudes toward what constitutes the "best" electronic keyer as there are c.w. men. Here's W4DFR's version with one-knob speed control, no relays and a built-in sidetone monitor.

Combined Key, Keyer and Monitor with No Relays

A Synched-Multivibrator Electronic Key

BY DR. ROY R. CAMPBELL,* W4DFR

SINCE the very beginning of the electronic key there has been considerable circuit development aimed at a hand sending device that would imitate the perfection of punched tape code. Such keys tend to make for pleasant receiving, but they can also place a strain on the sending operator, particularly if he is called upon to send at various speeds. While the keyer described here is not offered as a machine for perfect sending, we do think it is an economical step in the right direction for better and easier sending.

Even a Novice can learn to send with this key and do it better than with a straight key because the uniform characters are more readable. Yet the manual control is flexible enough so that it need not make a robot out of the operator and wipe out every trace of style. Sometimes in "pushing" a key, one will hit the dot post a split second too soon after a dash. At high speeds with a self-completing type key the dot may never be formed and the letter will be wrecked. With this key the dot will be made and the character will be readable even if the space is a bit short.

A few words about code: Code characters and words can be broken down into basic timing elements called bauds. A dot tone and the space following it are each considered as one baud. A dash tone is three bauds and its following space one baud. Thus in a string of dots and dashes the tones are in a 1 to 3 ratio but the total time for dots is half the time for dashes since the space is one baud in each case. Now the old-timer who is used to reading most anything and sends on a "bug" rarely notices differences in these ratios from one speed to another. In fact, most of us will set the weights on the dot lever at about 25 w.p.m. and attempt to send slowly by making rather long dashes and to send fast by making short dashes. It is not uncommon to hear code speed extended from 12 to 30 w.p.m. without any adjustment of the key mechanics. Sometimes an operator will attempt to QRS by making side-swiping motions on the dash post, and it is very difficult to send well by this method. The only sure cure for these bad habits is to have a system which simultaneously expands and contracts the dots, dashes and spaces. With this keyer, only one knob is ever used to adjust for different rates of sending, and this control works from about 8 w.p.m. until one's reflexes fail to register.

The clacking of relays operating at their best is bothersome, and later in their life they tend to stick and be generally unreliable. This keyer is absolutely silent in operation, since it has no relays to clack or adjust. It also features a sidetone keying monitor that operates independently but simultaneously with the transmitter keyed circuit. The keyer will operate in adapted cathode keying circuits up to the current limitation of the keyer tube, and it will also work with transmitters that use grid block keying. All parts are standard, and the cost should not exceed $30.00 if everything must be purchased new.

Those who have tried multivibrator key circuits in the past have experienced erratic opera-

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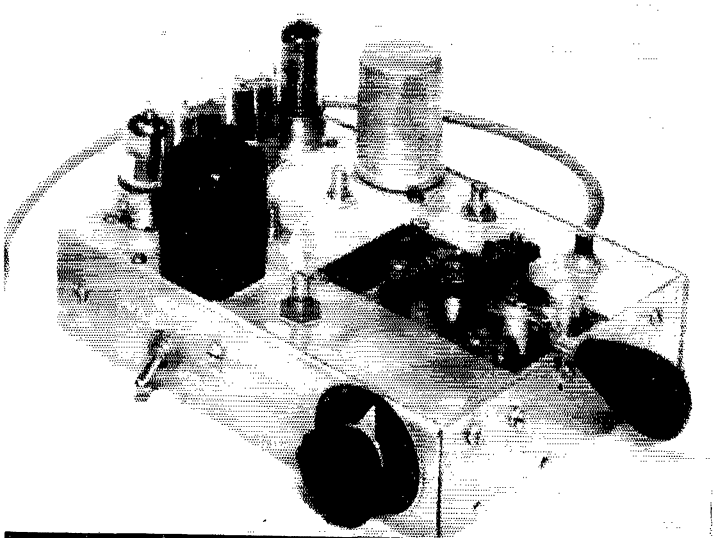


A homemade keying lever is built into the front of W4DFR's multivibrator-type key. The speed control on the side expands and contracts the lengths of dots, dashes and spaces simultaneously. The toggle switch adapts the unit to cathode or grid block keying circuits. Left to right along the back of the chassis are 12AU7's V_1 and V_2 used for the multivibrator and audio oscillator stages, the 12AX7 sidetone keyer and amplifier, and the 6CL6 keyer tube. The black can is the audio transformer used in the oscillator, and opposite it is the 10-μf. filter capacitor. The shafts between them belong to the tone control and the keyer bias adjustment. The sidetone gain control is to the left of the keying lever, and the dash-space and dot-dash ratio controls are on the right.

tion. A free-running multivibrator is very much like a beagle hound — it will take off and follow any tramp who whistles. In short, it will react to very weak alternating voltages from remote sources. However, this also has its advantages, for a multivibrator will synchronize with an a.c. voltage of desirable frequency and sufficient amplitude introduced at the proper place. In this keyer a generated audio voltage is introduced into the timing circuit. The amplitude of this synchronizing voltage is made just high enough to trigger the multivibrator circuit at regular intervals, and these intervals are controlled by adjusting the speed control. The same method is used to synchronize the sweep of an oscilloscope so waveforms can be viewed. In the time base of a scope, the reverse phase is made as short as possible and often blanked out (return trace), but in the keyer this is not the case. The reverse phase has a specific time that is equal to the desired *space* time between the dots and dashes. Another portion of the timing circuit operating in the opposite phase can be used to make the *tone* time of either a dot or a dash. Once the relative lengths of these times are set up, the actual lengths can be expanded or contracted without changing the ratios. Adequate control voltage is supplied to the timing circuits so they will not be subject to extraneous influences like hum or r.f. pickup.

Circuitry

As shown in the schematic diagram of Fig. 1, two triode sections of two 12AU7As, V_1 and V_{2A}, are used for the multivibrator. While the keying lever is in its neutral position, the cathode lead of V_1 is open, and V_{2A} draws current heavily. This causes the voltage at the plate of V_{2A} to drop to a low value. (Cathode resistor R_9 was made just

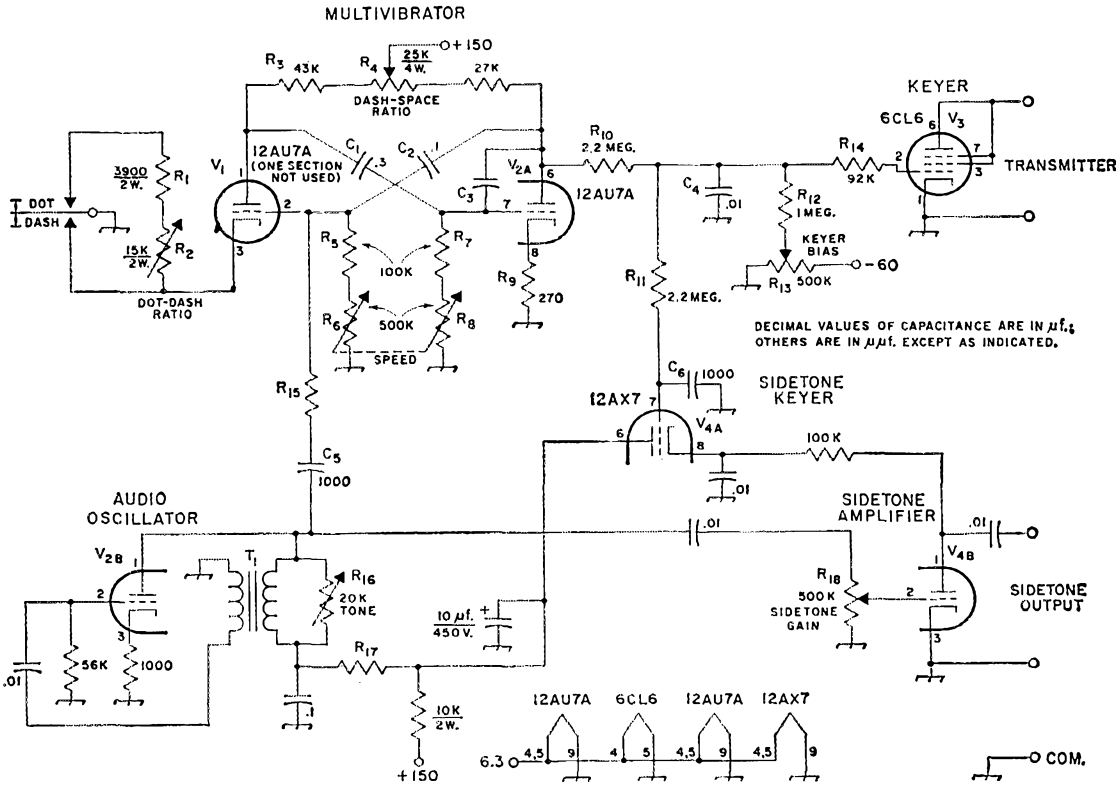
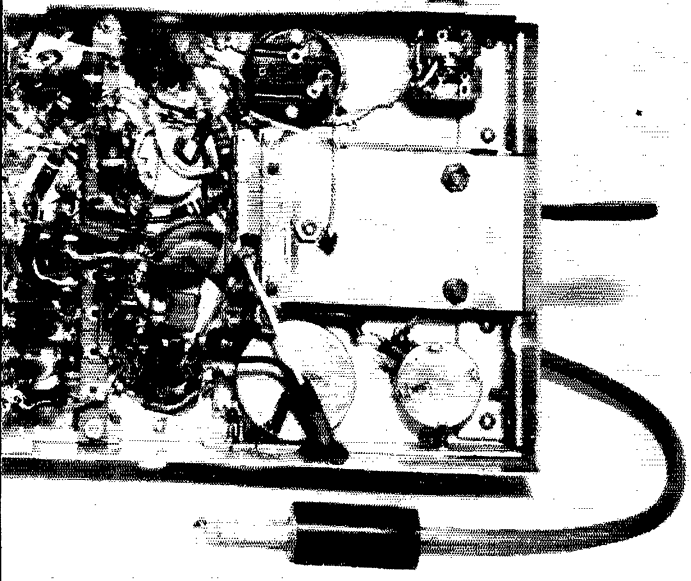


Fig. 1—Schematic diagram of the multivibrator key. Unless otherwise indicated, resistors are ½-watt composition; capacitor with polarity marked is electrolytic, others are disk ceramic.

C_1—0.3-μf. (three 0.1-μf. disk ceramics in parallel).
C_2—0.1-μf. disk ceramic.
C_3—About 6800-μμf. (see text).
C_4—0.01-μf. disk ceramic.
C_5, C_6—0.001-μf. disk ceramic.
R_1—3900 ohms, 2 watts.
R_2—15,000-ohm 2-watt control, wire-wound.
R_3—43,000 ohms, ½ watt.
R_4—25,000 ohm 4-watt control, wire-wound.
R_5, R_7—100,000 ohms ½ watt.
R_6, R_8—500,000 dual control (CTS-IRC 11-133 PQ control and M multisection).
R_9—270 ohms, ½ watt.
R_{10}, R_{11}—2.2 megohms, ½ watt.
R_{12}—1 megohm, ½ watt.
R_{13}, R_{18}—500,000-ohm control.
R_{14}—92,000 ohms, ½ watt.
R_{15}—About 68,000 ohms, ½ watt (see text).
R_{16}—20,000-ohm control.
R_{17}—10,000–56,000 ohms, ½ watt (see text).
T_1—3:1 audio transformer (Triad A31X or similar).



Bottom view of the keyer. The dual-potentiometer speed control is in the upper right corner, and the other adjustments can be identified from their positions in the top view. The aluminum plate on the right is the bottom of the keying lever assembly. The keying lead comes out the lower side of the chassis near the center. On the back side (to the left) are a power connector and a miniature jack for the sidetone output.

sufficiently large to self-bias the tube and prevent a ragged audio oscillation from occuring. With no excitation coming from V_1, this condition will continue as long as the paddle is in the neutral position. The resistance network, consisting of R_{10}, R_{11}, R_{12}, R_{13}, R_{14}, is adjusted to put a negative voltage greater than cutoff on the grid of the 6CL6 keyer tube V_3. Thus V_3 looks like an open circuit to whatever is connected across it.

Operating the key reverses the picture. When the paddle closes the cathode circuit of V_1, plate current flows and the voltage at the plate of V_1 is reduced because of the drop across R_3. The voltage across coupling capacitor C_1 cannot change instantaneously, so the voltage at the grid of V_{2A} goes negative by the same amount as the drop in plate voltage at V_1. In other words, C_1 charges up very quickly through R_3, R_4, the power-supply impedance, R_9 and the cathode-to-grid impedance of V_2. This charge causes a negative voltage greater than cutoff to appear at the grid of V_{2A}. When V_{2A} is cut off, its plate voltage rises suddenly and a portion of the increase feeds through resistors R_{10} and R_{14} to the grid of V_3. The latter will then draw current heavily if its plate and cathode are connected to a d.c. source of proper polarity. This condition is found at the key jack of cathode keying circuits as explained later. With a slight modification, V_3 will also control grid-block keying circuits.

V_{2A} will not remain cut off indefinitely. As soon as the charge on C_1 drains off through R_7, R_8 and the resistance of V_1 so that the grid voltage of V_{2A} reaches cutoff, V_{2A} begins to conduct. Its plate voltage then drops, and V_1 is cut off in turn by the voltage put across C_2. As long as the paddle keeps the cathode circuit of V_1 closed, V_1 and V_{2A} will switch back and forth automatically. The interval when V_1 is cut off (space) is determined mainly by C_2 and R_5R_6. The length of a dash tone (V_1 cathode grounded, V_{2A} cut off) is set by C_1 and R_7R_8. Since R_5R_6 always equals R_7R_8, and $C_1 = 3 \times C_2$, a dash will be three times as long as a space. R_4 provides a fine adjustment of this ratio and serves to balance the currents drawn by V_1 and V_{2A}. When the paddle is thrown to the dot post, R_1 and R_2 are added to the cathode circuit of V_1. The self-bias they provide limits the plate current, and when V_1 begins to conduct, its plate voltage and the grid voltage of V_{2A} drop less than before. V_{2A} is cut off for a shorter period forming a dot tone, and the relative length of this tone can be set by R_2.

Ganged potentiometers R_6 and R_8 become the sole adjustment necessary for speeding up or slowing down the dots, dashes and spaces. R_6 and R_8 should have the same taper although it does not matter what taper is used. The speed control actually works from about 8 w.p.m. to as fast as anyone can manipulate the key. Please do not turn it loose on *me*.

V_1 and V_{2A} generate a wave shape that is close to a square wave, and a small capacitor, C_3, is used to suppress a transient click that occurs at the end of a tone. The smallest value that will prove satisfactory here is the most desirable because it does have some effect on the timing ratios. Further shaping of the keying characteristic is done at the grid of the keyer tube. A large capacitor at C_4 makes for soft keying, while a smaller one makes sharper characters.

Another 12AU7A section, V_{2B}, was used for the stabilizing audio oscillator in one of the oldest circuits, the simple feedback. Low plate voltage is required for smooth operation as the feedback is very high, and the power supply should be thoroughly decoupled and filtered. Regeneration and also tone can be controlled by the variable resistor R_{16}. The exact frequency is immaterial, and any tone between 200 and 2000 c.p.s. that pleases the ear can be used. A small portion of the generated audio is fed to the grid of V_1 through C_5 and R_{15} to synchronize the multivibrator.

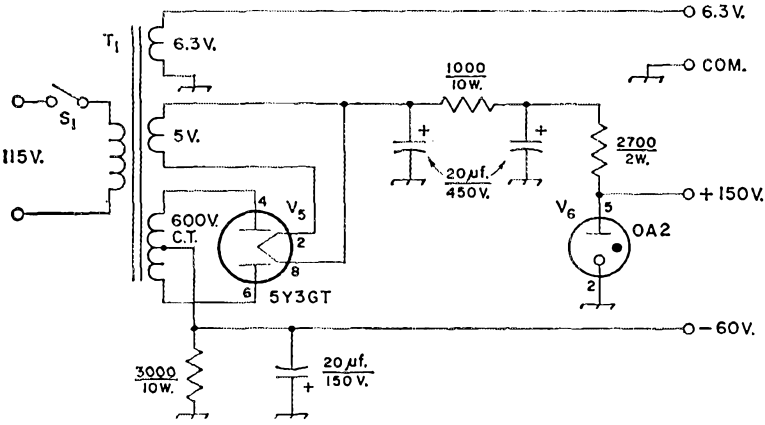


Fig. 2—Schematic diagram of a power supply suitable for the keyer. Capacitors are electrolytic.

S_1—S.p.s.t. toggle switch.

T_1—Power transformer: 600 volts center-tapped, 50 ma.; 6.3 volts, 2 amp.; 5 volts, 2 amp. (Triad R-7A).

The other use of the audio is for the side tone. We could see no use wasting a good tone when a facsimile was needed for monitoring, but using it proved to be quite an accomplishment. A circuit had to be used that would not only follow the operation of the keyer tube but also not affect it in any way. One experimental circuit worked beautifully until it was tried on the exciter. A nice modulated tone was found on the signal output. The solution was again the use of a very old circuit trick, keying the power supply to a small amplifier. One section of a 12AX7 tube, V_{4A}, was rigged up as an electronic keyer in the plate lead of V_{4B}, which is a sidetone "amplifier." The latter stage is not necessary to increase the volume (actually, it operates at a loss), but it is necessary to isolate and follow the keyer, V_3. C_6 is to prevent any possible reaction on the grid of V_3. A small value should be used here or the facsimile will not be exactly the same as the actual transmitted signal. Also, certain values will cause the sidetone output to ring.

The power supply diagramed in Fig. 2 is a conventional 40-ma. regulated job, except that a resistor is included in the center-tap lead to provide about 60 volts of negative bias. Of course, power may be obtained from the utility sockets on a receiver or transmitter if the correct voltages are available.

Connecting the Keyer

Do not expect to plug this keyer into any old keying jack and get good results. Ordinary mechanical keys are not selective as to polarity and offer almost zero resistance to the flow of current. Keyer tubes, on the other hand, will carry current in one direction only, and they do have some resistance which must be taken into account. Since the keyer tube must carry sufficient current to satisfy the circuit that is being keyed, heavy duty may require the use of several such tubes in parallel.

When using this unit with a cathode keying circuit, the grid return of the keyed tube in the transmitter must be connected to the key jack tip. If there is a meter in this circuit, it should be included also, as shown in Fig. 3B. This prevents the transmitter tube from developing self-bias due to the internal resistance of V_3. If the grid is returned as suggested, the keyer tube offers only a small load in series with the power supply, as would a resistor of equal value placed in the plate-supply lead. The designers of commercial gear have not considered the use of a keyer tube at the key jack and they usually make the grid return to the nearest convenient ground point. Of course, the keyer can be used to operate a d.c. relay of rather high current capacity if it is desired to do so. The keying characteristics are then no longer applied directly to the transmitter, and suitable click and splatter filters would have to be inserted as with a regular mechanical key. The automatic operation would, of course, be retained.

In conventional grid-block keying, the negative blocking voltage is reduced to zero by shorting it to ground with a mechanical key. This allows the normal grid leak or fixed bias to remain operative. The same condition exists if we allow a positive voltage to neutralize the negative voltage. By placing a positive voltage on the plate of keyer tube V_3 and connecting the cathode of V_3 to the grid block junction through a resistor, we are able to key the transmitter. Connection is made through the regular key jack. This arrangement is shown with a typical 807 buffer or amplifier

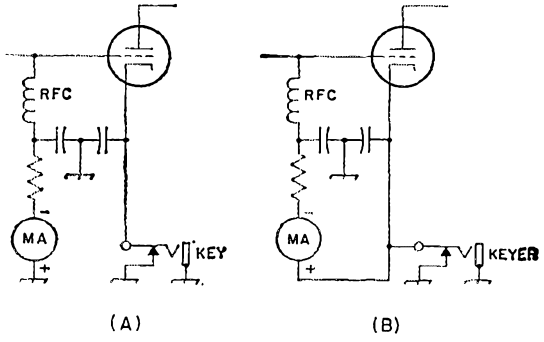


Fig. 3—(A) Conventional circuit for cathode keying. (B) Modified circuit for use with electronic keyer. The grid return is made through the key jack so that the voltage drop across the keyer will not add to the grid bias of the keyed stage.

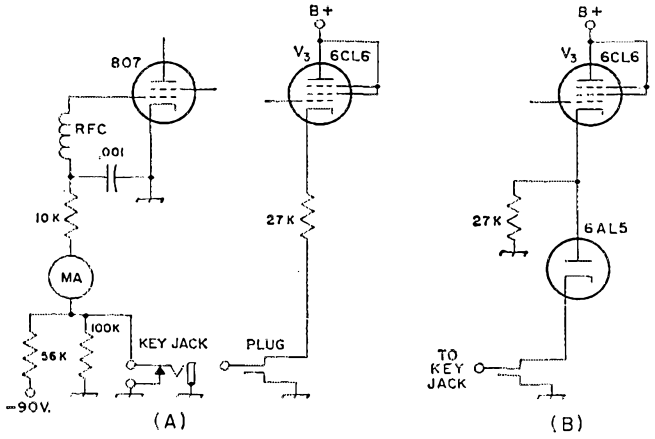


Fig. 4—(A) Diagram showing how the keyer can be used for grid-block keying a typical 807 final amplifier or buffer stage. A positive voltage applied through V_3 and the 27,000-ohm resistor neutralizes the negative blocking voltage and has the same effect as shorting it to ground with a mechanical key. (B) With higher blocking voltages it is necessary to use a diode tube in the keying lead. This reduces the negative voltage appearing at the cathode of the keyer.

stage in Fig. 4A. The keyer power supply described provides enough negative bias to cut off V_3 and key the 807 even with the 100K resistor and blocking bias in the cathode circuit. The circuit of Fig. 4B should be used if the negative blocking voltage is 100 volts or more. The diode tube reduces the negative voltage from the blocking system which appears at the cathode of V_3 during spaces but does not prevent the flow of positive pulses when V_3 is actuated. In case you want to use this keyer with both cathode and gridblock keyed transmitters, a d.p.d.t. switch can be added to switch the plate of V_3 from key lead to B+ and the cathode of V_3 from ground to the 27K resistor.

The output of the sidetone monitor may be connected to almost any audio amplifier. Some commercial receivers have a "phono" jack which can be used. Since the monitor output is high impedance, there is no deleterious reaction if this is fed directly to the grid of the first audio amplifier in the receiver with shielded wire. It is a general thing to have the audio amplifier portion of the receiver alive even though the front end is muted during transmissions. Problems like this are left to the constructor.

Construction and Adjustment

The keyer shown was built on a homemade 5½ × 7½ × 1½ inch chassis, but any standard chassis of about this size can be used. If the keying paddle is to be separate, you can reduce the size somewhat, and if the power supply is built in, you will need a larger chassis. I constructed my own keying paddle, but no claims are made as to its being better than a manufactured one. A modified bug is probably the quickest and cheapest way out if you have one. If the key is mounted on the chassis as shown, it will be necessary to cut an opening and submount it to get the proper operating height. If the key is remote, a double-circuit jack will take care of the problem.

The four tubes are arranged in a line down the back of the chassis, as shown in the photos. The positions of the variable resistors can be arranged to suit the taste of the constructor. Since there are no r.f. or high-frequency audio signals involved, wiring can be cabled and dressed to one's pet desires. Some may feel that there is an abundance of variable controls that could be replaced by fixed resistors. They do simplify initial adjustment, however, and are very handy for trimming up the action of the keyer after a tube replacement. Parts for the keyer should be of good quality but need not be of the precision type. Beware of bargain-variety paper capacitors, especially in the multivibrator circuit, since they may not hold a charge. General-purpose disk ceramics are good in this respect and occupy little space.

The first section of the key to get working is the audio oscillator. Apply heater and plate voltages and adjust R_{16} and the value of R_{17} for smooth operation at the desired frequency. Proper polarization of the audio transformer is important, so if the stage does not oscillate, reverse the connections to one winding of T_1.

Now connect the sidetone output to an audio amplifier and apply plate voltage to the remaining stages. With the keying lever closed, adjust R_{13} and R_{18} until a series of dots and dashes is heard. Adjustment of the multivibrator requires little effort but only an understanding of what one is trying to do. Just remember that a dash should be three times as long as either a dot or a space. Using a slow speed (R_6 and R_8 at maximum resistance) it is fairly simple to set the ratio adjustments, R_2 and R_4, with the aid of a metronome or sweep second hand. Once this has been accomplished, the speed control will compress and expand all the lengths simultaneously.

To synchronize the multivibrator, connect a variable resistor of about 1-megohm maximum at R_{15}. Adjust this resistor until the multivibrator runs about 20 per cent faster than it did with an open circuit at R_{15}. That is, it should make about five dots or dashes in the time it formerly made four. There will also be a slight change in ratio which can be corrected. Disconnect and measure the value of the variable resistor, and replace it with a ½-watt fixed resistor of similar value. Now the keyer should be ready for business.

If keying is to be done in a cathode circuit, connect V_3 across the key jack after having changed the grid return as described above. With the keying lever open, set R_{13} so that V_3 is cut off and no current flows to the keyed stage of the transmitter. Care should be taken not to operate the keyer tube too close to cutoff bias since it can become an effective modulator under these conditions. On the other hand, bias that is too negative may produce bad key clicks. Once the correct setting is established, no further adjustment is necessary. Capacitors C_3 and C_4 will also affect the keying characteristics as mentioned above, and they can be varied to suit the taste of the constructor and the circuit with which the key is used.

Grid-block keying requires a different adjustment procedure. The plate voltage applied to V_3 must be set to allow the keyed stage to draw normal grid current by the following method: First, adjust R_{13} in the keyer until a sidetone is heard strongly from the monitor. Hook a temporary voltage divider resistor between B+ and ground, and connect the slider to the plate of V_3. Start with the slider near the grounded end and increase the plate voltage until the grid of the keyed stage draws normal current with excitation applied. Then increase the bias on V_3 by turning R_{13} until the sidetone stops and the keyed stage blocks. Normal operation with the keying lever is now possible. The temporary voltage divider can be replaced with suitable fixed resistors or with a voltage source of the correct value.

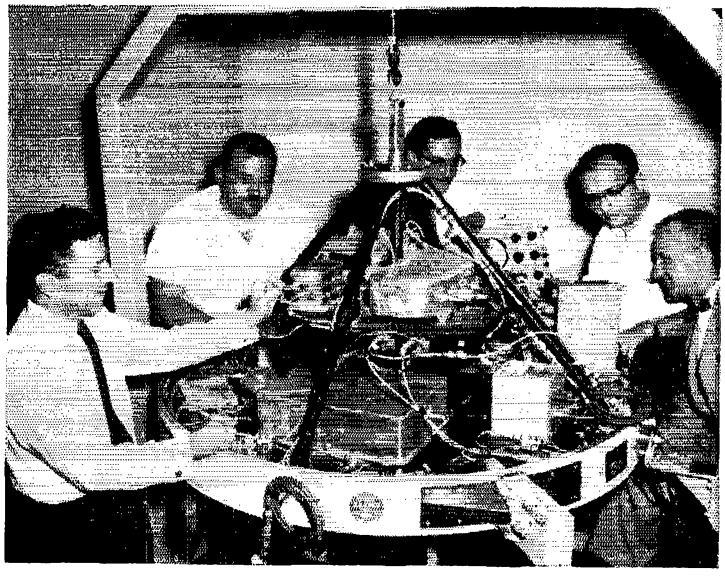
No further shaping should be necessary, but make the r.f. bypass in the grid circuit of the keyed stage of the transmitter as small as possible. Excessive bypassing will make the keying too soft. Sharpening of the characters can be accomplished by using lower values for R_{10} and R_{12} to load both the negative and positive supplies more heavily.

Operating the finished key is about as simple as a semiautomatic mechanical key. One only has to let the automatic features do the work of making both dots and dashes. There are no weights or screws to adjust for different speeds; merely turn one knob. QST

Strays

The launching of the Courier satellite this fall was a sustained effort in which a good many radio amateurs participated. Among those who played a major role (those with in-line design, development, or managerial responsibility) were the following: W2BQS, W2CMR, W2IFB, W2IZQ, W2JBU, W2MOV, K2SBG, W2SLW, W3GVO, K4OFU, W4PPH, WA6AID, WA6ATG, K6DMW, K6GVW, K6IVR, W6KFO, K6LFI, W6NER, K6OPR, K6RTU, and W6ZOZ. Those playing a supporting role in this project were: K2EBH, W2FTR, W2JJX, W2JPF, K3AAP, W3BFH, W3DJV, W3LSZ, W3PZH, W4LQV, K6AMF, K6EYD, WA6EZO, WA6FLS, WA6HZU, W6MHP, W6MHX, K6MOA, K6OKN, K6RHO, W6WC, W6YFG, W7IV, and W7PRX.

The prelaunch payload activity at the Atlantic Missile Range was supported by a staff that included W2BQS, K2SBG, W2SLW, and W6ZOZ. W2BQS directed Signal Corps payload activity. K2SBG (president of the Ocean County Radio Club) was Signal Corps Logistic specialist. W2SLW served as Signal Corps advisor on satellite environmental and testing problems. W6ZOZ was the senior Philco electrical engineer, the man most directly involved in the satellite's electronic functioning.



In this photo, left to right, are W6ZOZ, W2SLW, K6GVW, W2BQS, and K2SBG. The flight shells that contain the solar cells have been removed, and W6ZOZ is connecting a cable to one of the v.h.f. receivers while W2BQS is working on the message detector box of the command decoder.

• Recent Equipment —

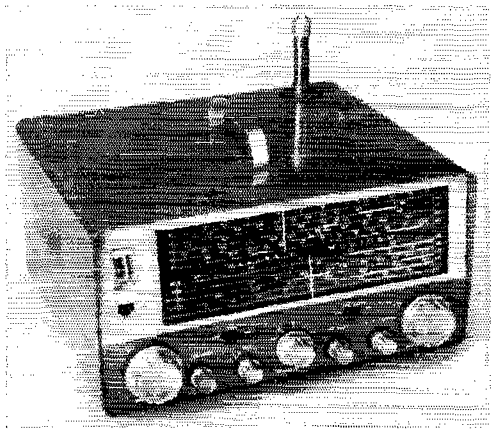
Heathkit Mohican Transistor Communications Receiver

The new Heath Mohican receiver Model GC-1A should squelch the cries of the skeptics who insist that transistors are still experimental and that their only ham application is in a few "novel" circuits. Although all-transistor communication receivers have been described before,[1] this is the first one that we know of that has been made available in kit or wired form. In any case, this should settle the question of whether transistors are ready for use in rather complicated circuits in the kit field.

The Mohican incorporates 10 transistors and 6 semiconductor diodes and is housed in a steel cabinet measuring 6⅞ inches high, 12 inches wide and 10 inches deep. These measurements are not much smaller than a vacuum-tube unit but represent about the smallest practical size one would want a receiver to have without sacrificing dial area, knob size, and so on. Both the cabinet and chassis are constructed from heavy gauge steel which gives the receiver a rugged, solid feel and probably contributes to its over-all stability. The entire unit weighs about 17 pounds.

Power requirements of the Mohican certainly place it in a class all its own when compared to vacuum tube receivers. Even with its complement of 10 transistors, only 12 volts at about 35 ma. is needed. When powered by batteries (8 standard type C flashlight cells) it can operate for as long as 400 hours under normal intermittent service.

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



The 9½ × 3-inch edged lighted dial commands most of the panel space on the Mohican receiver. The tuning meter is located at the upper left of the photograph with the a.v.c. switch directly below it. From left to right across the front panel are the MAIN TUNING knob, AUDIO GAIN, A.N.L. switch, B.F.O. control, BANDSWITCH, R.F. GAIN control, DIAL LIGHT switch, ANTENNA TUNING, and BAND-SPREAD knob. The whip antenna protruding from the top of the cabinet raises to about 55 inches and telescopes down to about 4 inches. A speaker not visible in the photograph is inside the cabinet under the perforations at the top left.

The GC-1A tunes the broadcast band through 32 Mc. in five bands, and has a separate bandspread dial calibration for the 80, 40-, 20-, 15- and 10-meter amateur bands. The five tuning ranges on the general coverage dial are 0.55 to 1.6 Mc., 1.6 to 4.0 Mc., 4.0 to 9.0 Mc., 9.0 to 20 Mc., and 20 to 32 Mc. The five amateur bands are calibrated from 3.5 to 4.0 Mc., 7 to 7.3 Mc., 14 to 14.35, 21 to 21.4 Mc., and 26.0 to 29.7 Mc. The receiver has an r.f. gain control, b.f.o., noise limiter and antenna trimmer and these are just a few of its features.

Some Circuit Details

The block diagram in Fig. 1 shows that except for the substitution of semiconductors for vacuum tubes, this unit contains about all of the sections usually found in a conventional vacuum-tube superhet receiver. Although the Mohican has a built-in whip antenna, an external one can be used (point *E*), provisions for which are made at the rear of the cabinet. The antenna is coupled by tuned circuits to the 2N1396 r.f. amplifier, Q_1, which is connected in a grounded-base amplifier circuit. The input tuned circuit contains a section of the three-gang main tuning capacitor, C_2, and the proper inductance for the desired band is switched across the capacity by the band switch. An antenna trimmer, C_1, adjustable from the front panel, is wired in shunt with C_2 so that the input circuit can be tuned to resonance. Gain of the r.f. amplifier is controlled by bias voltage supplied in part from the a.v.c. system, which may be turned on or off from the front panel. Also, an r.f. gain control, R_1, is located in the bias circuit of the r.f. amplifier and allows for manual control. All voltages for the r.f. amplifier, except the a.v.c. voltage, are regulated.

Output from the r.f. amplifier is coupled, by tuned circuits selected by the band switch, to the base of a 2N1225 mixer, Q_2, which is wired in a common emitter circuit. A variable capacitor, C_3, also part of the main tuning capacitor gang, tunes the mixer input circuit to the proper frequency. Oscillator signal from the local oscillator, Q_3, is capacitively coupled to the mixer and injected in the emitter of Q_2, resulting in an i.f. of 455 kc. All voltages to the mixer are regulated, as well as those used to power the local oscillator Q_3, which is a 2N1225 connected in a common-base circuit. The oscillator's tuned circuits are switched by the band switch and are tuned by the third section of the main tuning capacitor, C_4. Also located across the oscillator tuned circuit is the band-spread capacitor, C_5. This capacitor tunes only the oscillator circuit, but the r.f. amplifier can be touched up with the antenna trimmer and brought into resonance when necessary.

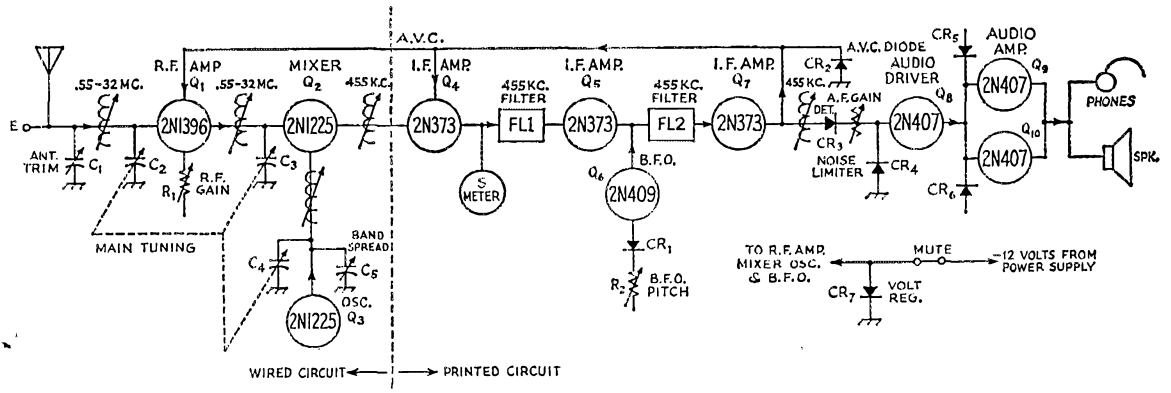


Fig. 1—Block diagram of the Heath Mohican receiver.

As Fig. 1 and the photographs show, some of the wiring consists of printed circuits while other sections are conventionally wired. The r.f. amplifier, mixer and oscillator circuits just discussed are all wired circuits and are assembled on a flat steel plate. All the tuned circuits, including the variable capacitors, band switch and transistors, are mounted on this deck and wired before being attached to the main chassis. The i.f. amplifier, as well as the detector and audio stages of the receiver, are part of the printed circuit portion and are also constructed in a separate operation and then added to the chassis.

The printed circuit i.f. amplifier consists of three stages of amplification all employing 2N373 transistors connected in common-emitter circuits. The first i.f. amplifier, Q_4, receives the 455-kc. signal from the mixer through a double-tuned i.f. transformer and the gain of the first i.f. amplifier is controlled by the a.v.c. system when in that function. Leaving the first i.f. amplifier, the 455-kc. signal is coupled into a special 455-kc. filter which occupies the position usually held by a transformer in a conventional i.f. amplifier. This filter is a ceramic element called a Transfilter[2] and it helps to achieve a fixed narrow band pass in the i.f. stages. One advantage of the Transfilter is its relatively high input impedance (2000 ohms) and low output impedance (300 ohms) which make it a natural for use in transistor circuits where impedance levels of this order are usually encountered. Actually, the two filters used in this unit operate somewhat like the conventional crystal-lattice filters since these ceramic elements exhibit a piezoelectric effect. The small ceramic disk (which is encapsulated in the holder) vibrates at the first overtone of its fundamental radial mode, giving the frequency-selective properties necessary in this application. Heath claims an i.f. selectivity of 3 kc. at 6 db. down and 25 kc. at 60 db. down. Fig. 2 shows an i.f. amplifier stage using the Transfilters. It should be noted that the bypass capacitor, C_6, in the emitter circuit of Q_5, is a 0.1-μf. unit resonant at 455 kc. It is a special frequency-selective ceramic element similar to the Transfilter. These special emitter bypass elements help improve the i.f. selectivity of the receiver.

A b.f.o. is provided for s.s.b. or c.w. reception and consists of a common-base oscillator using a 2N409 transistor, Q_6. Fig. 3 shows the circuit of the b.f.o., which incorporates an HD2257 diode, CR_1, instead of a variable capacitor, to control the oscillator frequency. A variable back bias is applied to the capacitor diode by potentiometer R_2, the b.f.o. control. The bias changes the capacitance of the diode which in turn can tune the b.f.o. through the pass band of the receiver.

[2] Made by Clevite Electronic Components, Division of Clevite Corp., Cleveland 14, Ohio.

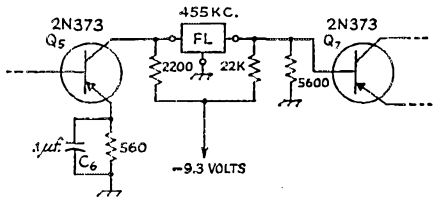


Fig. 2—455-kc. i.f. amplifier using a Transfilter interstage coupler. All resistors are ½ watt.

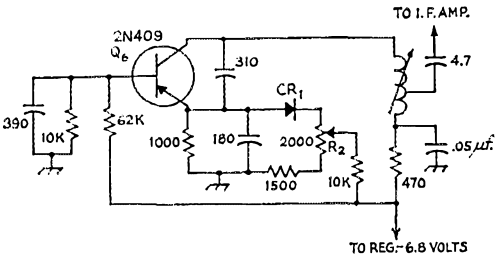
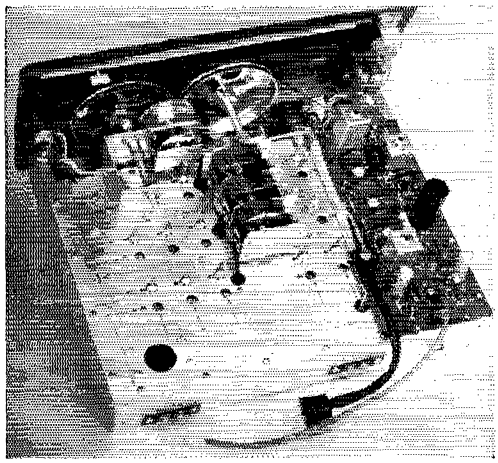


Fig. 3—Capacitor diode CR_1 is used for frequency control in this b.f.o. circuit. Unless otherwise specified, capacitances are in $\mu\mu$f., resistors are ½ watt.

Output from the b.f.o. is coupled through the 4.7-$\mu\mu$f. capacitor and applied to the collector of the 2nd i.f. amplifier, Q_5. To insure v.f.o. stability, the voltage to the b.f.o. circuit is regulated.

A tuning meter, calibrated on a scale of 10 for indication of relative signal strength, is connected in the collector circuit of the 1st i.f. am-



Top view of the Mohican's chassis shows the string-driven pulleys that turn the main tuning and band-spread capacitors. The large black cable at the bottom of the photograph is the power cable which connects to either the battery or a.c. power pack. The other cable is the speaker lead and is soldered to the speaker during final assembly. Although barely discernible in the photograph, the Transfilters are located on the printed circuit board between the two i.f. transformers.

plifier, Q_4. The meter is switched out of the circuit when a.v.c. is not used.

The collector circuit of the last i.f. amplifier, Q_7, is coupled to the a.v.c. diode, CR_2, which supplies the necessary a.v.c. voltage used to control the gain of the first i.f. and r.f. amplifiers.

After passing through the 3rd i.f. amplifier, Q_7, the 455-kc. signal is inductively coupled into the diode detector, CR_3, by a 455-kc. double-tuned i.f. transformer. The demodulated signal then passes through the audio gain control and is applied to the audio driver, Q_8, a 2N407 connected in a common-emitter circuit. The stage following the driver is shown in Fig. 4, and although it may appear unconventional at first it is actually a push-pull amplifier operating Class B. Audio from the driver is applied through the split-secondary transformer to the bases of the 2N407 audio amplifier transistors, Q_9 and Q_{10}.

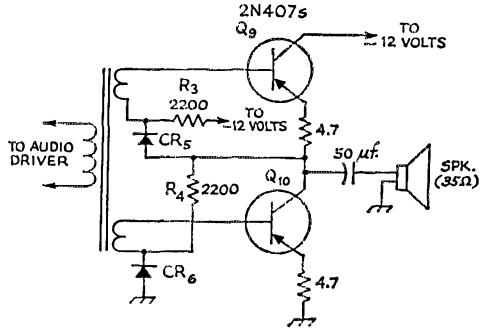


Fig. 4—The Class B push-pull audio stage. Diodes CR_5 and CR_6 are compensating diodes that stabilize the operation of the amplifier over a wide temperature and voltage range. Resistors are ½ watt.

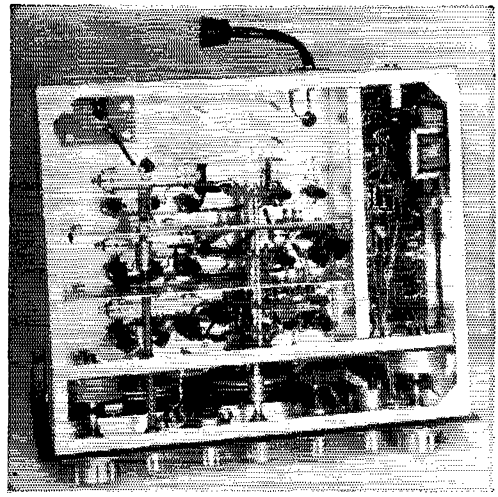
Resistors R_3 and R_4, along with diodes CR_5 and CR_6, form a voltage divider resulting in a collector-to-emitter voltage of about 6 volts on each transistor. This permits the power transistors to operate at equal voltages.

In addition to being part of the voltage divider, the 1N2326 diodes, CR_5 and CR_6, also regulate the operation of the amplifier over a wide temperature range. Since the diodes exhibit a negative temperature coefficient, they tend to compensate for collector current variations due to temperature changes. These diodes also compensate for voltage variations from the power supply and regulate proper bias on the output stage. Output is developed across the 35-ohm speaker, which can be switched out of the circuit by inserting low-impedance headphones in a circuit-closing jack on the rear of the chassis. Audio output is about 0.4 watt at 10 per cent distortion.

Power for the Mohican can be supplied either by batteries or by a 117-volt a.c. supply. The kit comes equipped for battery supply (without batteries) but the 117-volt power pack (Model XP-2) is available from Heath. In either case, 12 volts at about 35 ma. is necessary. As mentioned earlier, several of the stages in the receiver are voltage regulated. This is achieved by the use of the 1N754 diode, CR_7, shown in Fig. 1. This diode performs the same job as the common gas regulator tubes but at a much lower voltage. The one used in this receiver regulates at 6.8 volts.

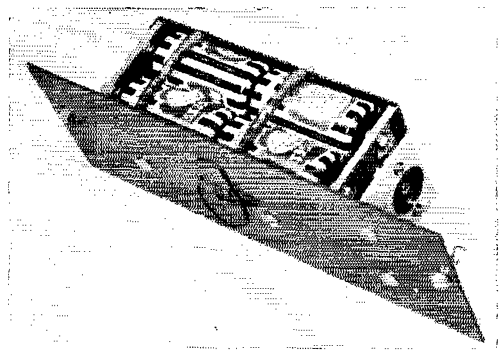
Construction Details

The Mohican is constructed in several steps with the various subassemblies wired and then



The front-end circuits in the large compartment appear to be quite complicated and cramped. However, in the step-by-step wiring process, this section goes together smoothly. The four-wafer band switch projects into this compartment at the right and the antenna trimmer control shaft goes through at the left. Notice the large cast flywheels used on the main and band-spread tuning shafts.

attached to the main chassis. The r.f. amplifier, mixer and oscillator stages are wired first and then attached to the flat steel plate visible in the bottom-view photograph. The most difficult step is wiring of the band switch after the baffles have been attached to the flat steel plate. However, a little patience and long fingers will eventually pay off. After the front-end circuits have been wired, components are mounted and soldered to the printed circuit board. The front-end deck and printed circuit are then attached to the main chassis. All of the operating controls, jacks and connectors are then mounted and the various sections are interconnected in the final wiring. Construction of the unit takes about 30 hours and this includes making a parts inventory before starting. Testing and alignment are not included in this estimate and time will probably vary depending upon test equipment and methods used, but it should not take more than two or three hours.



Power for the Mohican receiver is supplied by this 12-volt battery pack. A power cable connects to the small receptacle at the end of the battery case. This entire unit snaps into the rear of the receiver's cabinet. The a.c. power pack is identical in external appearance to the battery pack except for the obvious a.c. line cord. Only the battery pack is supplied as part of the kit.

Alignment and Testing

The Mohican instruction manual contains excellent step-by-step information for final testing and alignment. An r.f. signal generator and vacuum-tube voltmeter are used, although the v.t.v.m. is not absolutely necessary since the receiver's tuning meter can be used as an alignment indicator.

Operating controls on the receiver's front panel include the MAIN and BANDSPREAD tuning knobs which are string-coupled to the respective tuning capacitors, an A.V.C. on-off slide switch, AUDIO GAIN, B.F.O. on-off/pitch (this is a push-pull on-off switch and also a potentiometer), BANDSWITCH, R.F. GAIN, ANTENNA TUNING, A.N.L. slide switch, and DIAL LIGHTS spring return slide switch. The dial-light switch has the spring return feature to preserve the batteries. Antenna and ground connections, as well as the muting terminals and phone jack, are arranged along the rear of the chassis. The muting terminals are merely in series with the 12-volt power supply, since the receiver recovers almost immediately when power is applied. If the receiver is to be used along with an accompanying transmitter it is necessary not only to open the mute jumper but also to short the antenna terminal to ground since the signal from the transmitter could damage or destroy the r.f. amplifier transistor.

In the finer details, Mohican performance can't be expected to compare with vacuum-tube sets of the more-advanced type, of course. However, it certainly can hold its own on s.s.b., c.w., or a.m. with many communications receivers. A few suspicious teletype signals can be heard on the higher bands, but image response is usually a problem with any single-conversion receiver. Heath claims a sensitivity of 2 microvolts for 10-db. signal-to-noise ratio on all but the broadcast band, and the receiver sounds "hot" right up to the top frequency and does not seem to fall off in performance even on 10 meters. One common complaint usually directed toward all-transistor receivers is their inability to handle very strong signals. However, the a.v.c. system, along with the manual r.f. gain-control feature in the Mohican, seems to cope with even the strongest ones. — *E. L. C.*

Strays

Ever bring a friend over to the house to show him some new gadget, and then find that it won't work? Or take him to a favorite fishing spot and then find that the fish aren't biting? This seems to be a common experience for many of us, but that isn't the way it worked for Ray Meyers, W6MLZ, ARRL's Southwestern Division Director.

He had as a house guest a TV producer who wanted to hear some of the doings on an amateur band. Ray tuned across 7-Mc. and they listened to some of the local phone nets. After one of the nets stood by, W5FFX operating portable in New Mexico was heard sending QRRR. This distress call was answered by W6TSQ and W6MLZ, who were asked to get some sort of medical advice to assist a man who had just had a heart attack. (The nearest telephone to W5FFX was 15 miles away, and the nearest doctor was 40 miles away.) W6MLZ got a local doctor on the phone, who passed along instructions to W5FFX on what to do pending arrival of medical help at the scene. W6MLZ also made some long-distance phone calls, and got an ambulance dispatched from Des Moines, N. M. After a 65-mile trip the patient was delivered safely to a hospital in Clayton, N. M.

And so ham radio helped to save a man's life, while a TV producer got an excellent demonstration of hams in action.

Using the 7360 in the HBR-16

Beam Deflection Tube for Improved Product Detection

BY JOHN M. FILIPCZAK,* K2BTM

The use of a 7360 beam-deflection tube in the HBR-16 receiver results in a much improved product detector for the reception of sideband signals. The 7360 detector circuit not only provides greater audio output voltage and much lower intermodulation distortion, but also adds the feature of impulse noise limiting. The circuit is so designed that tube replacement does not require adjustment of element voltage.

ALTHOUGH pentagrid converters are basically product-detection devices, they have some inherent limitations. Characteristics of the pentagrid-converter tube are such that small changes in element voltages can shift tube operation out of the "center of the linear range" under large-signal conditions. The pentagrid product detector shown in Fig. 1, for example, has the carrier-insertion signal applied to grid No. 1 and the modulated sideband signal to grid No. 3. Because of the electronic interaction existing between grid No. 1 and grid No. 3, pentagrid converter tubes are seldom used to generate their own beat-frequency-oscillator signals in product-detector circuits.

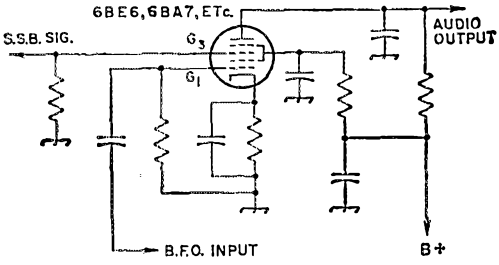


Fig. 1—Pentagrid product-detector circuit.

A second method of product detection; i.e., the popular Crosby system,[1] uses two dual-triode units which require additional socket space and components. The limitations of both systems can be circumvented by the use of the 7360 beam-deflection tube.

Features of the 7360

The 7360 is a grid-controlled beam-deflection tube having a cathode, control grid, screen grid, two deflecting electrodes, and two plates in a nine-pin miniature envelope. The tube was specifically designed for application in such sideband circuits as balanced modulators, balanced mixers, product detectors, and frequency converters.[2]

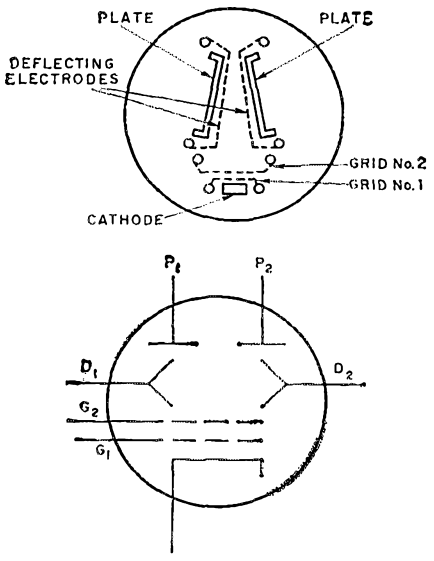


Fig. 2—Sketches showing the mechanical arrangement of electrodes in the 7360 and equivalent circuit symbol.

The tube structure, shown in Fig. 2, is such that the total beam current is determined by the voltage applied to grid No. 1 and grid No. 2. The difference in voltage between the deflecting electrodes determines the amount of beam current collected by each plate. In balanced operation, the beam current is divided equally between the two plates. When signals are applied to grid No. 1 and one of the deflecting electrodes, the resultant output contains signal components produced by the product of the input signals. Therefore, if the modulated signal is applied to one of the deflecting electrodes and the carrier insertion is applied to grid No. 1, the resultant output contains the desired audio component.

Receiver Modification

The October 1959 issue of *QST* presented an excellent article by W6TC on the HBR-16 receiver.[3] Because the pentagrid converter origi-

* Electron Tube Division, RCA, Harrison, N. J. Home address: 200 Maywood Ave., Maywood, N. J.

[1] M. Crosby, "Reception with Product Detectors," *QST*, May, 1956.

[2] Vance, "S.S.B. Exciter Circuits Using a New Beam-Deflection Tube," *QST*, March, 1960.

[3] Crosby, "The HBR-16 Communications Receiver," *QST*, October, 1959.

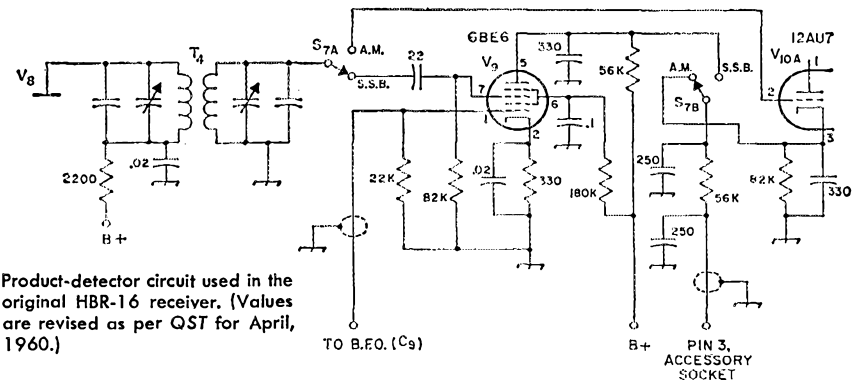


Fig. 3—Product-detector circuit used in the original HBR-16 receiver. (Values are revised as per QST for April, 1960.)

nally used for product detection in my own "home-brew" HBR-16 left much to be desired (strong signals produced distortion), conversion to the 7360 for product detection seemed worthwhile.

The incorporation of the 7360 into the HBR-16 required several modifications of the original circuit shown in Fig. 3. The seven-contact socket formerly occupied by the 6BE6 (V_9) was removed and replaced with a shielded nine-contact socket. All circuit components between the two sections of the a.m./s.s.b. switch (S_7) were removed. The r.f. filter network, consisting of a 5600-ohm resistor and two 250-$\mu\mu$f. capacitors, was left untouched. The bottom end of the second i.f. transformer (T_4) secondary was lifted from ground and connected as shown in Fig. 4. (Good wiring technique is essential here because of the limited space available.) Because this connection places approximately 35 volts d.c. on the secondary of T_4, a 0.1-μf. capacitor, C_1, was placed between the a.m. position of switch S_{7A} and the infinite-impedance detector grid (V_{10A}). A 1-megohm resistor was also added from grid to ground on V_{10A}. It was necessary to repeak T_4 for maximum gain after the conversion was completed. It was noted that the secondary of T_4 exhibited a sharper peak when tuned; in the original circuit, the tuning was much broader.

The b.f.o. output-coupling capacitor, C_9, was adjusted to bring the voltage up to 10 volts peak-to-peak on grid No. 1 of the 7360. Investigation of the particular b.f.o. circuit used in the HBR-16 indicated an output r.f. voltage slightly over 10 volts peak-to-peak. This adjustment is preferably made with the aid of an oscilloscope. If a scope is not available, C_9 may be adjusted for maximum undistorted audio-output signal. This value will be a little less than maximum capacitance.

Performance

A quick operating check of the completed circuit is simple to perform. Turn on the receiver and place the a.m./s.s.b. switch in the s.s.b. position with the b.f.o. on. Tune in an s.s.b. signal and adjust the b.f.o. for clear reception. Switching off the b.f.o. at this point should result in negligible audio at the speaker. (Because of the good isolation between the two signal elements, interaction is negligible.)

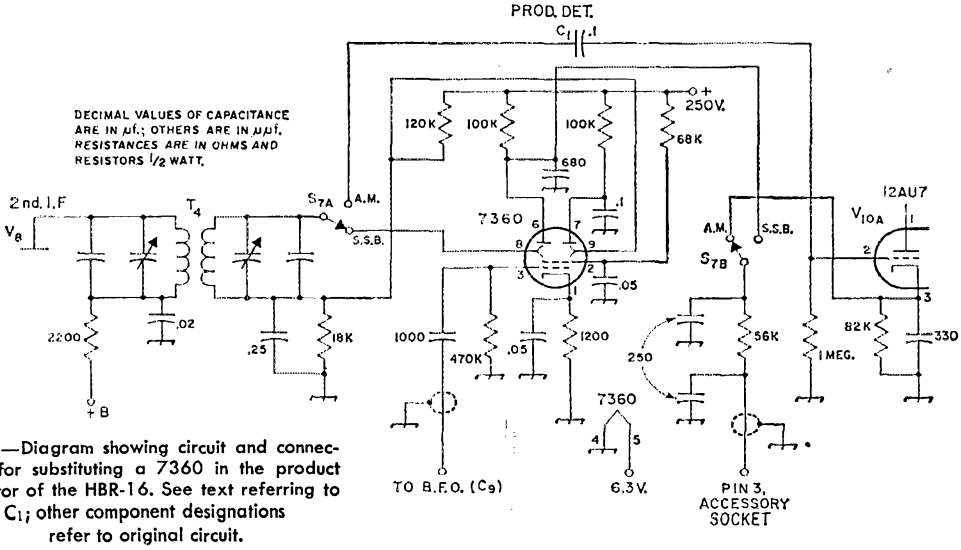


Fig. 4—Diagram showing circuit and connections for substituting a 7360 in the product detector of the HBR-16. See text referring to C_1; other component designations refer to original circuit.

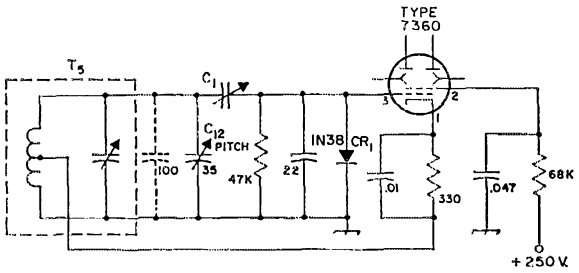


Fig. 5—B.f.o. circuit for self excitation. Decimal values of capacitance are in μf.; others in $\mu\mu$f. Resistances are in ohms and resistors ½ watt.
C_1—30-$\mu\mu$f. ceramic or mica trimmer.
C_{12}—See original b.f.o. circuit.
CR_1—1N38 germanium diode.
T_5—See original b.f.o. circuit.

Self Excitation

If desired, the 7360 may be used to provide its own b.f.o. excitation, thus eliminating the need for the separate 6BH6 b.f.o. tube, V_{11}. The author used this method of excitation in his final revision and the circuit is shown in Fig. 5. C_1 is used to adjust the signal level on grid No. 1 to a value of from 5 to 10 volts peak-to-peak with respect to the cathode. This adjustment shifts the b.f.o. frequency somewhat, but the shift can be compensated for by adjustment of the capacitor in T_5. The pitch control C_{12} is the front-panel control and is used to zero beat the incoming signal. The 100-$\mu\mu$f. capacitor shown in dotted lines was required to provide adjustment to zero beat but may not be required in all instances. The grid-clamping diode CR_1 prevents the No. 1 grid from approaching too closely to zero voltage, at which point distortion would result. Using this arrangement in my receiver, the stray coupling to the deflecting electrodes was in the order of 25 db. below the normal peak-signal level. Because the detector conversion gain of the 7360 in the product-detector circuit is about 6, the audio-output stage can be driven directly in most cases.

Noise Limiting

Another feature of the 7360 is its excellent noise-limiting capabilities. The normal signal voltage appearing at the deflecting electrodes should be limited to a maximum value of 8 volts peak-to-peak. If this voltage becomes larger, the audio signal becomes slightly clipped. Noise pulses ten times greater than the s.s.b. signal were only twice the peak audio signal after detection. It is recommended that the deflecting-electrode signal be kept near the maximum of 8 volts peak-to-peak to take advantage of this signal-limiting feature. The signal-limiting characteristics of the 7360 are shown in Fig. 6.

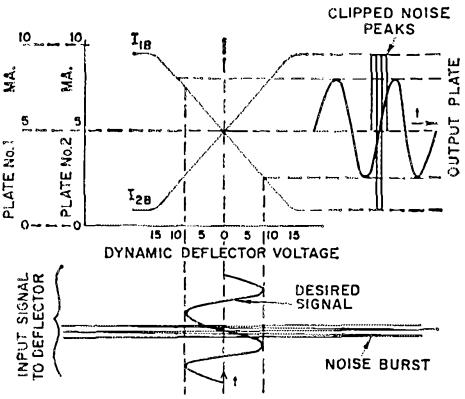


Fig. 6—Graph representing the signal-limiting properties of the 7360.

Precautions

The 7360, like other types of beam-deflection tubes, is affected by stray magnetic fields. Variations in magnetic fields cause corresponding variations in plate currents, and upset the tube's exceptionally good balance. Therefore, a tube shield is recommended for most applications.

Judging from the past articles in and correspondence to *QST*, there seems to be a great deal of interest in "home-brew" receivers. I might add that the experience gained from any sort of project dealing with receivers is worth more than the money invested in it. QST

Strays

Have you ever seen a picture which better depicted the wonder and delight of a youngster first listening to signals on the amateur bands? The young lady is Mary Anne Overton, and the operator is Gene Quinney, K4TTJ. The photo was taken by G. Ross Parsons, who is publicity chairman of the Savannah Amateur Radio Club (W4HBB). The occasion was the Coastal Empire Fair, at which the SARC had set up a booth publicizing amateur radio.

QST for

Transistor Converter for Six Meters

A Printed Circuit Unit Which Rivals Vacuum-Tube Models

BY DANIEL MEYER *

V.h.f. transistors are now available at reasonable prices, and this compact 50-Mc. converter makes good use of them. With a current drain of only 7.5 ma. at either 6 or 12 volts it's a natural for mobile, but its performance is definitely of home-station caliber. The etched circuitry used for all non-r.f. wiring helps keep size down and makes it easy to exactly duplicate the original layout.

USE transistors on six? You're kidding!" was the usual comment by the local hams when the subject of a six-meter transistor converter was mentioned. Until recently, this attitude was justified, due to the low gain, high noise and high cost of early r.f. transistors. Only superregenerative-type circuits were practical, and they suffered from the usual troubles that are found with superregenerative detectors, namely lack of selectivity, radiation of an interfering signal and critical adjustment.

The recent introduction of "mesa" and "drift" transistors suitable for use in the v.h.f. range has changed this picture. A superheterodyne-type six-meter converter using Amperex 2N1517 and 2N1516 transistors comes close to matching all but the "cascode" vacuum-tube circuits with respect to noise.

The converter described in this article has been used by K5HVE since March. Over a half dozen converters of the same type have been built since that time for both fixed station and mobile use. Everybody who has tried one has been impressed by the sensitivity and the absence of interference from stations operating at the i.f. The low power consumption and small size make this converter a natural for mobile use. The parts cost is under $25.00, even if all new components are used.

Circuit

Since the circuit design is different from that used with tubes, some of the more important points will be explained for the benefit of readers who would like to build converters for other frequencies or may just be interested in why this particular circuit was used.

The first thing to be considered is the antenna coupling network. This network must couple the signal from a 50-ohm coaxial transmission line to the input of the r.f. amplifier with a minimum of loss. In a standard grounded-cathode vacuum-tube circuit, there is only a very small amount of power transfer in the input grid circuit. The antenna coupling circuit is usually designed to present an impedance to the grid that is optimum with respect to noise figure, and the Q of the circuit is adjusted to give the desired bandwidth. With transistors, this is not the case; there is a very definite input impedance, and power transfer will take place in the input circuit. It is important to understand what this implies, since any losses in the input circuit will add directly to the noise figure of the converter.

The efficiency of the circuit can be expressed in terms of the loaded and unloaded Qs of the circuit. The formula is:

$$Efficiency = (1 - \frac{Q_l}{Q_u})^2$$

where Q_l is the loaded Q and Q_u the unloaded Q of the tuned circuit. To make this clearer, the loss may be shown in terms of db. *vs.* the Q_u/Q_l ratio, as in Fig. 1. As can readily be seen, to keep the losses in the input circuit below 1 db., the unloaded-to-loaded Q ratio of the tuned circuit must be over nine. "So what?" you say. Well, this shows that at high frequencies the input bandwidth may not be too narrow or the losses will be very high. If, for example, you wanted a 1-Mc. bandwidth at, say, 100 Mc., the necessary loaded Q is approximately 100, since

$$Loaded\ Q \simeq \frac{Center\ Frequency}{Bandwidth}$$

To keep the losses low, we find that we must build a tuned circuit with an unloaded Q of 900. Since it is usually not practical to wind coils with Qs exceeding 200 without special materials and techniques, we would in this case have to increase the bandwidth or take a 6-db. loss in the input circuit. In the case of this six-meter converter, the necessary loaded Q is 52/4 = 13, since the input tuned circuit is designed to be 3 db. down at 50 and 54 Mc. It is relatively easy

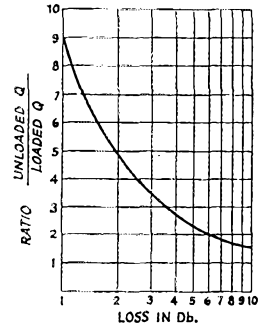


Fig. 1—Graph showing how the input circuit unloaded-to-loaded Q ratio affects circuit loss. To keep the loss under 1 db., this ratio must be greater than 9.

* Southwest Research Institute, 8500 Culebra Road, San Antonio 6, Texas.

to wind a coil with an unloaded Q nine to ten times this figure, so the input losses are held to less than 1 db. with this circuit.

The r.f. amplifier transistor, Q_1, in Fig. 2, is used in a common-base circuit. This is done for two reasons. First, with the transistor specified, the gain at 50 Mc. in a common-emitter configuration would be lower than that obtained with a common-base connection, and second, neutralization is not necessary with the common-base connection. When this transistor is operated at lower frequencies, the common-emitter circuit will produce more power gain if it is properly neutralized. The noise figure is the same with either type connection if enough gain is obtained to override the mixer noise.

Since the antenna circuit must be a wide-band, single-tuned circuit (in the interest of maximum sensitivity), it is advisable to use a more selective coupling network between the r.f. amplifier and the mixer. This will keep image and i.f. responses at a low level. A double-tuned circuit will give the desired flat gain characteristics between 50 and 54 Mc. and the needed rapid drop in gain above and below these frequencies. A top-capacitively-coupled double-tuned circuit is used. This type coupling is easier to adjust than inductive coupling when slug-tuned coil forms are used as in this converter. This type network will produce a higher loss than a single-tuned circuit unless it is greatly over-coupled, but the r.f. amplifier has increased the signal level to a point where it can override the mixer noise even with a 6-db. coupling network loss.

The mixer, Q_2, is operated as a common-emitter amplifier. At the intermediate frequency used here (either 7-11 or 14-18 Mc.) the common-emitter circuit will give a greater power gain, and neutralization is not necessary since

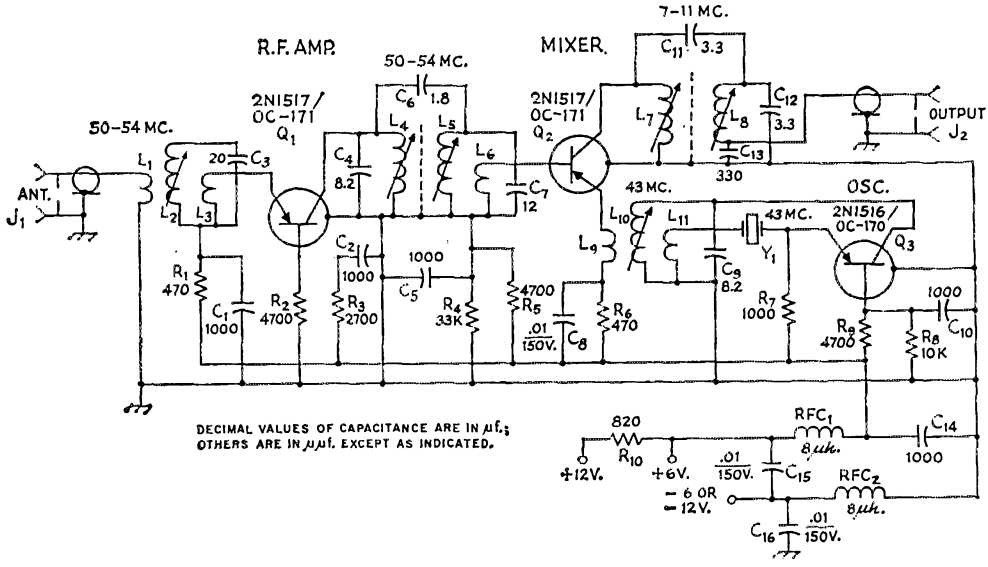


Fig. 2—Circuit diagram of the converter. Resistances are in ohms. Mixer and oscillator components specified are for an i.f. of 7–11 Mc. For 14–18-Mc. operation, see Fig. 3.

C_1, C_2, C_5, C_{10}, C_{14}—0.001-μf. disk ceramic.
C_3—20-$\mu\mu$f. silver mica or NPO ceramic.
C_4, C_9—8.2-$\mu\mu$f. silver mica or NPO ceramic.
C_6—1.8-$\mu\mu$f. silver mica or NPO ceramic.
C_7—12-$\mu\mu$f. silver mica or NPO ceramic.
C_8, C_{15}, C_{16}—0.01-μf., 150-volt disk ceramic.
C_{11}, C_{12}—3.3-$\mu\mu$f. silver mica or NPO ceramic.
C_{13}—330-$\mu\mu$f. silver mica or NPO ceramic.
J_1, J_2—Coax receptacle, any 52-ohm type.
L_1—2 t. No. 24 enam., close-wound on L_2 near cold end.
L_2—10 t. No. 24 enam., close-wound on ¼-inch diam. slug-tuned form (Miller 4500, CTC type LSM or equivalent).
L_3—1½ t. No. 24 enam., wound between turns of L_2 at cold end.
L_4—11 t. No. 24 enam., close-wound on ¼-inch slug-tuned form.
L_5—11 t. No. 24 enam., close-wound on ¼-inch slug-tuned form.
L_6—1¾ t. No. 24 enam., wound between turns of L_5 at cold end.
L_7, L_8—35-60 μh., slug-tuned (Miller 4509 or equivalent).
L_9—1 t. No. 24 enam., wound on L_{10} near cold end.
L_{10}—14 turns No. 24 enam. close-wound on ¼-inch slug-tuned form.
L_{11}—1 t. No. 24 enam., wound between turns of L_{10} at cold end.
R_1, R_6—470 ohms, ¼ watt.
R_2, R_5, R_9—4700 ohms, ¼ watt.
R_3—2700 ohms, ¼ watt.
R_4—33,000 ohms, ¼ watt.
R_7—1000 ohms, ¼ watt.
R_8—10,000 ohms, ¼ watt.
R_{10}—820 ohms, ¼ watt.
RFC_1, RFC_2—About 8 μh. One layer of No. 38 enam. close-wound on 1-megohm, 1-watt resistor.
Y_1—43-Mc. third overtone-type crystal.

the input and output frequencies are different. The mixer amplifies the difference between the incoming signal from the r.f. amplifier and the oscillator frequency. The r.f. signal is fed to the base, and the oscillator signal is coupled to the emitter. Introducing the r.f. and oscillator voltages at different points in the mixer circuit helps reduce interaction between the tuned circuits.

The output circuit for the mixer is another double-tuned circuit. This circuit has maximum response between 7-11 or 14-18 Mc. (whichever is used for the first i.f.). The output section of the network is connected in a pi-type configuration. This matches the transistor collector impedance to the 50-ohm impedance of the receiver input.

The oscillator, Q_3, is crystal-controlled and uses a grounded-base tickler circuit. Positive feedback from collector to emitter causes the oscillation. The crystal is in series with the feedback loop and presents a high impedance to the feedback signal at frequencies close to the third overtone frequency of the crystal. At the third overtone frequency the crystal impedance drops to a low value and allows oscillation to occur, provided the collector circuit is tuned to the same frequency. It is important not to use too much feedback in such a circuit, for stray capacitance associated with the crystal and its holder may couple enough feedback to allow oscillation at the collector circuit resonant frequency with no control by the crystal.

The r.f. filters in the power-supply leads prevent interfering signals from entering the converter by way of the power supply. This precaution, plus the double-tuned circuits and the shielding provided by the case, reduces interference from stations operating at the image and intermediate frequencies to a point where it will rarely be noticed. Image and i.f. rejection have been measured at 68 and 78 db., respectively.

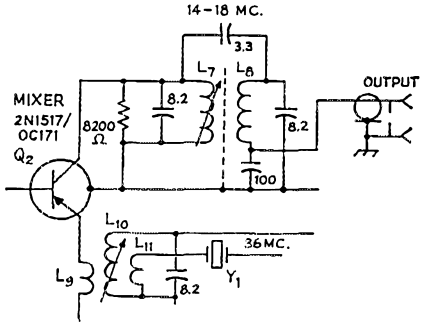


Fig. 3—Modified circuit for 14-18-Mc. i.f. Resistor is ¼-watt composition; capacitances are in $\mu\mu$f., and capacitors are 5 per cent silver mica or NPO ceramic.

L_7, L_8—40 t. No. 28 enam. close-wound on ¼-inch diam. slug-tuned form (Miller 4500, CTC type LSM or equivalent).

L_9—1 t. No. 24 enam. wound over L_{10} near cold end.

L_{10}—12 t. No. 24 enam. close-wound on ¼-inch slug-tuned form.

L_{11}—1 t. No. 24 enam. wound between turns of L_{10} near cold end.

Y_1—36-Mc. third overtone-type crystal.

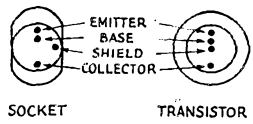


Fig. 4—Bottom view of the transistors and sockets showing pin connections.

Layout and Construction

The circuit design of a v.h.f. converter is only half the story. The layout used can make it either a valuable piece of equipment or just another box to collect dust in the corner. This converter was designed around a printed-circuit board. The construction, however, is not purely of the printed-circuit type. The board is used to mount the resistors and capacitors in the portions of the circuit that do not carry r.f. and for the oscillator feedback circuit. The tuned circuits are arranged so that all signal connections are made

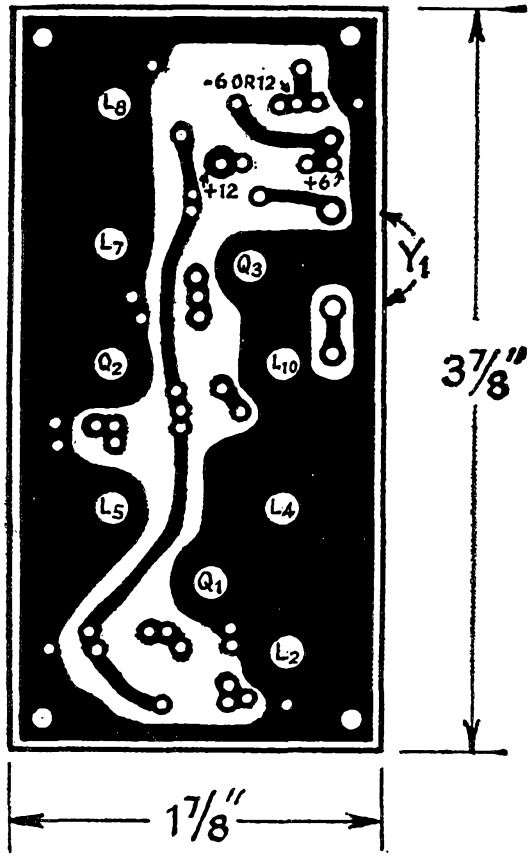
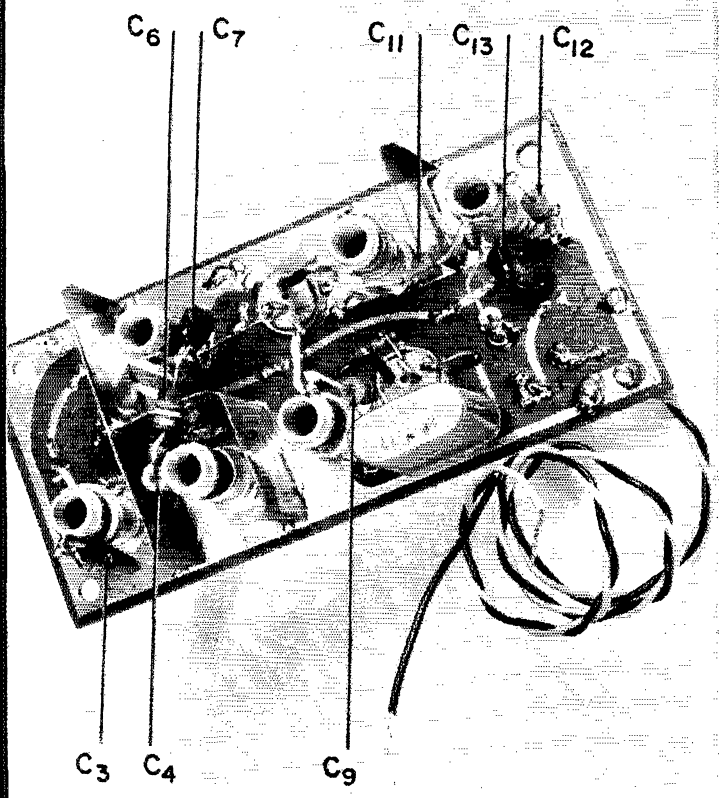


Fig. 5—Full-size pattern and drilling template for the circuit board. Black indicates the copper surface which should remain after etching. The four corner circles are drilled to pass 6-32 mounting screws. The nine large circles mark the positions of the coils and transistor sockets indicated. The two holes marked Y_1 are for pins, removed from an old socket, which hold the crystal. The small white dots indicate holes for the leads of resistors, capacitors and chokes. These can be identified by their relation to the top-view photograph.



Bottom view of the circuit board identifying the capacitors which are mounted on coil forms. Input coil L_2 is at the left, and the r.f. amplifier socket (mounted with the emitter to the left) is directly beneath the junction of the partition crossing the chassis and the L-shaped shield. L_4 is inside the compartment formed by these shields which are soldered together and to the common part of the circuit board. Coupling capacitor C_6 runs through a notch in the shield to L_5 above. The cross-chassis partition must be notched at the bottom to clear the 6-volt conductor running down the board; this notch is just to the left of C_6. L_{10} and the Q_3 socket, mounted with the emitter connection to the right, are next to the crystal. The socket for Q_2 is near the top edge of the board near the middle with the collector contact toward the edge. Output coils L_7 and L_8 are at the upper right separated by a third shield partition.

between the coil-form lugs and the transistor sockets. This prevents any problems with flux or moisture on the printed board causing losses at r.f. or i.f. The small size of transistors makes it easy to keep leads short and to keep stray circuit capacitance to a low value. The use of a printed board results in a very neat and clean layout with very little chance of minor variations in construction causing unsatisfactory performance.

The pattern of Fig. 5 should be copied onto a sheet of copper laminate board. Any method desired can be used, and any of the available "printed-circuit" kits will provide the necessary material. The photographic technique is the quickest and most accurate but it is rather costly if you do not own the necessary equipment.[1]

[1] The author will supply etched and drilled circuit boards for $2.00 each to any readers who would rather not attempt making their own.

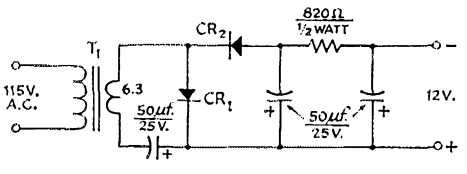


Fig. 6—Voltage doubler power supply for operating the converter from 115 v. a.c. Capacitors are electrolytic.

CR_1, CR_2—50-volt p.i.v., 250-ma. silicon rectifier (Pacific PS-005).

T_1—Filament transformer, 6.3 volts, 0.6 amp. (Triad F-13X or similar).

Next, wind all the coils as directed. Coils L_7 through L_{11} should be made for the i.f. you intend to use. Data for 7-11 and 14-18-Mc. i.f. outputs are given. The coils with bifilar windings use the bottom terminal on the coil form as a common point for both windings. Secondaries L_3, L_6 and L_{11} are wound between the primary turns on the bottom end of the coil forms. If output frequencies other than 7-11 or 14-18 Mc. are to be used, the oscillator and output coils will have to be changed to suit.

Mount the Elco 3304 transistor sockets in the circuit board first. The retaining rings may be pushed on with a 3/8-inch nut driver. The coils are mounted next in the places shown. Note that the coils are mounted with the windings on the same side of the board as the etched copper conductors. Mount the resistors, chokes, and capacitors on the top side of the board so that the leads extend out the copper side. Where connections must be made to a transistor socket, leads from one of the resistors or capacitors may be cut long enough to reach the socket pins. Fig. 4 shows the pin arrangement used on the transistors and on the sockets. The shield pin on each socket should be bent over and soldered to the retaining ring around the socket. The ring should then be soldered to the circuit board. The capacitors that mount on the coil forms (C_3, C_4, C_6, C_7, C_9, C_{11}, C_{12} and C_{13}) may now be installed and the remaining connections to the transistor sockets made with short pieces of wire.

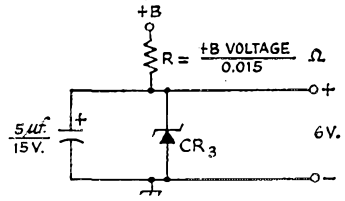


Fig. 7—Recommended method for powering the converter from a receiver plate supply. Capacitor is electrolytic. CR_3—1N753 Zener diode (Texas Instrument).

The shield partitions are cut from copper sheet stock. All shields are ¾ inch high. Be sure to leave clearance where the shield passes over the +6-volt line on the board near Q_1's socket. Solder the shields to the circuit board at all points where there is contact with the common side of the circuit. Solder the seam where the shields join under Q_1. Two pins, broken out of an old 7- or 9-pin miniature tube socket, are soldered into the board, and the oscillator crystal plugged into these pins.

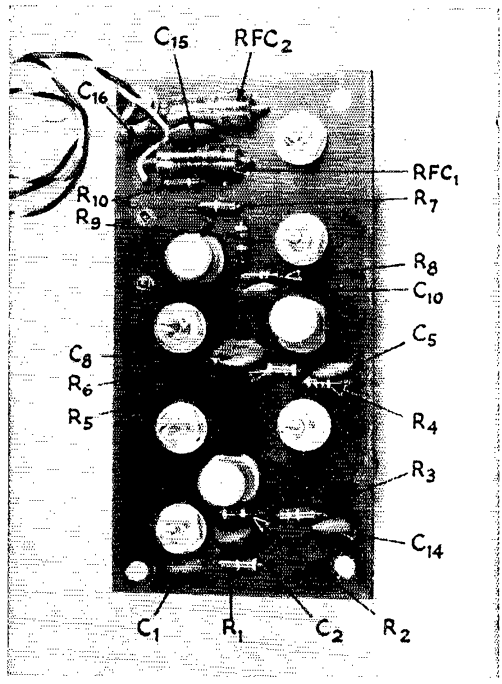
The shield leads on the transistors should be bent over to fit into the proper socket hole. The other transistor leads are cut off to about ¼-inch length and the transistors pushed into the sockets.

The circuit board is mounted in a Minibox with four 6-32 screws using ⅞-inch long spacers under the board. The connections to the coax receptacles are made after the board is mounted in the box. Holes are drilled in the cover so that the coils can be adjusted. Either 6- or 12-volt supplies may be used with this converter, and the current drain is 7.5 ma. with either voltage. Connections are made on the board at the points indicated in Fig. 5. Power may be obtained from a battery, an a.c. supply, or the receiver B supply if it will stand an additional 15-ma. drain. A simple 6-volt a.c.-operated supply is shown in Fig. 6, and Fig. 7 is a circuit for obtaining power from the receiver.

Alignment and Testing

To align this converter properly for flat response across the entire band, a sweep generator, oscilloscope and an accurate marker generator are necessary. However, fair results may be obtained by peaking the coils in the middle of the most-used range and then adjusting the slugs slightly for a constant noise output when the receiver is tuned across this portion of the band.

Before alignment is attempted, the coils must be checked for resonance. With the power *on*, check the r.f. coils L_2, L_4 and L_5 for resonance with a grid-dip meter. These coils should all resonate somewhere between 50 and 54 Mc., and the slugs in the coil forms should have sufficient range to vary the resonance between these two



Top view of the board. All resistors, capacitors and chokes are identified by arrows. The tuning slugs near the left edge of the board are, from bottom to top, L_2, L_4 and L_{10}. Near the right edge in the same order are L_5, L_7 and L_8. The transistor nearest the bottom is Q_1; Q_2 is at the right near the middle, and Q_3 is just above L_{10}. The two contacts to the left of Q_3 hold the crystal on the opposite side of the board.

frequencies. If any of the coils are off badly, check the value of the resonating capacitor and the number of turns on the coil. The value of the resonating capacitor may be changed slightly if necessary to bring the circuit resonance into the proper range.

The output coils, L_7 and L_8, should resonate at either 7 to 11 or 14 to 18 Mc., depending on

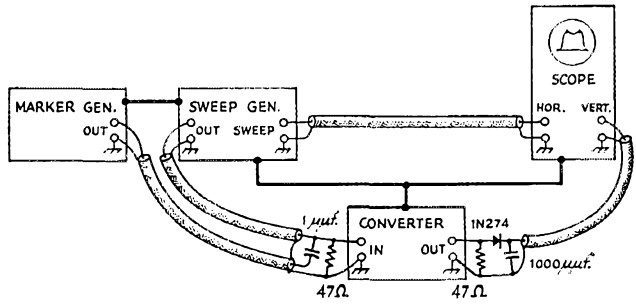
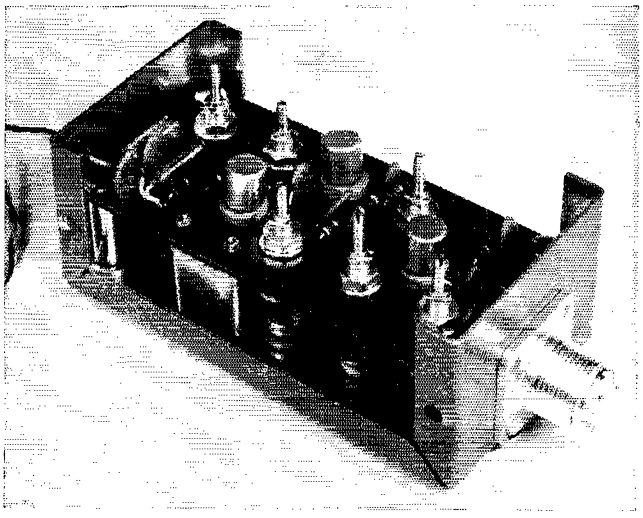


Fig. 8—Arrangement for using sweep-frequency and marker generators with an oscilloscope to align the converter. R.f. connections are made with 52-ohm coaxial cable. It is advisable to connect the cases of the instruments and converter with grounding braid or copper strap. Set the oscilloscope vertical gain at maximum, and adjust the sweep-generator output to give a trace 1 to 2 inches high.



The circuit board is mounted on spacers inside a 4 × 2⅛ × 1⅝-inch Minibox. The coils and the capacitors mounted on them are underneath, and the remaining capacitors, resistors and chokes are on top with their leads running through holes in the board. The antenna connector is on the right. The i.f. output fitting is on the far end and hidden in this view. Connections to these fittings are made after the board is in place.

which version is built. The oscillator coil should resonate at either 43 Mc. (with 7–11-Mc. output) or 36 Mc. (with 14–18-Mc. output). This should be checked with the crystal out of the circuit. The crystal should now be put back in place and the oscillator checked for oscillation. This may be done with a grid-dip meter or an r.f. probe and v.t.v.m. If there is no oscillation, adjust the slug in L_{10} slightly. The oscillator voltage at the emitter pin of transistor Q_2, with Q_2 out of the circuit, should be at least 0.2 volt as measured with an r.f. probe and v.t.v.m.

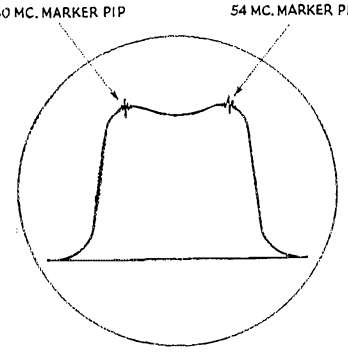


Fig. 9—Correct response characteristic as observed with the setup of Fig. 8. Set the marker-generator output to give as small a marker pip as can easily be seen (about 1/16 to 1/8 inch high). Too much marker injection will distort the curve.

After checking the circuits for proper resonance, the converter should be mounted in the case and connections made to the input and output as shown in Fig. 8. It is important that the input and output are both terminated with 47-ohm resistors; otherwise the response curve on the oscilloscope will not be correct. The slugs in coils L_2, L_4, L_5, L_7 and L_8 should be adjusted for a response as nearly like that shown in Fig. 9 as possible. The values of the coupling capacitors, C_6 and C_{11}, of the double-tuned circuits determine the distance between the two peaks on the response curve. If the distance between peaks is off by more than 1 Mc., the value of the coupling capacitors should be changed slightly to give a proper response. More capacitance will increase the spacing between peaks and less will reduce it.

The oscillator coil should be set by the following procedure: Watch the trace on the oscilloscope and start turning the oscillator slug either in or out. When the trace disappears, stop. Now count the number of turns in the other direction that it takes to make the oscillator stop. Set the slug halfway between these two points. This adjustment should be made with all covers on the converter housing. After adjusting the oscillator, check the settings of the other adjustments to make sure that installing the cover has not changed the response.

With a good antenna you should find that the noise goes up 1 to 3 S units when the antenna is plugged into the converter input. The noise figure is around 8 db., and the over-all gain is about 20 db. with 52-ohm input and output impedances. The converter has excellent overload characteristics and will not block or give spurious responses until the incoming signal from the antenna reaches approximately 0.2 volt.

The performance of this converter should convince even the most die-hard tube men that v.h.f. transistor equipment has arrived and is here to stay. QST

Strays

Some hams at Michigan Tech have formed a smallbore rifle team and would like to challenge other such rifle teams whose members include hams. Those on the Michigan Tech team include K8IFL, K8IFM, K8LHM, W9AGU, and K8NKR. If you're interested in a match, contact K8IFL at 504 Lake St., Ironwood, Mich.

• Technical Correspondence

DOUBLE-HUMPED FILTER RESPONSE AND INTELLIGIBILITY

250 Carl St.
Stage College, Pa.

Technical Editor, *QST:*

An interesting paper has been published by K. Kryter[1] describing experiments in which word and sentence intelligibility tests were conducted using filters having 500-cycle response centered at one, two and three frequencies (simultaneously) in the audio spectrum.

Since the crystal-lattice filters commonly used in s.s.b. have double-humped response (which has usually been flattened only with some difficulty) I wish to point out that the uncorrected double-humped response not only can pass intelligible audio, but can actually be used to advantage in poor signal-to-noise situations.

The conclusions arrived at by Kryter for the one-band system are summarized as follows:

1) For a 500-c.p.s. bandwidth filter, a center frequency of 1600–1700 c.p.s. appears best for speech intelligibility.

2) A 500-c.p.s. bandwidth is not intelligible enough for most communications systems.

The conclusions for a band-pass system using two 500-c.p.s. filters are:

1) The lower pass band should be centered around 500 to 750 c.p.s. This band contributes to "naturalness" and is essential to all speech systems.

2) The upper pass band gives the best results in either the region from 1500 to 1750 or from 2500 to 2700 c.p.s.

3) The 500-c.p.s. lower center frequency works better with the 1750-c.p.s. upper center frequency. The 750-c.p.s. lower center frequency works equally well with either the 1750- or the 2500-c.p.s. upper center frequency.

4) Two-band intelligibility is not as good as three-band intelligibility.

The conclusions for a three-band system are:

1) The optimum center frequencies for the three 500-c.p.s. band-pass filters are 500, 1500, and 2500 c.p.s., respectively. Observers uniformly agreed that the speech sounded natural and undistorted, maintaining the identity of the speaker.

2) A three-band system need have a total band width only half that of a continuous band-pass system for equal intelligibility.

3) In the presence of noise, equal intelligibility is achieved when the s./n. ratio with the best three-500-c.p.s. pass-band system is 5 to 10 db. lower than that required with the best nominal 1500-c.p.s. single pass-band filter system.

4) Audio components as much as 30 db. down from the maximum response contribute to the intelligibility for all systems.

In the practical case of the double-humped response of a lattice filter, it appears that the spacings between humps should be 1.2 kc., 1 kc., or 1.75 kc., to give the center frequency separations mentioned above for the two-band system. The center notch should be 30 db. down, but this may not be possible while still maintaining reasonable peak band widths. The outer skirts should also descend rapidly to more than 30 db. down for good noise suppression outside the desired band. In s.s.b. reception the b.f.o. should be set 500 c.p.s. below the lower center frequency in the first case, and 750 c.p.s. below in the second and third cases.

— *Angelo J. Campanella, K3IQU*

[1] Kryter, "Speech Bandwidth Compression Through Spectrum Selection," *The Journal of the Acoustical Society of America*," 32, p. 547–556, May, 1960.

ELECTRONIC EYEBALL

2608 S. Fern
Wichita 17, Kan.

Technical Editor, *QST:*

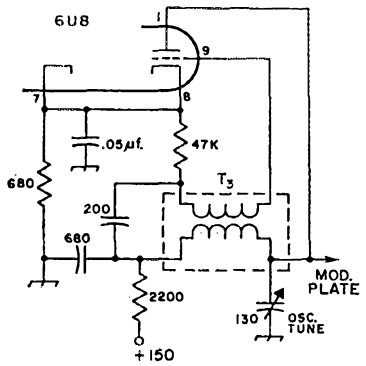
Since publication of the article on the "electronic eyeball"[1], I have received a number of letters asking for further explanation. These questions generally stem from four errors in the article:

1) The value of the sweep-width potentiometer is 0.5 megohm. This was omitted from the diagram, but picked up later in *QST*.

[1] *QST*, Jan. 1959, p. 37.

2) A 0.25-megohm ½-watt carbon resistor should be connected from the open end of the r.f. gain control to the 150-volt regulated line.

3) The 200-$\mu\mu$f. capacitor in the oscillator circuit should be connected as shown in the accompanying figure.



4) The Miller oscillator coil suggested in the text for 2-Mc. operation should be type 44-C, not 44-0.

Just recently, I purchased a new communications receiver (SX-111) which has a first i.f. frequency of 1650 kc. To convert the unit from 455- to 1650-kc. input I removed the surplus BC-453 coils and installed the Miller broadcast band coils as listed in the article. I found that when these coils are used the following changes must be made in the oscillator:

1) The 44-C oscillator coil should be removed from its shield can and coated with several coats of Q-dope to fix the wires to the form. This reduces frequency drift.

2) Switch the blue and green leads, then switch the black and red leads. These oscillator coils are normally wired so that the plate is connected to the tickler winding, and the grid is connected to the frequency-determining winding. In the eyeball circuit this is reversed, so the leads must be switched if the oscillator is to operate.

3) The 200-, 670-, and 100-$\mu\mu$f. capacitors in the oscillator/modulator frequency-determining circuit must be changed to NP0 types.

The coil coating, plus the change to NP0 capacitors, cured a very troublesome drift problem when the unit was changed from 455-kc. to 1650-kc. operation. The unit was connected to my SX-111 1650-kc. i.f. stage in the same manner as described in the article.

— *Louis I. Hutton, WØRQF*

PHONE RECEPTION WITH THE HBR-16

Box 391
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Technical Editor, *QST:*

I have finished building the HBR-16 receiver which appeared in the October 1959 issue of *QST*. With the aid of the HBR notes and the enlarged photographs, I found constructing this receiver similar to constructing a commercial kit. The HBR-16 project is somewhat more of a challenge than a kit; in my opinion, the constructor gets a liberal education in receiver circuitry.

The performance of this receiver is outstanding. The stability is there, the selectivity is more than I had hoped for, and the gain is such that separate manual i.f. gain and mixer gain controls were added. After using such a feature, I am surprised that the more expensive ham-band receivers have not incorporated these items.

In my opinion, the selectivity of the HBR-16 was a little too great for a.m. phone reception. The missing sidebands gave me an unfamiliar type of audio response which to my ears was very unpleasing. After calling this to the attention of Mr. Ted Crosby, the author of the article on the HBR-16, he suggested that if I planned to use it mostly on phone reception I try stagger-tuning the i.f.s. I stagger-

(*Continued on page 192*)

• Beginner and Novice

A Simple Antenna System for the Novice

Using Random-Length, End-Fed Wires

BY LEWIS G. McCOY,* W1ICP

An antenna that gets wide use on the lower-frequency bands, particularly with newcomers, is a random length of wire. The customary procedure is to have one end of the wire connected directly to the output terminal of the transmitter and the other end supported by a tree or mast. (Users of such antennas often refer to their antennas as "long" wires, although a long wire, as considered in connection with directive systems, is usually several wavelengths long at the operating frequency.) As with any antenna, there are certain problems one is likely to encounter in getting the system to work. In this article the random-length antenna will be discussed.

How Long An Antenna?

If the correct coupling methods are used between the transmitter and antenna, a wire that is quite short for the frequency can be made to work, although it is generally true that the shorter the antenna for a given frequency, the poorer its over-all performance. It is customary procedure to recommend antenna lengths no shorter than one-quarter wavelength for the frequency in use. However, shorter lengths will work and produce contacts.

For example, on 75 meters a quarter wavelength is about 60 feet long. Amateurs who operate 80-meter mobile usually have an 8-foot long whip for the antenna. A few years ago, W1BDI, the ARRL Communications Manager, operated 80-meter c.w. from his car on a trip around the country. Using 25 watts input and a short whip antenna, he managed to maintain a daily schedule with Headquarters from distances well over 2000 miles away. This example is mentioned to show the amateur with restricted antenna space that 80- and 40-meter operation is possible using very short antennas.

Nevertheless, assuming that multiband operation is planned with 80 meters as the lowest band, try to make your antenna at least 65 feet long. There are two general rules you can follow with this type of antenna — make it as long as possible and get it as high above ground as you possibly can. If you don't have a straight run of at least 65 feet, it is possible to bend the antenna to make up the difference. In other words, part of the antenna can be run at right angles in order to increase the over-all length. If you find it impossible to get a 65-foot run then make the antenna just as long as you can. The shorter antennas, while not having as good performance, will produce plenty of contacts.

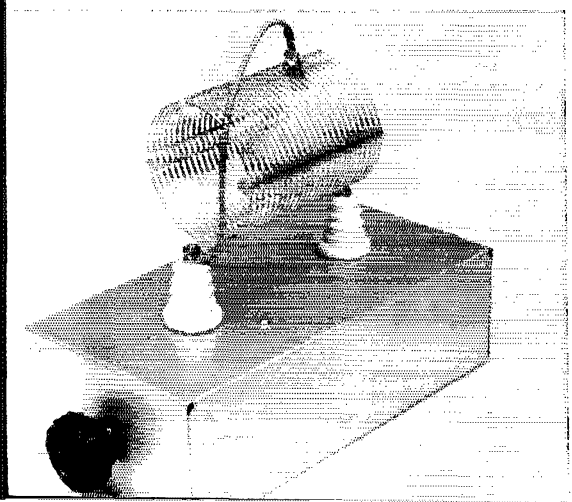
Shown in Fig. 1 are a couple of examples of typical installations. For example, if your shack is in the cellar or first floor, you can run the wire out the window, up to the eaves, and then out to the mast or support. If your mast supporting the far end of the antenna is high enough, you can bring a portion of the antenna back down toward ground to increase the overall length.

There is no way to predict in advance what the pattern of your antenna will be. The simplest approach is to put it up and try it. You'll soon discover which directions are best by the reports you receive. By all means, don't be afraid to experiment with different antenna layouts. You might be pleasantly surprised by the results.

What Materials To Use

Practically any kind of antenna wire can be used, either copper or aluminum, bare or insulated. However, No. 12 or 14 copper, copper-weld, or "copper-clad" is preferable. The antenna wire should, of course, be insulated wherever it goes through a wall or window and where it is supported. Flexible plastic tubing, available at any parts distributor, can be slipped over the wire at windows or through walls. Ordinary dime-

* Technical Assistant, *QST*.



The knob on the front of the chassis is the control for C_1. The clip lead, which is 9 inches long, is connected to the input end of the coil. An E. F. Johnson type LC8 is used for the clip. Feed-through insulators are used to hold the coil in place. A clip on the antenna lead can be used for connecting the antenna to the output end of the coil.

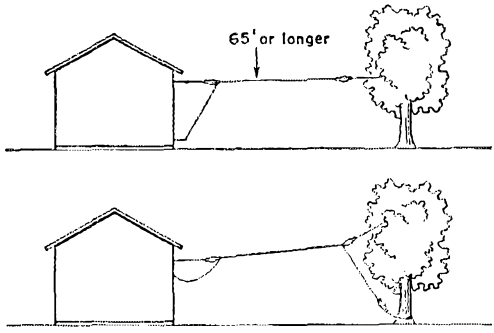


Fig. 1—These drawings demonstrate a couple of different methods for installing the antenna. As mentioned in the text, try to get the antenna as high as possible above ground.

store glass insulators can be used as end or support insulators.

Some amateurs who have landlord problems use a very fine wire, No. 30 or smaller, because the wire is practically invisible when it is up in the air. With fine wire, rubber bands can be used for supports and insulators. If you happen to be in such a situation it is worth while to consider such an installation. (You'll probably have to make the installation after dark, so don't lose the wire putting it up!)

Coupling the Antenna to the Transmitter

In many instances the end of the antenna can be connected directly to the antenna terminal on the transmitter. Most transmitters these days have a pi-network tank circuit which is capable of coupling over a wide range of values. There is no simple method of determining what the end of the antenna "looks like" to the transmitter. Depending on the band and frequency, the impedance at the end of the antenna will range from a few ohms to several thousand. For this reason a wide-range coupling circuit is needed at the transmitter, otherwise the transmitter will not load. Your instruction book for the transmitter should tell you what values the pi network will work into. While not in the Novice class, it should be pointed out that there are a few commercial rigs that will only work into a 50-ohm load. Only in rare instances will this type of antenna work out to be 50-ohm impedance. For this reason a coupling or matching circuit should be installed between the rig and antenna.

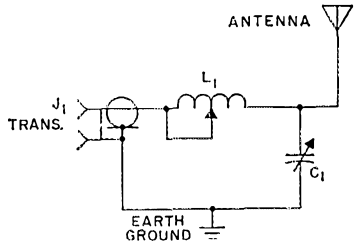


Fig. 2—Circuit diagram of the simple antenna coupler.
C_1—140-$\mu\mu$f. variable (Hammarlund MC-140-S, E. F. Johnson 140R12, or equivalent).
J_1—Coax chassis receptacle, SO-239.
L_1—24 turns No. 12, 6 turns per inch, 3-inch diameter (Air Dux 2406).

The Coupler

Shown in Fig. 2 is the circuit of a simple antenna coupler. The circuit consists of a coil, L_1, and a variable capacitor, C_1. In order to have the right amount of inductance for any band the coil is provided with a shorting clip which is used to short out turns on the coil. The unit shown in the photograph was mounted on a 3 × 5 × 10-inch chassis. There is nothing critical about the construction; in fact, the whole unit can be mounted "bread-board" style if desired.

The coupler should be connected to the transmitter via a length of coax line; either 50- or 70-ohm line will be suitable. The length of coax used will, of course, depend on where you mount the coupler. Some hams prefer to have their couplers mounted near where the antenna enters the shack and others want it near the transmitter. The latter position makes for easier adjustments.

If you have an s.w.r. bridge such as the Monimatch[1] or a similar type, it should be installed in the coax line. The use of an s.w.r. bridge is recommended because it will show you when the coupler is correctly adjusted and also serve as an output indicator. If you don't have a bridge, then you can use an output indicator such as a flashlight lamp in the antenna lead or a neon bulb touched to the end of the antenna.

Note in Fig. 2 that the coupler is connected to an external ground. (This is in addition to the ground connection that always should be made to the transmitter itself. See the Stray on page 69 of this issue.) This can be a water pipe or a connection to a ground rod driven in the earth. The setup will work without the ground connection, but you'll probably get better results if you use one. The thing to do is to try the coupler both ways.

Adjustment Procedure

Connect the end of the antenna to the coupler at the junction of C_1L_1 as shown in the circuit diagram. If you are using enamel-covered antenna wire be sure to scrape off the enamel! Let's suppose you are starting off on 80 meters. Turn on the rig and resonate the final amplifier for a dip in the plate-meter reading. If you are using an s.w.r. bridge, switch the bridge meter to read reflected power and then adjust C_1, looking for a dip in the bridge meter. Unless you are very lucky you probably won't get an indication because the coil tap won't be at the correct spot. Start at one end of the coil and short out one turn at a time. Continue adjusting C_1 until you reach a point where the bridge meter starts to dip or "null." Retune the amplifier tank circuit to resonance each time you adjust C_1 or the tap.

Once you get close to the correct tap point you'll probably have to move the tap a fraction

[1] See the measurements chapter of the ARRL *Handbook*.

of a turn at a time in order to get a complete null on the bridge meter. When you find the correct tap point, switch the bridge meter to read forward power. Next, adjust the transmitter loading control to bring your plate current up to whatever full loading is supposed to be. Don't change the settings of the tap or C_1 because once you have the coupler adjusted for a null as indicated by the bridge meter, the coupler is correctly adjusted for the frequency you are using. You can use the forward power reading of the bridge meter to help you adjust the transmitter tank capacitor and the loading control. Tune the transmitter controls for maximum power output as indicated by the bridge meter while keeping the plate current reading to whatever limits are required for the transmitter in use.

If you are using an output indicator instead of a bridge, keep adjusting C_1 and the tap until you get an indication of power output. Be sure to resonate the plate circuit of the transmitter for a plate meter dip as you make each adjustment of C_1 and the tap. The idea here is to get the maximum power output for a given plate current reading. When you have such a condition the coupler will be adjusted correctly.

Make a note of the settings of C_1 and the tap position and then proceed to the next band. Keeping a record of the settings will make it that much easier when you want to switch bands. The same adjustment methods outlined above should be used on the other bands. QST

For the Command Receiver:

Noise Limiter, A.V.C., and S Meter

BY LEWIS G. McCOY,* W1ICP

The modifications described here add to the basic ARC-5 set features most amateurs want in receivers nowadays. Although worked up primarily for the BC-455 in the v.h.f. converter combination described in November QST, they can be applied to any of the several similar models in the ARC-5 series.

RECENTLY in *QST* it was shown how an economical two- and six-meter receiving setup could be made, using a BC-455 as a tunable i.f.[1] While the BC-455 makes a good receiver for the purpose, a few simple additions will make it even better. These additions include a noise limiter, an S meter, an audio gain control, and improved a.v.c. This article will show how to make the improvements.

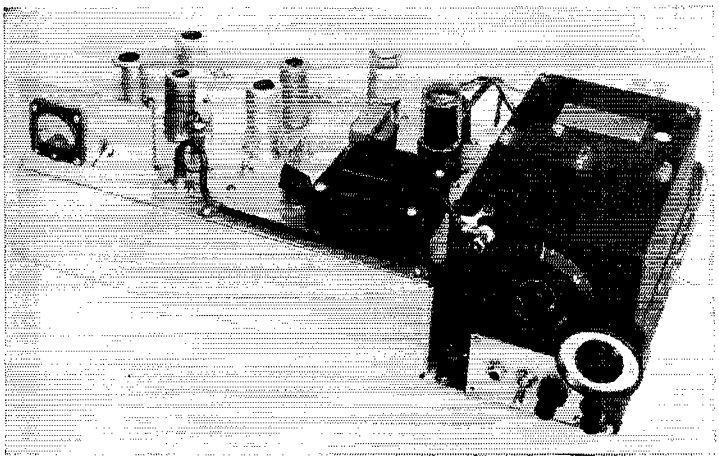
Improving the A.V.C.

A better a.v.c. system can be incorporated into the BC-455 by the simple addition of two resistors and a capacitor. Shown in Fig. 1 are the original and modified circuits. This diagram also shows the noise limiter circuit which will be treated a little later. In Fig. 1 the original wiring is shown by light lines. All the components and wiring shown with the heavier lines are the additions. If you happen to have access to a complete diagram of the BC-455 you'll find that the circuit component designations in the upper drawing are the same as those in the original circuit.

The first step is, of course, removing the bottom plate of the receiver. Locate the socket for the detector tube. Some models of the receiver used a 12SR7 while others had a 12SQ7 for the detector. However, this is unimportant because the base connections for both tubes are identical. On

* Technical Assistant, *QST*.

[1] *QST*, Nov. 1960, p. 39.



At the far left of the converter chassis is the small panel that holds the S-meter and S_3. The 6C4 is visible just to the rear of the r.f. output connector. On the BC-455 panel the audio gain control is just below the main tuning knob. The noise-limiter switch and the shielded lead from the S-meter circuit can be seen on the side of the BC-455.

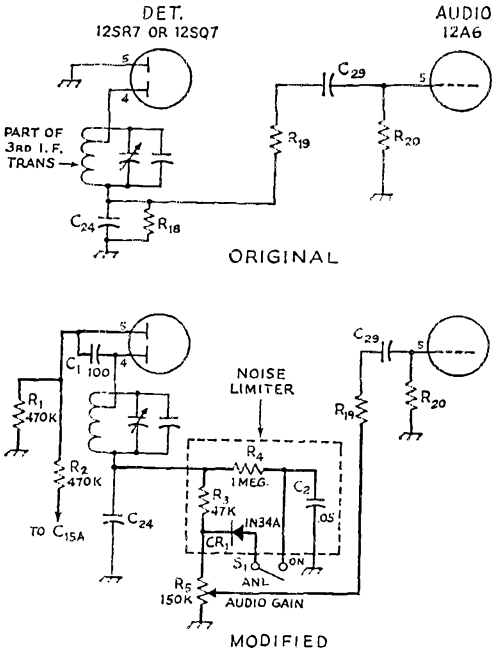


Fig. 1—Circuit diagram showing the original and modified circuits for the a.v.c. and noise-limiter additions. Wiring shown in the heavy lines indicates added components. All resistors are ½ watt.

C_1—100-$\mu\mu$f. mica.
C_2—0.05-μf. (or 0.047-μf.) 200-volt paper.
CR_1—1N34A germanium diode.
R_1, R_2—0.47 megohm.
R_3—47,000 ohms.
R_4—1 megohm.
R_5—0.15-megohm potentiometer, audio taper.
S_1—S.p.s.t. toggle switch.

checking the socket connections you'll find that Pin 5 is connected to the chassis. Remove this lead from Pin 5. Next, connect a 100-$\mu\mu$f. mica capacitor, C_1, between Pins 4 and 5. Connect a 470,000-ohm resistor between Pin 5 and chassis. Another 470,000-ohm resistor should be connected between Pin 4 and C_{15A}. C_{15} is a potted capacitor consisting of three sections, 0.05 μf. each, and is located directly below the 12A6 audio tube. The terminal you want is the one closest to the front of the BC-455; leave the old (blue) lead connected when you solder on the new lead. Next, find R_{11}, a 100,000-ohm, ½-watt resistor (brown-black-yellow) mounted on a block of four resistors located on the same side of the chassis as C_{15}, close to the 12SK7 socket. Remove R_{11} from the circuit by heating the mounting points and gently pulling up on the leads.

When operating c.w., the a.v.c. should be turned off. This is made possible by changing the b.f.o. switch (S_2 in Fig. 4 of the November article) from an s.p.s.t. to an s.p.d.t. toggle. This modification is shown here in Fig. 2. The arm of the switch should be connected to chassis ground and one switch terminal to Pin 5 of the connector in the front compartment of the BC-455. The other switch terminal should be connected to Pin 3 of the connector. Connect an insulated wire between the base of Pin 3 and the junction of C_{15A} and the 470,000-ohm resistor, R_2. You'll have to remove the plug-in coil assembly that is immediately to the rear of the connector in order to get at the base of Pin 3. The coils can be taken out by first removing the two screws, one on either side of the BC-455, that hold the coils in place. Once the screws are removed, the coils can be lifted out.

While you have the coils out, install the audio gain control, R_5 in Fig. 1. In order to have enough room for mounting the gain control, remove the 3-μf. potted capacitor that is mounted on the front panel of the receiver. The capacitor is held in place by two screws. Unsolder and remove the lead that goes from the capacitor to the base of Pin 1 on the connector. Next, mount R_5 in the space formerly occupied by the capacitor. Connect a lead from one side of R_5 to chassis. The remaining two leads to R_5 can be installed when the noise limiter is wired into the set. Replace the plug-in coil assembly, making sure that none of the wiring to the base terminals of the connector is shorted to the coil box.

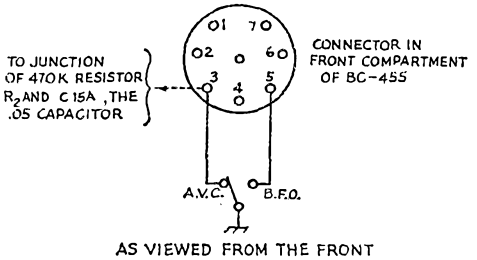


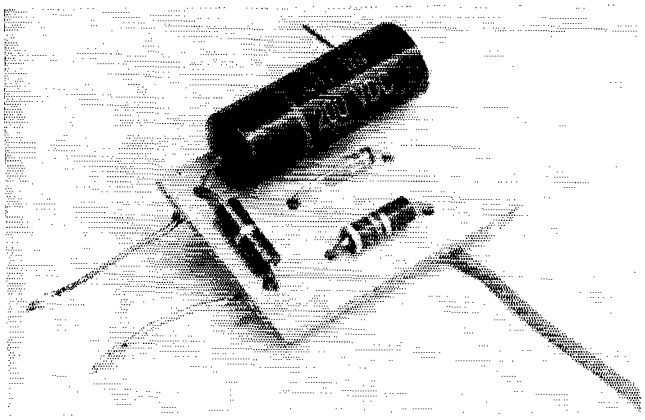
Fig. 2—Drawing showing the installation of the a.v.c.-b.f.o. switch. Not shown are the r.f. gain control and headphone jack (see Fig. 4 of the original article).

The Noise Limiter

The simplest method of installing the noise limiter is to mount all of the components, with the exception of R_5 and S_1, on a small insulating board. The assembly is shown in a photograph. A piece of bakelite or plastic dishware available in any dime store can be used for the board. The board shown in the photograph was cut from a plastic saucer.

When soldering connections to the 1N34A germanium diode, CR_1, hold the lead with a pair of pliers between the point being soldered and the body of the diode. Too much heat can ruin the diode and the pliers will prevent excessive heat from reaching the body of the diode.

An s.p.s.t. switch, S_1, is used to switch the noise limiter in or out as needed. There isn't enough room to mount the switch on the front panel of the BC-455, so the next best spot is on the side of the unit. The switch is installed between C_{15} and the next potted capacitor toward the front of the BC-455. This latter unit has the BC-455 designation C_{30}, and is a 15-μf. audio



The noise-limiter components mounted on an insulating board. The text describes the connections for the various leads coming from the board. The resistor at the left is R_4. In color-coded diodes, the end toward which the colored bands are grouped is the cathode. Other types have a bar or dot to indicate the cathode.

bypass capacitor. It is necessary to remove the bottom screw holding C_{30} and swing the capacitor more toward the front of the receiver in order to get enough room for S_1. At the same time you mount the switch make a ⅛-inch hole in the chassis wall beside the switch. This hole will be used for the lead from the S-meter circuit.

Next, locate R_{18}, R_{19}, and C_{24} (BC-455 circuit numbers). The two resistors are on a block just to the left of and below the 12SR7 socket as you view the bottom of the set with the panel to the left. The first resistor is R_{18}, 510,000 ohms (green-brown-yellow), and the second is R_{19}, 100,000 ohms (brown-black-yellow). Remove R_{18} from the receiver. One side of R_{18} was grounded and the other side was connected to R_{19} and also, through a short lead, to C_{24}. Lift this short lead at the end where it was attached to R_{18}. Next, connect an insulated wire from R_{19} to the arm of the audio gain control, R_5. Dress this lead across the chassis and then down the side to the front, running it under the potted capacitors along the side. You can now install the board holding the noise limiter components in place.

The lead from the junction of R_3 and R_4, Fig. 1, should be connected to the end of the short lead you lifted from R_{18}. The lead from C_2 to chassis ground can be connected to the ground terminal that formerly held R_{18}. An insulated lead from the junction of R_3 and CR_1 should be dressed along the side of the chassis up the remaining terminal on the audio gain control. The remaining two leads from the limiter board should be connected to the two terminals on S_1.

S-Meter Addition

Fig. 3 is the circuit diagram for the S meter. A 6C4 triode is used because its heater current is only 150 ma., and the power transformer used in the original converter unit will handle this additional heater current.

As can be seen in the photograph, the components for the S meter are installed at the left-hand corner of the converter chassis. The meter, M_1, and s.p.s.t. toggle switch, S_3, are mounted on a small panel made from a piece of aluminum. There is nothing critical about the installation of the various parts for the circuit.

The 130-volt lead to the junction of the two 470-ohm resistors was taken from the arm of S_{1A} of the November circuit. The control voltage for the S-meter circuit is fed from the BC-455 through the octal socket, J_4, of the November circuit, and the lead from the 6C4 grid to J_4 should be run in shielded wire to avoid chances of stray pickup. Connect this lead to any unused terminal on J_4. Another shielded lead should be connected to the corresponding terminal on P_1, the lead from P_1 being dressed around the side of the BC-455 and into the hole next to the noise-limiter switch. The end of this lead should be connected to the junction of C_{15A} and R_2, the .47-megohm resistor.

Toward the rear of the BC-455 are two 10-watt resistors mounted in a vertical position. At the bottom (closest to the chassis) of the one on the same side of the receiver as C_{15} is a terminal with a black lead connected to it. Remove this lead from the terminal. This increases the screen voltage on the r.f. and i.f. tubes in the BC-455, resulting in more satisfactory S-meter indications.

In order to adjust the S meter, turn on the

(*Continued on page 190*)

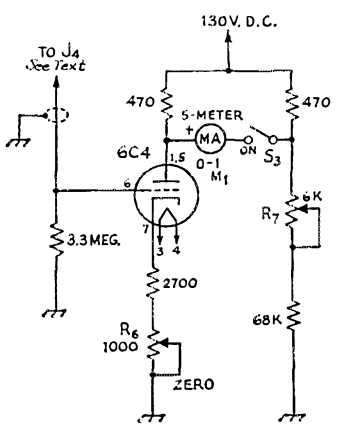


Fig. 3—Circuit diagram of the S meter. All fixed resistors are ½ watt.

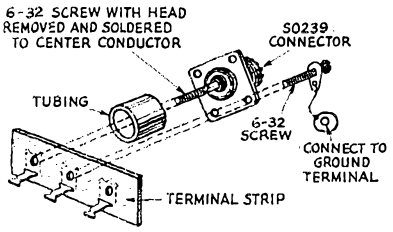
M_1—0–1-ma. milliammeter.
R_6—1000-ohm control.
R_7—6000-ohm control.
S_3—S.p.s.t. toggle.

Hints and Kinks For the Experimenter

COAX-TO-TERMINAL-STRIP ADAPTER

THE accompanying sketch shows how I added a coaxial connector to the antenna terminal of my RME 4350 receiver. This method eliminates the need for drilling a hole in the receiver's chassis to mount the connector. Remove the head from a 6-32 screw and solder the screw to the center conductor of the coax connector. The connector is then screwed into the terminal strip with a section of small tubing inserted as shown in the sketch. Another 6-32 screw is inserted through one of the holes in the connector flange and is screwed into the other antenna terminal. Also connected to this screw is a lead that is attached to the ground terminal on the terminal strip. Almost any terminal strip can be used with this scheme since spacing between the lugs seems to be a standard ½-inch, which is just the right measurement to line up with the holes in the SO-239 connector.

— *Dr. L. M. Salinger, K5MSQ*



K5MSQ's coax-to-terminal strip adapter.

BOTTLING UP CHEMICAL FUMES

CORROSIVE vapors from chemicals commonly used around the ham workshop can be contained more effectively by storing the liquids in flexible plastic bottles. Fill the bottle about one half to three quarters full, then squeeze the bottle until the liquid almost reaches the top of the bottle. Now screw on the lid. This action creates a region of reduced pressure inside the bottle. If there is a slight leak around the lid, the chemical fumes will be contained inside the bottle since the air outside the container will be sucked into the bottle. The squeezing action will probably have to be repeated periodically, depending upon the size of any leak.

— *Robert L. Martin, K1CJX*

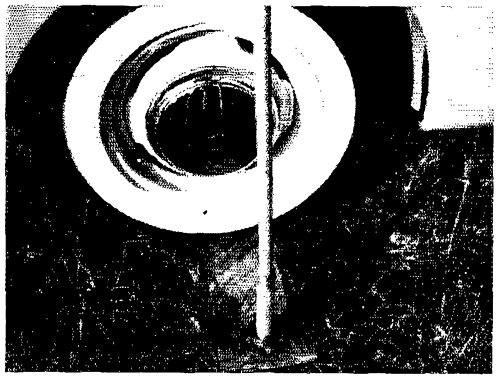
RESURRECT BROKEN TRANSISTORS

IF YOU have a transistor that is not usable because of a broken lead, take a small needle and force it into the opening around the broken lead and apply some cement to strengthen the connection. If the transistor is going to be soldered into a circuit, it probably would be wise to solder a lead to the needle before it is inserted into the transistor.

— *Earl F. Hardwick*

PORTABLE MAST HOLDER

THE accompanying photograph shows the arrangement used by K1CCL for supporting an antenna mast on portable location. A pipe flange is attached to the piece of plywood. A short length of pipe which will mate with the threads of the flange is also necessary. To use the mast holder, place the board on the ground and drive the car up on it so that one of the wheels is on top of the board. Screw the pipe into the flange and insert the mast in the pipe. The entire assembly can be carried in the trunk if the mast is made up of attachable sections. This scheme will work with most v.h.f. antennas and probably would also take care of a lightweight low-frequency beam.



EARPHONE COVER PADS

OLD-FASHIONED uncomfortable headphones can be modernized by outfitting them with a set of vinyl plastic doorknob covers available from most hardware or five-and-dime stores. Cut a small hole in the center of each cover and slip the covers over the phones. The earphones can then be worn much longer without discomfort.

— *Les Collum, K0RHI*

12-VOLT SYSTEM FOR VOLKSWAGEN

WHILE planning a mobile installation for my new Volkswagen, I learned that an accessory electrical system is available from all franchised VW dealers. The system consists of a 12- (or 6) volt generator, the necessary mounting brackets and hardware, 6- or 12-volt large capacity battery, and voltage regulator. This accessory system is entirely separate from the original electrical

system. Although primarily intended for use with the VW bus or truck, the system will fit the sedan without modification.

— *Dave Farris, W3VBP*

BROKEN TAP REMOVER

WHILE tapping a hole in some aluminum stock I broke off the tap inside the hole. I tried to grip the broken piece with pliers to no avail. Every method I could think of to remove it would destroy the original hole or the threads. A chemist friend of mine suggested that I immerse the part in 50 per cent solution of nitric acid. I tried this and in a few hours the steel tap was completely dissolved and the aluminum was none the worse for wear. If the aluminum piece is too large for immersion, an eyedropper can be used to apply the acid.

— *John S. Sisson, jr., WA2GWF*

MAGIC-EYE TUBE HINT

PART of the heater voltage in the popular Command Set transmitters is used as bias on the 1629 magic-eye tube. This is fine when the transmitter is used with a d.c. heater supply, but most amateurs use a.c. on the heaters, which gives the tube picture a fuzzy appearance. To use the 1629 with an a.c. heater supply, disconnect its cathode and ground it through a bias resistor. The value is not critical; something like 4700 ohms, ½ watt, should do.

TRANSISTOR GAIN CHECKER

IT is possible to measure the small signal current gain (beta) of a junction transistor by means of the simple circuit shown in Fig. 1.

An audio signal source of one volt r.m.s. at 1000 cycles is required. This can be supplied by an audio signal generator. The tone from the generator is fed into the input jack of the checker. Also, an a.c. voltmeter will be needed, preferably a.v.t.v.m.

First apply the voltmeter to the input and adjust the signal source for one volt. Connect the voltmeter to the output and adjust R_1 until a maximum reading is obtained on the output voltmeter. The output current is $\frac{E}{1000}$ and the gain is found by dividing the output current by 10μa. The diagram shown is for checking p-n-p transistors. In order to measure n-p-n units, reverse the battery polarity.

— *Sol Davis, W3WPN*

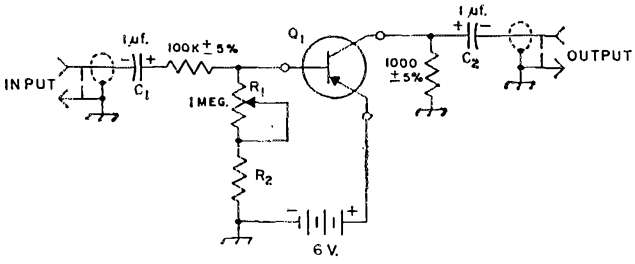


Fig. 1—Transistor beta checker. C_1 and C_2 should preferably be nonpolarized capacitors. However, the polarized type can be used if proper polarity is observed. Resistor R_2 should have a value that will limit the base current to a safe value in case R_1 is set at minimum resistance.

METER SAFETY

WHILE building a transmitter recently, a problem arose concerning the method to be used in protecting exposed meter terminals. The solution finally evolved from the use of a pair of ceramic plate caps is shown in the accompanying photograph. Most meters of the 2½-inch variety or larger come with a pair of washers on the terminals. When the terminal nuts are tightened down on the washers, Millen No. 36002 or National SPP-3, ¾-inch plate caps should slide over the washers, forming a tight connecton. If these fit too loosely, perhaps a modification of Millen 36004 will serve better.

Of course, before the caps are placed on, the leads for the meter should be soldered to the cap connections.

— *A. Gordon Davis, KN1LYO*

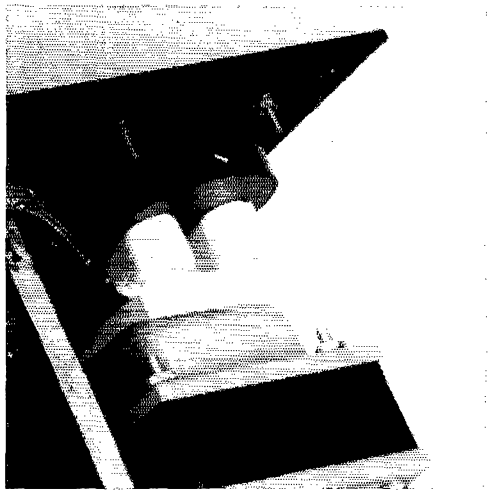


Plate caps used to protect exposed meter terminals.

USE OF BUG KEY AS SIDESWIPER

THE ordinary bug key can be used as a sideswiper merely by Scotch taping the vibrator arm to the damper and readjusting the bug. The "feel" and action of the original bug are not lost by doing this.

—*Katashi Nose, KH61J*

PEPPING UP THE SPARC TRANSCEIVER

THE greatest limiting factor in the SPARC transceiver written up in July, 1959, *QST*, was the operation of the receiver section. The modifications shown in Fig. 2 will improve the performance of this section and can be made without any major overhaul in the original unit.

The circuit utilizes a separate interruption frequency oscillator for the superregeneration detector. The heart of the circuit is the coil, L_1, which is obtainable from most radio supply houses. The voltage from the oscillator is coupled into the plate circuit of the detector through the transceiver transformer, T_1, and the choke, RFC_2.

Changing over to the new circuit is quite simple. The original 1T4 detector tube is replaced with a 3A5 dual triode with proper socket connection changes. Note that it is not necessary to change the position of L_5, C_1 or C_2. The 0.22-μf. decoupling capacitor shown in the original photo (page 28, July, 1959, *QST*) is not used in this new circuit. The new coil, L, can be mounted on a small angle bracket and then attached to one of the coil mounting studs which fit neatly under the chassis. Many original builders had difficulties because C_1 was not mounted in the prescribed manner. It is strongly advised that C_1 be mounted according to original instructions.

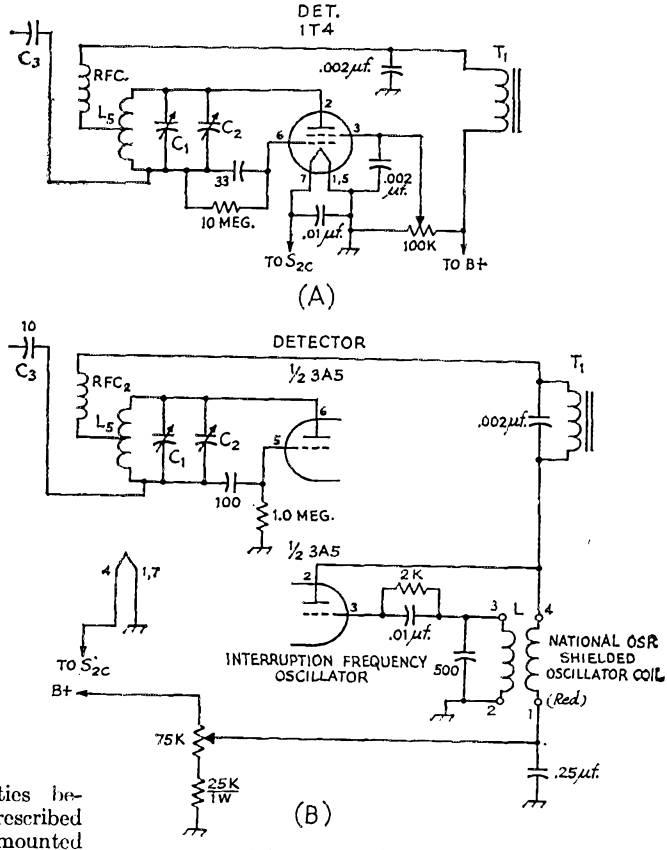


Fig. 2—Before (A) and after (B) receiver circuit of the SPARC transceiver. All capacitances are in $\mu\mu$f unless specified otherwise. Inductance *L* is a National OSR oscillator coil.

To identify the proper leads of the coil L_1, consider the lug with the red paint marker as lug 1, with lugs 2, 3, and 4 following clockwise (viewed from the bottom). A 3-lug terminal strip is mounted just below the 0.25-μfd. capacitor and accommodates the two leads from T_1 and its associated parts. The Z-50 RFC_2 can be seen below the 0.25-μf. capacitor and the 0.002-μf. disk ceramic below the RFC_2. The 2000-ohm resistor and 0.01-μf. capacitor combination to Pin 3 of the 3A5 can be seen to the left of C_2, the 3–30-$\mu\mu$f. ceramic trimmer. Note the 100-$\mu\mu$f. mica capacitor over the 3A5 tube socket and the 10-$\mu\mu$f. tubular ceramic capacitor, C_3, just to the right of the tube socket. Although not visible in the photograph, L_5 is still mounted well away from C_1 and C_2 in such a manner that it extends partly below the chassis as shown in the original article. High voltage to the 75,000-ohm potentiometer is taken from a terminal strip near the 1T4 amplifier tube. — *L. F. Worthington, K4HDX*

NOISE LIMITER FOR HYBRID RECEIVERS

PRACTICALLY all of the automobile b.c. sets today are of the hybrid variety which require a plate voltage of only 12 volts. The dark lines in Fig. 3 show the circuit of a self-adjusting series limiter that can be used in hybrid circuits. It is important that the diode CR_1 be silicon and of the high-back resistance type. Some silicon diodes give only fair results and germanium diodes will not work at all. The 1N658 computer diode works well in this application and its performance can be compared to that of a vacuum tube. The limiter can be switched out of the circuit by shorting the diode CR_1, but the leads to the switch should be as short as possible and must be shielded. — *Samuel M. Bases, K2IUV*

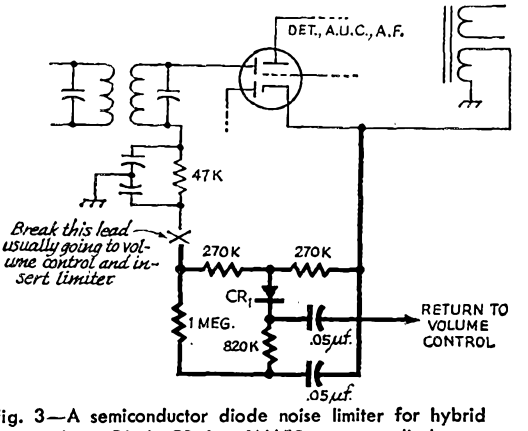


Fig. 3—A semiconductor diode noise limiter for hybrid receivers. Diode CR_1 is a 1N658 computer diode.

1960 Field Day Report

UMPTEEN million mosquitoes, as many pesky ants, a multitude of moths, a billion black flies (the kind that bite), and 13,488 hams all assembled on Saturday, June 25, for Field Day 1960. The scene varied from a hilltop panorama in New England where beams were going up under threat of tornadoes to the fields and pampas of the South and Southwest, where masts were being raised in the greatest downpour seen thereabouts in years. That Saturday scene contrasted from a picturesque bluff overlooking the Mississippi, to a majestic corn-field of the Midwest, to a lofty crag in the Rockies, to the fertile valleys of the usually wet Pacific Northwest, where guys were anchored under blue and sunny skies. From Lost Lake, British Columbia, to Dog Island, Florida, one could hear: "*Pitch that tent . . . Fasten that guy. Not him, the wire! . . . Hoist up that beam . . . Don't burn my hamburgers. . . . Who checked the generator last? . . . Which way's the beam pointed? . . . Hey, we worked him before.*" Like the 1775 shot heard round the world, 1960 Field Day shouts echoed: "*449, eh; well, we'll fix you . . . turn on the high power, boys . . . grrr!*" "*What's that wire I just tripped over outside?*" And such famous last words as: "*You're sure that guy's going to hold that mast?*" "*Weather man said we're in for a nice sunny day.*" "*Now lessee; at the flip of this switch I can read the s.w.r. on this antenna. Hmmmm.*" Click.

←← This just about tells the entire 1960 Field Day story. Photo (1) finds the Old Natchez ARC, W5KHB/5, putting the finishing touches on their beam installation. (2) Probably the most popular guy on Field Day is the chief chef. W6OCD here whips up grub for the Ampex ARC, K6QEZ/6. (3) Of course no Field Day is complete without the generator like that of W1LNI/1. (4) We came here to operate and that's just what we're doing says the Coshocton County ARC. (5) W9SXL amens that for the Central Illinois RC, W9AML/9. (6) Pausing between contacts for a munch on a hamburger is this teen-age operator for the Cumberland Valley ARC, K3GFW/3. (7) The South Jersey Radio Assn., K2AA/2 found these new quarters this year. (8) "Hoist away,"— Vermillion County AR Assn., W9MJL/9. (9) This nice operating tent belongs to the Lake Success RC, W2YKQ/2. (10) And SCV-SCM K6DYX gets in his licks for the Monterey Bay RC, W6UCS/6. (11) Meanwhile the Muskegon Area AR Council, W8ZHO/8 prefers this style of nighttime operating. Yawn!

Just about all set for FD action is this cubical quad being put together by the Caribbean Air Command MARS RC, KZ5AF/KZ5. Handling its construction are from left to right: KZ5s RB, BS, RR, LL, and W3VOC.

Band conditions in almost all areas were at least good everywhere and simply sizzling in many places. V.h.f. disappointed a little in the East where DX was hard to come by. Many a FD installation was counting on a better score from their v.h.f. set-ups. Forty meters, as thick as molasses, called for a really efficient antenna system to buck the knee-deep QRM on that band. Eighty and 75 meters was reliable even through the night in most areas, being spared of wee-hour black-outs of the past few years. Sideband rigs are becoming a must on 20 meters to score big on voice on that band. Twenty c.w. was a little sporadic but generally reliable. Ten and 15 meters varied as much as being nil in some areas to being "our best band" in other sections of the country.

While sinking our crunchers into a juicy steak, we often forget that the main feature of Field Day is making contacts . . . making contacts, that is, *with emergency power*. Those groups that proved that they could handle communications efficiently and effectively without commercial power are the real winners on Field Day whether they made one contact or a thousand. In a natural disaster *you* might be called upon to operate in like manner as Field Day. Hurrah to those clubs, individuals, and groups that have their stations and generator on immediate recall duty to the field.

Contacts, multipliers, scores, competition . . . spur us on to greater performance heights. In the score department the Valley Amateur Radio Club, W7HZ/7 chorused with joy: "Well at last we attained the score we should have had either of the last two years. 1958 buried us with Mr. Borealis, and 1959 took pot-shots at us with atmospherics. But ah! 1960 . . . beautiful conditions, blue sky, and all rigs ready to go. This had to be it, and those of us who had been pointing for this day for thirteen years, knew it had arrived." Well, that day had arrived, as W7HZ/7 posted the highest Field Day score ever with 3390 contacts and 30,735 points, with 79 people contributing their efforts in keeping 10 rigs scoring constantly. Twenty-four other hard-working clubs soared past the five-figure mark, indicative of 1960's fine band conditions.

From the competition angle, the idea is to best those running a like number of transmitters. These Class A clubs or groups producing the highest scores in their respective class deserve a round of applause:

Class	*Call*	*Club Name*	*Score*
1A	W3EIS/3	Potomac Valley RC	7866
2A	W3FRY/3	Frankford RC	11,322
3A	W9AA/9	Hamfesters RC	14,319
4A	W6JBT/6	Citrus Belt ARC	13,140
5A	K8AIR/8	Amateur MARS Comm. Club	15,336
6A	K2AA/2	South Jersey R Assn.	16,839
7A	W9SW/9	Chicago Suburban R Assn.	12,231
8A	K6DTA/6	West Valley RC	9072
9A	W1GLA/1	Framingham RC	7623
10A	W7HZ/7	Valley ARC	30,735
11A	W6RW/6	(nonclub) group	23,535
12A	W2LI/2	Tri-County R Assn.	23,022

Looking at it from the geographical point of view, these groups came out on tops:

W1EIA/1	10,551	K0QMH/0	8838
W2LI/2	23,022	KP4ATQ/KP4	4134
W3RCN/3	15,996	KZ5AF/KZ5	5262
W4SKH/4	8887	VE1PF/1	2457
W5SC/5	14,892	VE2ADX/2	4608
W6RW/6	23,535	VE3NAR/3	9561
KH6WO/KH6	5391	VE4DF/4	798
W7HZ/7	30,735	VE5QC/5	906
KL7AZN/KL7	3060	VE6NQ/6	3118
K8AIR/8	15,336	VE7ARV/7	6426
W9AA/9	14,319	W4HSF/VO1	1368

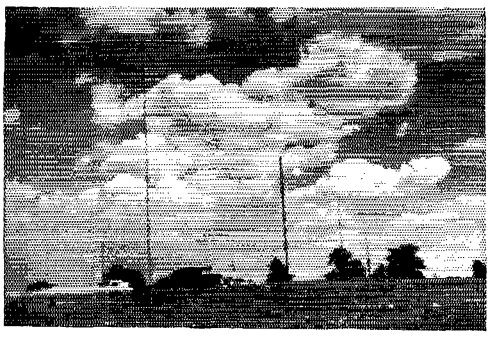
Those beaming faces reflect that the Valley ARC, W7HZ/7, had set a Field Day scoring record of 30,735 points with 10 rigs. A total of 3390 contacts were recorded during the 24-hour period. Left to right are: K7BBO, W7SGC, CMQ, PUA, SLB, DNU, JJK, HMQ, MPH, a YL, W7RT, OIV, GHV, K7DOB, W7UMJ, a visitor, W7OUI, TYI, and K7LRK.

The Class B, unit/individual set-ups of only one or two hams teamed up with either one or two transmitters, fire up their rigs on emergency power, including batteries. This is just the kind of stuff needed should a single ham become the only source of communication in a marooned community. Leading this field was W9WNV/9 who teamed up with W9PWU running one rig to score 15,714. Three complete sets of batteries produced the maximum 13.5 multiplier to score big for the Chicago duet.

The Sixes dominated the mobile section, except for W8PVC/8, who led the Westpark Radiops in piling up the top mobile aggregate score of 51,755 points. This year, however, the Radio Amateur Mobile Society of California issued a serious challenge, proving for the first time that the Ohio-men can possibly "be taken."

Everyone should be proud of his effort in Field Day. Ham radio received some excellent spreads in newspapers throughout the country. Once more ham radio proved its worth in the public's eye. Congratulations on a job well done. Now let's see what the many groups had to say for themselves by these quotes.

— *W1DGL*



The Watchung Valley RC, W2WW/2, and many other FD sites were fortunate enough to have beautiful puffy-white skies like this hover overhead.

Quotes

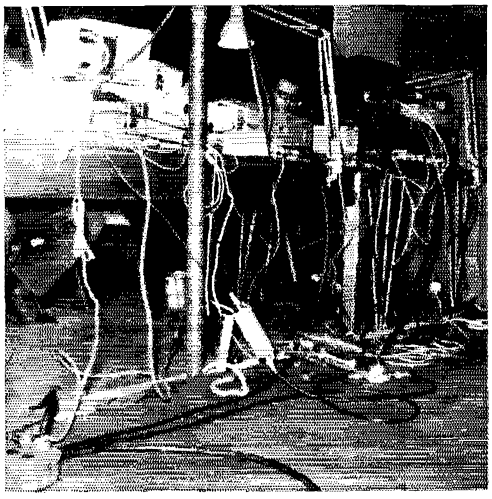
"Fair conditions and fine ops added up to make a most interesting, fruitful, and enjoyable Field Day. S.s.b. surely makes a big difference and is certainly here to stay." — *Nittany Mountain Moonshine & Rhombic Soc., W3WJD/3.* . . . "Darned generator used 47 gallons of gas, practically depleting our treasury." — *Elizabethtown AR Soc., W3MFW/3.* . . . "The club this year found a fine spot in northeast Philadelphia on the grounds of a state mental hospital. Several XYLs thought it was a fitting place for FD week end." — *Beacon Radio Amateurs, W3ATR/3.* . . . "Tried s.s.b. for first time — why didn't we use it before? Everyone here had a great time." — *Jewish Community Center ARC, K8PBQ/8.* . . . "And the rains came to the North Texas section where K5QBA/5 spent the 1960 Field Day week end immersed on the shore of Garza Little Elm Lake northwest of Dallas. Rain fell throughout the FD period but proved to be less of an inconvenience than anticipated as the tent proved watertight." — *K5QBA/5.* . . . "It was perhaps the worst week end rainwise we have encountered since we all got together many years ago. Taking all into account, however, it wasn't a bad week-end." — *VE2CB/2.* . . . "Amazed at number of stations active this year." — *Upper Arlington High School RC, K8HHF/8.* . . . "We worked many stations over 100 miles on two meters with only a whip on the Communicator III." — *ARC of Falls Church, Virginia, W4PAY/4.* . . . 'It is interesting to note that s.s.b. outscored c.w. here for the first time." — *Pittsburg County ARC, W5UAO/5.* . . . "As we were in a park area, local residents visited us in large numbers." — *Intercity RC, W8MFY/8.* . . . "Many a pleasant night before FD whiled away arguing the hows of mounting and the whys of such poor voltage regulation — after all we were only trying to run two HQ170s and two power supplies for 30-watt rigs and a few lights off the blessed 300 watt alternator." — *Three Half Baked Virginia Hams, K4IKF/4.* . . . "Thought the 20 meter rig was haywire until we discovered coax relay installed backwards." — *Lower Columbia AR Assn., W7NCW/7.* . . . "We placed some aluminum irrigation pipe underneath our dipoles to afford a better ground. The whole thing was on the bank of the Columbia River." — *Twin City RC, W7LA/7.* . . . "This was one of the best FD exercises in which our club has been. The conditions were tremendous and the weather at our location was the best yet. What more could you ask for?" — *Albert Lea Spider Web AR Assn., Freeborn Division, KØKCY/Ø.* . . . "We operated on a high 400 foot bluff overlooking Lake Michigan." — *Mason County RC, K8DXF/8.* . . . "Operated from an altitude of 9500 feet. Froze during the night and got sun burned during the day. The same group expects to operate from 12,000 feet next year." — *K6ROU/6.* . . . "When the receiver b.f.o. gave up in the wee small hours, W2CTA found that by leaving the transmitter v.f.o. running, it was possible to work c.w. stations on our own frequency. Where else would you work them?" — *W2PSD/2.*

. . . "Had a wonderful time except for some local QRN from an electric fence in a pasture. Asked the farmer to shut it off and he did. Everything was FB after that until Sunday afternoon when the herd of 30 cows broke loose. K8BFF and K8NXF had to chase them for a half-mile!" — *St. Joseph High School RC, W8KTZ/8.* . . . "Worked K7s CHC, CCH, and CHH at which point the log keeper left for an indefinite coffee break. We had a very FB location this year atop a four story ex-fire control tower. Flanking us were three 90-foot guyed poles. For the first time in anyone's experience we ran into a skip zone on 80 meters, apparently because the antennas were so high." — *Astoria ARC, W7QXS/7.* . . . "The weather, band conditions, and fishing in the Saco River were good." — *W1LN1/1.* . . . "The antenna was a long wire, strung up the mountainside; it acted as a reflector and director to the southeast. Signal strength tests showed it was something like a beam in its characteristics." — *Terrace AR Assn., VE7AJY/7.* . . . "First FD on our own and aside from a bent mast section and a broken coke bottle, no casualties." — *K9OET/9.* . . . "The QRM was *horrendous!* We still bettered last year's score though." — *Helix High School Kil-o-cycles RC, WA6JDL/6.* . . . "Our tenth Field Day ended with a very sad note as 'Our Old Timer,' W2LZ, became a Silent Key while on duty at Field Day. He died doing what he loved most. The gang here lost one of the real vets." — *Walton Radio Assn., W2LZ/2.* . . . "After trying in vain for five hours to work somebody, one of the operators noticed the antenna connected to the speaker terminal." — *K1IVK/1.* . . . "Did you ever try to work s.s.b. with a single 600 watt generator for power? It's a problem, believe me. With the generator output at 125 volts on standby, the SX101 worked FB. But key the transmitter, and pow! The line drops to about 70 volts, the receiver takes off on one big excursion, like a rocket. By the time you find your contact again, he has already worked three or four other stations wondering what happened to the lid that called a couple of minutes ago. Man, it 'sore' was a lot of fun." — *Tri-State AR Assn., W8KEG/8.* . . . "Our generator caught fire at 3 A.M. during servicing. Engine was not running but gasoline spilled on the top of the tank and ran down on the hot manifold. Wet blankets were used to put out the blaze. Advise that generators should be placed away from the main camp and serviced only after the engine has had sufficient time to cool." — *K5JXE/5.* . . . "Had QRM from a local frog in the lake!" — *Club des Jeunes Operateurs, VE2JC/2.* . . . "We had a wonderful location high and dry in a state park with 500 Boy Scouts camping below us in the valley. Do light-wave QSOs count? We made five with the Boy Scouts." — *Bishop Lake 6 and 15 Club of Michigan, W8OVY/8.* . . . "Operations rather ill-planned this year, but it stirred up much club interest that we hope will pay off next year with a better showing." — *Montachusett ARC, W1GZ/1.* . . . "This was first FD attempt by newly organized VA Hospital RC. All members of club enjoyed the activity including the ambulant patients who witnessed our operation. Most VA Hospitals now are equipped with amateur radio gear and we were encouraged by our Washington Central Office to participate this year in FD." — *Veterans Hospital ARC of Batavia, N. Y., WA2LRA/2.* . . . "We operated two rigs under separate funeral tents. By the end of FD we were afraid the funeral tents were going to be a necessity." — *Johnston County C.D. RC, K4SWR/4.* . . . "Conditions in general were poorer than last year with v.h.f. much worse. Two meters was especially bad with limits of Conn. and Jersey; other years we have had the advantage of minor inversion to cover the whole Atlantic seaboard from Maine to Virginia." — *Larkfield ARC, K2AAW/2.* . . . "S.s.b. was tried for the first time and proved the most efficient way to make contacts." — *Cranston AR Assn., W1VXL/1.* . . . "The gang worked like slaves from early Saturday morning setting up four operating tents, a mess tent, plus a 100-foot hydraulic tower. Will be back pitching next year." — *Telephone Employees AR Assn., K2CD/2.* . . . "Our only unusual incident was the necessity of running our 80-meter transmitter upside down. We did not operate standing on our heads, but maybe this would have helped." — *AR Assn. of the Tonawandas, W2SEX/2.* . . . "Propane driven generator was very successful for uninterrupted power. Generator ran 30 hours without refueling. Twenty meter c.w. boys had a full-sized cubical quad antenna." — *Chicago Suburban Radio Assn., W9SW/9.* . . . "The forest fires kept us all out in the field operating 24 hours around the clock for several days, as did the search for the lost boy up in the mountains." — *Convair Pomona Ham Club & Tri-County AR Assn., K6AGF/6.* . . . "Our bad showing on 40 meter s.s.b. was found to be caused by the sudden lack of drive to the final caused by low a.c. voltage — it was at the end of one of the a.c. lines. After robbing the generator used by the ladies for cooking, things perked up on 40." — *Wheaton Community Radio Amateurs, W9FQ/9.* . . . "This year our individual generators and seven stations were under public exhibition in a public park. Approximately 250 people visited our site. A great deal of public interest in the actual test was evidenced particularly in the fact that we were operating all rigs (one excepted) on individual generators." — *Palo Alto AR Assn., W6ABZ/6.* . . . "Hot zingies! No rain. First FD we ever had without rain. Conditions were very good." — *Grays Harbor ARC, W7ZA/7.* . . . "Memorial call W6TJ issued less than a week before FD." — *Riverside County AR Assn., W6TJ/6.* . . . "We did not catch any big prize this time except a five-foot rattlesnake." — *K5RAV/5.* . . . "Our highest FD score to date was achieved operating atop Bald Mountain in Northeastern Oregon. Our highest single band score was on 20 c.w. using the marvelous 'Magi-trak-op-saver' built by W7EMP. We worked 49 states, the culprit being Wyoming." — *Walla Walla Valley ARC, W7DP/7.* . . . "We were concerned when we saw a caravan of mobiles passing our FD site Saturday morning to set up operations a mile away. But as it turned out it was our best FD in six years of participation." — *Detroit Metropolitan RC, W8LXE/8.* . . . "Six months ago this group didn't know what Field Day was, being just common citizens; they received their tickets in December 1959. Forty-five minutes after FD started they were veterans and are now talking of how to better next year's score." — *Manahoy Valley Brass Pounders Klub, W3DUI/3.* . . . "Good conditions all the way around. The only problem we had was that a cow in the barn in which we were operating kept mooing and tripping the VOX on the Collins." — *Queen City Emergency Net, W8VVL/8.* . . . "Ideal weather and band

CLUB AGGREGATE MOBILE SCORES

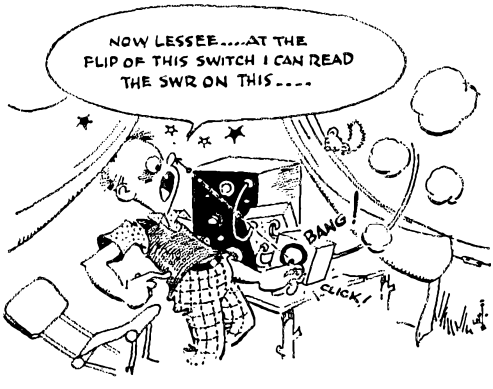
Westpark Radiops	51,755
Radio Amateur Mobile Society (Calif.)	37,814
Phil-Mont Mobile Radio Club (Penna.)	25,801
Associated Radio Amateurs of Long Beach	13,542
Mobile Amateur Radio Club of South Bend	6643
Coffee Dunkers of Detroit	3213
Eastern Pennsylvania Amateurs	2741
Southeast Radio Amateur Club (Calif.)	1485
Skywide Amateur Radio Club (Ont.)	602

"Speed it up! You're only working one every three minutes," jeer these two onlookers, W8PNS and K8NNR, as W8FDI log keeper and W8GB operator plug away for the Bendix RC, W8OFW/8.



Whoever termed radio as "wireless" never went on Field Day. Feet and heads peering from behind this maze belong to the Linfield ARC, W7SGD/7.

conditions. No mosquitoes! Almost ready at starting time." — *Du Page RC, W9DUP/9.* . . . "Worked more stations on six meters after the five element fell and broke two elements than when it had all five." — *K8MUG/8.* . . . "Rig very reliable; broke down every six hours without fail." — *Washington RC, W3CAB/3.* . . . "Who repealed Murphy's Law? Mistuned antennas, low voltage, thunder storms, shortage of cold beer, and the usual gremlins didn't show this year. Used s.s.b. on 14 Mc. for the first time and expect to try it on 7 Mc. next year too." — *RC of Tacoma, W7DK/7.* . . . "One novel feature of our operation was the use of one special setup to fill in time on any band when normal equipment failed. It saved many contacts for us." — *Rock Creek AR Assn., W3RCN/3.* . . . "Suggest clarification of method of scoring contacts with DX stations. Present rules say we can work ANY amateur station in contest." — *Rochester ARC, WØTJA/Ø* (Yep, that's right . . . ANY amateur station. — *Ed.*) . . . "You've heard of the straw that broke the camel's back; well, we plugged a 20-cup coffee-maker into our old generator and it almost broke our generator's back. We had a great time." — *Biggs AFB MARS, K5FHO/5.* . . . "Much better site than last year, and more operator experience helped us beat our last year's score by 55%." — *Thornton Schools RC, K9PKJ/9.* . . . "Great improvement over last year's 660 points." — *Pioneer ARC, K4VMF/4.* . . . "Cows gathered around our 50-foot mast Saturday night and almost succeeded in butting it down." — *R Transmitting Communications Org., K8RQA/8.* . . . "We found that by using our YL ops on 20 s.s.b., we made more QSOs than we would have, had we used our OMs. We often had four or five stations answering at a time." — *University AR Soc., WØTEY/Ø.* . . . "The moths ate the clothes off our backs. About 0400 they were done." — *York Community Hi RC, K9OVI/9.* . . . "Our score will destroy any moral victory won last year by our club's phone group." — *Cuyahoga Falls ARC (CW Group), W8SMK/8.* . . . "We used an interesting support for our 6-meter beam . . . two twenty-foot lengths of 2-inch aluminum irrigation tubing were butted together with a 2-inch coupling made of the same material. With two sets of guys this support performed very well." — *Chester County ARC, K3BKG/3.* . . . "We are still looking for the 1959 black Ford Galaxie that ran over the 40-meter power cord and busted one of the connectors, causing a short circuit cutting off 80- and 40-meter operation." — *Manchester RC, W1KKS/1.* . . . "Gusts up to 50 m.p.h. created problems in raising the 8-element two-meter beam atop a fire tower." — *Apple Pie Hill ARC, W2PG/2.* . . . "Weather conditions were ideal this FD. Only trouble encountered this year was the generator conking out Sunday morning. Cause of the trouble proved to be one large mouse nest lodged inside the generator casing near the brushes and relay." — *Minot AR Assn., WØEEK/Ø.* . . . "Best FD weather we ever had. Threat of a tornado Friday, threat of rain Saturday, and threat of sun-stroke Sunday. Fortunately none of these developed." — *Northeastern University MARS C, K1WAS/1.* . . . "We operated FD from Pinnacle Rock State Park in West Va. The rock itself is about 100 feet high and 50 feet wide. Access to the top is possible only for the nimble and sure-footed. We secured a 20-foot mast right on top of the Pinnacle; traffic on route U.S. 52 was slowed down somewhat by astounded passersby spying that beautiful shiny beam perched on top of the impossible." — *East River ARC, W3SSA/3.* . . . "Could have been better but because of storm impending, had to be careful of extreme heights." — *Newport County RC, W1SYE/1.* . . . "Compared to previous years we did poorly on v.h.f. bands. C.w. and s.s.b. got most of our points." — *Ocean County AR Assn., W2AFU/2.* . . . "Frogman KØKTP with the aid of KØENM swam the swollen Turkey River to raise an antenna." *Tube and Shutter C, WØCVJ/Ø.* . . . "Had one six-meter beam taken down the easy way when the blade of a windmill decided to turn." — *Tech ARC, WØGHZ/Ø.* . . . "We were sincerely shocked when we were warned that a pack of 200 cub scouts would be in the area in the morning. Later found us crowded by another group of 200 from a women's club and an office party of 50. Few of us were sorry about suspending operation before our 24 hours were up." — *Walnut Hills High School RC, K8HLE/8.* . . . "We like others to feel the extra trouble of putting up beams really pays off. Twenty-foot extension ladders and available trees really simplify antenna installation. Antennas are the key to a good FD." — *Robbin RC, VE3BNK/3.* . . . "Murphy's Law was in full force here. Antennas had to be reinstalled after a severe windstorm struck. Conditions good." — *Winslow AR Soc., K9KRN/9.* . . . "FD is catching on in Manitoba." — *Beausejour RC, VE4JW/4.* . . . "An emergency arose during FD when some chaps, in open defiance of the law, started discharging a firearm into the base of the hill where we were set up. A message via radio to the city constabulary resulted in the prompt appearance of three squad cars armed ot the teeth. The culprit was duly apprehended and lugged off to the local bastile. The police were of the opinion, however, that they saved his life not ours, because of the wretched condition of 'the lil ole shotgun that his grandpappy in Arkansas gave him.'" — *San Francisco RC, WØPW/6.* . . . "The elements cooperated to make our FD a very realistic emergency test. During the FD operation, this part of Texas had its heaviest rain in 82 years. Seventeen inches of rain fell at our FD site in 30 hours." — *Suburban West ARC, K5YJG/5.* . . . "The club finished construction of three low power all-band phone-c.w. rigs, but unfortunately they were not ready in time for this year's FD. We expect to have them all checked out and de-bugged by next June." — *Niagara RC, W2QYV/2.* . . . "This year we used field phones between our four different rigs for improved coordination. The chow was excellent and there were no chiggers this year." — *Ventura County ARC, K6CST/6.* . . . "Conditions very good after tornado scare." — *Waterbury ARC, W1LAS/1.* . . .

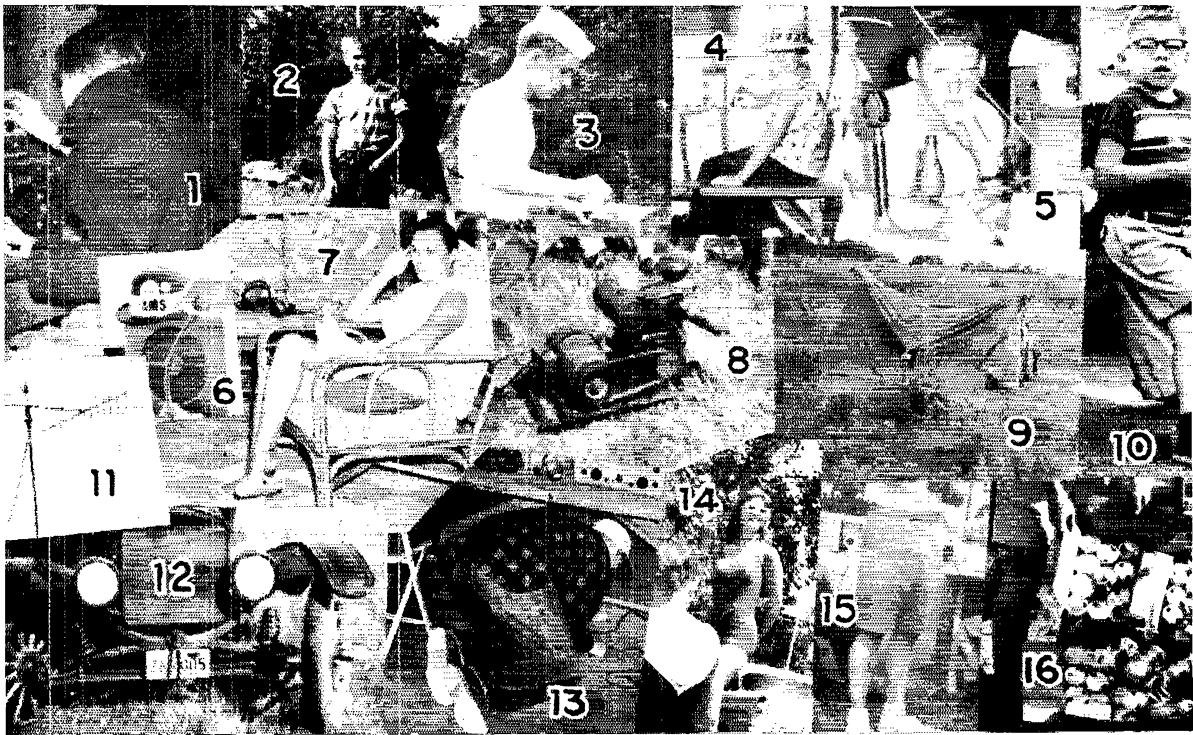


"Our old FD site burned down so we had to look at several new sites before we found an ideal spot on a high hilltop farm." — *South Jersey R Assn., K2AA/2.* . . . "Whoever drained the generator radiators last winter forgot to replace the block plugs. A bit of quick machine work saved the day." — *Asheville ARC, W4MOE/4.* . . . "Five green operators and four green loggers learned a lot." — *K6YVN/6.* . . . "Generator never missed a lick the whole 24 hours." — *Edmond AR Soc., K5SAM/5.* . . . "After staying up all night most of our operators couldn't even push a pencil. Next year we sleep." — *807 Soc. of Central High School, K3GTZ/3.* . . . "Things were going great until the generator gave us a present of 150 volts and blew out three transmitters and a receiver. But that didn't stop us. It wasn't until our bread supply ran out that we quit." — *Oxford Circle RC, K3ALD/3.* . . . "Our second FD a 300% improvement over our first." — *Teen Hams of Toledo, K8KAS/8.* . . . "Except for almost freezing to death we had a good time. Worked K2AA while beam was just being raised up!" — *Lower Yakima Valley R Amateurs, W7BCZ/7.* . . . "Find 80 c.w. to be the most reliable taking everything into consideration." — *K2TIM/2.* . . . "We tried to get more contacts on one rig by using two v.f.o.'s. This did not work because of difficulties in coupling the v.f.o. to the transmitter." — *Abington ARC, K3CSG/3.* . . . "Our group was piloted strictly by teenagers. We broke all our previous records by getting 200 contacts more than last year." — *Winona ARC, WØLUX/Ø.* . . . "The S-Line combo sure did rack up the s.s.b. contacts." — *Muskingum ARC, W8INS/8.* . . . "We had to transport gasoline about a quarter mile by hand for the generator which was merrily drinking up the stuff." — *K2LXL/2.* . . . "This was the first all YL Field Day in Hawaii." — *KH6 YL ARC, KH6AFL/KH6.* . . . "You can expect the boys from the University of Denver to be out again next year to give it the old college try." — *University of Denver ARC, WØANA/Ø.* . . . "Our club's FD activities were featured on a TV newscast including movies taken at the FD site. The newscaster is a ham!" — *Northwest St. Louis ARC, KØAXU/Ø.* . . . "New homebrew keyer worked like a charm." — *W8BYV/8.* . . . "Eureka, nothing went wrong!" — *Milwaukee High Speed CW Specialists, K9BSH/9.* . . . "W9NQW was interrupted from operating the rig long enough to take his wife to the hospital, who in turn presented him with a baby boy." — *Neenah-Menasha ARC, W9JCL/9.* . . . "Only difficulties were with the nuts that held the mikes and keys." —

Pity the poor Field Day chairman who tries to compute the Field Day score from sloppy, illegible, beer-stained logs. K5UUJ for the Harrison Emergency Communications Assn., K5UUJ/5, here gives it the old college try, but finally looks up amidst log sheets, pen in mouth, and abacus, searching for sympathy. None here at League headquarters, where 1384 entries had to be checked.

South Amboy R Amateurs, K2BEV/2. . . . "This was the first FD experience for any of the crew. The young hams' eyes popped as we ran a cool, efficient QRP rig into resonant doublets." — *W9IPT/9.* . . . "Saturday after everything had been set up, we were hit by winds of a tornado whose center was only about 15 miles away. At one point it took almost 12 men to hold down the tent and prevent it from blowing away. After the winds subsided, everything was hurriedly reassembled. The club was back on again only one-half hour later than planned." — *Hellertown*

Photo Quiz, Field Day's Guess Who? Can you spot any of these shots as being a fragment from your Field Day set-up? Better check closely . . . for instance, was that little boy (photo 10) a bystander at your FD site? See page 65 for identities.



Field Day seems to have the uncanny habit of having gremlins turn up in rigs that otherwise work FB. To combat this you need patience and a ready soldering gun. Probing into the rig difficulties of the Radio Club of Kauai, KH6LG/KH6, (left) are KH6LG and KH6DLZ. Meanwhile (right) this rig at the Marine Corps Supply Center, K4MCL/4, goes back into operation thanks to a hot soldering iron.

ARC, W3EKL/3. . . . "A group of young promising c.w. ops replacing some of the old hands." — *Candlewood AR Assn., W1VB/1.* . . . "In spite of burning out two Communicators (160 line voltage from a new generator), high SWR on certain antennas, crews going to sleep, and our best two-meter operator suffering from heat exhaustion, we bettered last year's score." — *Rio Hondo RC, K6PVN/6.* . . . "Activity on 7 Mc. was so great that our operators experienced difficulty in separating the answering stations." — *Bristol ARC, W4THM/4.* . . . "Good weather and ops but not enough of them." — *Harrisburg R Amateurs C, W3ZEK/3.* . . . "As far as we can find out, this was first FD on record in this (Inyo) county." — *W6JUM/6.* . . . "The order of the day was: 'Come and take over for a while and let me take a nap . . . thud, operator collapses, his body removed, and another operator takes over.'" — *K4RIN/4.* . . . "We had three troubles — coyotes, snakes, and rigs." — *WA6AJD/6.* . . . "Nuts!" — *K4LDR/4.* . . . "I just want to say that more Novices should get in FD. We had more fun in FD than any other operating activity." — *KN9UOV/9.* . . . "Boy, one hour of sleep is worse than no sleep at all." — *W8UDB/8.* . . . "At the conclusion of FD operations, we pulled up camp, packed tent, etc., in the car trunk, and set up the equipment on the rear seat of the car, where we worked mobile using the generator in the trunk with its exhaust protruding between trunk lid and car body. It goes without saying, that the put-put of the generator brought many queer glances from passersby as we proceeded down the highway." — *K7IQA/7.* . . . "The bulk of our contacts were made with the Midwest, South, and far West, with most of these stations overjoyed to hear Vermont." — *K1DRX/1.* . . . "Three days of continuous thunderstorms and small cloudbursts. And you thought you had bad QRN!" — *K4CTX/4.* . . . "We used a homebrew bug made from an old hacksaw blade, tin, and rubber bands." — *KØMGG/Ø.* . . . "Was chased at 3 o'clock in the morning from the operating position by a black bear!" — *K2BBX/2.* . . . "During the first hour of operating I noticed gray columns of smoke coming from my transmitter followed by a terrific smell. Investigating I found a dead beetle, half roasted on my 6DQ6A!" — *KN3KHK/3.* . . . "At exactly 2 P.M. MST, our quitting time, the generator burned up the last drop of gas in the tank, saving us from having to drain it. Wonder how many others figured their fuel consumption so closely?" — *Dawes County ARC, KØKXX/Ø.* . . . "Everyone had a fine time except when the fireplace backfired filling the room with smoke . . . resulting in nine well-smoked hams." — *Adams County AR Soc., W3KGN/3.* . . . "Some log sheets were destroyed by rain, as we got 4.15 inches during the week end." — *Temple ARC, K5INH/5.* . . . "We did not run up a high score but opened up a new world for our two Novice operators; they are still up in cloud 19 over the whole thing." — *W9GQY/9.* . . . "We had a good time but Alaska is bucking odds on FD scores. The XYLs of the club provided a wonderful chicken dinner, for the cry this year was 'Chicken, no ham for the hams this Field Day.'" — *Kodiak ARC, KL7AWR/KL7.* . . . "We operated from Dog Island near Carabelle, Florida. It was like a DX-pedition as we had to transport everything. The ferry broke down as well, and we had to rely on fishing boats to get some of the gear transported." — *Thomasville, Ga., ARC, W4UCJ/4.* . . . "I strongly recommend a folded dipole for 80 and 40 meter emergency work. It is very light, and will not get tangled easily." — *K8LGX/8.* . . . "Well, anyway, I'll bet I was the lowest powered station on FD . . . one-tenth watt output on 50 Mc. The entire station, transmitter, receiver, 3-element beam, telephone handset, and 15-foot antenna support all weighed under 12 pounds." — *W1HDQ/1.* . . . "We claim to be the lowest powered actual FD station in operation with .5 watts input. We worked stations as far away as 350 miles." — *W6ZRJ/6* (Uh, uh. See W1HDQ/1 above, but he doesn't claim any DX! — *Ed.*). . . . "Even cold hamburgers tasted good for breakfast." — *W7JBN/7.* . . . "We were set up close to the Ohio River, near the border-line between the 4th, 8th, and 9th call areas; could see into three states." — *KN8RRH/8.* . . . "I set up in the rain, operated in the rain, and dismantled in the rain. I was wet and the equipment was wet." — *W5GH/5.* . . . "NCSd the Minnesota Section Net from our portable site with 30 watts." — *KØIJL/Ø.* . . . "The usual mid-winter pre-planning started earlier and lasted longer than ever before with talk of more power, more generators, more food, better antennas. The 80-meter beam was laid out with surveying equipment so that it would favor the heavily populated Northeast and Southwest. Eight masts were required to support this antenna alone. The gang of some 40 fellows consumed 17 pounds of ground beef, three pecks of potatoes, six dozen eggs, three pounds of cheese, five pounds of lunch meat, 15 pounds of onions, 12 pounds of bacon, eight quarts of milk, six cans of beans, four boxes of pancake flour, many loaves of bread, huge pot of home baked beans, to say nothing of the seven cases of pop that disappeared. We cut 40-foot high call letters in the tall grass to identify W8ZHO." — *Muskegon Area AR Council, W8ZHO/8.* . . . "We were almost off the air even before getting started when a group of angry campers headed by a forest ranger complained about the noise of our generator. A hastily rigged muffler soon solved the problem. The forest ranger was a ham, hi." — *W3HWE/4.*

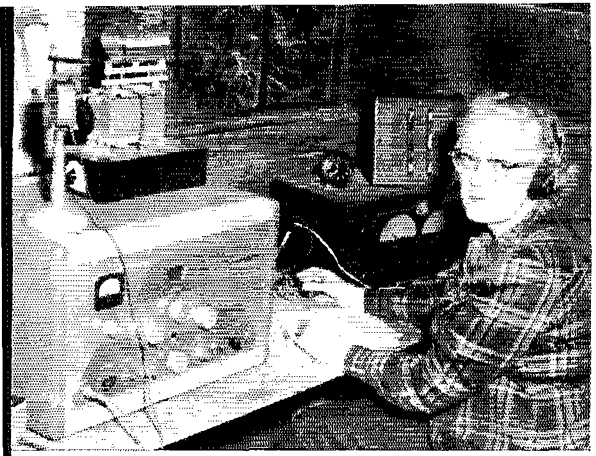
SCORES

CLASS A

Class A stations are clubs and groups in the field. Scores are tabulated according to the number of transmitters operated simultaneously at each station. The figures and letters following each call indicate the number of valid contacts, the power inputs used, the number of participants at each station and the final score. The "power classification" used in computing the score is indicated by the letters A, B or C after the number of QSOs shown. A indicates power up to and including 30 watts (multiplier of 3); B indicates power over 30, up to and including 150 watts (multiplier of 2); C indicates over 150 watts (multiplier of 1).

One Transmitter

W3EIS/3	Potomac Valley RC	848-	A- 6-	7866
W6QFK/6	San Gabriel Valley RC	619-	A-35-	6210
KH6WO/KH6	Honolulu ARC	606-	AB-30-	5391
KH6RS/KH6	Maui ARC	545-	A-15-	5130
W4YUU/4	Tallahassee ARC	395-	A- 8-	3780
WØDEP/Ø	(nonclub group)	374-	A- 3-	3591
K2DXV/2	RA of Erie County	371-	A- 6-	3584
W3QA/3	Westinghouse Friendship ARC	373-	A-16-	3582
WØNWX/Ø	Central Iowa & Newton ARCs	389-	AB-15-	3576
K5UUJ/5	Harrison Emergency Communications Assn	544-	AB-10-	3417
K6LDA/6	Crescent Bay Emergency Net	344-	A-12-	3321
W3RVC/3	Allegheny-Kiski ARA	509-	AB-25-	3237
WØLUX/Ø	Winona ARC	514-	B-12-	3234
W8SMK/8	Cuyahoga Falls ARC (CW Group)	529-	B- 4-	3174
K8EPV/8	Brass Pounders ARC	325-	A-10-	3168
K7GHV/7	Beaverton Mike & Key Club	460-	AB-10-	3027
K6UNO/6	Royal Society of Sleepy Insomniacs	335-	A- 4-	3015
W7OTV/7	Tualatin Valley ARC	396-	AB-10-	3002
W7LHM/7	(nonclub group)	491-	AB- 7-	2991
W8VPC/8	(nonclub group)	305-	A- 5-	2970
W8NCF/8	Tusco RC	327-	A-10-	2943
W2HQL/2	Westchester IBM RC	473-	B-10-	2838
W8INS/8	Muskingum ARC	449-	B-28-	2694
W4DPD/4	Lake Wales ARC	403-	AB-10-	2691
W7SGD/7	Linfield ARC	419-	B- 6-	2664
W9NZ/9	SWANI ARC (So. group)	323-	AB-17-	2589
KØOYM/Ø	Mid-Mo ARC	266-	AB-13-	2568
WØCKF/Ø	Minneapolis RC	401-	B-10-	2556
K2LXL/2	(nonclub group)	282-	A- 3-	2538
W5MPZ/5	Sandia Base RC	421-	B- 5-	2526
W2UDD/2	KHT ARC	391-	B-16-	2508
KH6AFL/KH6	KH6 YL ARC	378-	AB- 5-	2484
W8RTR/8	Canton ARC	275-	A-12-	2475
WØANA/Ø	Univ. of Denver ARC	250-	A- 3-	2475
W9NGI/9	Soc. of Radio Ops	385-	B-10-	2466
K4BDT/4	Manatee ARC	381-	B-12-	2436
KØAXU/Ø	Northwest St. Louis ARC	378-	B-14-	2418
W4MM/4	Albany ARC	366-	B-25-	2346
W2AE/2	RA of Greater Syracuse	348-	AB- 6-	2325
W6BLY/6	Whittier Radio 50 Club	233-	A- 8-	2322
K7DON/7	(nonclub group)	360-	B- 4-	2310
K8ITH/8	Canton-Massillon Area RC	230-	A- 4-	2304
KØINN/Ø	(nonclub group)	348-	AB- 7-	2292
K4RAD/4	(nonclub group)	254-	AB- 3-	2244
W6MIX/6	El Dorado County ARC	224-	A- 5-	2241
W2MG/2	The Southhillmen	330-	AB-10-	2211
W3NUF/3	(nonclub group)	367-	B- 4-	2202
W8BYV/8	(nonclub group)	361-	B- 6-	2166
W5CYN/5	Hot Springs ARC	360-	B-18-	2160
K8APE/8	Massillon ARC	236-	A-12-	2124
VE1JV/1	Pictou County ARC	210-	A- 7-	2115
W9YIT/9	(nonclub group)	352-	B- 3-	2112
K9BSH/9	Milwaukee High Speed CW Specialists	209-	A- 3-	2106
W7VPA/7	Richland ARC	233-	A-12-	2097
W6IFZ/6	Richmond ARC	322-	B- 8-	2094
W9LIT/9	Tri-State AR Soc	323-	B- 4-	2088
W9LVO/9	Oconto County AR Assn.	321-	B- 5-	2076
WØORN/Ø	Pumpkin Creek RC	344-	B- 4-	2064
W9JCL/9	Neenah-Menasha ARC	340-	B-20-	2040
K6JSJ/6	Tamalpais ARC	198-	A-15-	2007
K5UTV/5	(nonclub group)	333-	B- 3-	1998
W1FWH/1	Newington AR League	221-	A-11-	1989
W8EXI/8	Buckeye Shortwave R Assn.	218-	A-14-	1962
K4ART/4	(nonclub group)	191-	A- 3-	1944
WØFFN/Ø	(nonclub group)	296-	B- 4-	1926
KH6LM/KH6	(nonclub group)	211-	A- 6-	1899
K9DVF/9	SWANI ARC (No. group)	283-	AB-14-	1863
K8PTP/8	Canton Teenage RC	206-	A- 7-	1854
W4NOZ/4	Barnwell, S. C. Mike & Key Club	205-	A-15-	1845
K5ISI/5	Jefferson Parish ARC	276-	B- 5-	1806
W1CB/1	Burlington AR Assn.	175-	A-10-	1800
K2BEV/2	South Amboy RA	175-	A- 3-	1800
WØZWY/Ø	Sioux Falls ARC	258-	B-18-	1722
W9IPT/9	(nonclub group)	185-	A- 6-	1665
W3EAX/3	Johns Hopkins Univ.—Univ of Md. AR Assn.	156-	A- 6-	1629
W3EKL/3	*Hellertown ARC*	*230-*	*AB-12-*	*1620*
WØTFW/Ø	(nonclub group)	266-	AB- 4-	1605
W4VX/4	(nonclub group)	266-	AB- 5-	1599
W5VFM/5	Sabine Valley ARC	251-	B- 8-	1596
W4DKD/4	Sarasota AR Assn	177-	A-13-	1593
W2TIO/2	Royal Order of Feedline Warmers	261-	B-10-	1566
W9DD/9	Richmond AR Assn	172-	A- -	1548
W9CHD/9	(nonclub group)	171-	A- 3-	1539
K9MSP/9	Michiana VHF Club	170-	A-30-	1530
W4EM/4	Mid-South AR Assn.	207-	AB-13-	1488
W1EH/1	South Lyme Beer, Chowder & Propagation Soc.	222-	B- 4-	1482
VE1DN/1	Dartmouth ARC	164-	A- -	1476
W7SO/7	Albany ARC	246-	B-10-	1476
K6IQP/6	(nonclub group)	138-	A- 3-	1467
K5LJK/5	Baytown ARC	425-	BC-12-	1464
W7LA/7	Twin City RC	162-	A-10-	1458
KØITZ/Ø	Nodaway Valley R Assn	242-	B- 5-	1452
KØKCY/Ø	Albert Lea Area Spider Web AR Assn, Freeborn Division	212-	B- 5-	1434
K8DXF/8	Mason County RC	212-	B- 8-	1422
K6ROU/6	(nonclub group)	235-	B- 5-	1410
K8BTP/8	Quaker R Assn	213-	B- -	1398
WA2CZS/2	Clifton CD Communications Section	153-	A-20-	1377
W4HSF/VO1	Argentia ARC	203-	B-13-	1368
W4JJR/4	Cheraw RA League	202-	B-15-	1362
W2PSD/2	(nonclub group)	125-	A- 6-	1350
KØMMA/Ø	Sugar Creek RC	225-	B- 5-	1350
W4FXY/4	Charlotte Sideband Club	223	B- 6-	1338
K2SKO/2	Peanut Whistle Net Radiators	196-	B- 5-	1296
VE1PB/3	(nonclub group)	216-	B- 4-	1296
W2UMI/2	Oswego County AR Assn.	190-	B-12-	1290
K7AYF/7	Shy-Wy RC	190-	B- 6-	1290
WØZK/Ø	O.B.P. #1	215-	B-10-	1290
VE2CO/2	Lakeshore Field Day Group	190-	B- 3-	1290
W6SKK/6	(nonclub group)	214-	B- 4-	1284
W7FO/7	Butte ARC	188-	AB-13-	1281
W7IXH/7	Scottsdale Gang	195-	AB- 4-	1275
K9VRS/9	Taft High School ARC	155-	AB- 5-	1275
K9DFK/9	No. Central Indiana ARC	210-	B- 5-	1260
W1ECV/1	Southington AR Assn.	204-	AB-12-	1251
K5GQD/5	Texoma ARC	207-	B- 9-	1242
K5JGN/5	Jasper High School RC	138-	A- 4-	1242
W3MER/3	Huntingdon County ARC	206-	B- 9-	1236
KØCCM/Ø	(nonclub group)	204-	B- 4-	1224
W8BSR/8	Cuyahoga Falls RC	174-	B- 4-	1194
W2PET/2	(nonclub group)	170-	B- 3-	1176
W7TQC/7	Anaconda ARC	171-	B-15-	1176
WØMDM/Ø	(nonclub group)	196-	B- 7-	1176
K9RMA/9	Notre Dame High School RC	189-	B- 8-	1134
W5AQR/5	Ville Platte RA	188-	B- 9-	1128
KØOTH/Ø	Rochester Rebel RC	124-	A- 5-	1116
W8KTZ/3	St. Joseph High School RC	98-	A- 3-	1107
K5BYB/5	(nonclub group)	184-	B- 6-	1104
W4UHC/4	Ancient City ARC	122-	A- 7-	1098
W5RKI/5	El Aguila RC	122-	A- 7-	1098
W7QXS/7	Astoria ARC	183-	B-11-	1098
KØBJL/Ø	(nonclub group)	182-	B- 6-	1092
K4HFT/4	Marconi AR Klub	178-	AB- 8-	1071
K9UNI/9	Valley VHF Club	119-	A- 9-	1071
W4DXI/4	(nonclub group)	153-	B- 3-	1068
KØKKQ/9	East Central Minn. ARC	176-	B-12-	1056
W3JME/3	Chesapeake ARC	92-	A- 8-	1053
W1LNI/1	(nonclub group)	149-	B- 3-	1044
K5CXP/5	(nonclub group)	90-	A- 3-	1035
K8SMD/6	(nonclub group)	145-	B- 4-	1020
KØEJS/Ø	Galva ARC	145-	B- 6-	1020
KØHFX/Ø	(nonclub group)	168-	AB- -	1020
K9YCJ/9	Gibson ARC	169-	B- 8-	1014
K5GHS/5	(nonclub group)	168-	B- 8-	1008
KØSOQ/Ø	Hastings (Nebr.) ARC	142-	B- 6-	1002
W4OIX/4	Kinston AR Soc	164-	B- 7-	984
VE7AJY/7	Terrace AR Assn	139-	B- 5-	984
W8JBT/8	Hickory Corners Engineering Soc	135-	B- 3-	960
W4CHK/4	Clinch Valley RC	159-	B- 4-	954
W3CJI/3	Baltimore Polytechnic Institute RC	133-	B-10-	948
W3KYR/3	Boys' Club of St. Marys AR Soc	104-	A- 7-	936
W6OT/6	Oakland RC	104-	A- -	936
K9OET/9	(nonclub group)	155-	B- 3-	930
W3MVQ/2	Friendly AR Transmitting Soc.	128-	B- 8-	918
K5TXX/5	Dallas 6 Meter Club	102-	A-16-	918
W2EBE/2	Radions	101-	A- 6-	909
VE2APX/2	St. Jean RC	125-	B- 8-	900
WA6JDL/6	Helix High School Kilo-cycles RC	122-	B- 6-	894
W2PE/2	R Assn. of Western N.Y.	198-ABC-	5-	864
K5LWN/5	(nonclub group)	117-	B- 3-	852
VE7RN/7	(nonclub group)	116-	B- 5-	846
W2PT/2	Plainview ARC	140-	B-14-	840
WØUNT/Ø	Lawrence ARC	139-	B-12-	834
K3KPZ/3	(nonclub group)	92-	A- 3-	828
KØKXX/Ø	Dawes County ARC	65-	A- 9-	810
K3ALL/3	Pocono AR Klub	134-	B-12-	804
WØFX/Ø	Jamestown ARC	133-	B- 8-	798
VE3AMQ/3	(nonclub group)	131-	B- 3-	786
W3BBE/3	Calvert Hall College RC	84-	A- 3-	756
KØWGP/Ø	(nonclub group)	82-	A- 3-	738
K2QAA/2	(nonclub group)	94-	AB- 7-	732
W9MAK/9	(nonclub group)	119-	B- 3-	714
KP6AO/KH6	(nonclub group)	118-	B- 6-	708

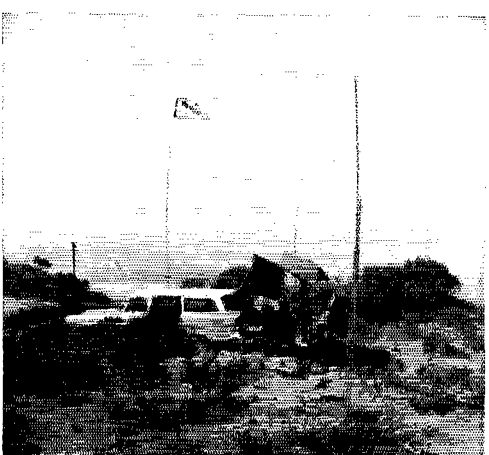


YLs and XYLs certainly get their share of operating on Field Day. Keying the bug here is WA6BVE for W6JUM/6 group.

K3DKC/3	(nonclub group)	116-	B- 3-	696
VE6QE/6	Central Alberta R League	116-	B-20-	698
VE2EE/2	Canadair ARC	107-	B- 4-	642
K5HHM/5	(nonclub group)	78-	B- 3-	618
K6YXE/6	(nonclub group)	101-	B- 3-	606
W8GQN/8	Straits Area RC	101-	B-17-	606
W8SIO/8	Southwest Michigan RC	278-	A- 5-	606
KØVVY/Ø	South Dakota School of Mines & Technology ARC	73-	AB- 3-	603
K8KKJ/8	Chain-O-Lakes AR Assn	102-	BC- 8-	600
K8SUB/8	(nonclub group)	100-	B- 3-	600
K5RLM/5	Wheatstraw ARC	74-	B- 3-	594
W4ABZ/4	Ringgold High School ARC	72-	B- 5-	582
W2GPQ/2	(nonclub group)	60-	A- 3-	540
K4AEQ/4	(nonclub group)	60-	A- 4-	540
VE3HK/3	Elliot Lake ARC	90-	B-10-	540
VE7AHR/7	Prince Rupert ARC	60-	A- 4-	540
W3KGN/3	Adams County AR Soc.	88-	B- 9-	528
K1IUL/1	Avco-Everett RC	57-	A- 3-	513
K7AIA/7	Santiam RC	141-	C- 6-	498
VE7AFW/7	(nonclub group)	81-	B- 4-	486
K3EHM/3	(nonclub group)	228-	AB- 4-	476
W3VJV/3	(nonclub group)	79-	B- 4-	474
KØJOQ/Ø	Crete ARC	53-	B- 3-	468
W2WZQ/2	(nonclub group)	152-	C- 4-	456
WØUOD/Ø	Iowa Great Lakes ARC	74-	B- 4-	444
K9ROC/9	(nonclub group)	55-	AB- 4-	426
KN9TIG/9	(nonclub group)	65-	B- 3-	390
K5INH/5	Temple ARC	41-	A- 5-	369
W7AOT/7	Pocatello ARC & Eastern Idaho R Soc.	66-	B- 4-	396
KNØWEN/Ø	Sioux Falls ARC, Novice Group	41-	B-10-	396
VE3BAT/3	Kirkland Lake AR Assn	41-	A- 8-	369
K2DTW/2	Monroe High School ARC	193-	B- 3-	386
W4GIM/4	(nonclub group)	60-	B- 5-	360
WØTIA/Ø	Homesteader ARC	59-	B-10-	354
KN8SQM/8	Cuyahoga Falls RC, Novice Group	33-	B- 4-	348
KN9WIH/9	Four Lakes ARC	56-	B- 5-	336
VE5MA/5	Moose Jaw ARC	31-	B-12-	336
W9GQY/9	(nonclub group)	37-	A- 4-	333
K8MIT/8	Niles ARC	51-	B- 4-	306
KN8RBT/8	(nonclub group)	33-	A- 4-	297
K1DYG/1	(nonclub group)	6-	A- 3-	279
K8DAW/8	(nonclub group)	115-	AB- 3-	236
WØLJX/Ø	Albert Lea Area Spider Web AR Assn, Camp Moraine Division	92-	B-11-	234
K3HKI/4	St. Mary's County ARC	25-	A- 3-	225
KL7AWR/KL7	Kodiak ARC	68-	B- 6-	196
W1CUT/1	Headquarters Lab Gang	15-	AB- 3-	120
W1BB/1	(nonclub group)	16-	B- 3-	96
WA2DNR/2	Colonie Central High School RC	6-	B- 9-	36

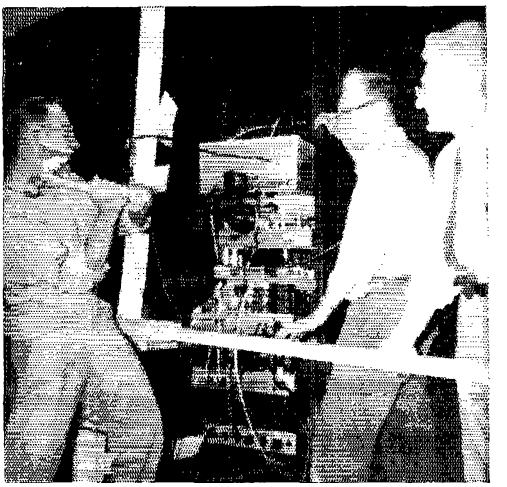
Two Transmitters Operated Simultaneously

W3FRY/3	Frankford RC	1233-	A-10-11	1,322
W2SSC/2	Niagara Frontier DX Assn	1104-	A- 7-10	1,161
W3WJD/3	Nittany Mt. Moonshine & Rhombic Soc.	1054-	A- 5-	9486
W3MFW/3	Elizabethtown AR Soc.	894-	A-20-	8226
W9PCS/9	York RC	880-	AB- 6-	6804
K8DDH/8	Northern Ohio Teenage DX Club	827-	AB- 5-	6405
W8CEA/8	Miami Valley AR Contest Soc.	719-	AB-12-	6282
W3ATR/3	Beacon RA	654-	A-10-	6111
W6PD/6	Foothill Mobile Net	617-	A- 4-	5778
W3ISE/3	Soc. for the Preservation of Key Clicks, Splatter & TVI	588-	A- 7-	5535
W6MHM/6	Bell Gardens AR Assn.	568-	A-12-	5337
W8COE/8	Kanawha RC	796-	AB-25-	5196
K8PBQ/8	Jewish Community Center ARC of Detroit	605-	AB-14-	5043
W3PSH/3	Keystone ARC	529-	A- 7-	4986
W8OFW/8	Bendix RC	806-	B-12-	4986
W2AYJ/2	Order of Boiled Owls	811-	B- 5-	4866
K4UYT/4	Hampton Roads RC	506-	A-20-	4554
W9NUW/9	Wisconsin Valley R Assn	558-	AB-22-	4494
W4FU/8	Ohio Valley AR Assn	720-	B-16-	4470
W9IU/9	Izaak Walton Contesters	707-	B- 3-	4242
W8VPV/8	Cuyahoga Falls RC (Phone Group)	444-	A-20-	4221
K6VTT/6	Merced ARC	691-	AB-18-	4152
WØRFU/Ø	Bandhoppers RC	509-	AB-11-	4116
K5QBA/5	(nonclub group)	620-	AB-14-	4020
K2GUG/2	Tube Toppers	402-	A- 7-	3843
W4FJ/4	Richmond ARC	623-	B-20-	3738
W8RYI/8	Kalamazoo ARC	381-	A-20-	3654
WA2GVT/2	Camptown ARC	386-	AB- 8-	3633
VE2CB/2	(nonclub group)	371-	A-14-	3564
W2ODV/2	Bayonne ARC	433-	AB-10-	3516
W4KLN/4	Columbus High School ARC	375-	AB- 4-	3507
W4JRA/4	Louisville Gas & Electric Co. Amateurs	550-	B- 6-	3450
W4EEU/4	Tidewater Mobile RC	544-	B-28-	3414
K8HHF/8	Upper Arlington High School RC	395-	AB- 7-	3375
W4AKC/4	Rock Hill ARC	374-	A- 7-	3366
K5KMS/5	(nonclub group)	556-	B- 7-	3336
W6TO/6	Fresno ARC	496-	AB-32-	3315
K5ZPR/5	Winkler County ARC	550-	B-19-	3300
W4MN/4	Palmetto ARC	544-	B-10-	3264
K5OJ1/5	Texas Instruments ARC	626-	BC-13-	3183
K4BV/4	Daytona Beach AR Assn	500-	B-38-	3150
W6HDO/6	Raytheon Gang	410-	AB-10-	3108
W4LLO/4	Key West ARC	516-	B-10-	3096
K6BEP/6	Alexander Hamilton High School RC Alumni Assn	319-	A- 6-	3096
K2UNY/2	Tioga AR Assn	511-	B-12-	3066
K4BE/4	(nonclub group)	509-	B-15-	3054
W2GLO/2	Levittown ARC	405-	AB-26-	3042
K3CLF/3	St. Patricks Circuit Breakers ARC	513-	AB- 4-	3034
K3KPO/3	Eastern Pennsylvania A	369-	AB-14-	3009
W8MRM/8	Motor City RC	470-	B-15-	2982
VE3RAM/3	Ottawa Valley Mobile RC	494-	AB-22-	2976
W4PAY/4	ARC of Falls Church	297-	A- 9-	2898
K4ZJT/4	Roane County ARC	413-	AB-16-	2889
W7TD/7	Apple City RC	454-	AB-12-	2889
W3EAN/3	Main Line Dandies	428-	AB- 8-	2880
W5UAO/5	Pittsburg County ARC	455-	B-12-	2880
W8MFY/8	Intercity RC	316-	A-48-	2844
K4IKF/4	Three Half-Baked Virginia Hams	290-	A- 4-	2835
K5DBL/5	(nonclub group)	471-	B- 9-	2826
WØERH/Ø	Johnson County RAC	377-	AB- 8-	2793
K8UTT/8	Ford AR League	440-	B-26-	2790
W4MRC/4	Hialeah RC	430-	AB-16-	2751
WØWWA/Ø	Prairie Village Teenage RC	422-	AB- 7-	2748
K4JLA/4	Spartanburg ARC	277-	A- 9-	2718
W6TJA/Ø	Rochester ARC	428-	B-26-	2718
K4IVI/4	North Augusta Belvedere RC	359-	AB-20-	2691
KØUDN/Ø	Sandhills ARC	419-	B- 5-	2688



That classy WA6JDL banner marks the FD site of the Helix High School Kil-o-cycles RC, WA6JDL/6.

K5LAC/5	The Celina Group	397-	AB-	6-	2685
W1BFB/1	So. R. I. DX and Propagation Assn.	438-	AB-	8-	2652
K2UTN/2	(nonclub group)	303-	AB-	4-	2622
VE7AAM/7	Penticton CD ARC	262-	A-	10-	2601
K4CK/4	Winter Haven AR Assn.	432-	B-	17-	2592
K9GFQ/9	IMO VHF Club	406-	B-	20-	2586
K4CE/4	Everglades ARC	424-	B-	12-	2564
W1YU/1	Yale Univ. RC	284-	A-	4-	2556
K6FDG/6	Solano ARC	425-	B-	11-	2550
WØIA/Ø	Boulder ARC	398-	B-	12-	2550
WØFLN/9	St. Louis Univ. ARC	323-	AB-	10-	2526
K5FHO/5	Biggs AFB MARS	324-	AB-	6-	2517
K6BAG/6	Pacifico RC	417-	B-	12-	2502
W3BIP/3	The DX Club	502-	BC-	13-	2469
W4CN/4	AR Transmitting Soc.	345-	AB-	25-	2468
WA6MAO/6	Bay Area YL ARC	307-	AB-	9-	2463
K9PKJ/9	Thornton Schools RC	384-	AB-	15-	2463
K5ABR/5	McCurtain County ARC	407-	B-	6-	2442
W2IEP/2	Greene ARC	282-	AB-	12-	2433
W9HRM/9	Milwaukee RAC	245-	A-	20-	2430
W8DOG/8	Forest City ARC	375-	B-	15-	2412
W3RSC/3	All Band AR Klub	265-	A-	9-	2385
K3ANU/3	Short Skip RC	395-	B-	15-	2370
W2PQZ/2	Putnam County AR Assn.	328-	AB-	10-	2358
K4VMF/4	Pioneer ARC	386-	AB-	-	2343
W7RJV/7	Leavenworth ARC	362-	B-	9-	2334
W3APR/3	North Hills Brass Pounders & Gum Beaters	298-	AB-	4-	2331
K8EZD/8	Hillsdale ARC	253-	A-	5-	2277
WØYWW/Ø	Ottumwa ARC	376-	B-	11-	2256
VE1IM/1	Annapolis Valley ARC	351-	B-	12-	2256
KØLEUD/Ø	Arrowhead ARC	375-	B-	8-	2250
W4DU/4	Jacksonville AR Soc.	269-	AB-	8-	2232
K5KMW/5	Iberia RC	247-	A-	6-	2223
W1OC/1	Concord Brasspounders	730-	C-	5-	2190
K2LSA/2	State Line RC	243-	A-	13-	2187
K7CBP/7	Klamath Basin AR Assn.	339-	B-	12-	2184
W8AM/8	Coffee Dunkers of Detroit	322-	B-	11-	2166
W7SAA/7	Salem ARC	336-	B-	10-	2136
W7BUT/7	Nemark	352-	B-	10-	2112
W9VT/9	Tri-Town RAC	340-	AB-	19-	2097
W6VSL/6	San Diego YL RC	323-	B-	7-	2088
W9WCS/9	Allison ARC	348-	B-	8-	2088
W1EDH/1	Middlesex AR Soc.	231-	A-	10-	2079
W2TCU/2	Auburn AR Assn.	258-	AB-	14-	2049
W9QEH/9	RARRC	227-	A-	3-	2043
W1ZLH/1	Middlebury Mike & Key Club	315-	B-	16-	2040
W2DYM/2	Amateur UHF Club of Jamaica	201-	A-	6-	2034
K3LDD/3	Philadelphia Electric Co Co. Employees Assn. RC	314-	B-	24-	2034
W7AGE/7	(nonclub group)	199-	A-	4-	2016
K8QIM/8	Oak Park ARC	326-	AB-	15-	1995
W5QEG/5	Southwest La. ARC	307-	B-	12-	1992
W4DK/4	Owensboro ARC	371-	BC-	23-	1983
W9WWI/9	Clark County RC	330-	B-	9-	1980
W7BKB/7	Glacier RC	266-	AB-	6-	1971
K4KAB/4	(nonclub group)	327-	B-	3-	1962
W8WUT/8	(nonclub group)	277-	AB-	12-	1956
W4KVK/4	Audubon AR Soc.	324-	B-	-	1944
K1IEM/1	(nonclub group)	255-	AB-	3-	1929
W7ECA/7	Electric City RC	314-	B-	13-	1884
W9CFL/9	Point RA	306-	AB-	15-	1878
K8RQA/8	R Transmitting Communications Org.	285-	B-	4-	1872
K4DXZ/4	Valley ARC	207-	A-	6-	1863
K3COU/3	(nonclub group)	305-	AB-	12-	1860
WA6BAI/6	Tulare County ARC	276-	AB-	6-	1854
K9GMS/9	Klix, Chirp & Splatter Soc. of Rockford	279-	AB-	8-	1851
K5FEU/5	Jackson County ARC	308-	B-	11-	1848
K7LYY/7	Flathead Valley ARC	180-	A-	12-	1845
K9INY/9	Fayette County RC	207-	AB-	7-	1838
KØNRM/Ø	Kaw Blue RC	296-	B-	14-	1776
K7ENZ/7	Evergreen ARC	294-	B-	4-	1764
K5OVT/5	Bartlesville ARC	187-	AB-	30-	1752
K2BCI/2	Wantagh ARC	221-	AB-	10-	1728
W7LAB/7	Ogden ARC	287-	B-	13-	1722
WØTEY/Ø	Univ of Minn. AR Soc.	287-	B-	7-	1722
W3CMX/3	Naval Research Lab. ARC	163-	A-	5-	1710
K3EUJ/3	Germantown RC	285-	B-	9-	1710
K5INJ/5	Mississippi County AR Assn.	259-	A-	6-	1704
K9OVI/9	York Community Hi RC	189-	A-	4-	1701
W6SF/6	Stockton ARC	188-	A-	8-	1692
KØHEB/Ø	Missouri Valley ARC	280-	B-	8-	1680
KØQIK/Ø	Lake Region ARC	255-	B-	20-	1680
W5FQ/5	Meridian ARC	274-	B-	-	1668
W3AWA/3	Mobile Sixers RC	245-	B-	20-	1620
W9VWX/9	Waupaca ARC	270-	B-	9-	1620
W2LZ/2	Walton R Assn.	178-	A-	8-	1603
K8BLS/8	Butler County VHF Assn.	263-	B-	10-	1578
W3PRC/3	(nonclub group)	237-	B-	12-	1572
K5VOZ/5	Lawton Ft. Sill ARC	237-	B-	10-	1572
W8UMD/8	Treaty City AR Assn.	262-	B-	6-	1572
K2HMA/2	(nonclub group)	214-	AB-	7-	1539
K6MQX/6	(nonclub group)	185-	AB-	6-	1527
K1IVK/1	(nonclub group)	167-	A-	3-	1503
W4TM/4	Jackson RC	176-	AB-	16-	1503
W7AIA/7	Clark County ARC	225-	B-	10-	1500
W8ODJ/8	Buckeye Shortwave R Assn.	249-	B-	20-	1494
K5KOR/5	Amarillo High School RC	223-	B-	10-	1488
W6FBK/6	Humboldt ARC	222-	A-	4-	1482
KH6CDM/KH6	(nonclub group)	244-	B-	7-	1464



The Seneca RC, W8ID/8, resorts to this time-tested cure for the inoperative 6-meter phone rig. Wielding the axe is W8MVE, while W8QXO and K8AHK are obviously trying to stop this mad endeavor.

K9MAN/9	Calumet ARC	216-	B-	8-	1446
W8MA1/8	Blossomland AR Assn.	239-	AB-	7-	1437
W9YBA/9	AR Ragchewers of Whitewater	239-	B-	8-	1434
KØSGI/Ø	(nonclub group)	212-	B-	4-	1422
W9AIQ/9	Door County ARC	236-	B-	-	1416
W7YXG/7	Great Falls RC	209-	B-	20-	1410
K8EMY/8	Southeast ARC	235-	B-	10-	1410
VE3HCD/3	Sarnia ARC	210-	B-	8-	1410
WØZRT/Ø	Central Dakota R Assn.	234-	B-	10-	1404
VE3AJ/3	Lakehead ARC	234-	B-	10-	1404
W8KEG/8	Tri-State AR Assn	201-	AB-	20-	1386
VE3QCD/3	Kingston ARC	229-	B-	8-	1374
K5JXE/5	(nonclub group)	201-	B-	4-	1356
K5NBF/5	Tri-County ARC & Navy Reserve	300-	BC-	8-	1350
K7CCH/7	Coos County RC	196-	AB-	12-	1341
WA8CEX/6	Royal Order of Banshees	148-	A-	8-	1332
VE7APL/7	North & West Vancouver ARC	123-	A-	4-	1332
K3EOQ/3	Ivyridge ARC	215-	B-	15-	1290
K7IWL/7	Shadle Park High School ARC	213-	B-	6-	1278
W8OAJ/3	Mercer County AR Assn	213-	B-	10-	1278
VE2JC/2	Club des Jeunes Operateurs	213-	B-	11-	1278
K4GUG/4	Richmond ARC #2	211-	AB-	-	1275
W8IAD/8	(nonclub group)	205-	B-	4-	1230
W6HBW/6	Yuba-Sutter ARC	179-	B-	5-	1224
W7UQI/7	Clackamas AR Soc.	202-	B-	10-	1212
K1JMQ/1	Lexington High School RC	109-	A-	5-	1206
W8OVY/8	Bishop Lake 6 & 15 Club of Michigan	164-	AB-	6-	1203
W9SFG/9	Central Homebrew C.	199-	B-	10-	1194
VE3CKV/3	Algoma ARC	198-	B-	10-	1188
K9VHF/9	Fishers High School ARC	122-	AB-	7-	1185
K9EAM/9	Green Bay Mike & Key Club	197-	B-	20-	1182
W9GFD/9	Prairie ARC	195-	B-	12-	1170
K6DBS/6	Convair RAC	176-	AB-	12-	1155
WØHGG/Ø	Pioneer RC	322-	BC-	15-	1143
K2GVR/2	Black River Valley ARC	190-	B-	12-	1140
K9OWN/9	(nonclub group)	181-	B-	8-	1086
KØIUJ/Ø	Omaha ARC	181-	B-	7-	1086
W9ROM/9	Kenosha R Comm Soc.	180-	B-	5-	1080
W3EXW/3	Etna RC	118-	A-	8-	1062
W2SSK/2	Westfield AR Soc.	115-	A-	12-	1035
K2QEQ/2	Explorer Post 304	90-	A-	10-	1035
K9LDU/9	Lawrence Central High School ARC	174-	B-	3-	1024
W6SG/6	Marin ARC	165-	B-	12-	990
WØRLI/Ø	(nonclub group)	156-	AB-	3-	987
K2BIO/2	(nonclub group)	154-	AB-	3-	969
K2HJY/2	Medford Wireless Assn.	160-	B-	7-	960
VE2AWD/2	(nonclub group)	133-	B-	4-	948
W3HWE/4	(nonclub group)	129-	AB-	3-	915
VE5QC/5	"QC" Club	151-	B-	6-	906
W6BTP/6	(nonclub group)	135-	AB-	3-	891
K4MCL/4	Sowega ARC	228-	ABC-	6-	882
W4RKC/4	Shenandoah Valley ARC	121-	B-	15-	876
W2ZJ/2	Elmira AR Assn.	118-	AB-	25-	843
VE6UV/6	(nonclub group)	176-	BC-	5-	840
K1BOS/1	Southwick, Mass. CD Group	93-	A-	3-	837
W5LNS/5	(nonclub group)	139-	B-	4-	834
K4YJT/4	Mike & Key Club of Greenville	136-	B-	25-	816
W4N8M/4	Central Va. ARC	406-	B-	9-	812
K6AL1/6	(nonclub group)	116-	AB-	4-	807
WØEBL/Ø	Ninnescah ARC	109-	B-	8-	804

VE4DF/4	Cranberry Portage ARC	108-	B-14-	798
W0TWU/0	McPherson ARC	126-	AB- 7-	783
W2DLW/2	Pelham RC	129-	B- 3-	774
K9CCL/9	Kishwaukee RC	218-	BC- 6-	774
K4QQE/4	Broward County 6 Meter CD Net	128-	B-12-	768
W7WKR/7	(nonclub group)	103-	B- 3-	768
VE5NN/5	Regina AR Assn.	124-	B-10-	744
W7GUS/7	(nonclub group)	80-	A- 3-	720
K3HUO/3	So. Community YMCA RC	119-	B- 8-	714
K9BAD/9	(nonclub group)	89-	AC- 4-	693
VE7ASM/7	Fraser Valley ARC	69-	AB- 7-	621
K8RPI/8	Key Clicker's ARC	100-	B-15-	600
W9QAJ/9	Owen County ARC	68-	AB- 9-	567
W1GZ/1	Montachusett ARC	234-	AB- -	544
K7CHC/7	(nonclub group)	230-	AB- 3-	533
K3GOO/3	Juniata County ARC	50-	AB-10-	528
K3ISN/3	So. Butler County Hamsters R Assn.	85-	AB-14-	528
W9AAH/9	(nonclub group)	88-	BC- 4-	525
K1GVQ/1	(nonclub group)	62-	B- 3-	522
K3KJG/3	Butler Sr. High School ARC	77-	AB- 7-	483
W1KOO/1	Burlington ARC	107-	BC- 7-	387
W8APJ/8	Bluffton RC	146-	AB- 7-	359
WA2LRA/2	Veterans Hospital ARC of Batavia, N. Y.	58-	B- 7-	348
W9BVM/9	Argonne RC	92-	B- 6-	344
WA2BFP/2	Indispensable Fahaloo R.	166-	B- 3-	332
K4SWR/4	Johnston County CD RC	51-	B- 4-	306
K4QIA/4	Ashley High School RC.	44-	AB- 4-	303
W3SJI/3	Hazleton ARC	147-	B- 7-	294
K0DHY/0	Hector Area RC	72-	BC-11-	294
W9GPS/9	(nonclub group)	103-	AB- 5-	241
W7YUP/7	Eastern Montana RC	39-	B-10-	234
K0KNM/0	(nonclub group)	38-	B- 3-	228
W0QEV/0	Washington Univ. ARC	31-	AB- 4-	216
K2KHB/2	Brighton High School ARC	27-	AB- 7-	207
W7HMK/7	Central Oregon RA	92-	B-10-	184
K5PIZ/5	Alamo Heights High School ARC	62-	B- 7-	174
W8RIW/8	Branch County ARC	27-	B- 7-	162

Three Transmitters Operated Simultaneously

W9AA/9	Hamfesters RC	1560-	A-12-14,319	
K5DGI/5	(nonclub group)	1520-	A- 7-13,905	
W5KHB/5	Old Natchez ARC	1212-	A-15-11,160	
W8AF/8	Westpark Radiops	1290-	AB-40-	8691
W2ODP/2	Irvington RAC	911-	A-22-	8424
W6MRT/6	Aerojet RAC	877-	A-25-	8118
W4PLB/4	Orlando ARC	1001-	AB-40-	7461
W9AB/9	Michiana ARC	785-	A-20-	7290
W6MSO/6	Inglewood ARC	733-	A-12-	6822
W2URW/2	Mid-Island RC	709-	A-15-	6624
W2MO/2	Livingston ARC	788-	AB-25-	6513
VE7ARV/7	Vancouver ARC	681-	A-15-	6426
W6OPT/6	Santa Monica City College Rebels	703-	A-12-	6327
K2BR/2	Southern Counties AR Assn.	667-	A-16-	6228
K4OSQ/4	Miami Springs RC	937-	B-16-	5772
K5FHU/5	(nonclub group)	849-	AB-16-	5718
W3OK/3	Delaware-Lehigh ARC	605-	A-18-	5445
K5YJG/5	Suburban West ARC	879-	B-30-	5424
W6ASH/6	San Francisco Peninsula MARS Group	574-	A-15-	5391
W7YN/7	Nevada AR Assn.	634-	AB-21-	5373
KZ5AF/KZ5	Caribbean Air Command MARS RC	852-	B- 9-	5262
W6KA/6	Pasadena RC	573-	A-15-	5157
W4VO/4	Northwest Georgia ARC	813-	B- 5-	5028
VE7BAR/7	Burnaby ARC	527-	A-15-	5006
W4GNF/4	Greensboro RC	833-	B-15-	4998
W4ABK/4	Kentuckyana RC	805-	B-25-	4980
W7NTO/7	Lewis County ARC	514-	A-20-	4851
W6AEX/6	Soc. of AR Operators	685-	AB-11-	4725
W4AM/4	Frye ARC	762-	B-15-	4722
W5FC/5	Dallas ARC	722-	B-12-	4482
VE3DOH/3	Windsor ARC	496-	A-30-	4464
W5GU/5	Oklahoma City ARC	689-	AB-25-	4428
K2TRN/2	Lockport ARC	772-A	BC-30-	4307
W6IJK/6	Sacramento Aerojet RAC	452-	A-35-	4293
W2QYV/2	Niagara RC	694-	AB-20-	4263
K6BF/6	Santa Barbara ARC	684-	AB-11-	4239
K6FAV/6	McClellan AR Soc.	637-	AB-36-	4212
W1DDD/1	Blackstone Valley ARC	600-	AB-20-	4197
W9MJL/9	Vermillion County AR Assn.	784-	BC-40-	4182
KP4ATQ/KP4	Navy Rosy Roads ARC	664-	B- 8-	4134
W5ECP/5	Mañana Mt. Moonshine & Rhombic Soc	437-	A- 3-	4158
K6CST/6	Ventura County ARC	555-	AB-24-	4041
W9CAF/9	Chicago ARC	421-	A-20-	4014
W9WR/9	Chicago R Traffic Assn.	423-	AB-13-	3975
K0LDN/0	Iowa-Illinois ARC	649-	B-27-	3894
W6SNK/6	Bay Cities ARC	495-	AB-12-	3849
W3MKA/3	West Phila. R Assn.	638-	B-12-	3828
W1LAS/1	Waterbury ARC	421-	A-16-	3789
K2ODP/2	Woodbridge RC	551-	AB-18-	3762
W4TRC/4	Kingsport ARC	597-	B-20-	3732
W7ZA/7	Grays Harbor ARC	468-	AB-30-	3660
W5HMF/5	Oil Capital Mobile Club	529-	AB-15-	3657
K9QDE/9	Kokomo ARC	485-	AB-25-	3606
W8AI/8	Parma RC	600-	B-40-	3600
K8NTE/8	Kent RC	571-	B-27-	3576
W6TJ/6	Riverside County AR Assn.	503-	AB- -	3558
W5IU/5	Kerrville RC	592-	B- 6-	3552
K5RAV/5	(nonclub group)	547-	AB- 9-	3546
K2PQI/2	Bethpage ARC	494-	AB-15-	3471
W8ZHO/8	Muskegon Area AR Council	519-	AB-18-	3429
VE7EZ/7	Victoria Short Wave Club	544-	B-12-	3410
W7IO/7	Arizona ARC	703-	BC-14-	3381
W7AQ/7	Yakima ARC	515-	AB-20-	3363
W1WFB/1	Milford ARC	558-	B-18-	3348
W1MHL/1	Waltham AR Assn.	346-	A-10-	3339
K2EJB/2	Salem County ARC	531-	B-10-	3336
W5YM/5	ARC of Univ. of Ark.	523-	B- 6-	3288
VE3AIS/3	Oakville ARC	400-	AB-12-	3186
K4MVN/4	South-Port ARC	529-	B- 6-	3174
W0RC/0	Wichita ARC	530-	BC-18-	3174
W6VOA/6	DX-Ploiters	327-	A- 8-	3168
W7VE/7	AR Assn. of Bremerton	498-	B- 8-	3150
K9JEM/9	(nonclub group)	525-	B-13-	3150
W7NBR/7	Spokane RAC	524-	B- -	3144
K9IKI/9	Hampton RC	349-	A- 7-	3141
W7DP/7	Walla Walla Valley ARC	477-	AB-12-	3114
K3DBE/3	Aliquippa Area RA Assn.	489-	B-15-	3084
K4JVA/4	South Miami RC	422-	AB-20-	3084
VE3ES/3	(nonclub group)	488-	AB- 4-	3078
K5WPH/5	Sun City ARC	511-	B-50-	3066
W5WTH/5	South Plains ARC	575-	BC-20-	3051
W9PNA/9	RCA ARC of Indianapolis	484-	B-20-	2994
W5ES/5	El Paso ARC	418-	AB-15-	2931
W9REG/9	Tippecanoe AR Assn.	400-	AB-30-	2925
W8LXE/8	Detroit Metropolitan RC	431-	AB-10-	2898
K3EWY/3	Bucks-Mont Teenage ARC	438-	AB-20-	2841
K7BLR/7	Utah ARC	173-	B-14-	2838
W9OD/9	River Park RC	470-	B-12-	2820
W3CSL/3	Monessen ARC	429-	B-15-	2760
W4HFH/4	Alexandria RC	435-	B-17-	2760
K9ACR/9	Miami County RC	427-	B-13-	2712
K2BHQ/3	Delmont RC	425-	B-10-	2670
W6OT/6	Oakland RC, Oakland Chapter, American Red Cross	262-	A- 8-	2601
KH6BVM/KH6	Teen-Amateur R of Hawaii	407-	B-12-	2592
W8AW/8	Edison-RA Assn.	405-	B-16-	2580
K8IEK/8	St. Clair Valley ARC	430-	B-21-	2580
K6TFT/6	South Bay AR Soc.	261-	A-18-	2574
W5ND/5	Orange ARC	344-	AB-12-	2568
W8JPT/8	Livonia RC	402-	AB- -	2562
W4NYK/4	Blue Ridge R Soc.	421-	B-20-	2526
W8HNY/8	(nonclub group)	421-	B- 8-	2526
VE3BSQ/3	Belleville & Districts ARC	396-	B-12-	2526
K4ALI/4	Pensacola ARC	391-	B-20-	2496
W8ZZ/8	Detroit AR Assn.	246-	A-13-	2475
W3DUI/3	Mahanoy Valley Brass Pounders Klub	288-	AB-15-	2409
K5ISK/5	Oklahoma State Tech AR Assn.	400-	B- 6-	2400
K9QAL/9	Martinsville ARC	344-	AB-10-	2397
W8VVL/8	Queen City Emergency Net	372-	B-32-	2382
W5WZ/5	Tombigbee ARC	396-	B-20-	2376
W4MWI/4	Fort Myers ARC	395-	B- -	2370
W8PYY/8	Jackson County VHF Club	313-	AB- -	2346
W5KC/5	Baton Rouge ARC	288-	AB-12-	2340
W2MAU/2	Syracuse VHF Club	390-	BC- 6-	2340
WA6BMH/6	Poinsettia RC	381-	AB-22-	2337
W6RZB/6	(nonclub group)	246-	AB-10-	2313
W9DUP/9	Du Page RC	385-	B-12-	2310
W8FY/8	Van Wert ARC	378-	B-17-	2268
K8MUG/8	Tire Town RC	378-	B- -	2268
W9EBN/9	Sky Wire RC	348-	B-12-	2262
VE1FO/1	Halifax ARC	375-	B-14-	2250
W5QA/5	Abilene ARC	260-	AB-15-	2223
W8LIW/8	Albion ARC	332-	AB- 9-	2208
W1NEM/1	Hartford County AR Assn.	218-	A- 8-	2187
W5BMN/5	Acadia ARC	280-	AB-12-	2172
K5JFC/5	Dyess AFB ARC	283-	AB-12-	2172
W3CAB/3	Washington RC	290-	AB- 5-	2145
K6YVN/6	(nonclub group)	348-	B- 5-	2088
K5SAM/5	Edmond AR Soc.	317-	B- 8-	2064
W1KVI/1	Portland A Wireless Assn.	306-	AB- 6-	2028
VE3DSA/3	(nonclub group)	225-	A- 4-	2025
W1FML/1	Tri-City ARC	336-	B-25-	2016
K3HSP/3	Foothills RC	335-	B-14-	2010
W7KYC/7	Portland ARC	331-	B- -	1986
W0DUO/0	Worth County ARC	306-	B- 8-	1986
W3VV/3	McKean County RC	325-	B-26-	1950
K5TPU/5	Curry County N. Mex. ARC	324-	B- 7-	1944
VE1LC/1	Loyalist City ARC	254-	AB-20-	1917
W3SOB/3	York Road RC	291-	B-15-	1896
W9EQQ/9	Ninth Area RC	269-	AB-20-	1872
W9TCH/9	Rock River RC	307-	B- 8-	1842
K8POE/8	Logan ARC	274-	B-25-	1794
K3BGI/3	Somerset County ARC	292-	B- 6-	1752
K3GTZ/3	807 Soc. of Central High School	261-	AB-13-	1737
W0BLK/0	Black Hills AC	289-	B-35-	1734
W3AME/3	Clearfield County AR Assn.	283-	B- 7-	1728
VE1TQ/1	Liverpool CD Club	263-	B-20-	1728
W1WEF/1	Hampden County RC	190-	A- 6-	1710
K6IXV/6	La Jolla RC	279-	B- 9-	1674
K3ALD/3	Oxford Circle RC	268-	AB-15-	1668
W3FZC/3	MIC ARC	185-	A-10-	1665
W8MAA/8	Central Michigan ARC	185-	A-10-	1665
W0NKL/0	Jayhawk ARC	415-A	BC-17-	1665
K7GHG/7	Magic Valley RA	251-	B-12-	1656
W0UAN/0	Honeywell ARC	256-	AB-15-	1656
W4NJA/4	Paducah AC	274-	B-12-	1644
K8KAS/8	Teen Hams of Toledo	245-	AB-15-	1632
W8MMD/8	Ohio Bell Boys	270-	B- 7-	1620
K4IUF/4	RAC of Knoxville	269-	B-15-	1614

K5ELG, a polio victim from 1949, symbolizes the spirit of Field Day as he capably mans this phone rig for the Kay County ARC, W5EQT/5. *(Ponca City News Photo)*

W9BXR/9	Montgomery County AREC	267-	B- -		1602
K9HFI/9	La Crosse ARC	265-	B-15-		1590
W3DZW/3	(nonclub group)	185-	AB- 5-		1572
W7BCZ/7	Lower Yakima Valley RA	233-	B-13-		1548
K2TAZ/2	Northern Nassau ARC	226-	AB- -		1527
K1JMR/1	Norwood ARC	216-	AB-19-		1521
K5SKF/5	Gulf Area YL AR Klub	252-	B- 8-		1512
W6YR/6	Student Engineers RC	218-	AB-11-		1452
WØIII/Ø	Story County AREC	253-	BC-20-		1428
K7KRR/7	Mt. Erie RC	207-	B-10-		1392
K4VRU/4	Clearwater AR Soc.	205-	AB-25-		1389
W3CCX/3	Mt. Airy VHF RC	230-	B-12-		1380
W4BFB/4	Mecklenburg AR Soc.	230-	B-12-		1380
K2IBC/2	Avenel RC	199-	AB-12-		1359
K1EFW/1	(nonclub group)	140-	AB- 5-		1311
W9BUJ/9	River Valley RC	179-	AB-10-		1302
W8NXF/8	(nonclub group)	268-	ABC- 7-		1260
KØYAX/Ø	Three Rivers Ham Club	185-	B-15-		1260
K2YNT/2	Metuchen Y RC	155-	AB-12-		1218
WA6DGZ/6	Far West RC	190-	AB- 3-		1215
K2TIM/2	(nonclub group)	181-	AB- 8-		1191
W7YNJ/7	Casper ARC	170-	B-22-		1170
KL7AA/KL7	Anchorage ARC	158-	AB- 7-		1167
W1TKA/2	Stamford ARC	192-	B-15-		1152
K3AIR/3	Olmsted ARC	171-	AB-14-		1146
W6UDL/6	(nonclub group)	129-	AB- 3-		1128
W1SMO/1	(nonclub group)	105-	AB- 9-		1122
W5AVT/5	North West La. RC	160-	AB- 6-		1104
KØGIA/Ø	Air Capital AR Assn.	173-	AB-22-		1092
W2RQA/2	(nonclub group)	351-	AB- 3-		1034
W2JC/2	Bloomfield RC	114-	A- 9-		1026
WØFDJ/Ø	Kansas-Nebraska RC	137-	B-30-		972
KØGZX/Ø	Newton ARC	156-	B-10-		966
KØIGO/Ø	(nonclub group)	135-	B- 7-		960
K2YGY/2	Carteret CD Radio Group	172-	ABC- 9-		948
W9LMA/9	Midway RC	104-	A-20-		936
K3CSG/3	Abington ARC	154-	AB-10-		933
K8NMD/8	RA Activities League	189-	ABC- 9-		897
K9DDG/9	Chiburban R Mobileers	99-	A- 6-		891
K9TBN/9	Emergency Service R Assn.	135-	AB- 7-		897
W7HQM/7	Boeing Employees' AR Soc.	145-	B-18-		870
W8KDK/8	Genoa RC	142-	B-12-		852
W4DEJ/4	Raleigh Teenage ARC	140-	B- 7-		840
K1KAK/1	Spud Pickers AR Klub	142-	BC- 9-		813
KØZCJ/Ø	The Communicators	127-	AB- 5-		813
W8FCY/8	Oregon City RC	166-	ABC- 8-		798
KL7WAF/KL7	Wildwood Station ARC	107-	B-22-		792
W4WYX/4	(nonclub group)	107-	AB- 3-		720
VE3RAR/3	Civil Service RA ARC	116-	B-14-		696
KL7CUD/KL7	Polar AR Klub of Alaska	62-	AB- 8-		676
K3HDO/3	District Heights RC	194-	AC- 5-		636
VE7QR/7	Point ARC	104-	B- 4-		624
K7GTK/7	Treasure Valley R Assn	98-	B- 7-		588
W8NCK/8	Sandusky Valley ARC	127-	ABC- 8-		561
KØAZY/Ø	Kirkwood High School ARC	87-	AB- 7-		546
W9ELJ/9	Key & Mike ARC	90-	B-10-		540
KØTSW/Ø	New Ulm RC	90-	B- 8-		540
K2MXN/2	Burlington SW RC	71-	AB- 8-		537
VE3PCD/3	Norquebont AR Assn (Porcupine Branch)	83-	B- 6-		498
W8PIF/8	Marinette & Menominee RC	82-	B- -		492
W2BMW/3	Tu-Boro RC	205-	AB-13-		429
W1AZT/1	(nonclub group)	184-	AB- 5-		383
K3GXP/3	Fort Howard ARC	50-	B-15-		300
W8AX/8	Thumb ARC	48-	AB- 6-		300

ANSWERS TO PHOTO QUIZ

quiz on page 59

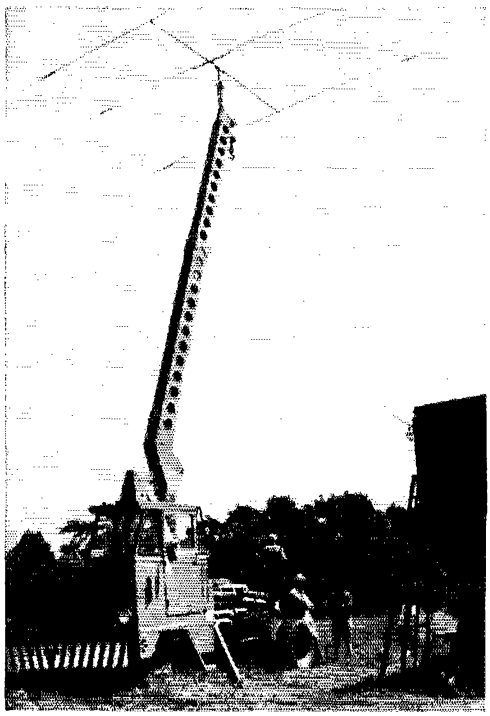
1. K6YXE/6
2. Pompton Valley RC, W2OR/2
3. Chippewa Secondary School ARC, VE3CYD/3
4. WA6DNM/6
5. Michigan City ARC, W9HW/9
6. Downey ARC, W6TOI/6
7. Davy Rosy Roads ARC, KP4ATQ/KP4
8. St. Croix Valley RC, VE1PF/1
9. KØTLJ/Ø
10. Mid-South AR Assn., W4EM/4
11. North Hills RC, K6QWL/6
12. St. Croix Valley RC, VE1PF/1
13. Mt. Diablo ARC, W6CX/6
14. W8BMN
15. Straits Area RC, W8GQN/8
16. Bayonne ARC, W2ODV/2

W9ZRY/9	Flambeau AR Tech. Soc.	46-	B- 3-		276
K3AHR/3	Carbon ARC	162-	ABC-10-		252
K2RBW/2	(nonclub group)	87-	B- -		174
	Four Transmitters Operated Simultaneously				
W6JBT/6	Citrus Belt ARC	1460-	A-20-13.		140
W2OR/2	Pompton Valley RC	1364-	A-50-12.		510
W2VDJ/2	Lakeland AR Assn	1216-	A-16-11.		187
W1EIA/1	Connecticut Wireless Assn	1194-	AB-15-10.		551
W2OYH/2	Morris RC	1041-	A-30-		9693
KØQMH/Ø	Montrose County ARC	957-	A-17-		8838
W8TO/8	Columbus AR Assn	1015-	AB-31-		8565
W4SKH/4	Oak Ridge R Operators Club	1097-	AB-41-		8487
K6ZHU/6	San Fernando Valley Students RC	872-	AB-12-		7752
W1VB/1	Candlewood AR Assn.	866-	AB-38-		7539
W4NVU/4	Dade RC	866-	AB-20-		7263
K4HEX/4	Lynchburg ARC	1161-	B-30-		7116
K6PVN/6	Rio Hondo RC	835-	AB-20-		6825
W6AIL/6	Central Contra Costa RACES Group	694-	A- 5-		6507
W4THM/4	Bristol ARC	918-	AB-20-		6345
WØOUI/Ø	Denver RC	677-	A-34-		6315
W2CWW/2	Staten Island AR Assn.	761-	AB-20-		6272
W5ABD/5	Westside ARC	919-	B-12-		5664
W9HT/9	(nonclub group)	897-	B-12-		5502
K2OM1/2	Raritan Bay RA	581-	A-14-		5454
W9HW/9	Michigan City ARC	798-	AB-35-		5415
W9OFR/9	Joliet AR Soc.	805-	AB-20-		5298
W9DUK/9	Delaware AR Assn	608-	AB-30-		5154
W3ZEK/3	Harrisburg RAC	670-	ABC-32-		5061
W1OMI/1	El-Ray RC	548-	A- 9-		4932
W6WC/6	South Peninsula AR Klub	722-	AB-22-		4800
K8TKA/8	The 20/9 ARC	750-	B-36-		4650
VE2ADX/2	South Shore ARC	743-	B-18-		4608
W1USS/1	Pittsfield RC	706-	B-15-		4236
KØOKI/Ø	Kansas City ARC	673-	B-15-		4188
W8LT/8	ARC of Ohio State Univ.	697-	B-15-		4182
K1COV/1	(nonclub group)	459-	A-12		4131
W8KGG/8	Huron Valley AR Assn.	682-	AB-20-		4119
W3CWC/3	Antietam R Assn.	470-	AB-18-		4110
W2GLQ/2	Nutley AR Soc.	453-	AB-14-		4059
W5KP/5	Dallas 10 Meter Net	673-	B-15-		4038
WA2NGI/2	Gloucester County RC	596-	AB- -		3933
W2ZQ/2	Delaware Valley R Assn.	589-	AB-20-		3924
K6FDU/6	(nonclub group)	618-	B- 6-		3858
W6JUM/6	(nonclub group)	604-	B- 8-		3774
W5CF/5	Kilocycle Club of Ft. Worth	600-	B-17-		3768
W1WHF/1	Hamden AR Assn.	584-	AB-15-		3720
W6TOI/6	Downey ARC	587-	AB-10-		3717
W5DPA/5	Houston ARC	547-	AB-18-		3708
W6EBK/6	Baldwin Park CD & AREC	373-	A-15-		3600
W9AML/9	Central Illinois RC	511-	AB-30-		3552
K2DZ/1	Westchester AR Assn.	854-	BC-23-		3499
W8IQE/8	Tri-Cities ARC	537-	B-13-		3372
W4ACQ/4	ARC of Selma, Alabama	531-	B-10-		3336
W9ARA/9	Bloomington ARC	487-	AB-16-		3315
W4YKY/4	Lake AR Assn	543-	AB-20-		3264
VE6NQ/6	Calgary AR Assn.	476-	B-23-		3118
W4BFM/4	Decatur ARC	461-	AB-12-		3060
KL7AZN/KL7	Bering ARC	485-	B-10-		3060
K1GAY/1	Bedford RC	425-	AB- 9-		3006
W9GKI/9	Rockford AR Assn.	474-	B-10-		2994
W4SRX/4	Eglin AR Soc.	412-	AB-20-		2937
K3BKG/3	Chester County ARC	408-	AB-15-		2922
W1KKS/1	Manchester RC	429-	AB- 8-		2778
K6LSZ/6	Sidewinder RC	327-	AB- 8-		2772
W9FB/9	Lake County ARC	695-	ABC-13-		2700
WØEQU/Ø	Ak-sar-Ben RC	297-	A-12-		2673
W2PG/2	Apple Pie Hill ARC	302-	AB-16-		2655
W3PGA/3	Aero ARC	290-	A- 9-		2610
WØEEK/Ø	Minot AR Assn	427-	B-15-		2562
K1WAS/1	Northeastern Univ. MARS Club	407-	AB-10-		2490
K2OFQ/2	Frog Hollow RC	335-	AB-12-		2484
VE1PF/1	St. Croix Valley RC	242-	A-17-		2457
W4VTF/4	Catawba Valley ARC	406-	AB- 6-		2454
KØBXD/Ø	Flint Hills ARC	397-	B-15-		2382
K8BYI/8	Southeastern Mich. AR Assn	233-	A-28-		2322

W4HBB/4	Savannah ARC	668-	BC-20-	2298
W1YQM/1	Melrose CD Group	296-	AB- 5-	2286
W2ODT/2	Adirondack RC	331-	AB-10-	2244
W7YYE/7	Oregonian AR Soc.	342-	B- 6-	2202
W8RXY/8	(nonclub group)	365-	B-20-	2190
W1AQ/1	Associated RA of So. New England	332-	B-15-	2142
K7IGW/7	ARC of Olympia	356-	B- 9-	2136
W8SSA/8	East River ARC	314-	B-18-	2034
W6LAIN/6	San Mateo RC	337-	B-15-	2022
W3GV/3	R Assn. of Erie	318-	AB-12-	1968
W8SYE/1	Newport County RC	310-	AB-17-	1965
W1HGV/1	Nashua Mike & Key Club	300-	B-15-	1950
W8VKE/8	Defiance County RC	320-	B-10-	1920
K5HFW/5	Clinton-Sherman AFB ARC	342-	BC-15-	1914
VE1NA/1	(nonclub group)	287-	B- 6-	1872
W1BRF/1	Quinebaug Valley ARC	219-	AB-15-	1806
W1JT/1	East Providence AR Assn.	194-	AB-10-	1704
K7AUO/7	Tektronix Employees RAC	279-	B-10-	1674
K2BWK/2	Squaw Island ARC	239-	AB-12-	1659
VE3YJ/3	London ARC	244-	B-50-	1614
W8LKY/8	Tri-County AR Assn.	264-	AB- 4-	1587
VE2MO/2	St. Maurice Valley AR Assn.	238-	AB-15-	1581
W2AFU/2	Ocean County AR Assn.	281-	ABC-11-	1530
W1FJI/1	Whaling City Hi-Banders	133-	A- 8-	1422
W1ORS/1	Stratford ARC	156-	A-13-	1404
WØMAO/Ø	Stratford ARC	156-	A-13-	1404
WØCVJ/Ø	Tube & Shutter Club	204-	B-12-	1344
W7BB/7	Lake Washington ARC.	215-	AB-14-	1311
W3SL/3	Delaware ARC	182-	AB-15-	1257
K9ENM/9	Communicators RC	222-	BC-12-	1200
VE7BQ/7	Totem ARC	187-	AB- 8-	1167
K8QRC/8	Ashtabula ARC	164-	AB-10-	1152
K4OKZ/3	(nonclub group)	190-	AB- 8-	1146
K2REY/2	Jersey City RC	187-	B- 9-	1122
WØGHZ/Ø	Tech ARC	164-	B-14-	984
W1WQM/1	Port City ARC	131-	AB-11-	903
W9DEQ/9	Chicago YLRL	95-	AB- 7-	855
K8HLE/8	Walnut Hills High School RC	134-	AB- 7-	834
W8CRR/8	Scioto Valley ARC	409-	ABC-20-	756
VE3BNK/3	Robiln RC	126-	B-10-	756
K8PBN/8	Ft. Hamilton AR Assn.	264-	B- 9-	528
K9KRN/9	Winslow AR Soc.	268-	AB- 9-	540
VE4JW/4	Beausejour RC	60-	B- 7-	510
W2TKZ/1	(nonclub group)	154-	ABC- 6-	354

Five Transmitters Operated Simultaneously

K8AIR/8	A MARS Communications Club	1684-	A-27-15,336	



Can you beat this for a beam mast? Could prove a mite costly as an investment but then again some have the proverbial "connections," as the Rochester ARC, WØTJA/Ø.

W2YKQ/2	Lake Success RC	1133-	A-22-10,692	
W2GTD/2	Ridgewood ARC	1117-	A-23-10,278	
W7AW/7	West Seattle ARC	1023-	A-26-	9432
W6UUS/6	Convair Astro RC	913-	A-25-	8442
W3BTN/3	North Penn ARC	1162-	AB-30-	7497
K2AE/2	Schenectady AR Assn.	1064-	AB-34-	6816
W6MRO/6	Newport AR Soc.	721-	A-40-	6714
K9AVO/9	Western Electric ARC & Hoosier AR Membership Soc.	961-	B-24-	5988
K2AAW/2	Larkfield ARC	640-	A-18-	5985
W2OPB/2	Teenage Field Day ARC	871-	AB-16-	5937
KØEMH/Ø	Sioux City AR Assn.	939-	BC-30-	5424
K1BCI/1	CQ RC	841-	AB-26-	5418
K6CVF/6	Bandspanners RC	794-	AB-12-	5406
WA2LAQ/2	Bayside ARC	734-	AB-14-	5193
K3IZU/3	Bucks County ARC	754-	AB- -	4713
W6CX/6	Mt. Diablo ARC	478-	A-26-	4581
W1VXL/1	Cranston AR Assn.	736-	B-25-	4578
W8GWR/8	Blennerhassett ARC	735-	B-10-	4560
VE3DRT/3	Skywide ARC	657-	AB-27-	4215
K3HKK/3	Nittany ARC	644-	AB-23-	4137
K2CD/2	Telephone Employees AR Assn.	654-	B-30-	4086
KØDWC/Ø	Bellevue ARC	650-	B-10-	4062
W8ICS/8	Indian Hills RC	557-	AB-45-	3776
VE3DC/3	Hamilton ARC	492-	AB-16-	3756
K1MUJ/1	Eastern Conn. AR Assn.	626-	ABC-20-	3729
K2MQW/2	Five Towns RC	514-	AB-40-	3700
W8EHI/8	Marietta ARC	385-	A-17-	3690
W1GFF/1	Research City AR Assn.	557-	AB-11-	3645
K9IND/9	West Suburban YMCA AR Council	531-	AB-17-	3537
K3GFW/3	Cumberland Valley ARC	389-	A-22-	3501
K5SRO/5	San Antonio Police RC.	582-	B- 7-	3492
K6QWL/6	North Hills RC	362-	A-11-	3483
W4AY/4	Nashville ARC	536-	AB- -	3423
K9TSM/9	Goshen ARC	488-	AB-15-	3378
W2LQO/2	Grumman ARC	515-	AB-21-	3366
K5LRU/5	Muskogee ARC	490-	AB-37-	3336
W2III/2	Mohawk ARC	496-	AB-15-	3312
W8HTX/8	Heath ARC	525-	B-16-	3306
VE3ZM/3	Guelph ARC	468-	AB-15-	3303
W2UF/2	Western Westchester RC	486-	AB-19-	3261
W3QZF/3	Horseshoe RC	496-	AB- -	3207
VE3SRC/3	Scarboro ARC	485-	AB- 5-	3201
K9WFL/9	Huntington ARC	529-	B-15-	3174
W2SEX/2	AR Assn. of the Tonawandas	428-	AB-35-	3168
KZ5PA/KZ5	Crossroads ARC	478-	B- 9-	3018
W9VZZ/9	Falls ARC	461-	AB-30-	2856
W3AVK/3	West Branch AR Assn.	398-	AB-18-	2817
W6BXN/6	Turlock ARC	450-	ABC-20-	2478
K6KIV/6	Marmonics-MARS RC	462-	AB-12-	2478
W4CA/4	Blue Ridge AR Soc.	399-	AB-30-	2449
W8ID/8	Seneca RC	423-	ABC-17-	2409
W1PX/1	Town of Barnstable RC	331-	AB-20-	2304
K6HAI/6	North Shores ARC	335-	AB- 7-	2151
VE3DCE/3	Niagara Peninsula ARC	285-	AB-23-	2109
W9RJY/9	Fort Wayne RC	333-	B-14-	1998
K8DAC/8	Saginaw Valley AR Assn.	299-	AB-25-	1989
W1AEW/1	Pioneer Valley ARC	320-	AB- 6-	1962
WA6DJS/6	El Cajon Valley High School ARC	225-	AB-13-	1902
W2IWI/2	Albany AR Assn.	240-	AB- 8-	1806
W3NBR/3	Washington County ARC	245-	B-18-	1620
VE3CBC/3	Canadian Broadcasting Corp. ARC of Toronto	166-	AB- 8-	1590
K8RPJ/8	Tri-County AR Assn.	247-	B-15-	1482
W2AVZ/2	Hamilton Township R Assn.	198-	ABC-15-	1281
W3NAV/3	Coke Center RC	130-	AB- 6-	927
K2VSU/2	A. B. Davis High School RC	102-	A- 6-	918
K1OOR/1	King Philip AR Soc.	428-	AB- 8-	864
K1MPN/1	Central Vermont ARC.	118-	B-20-	708
W1CBV/1	(nonclub group)	53-	AB- 7-	444
W2KVG/2	Tryion RC	159-	AB- -	377

Six Transmitters Operated Simultaneously

K2AA/2	South Jersey R Assn.	1845-	A-70-16,839	
K9AVE/9	Illinois Valley R Assn.	1016-	A-19-	9398
W5EQT/5	Kay County ARC	1427-	AB-16-	8733
W4EOH/4	Jefferson County AREC	1270-	B-41-	7770
K6QEZ/6	Ampex ARC	1058-	AB-26-	7101
W6WWJ/6	South County AR Soc.	1006-	AB-22-	7071
W1ECO/1	Submarine Signal RC	722-	AB-35-	6036
W3PIQ/3	South Hills Brass Pounders & Modulators	873-	AB-26-	5802
W5KA/5	Austin ARC	940-	AB- -	5772
W3KEF/8	Gentle MARS Club	878-	AB-54-	5691
K9GXV/9	Salt Chair ARC	807-	ABC-43-	5070
VE3JJ/3	West Side RC	536-	A-16-	5067
W2US/2	Suffolk County RC	813-	B-30-	5028
K6SIR/6	Ramona RC	644-	AB-14-	4806
VE3KCD/3	Kitchener Waterloo ARC	630-	B-27-	3843
W4BTI/4	Kennehoochee ARC	611-	AB-17-	3684
WA2DNI/2	Monmouth ARC	409-	A-18-	3681
W6MLK/6	High Frequency A Mobile Soc.	519-	AB-17-	3600
VE3NSR/3	North Shore RC	662-	BC- -	3588
K4FDS/4	Panama City ARC	566-	B-14-	3396
K1BKE/1	Contoocook Valley RC	392-	A-15-	3303
W4GAC/4	St. Petersburg ARC & Suncoast VHF Club	504-	AB-32-	3105
W6AK/6	Sacramento ARC	431-	AB- -	2964
W4MOE/4	Asheville ARC	436-	AB-15-	2835
K8TIH/8	Wood County ARC	418-	B-15-	2658
W4PAR/4	Davidson ARC	293-	A-20-	2637
K9MVV/9	Duneland AR Assn.	514-	ABC-30-	2598
W1KVZ/1	Yankee RC	367-	B-15-	2202

W6SD/6	San Fernando Valley RC	300-	AB-14-	2118
K2RLI/2	Rosiyn Teenage ARC	302-	AB- -	2004

Seven Transmitters Operated Simultaneously

W9SW/9	Chicago Suburban R Assn	1478-	AB-45-12,231
K6AGF/6	Convair Pomona Ham Club & Tri-Country AR Assn	1227-	A-30-11,268
W2WW/2	Watchung Valley RC	1159-	A-40-10,656
W1ASZ/1	Univ. of New Hampshire ARC	870-	A-16- 8055
K4DTV/4	Huntsville ARC	1201-	B-27- 7206
W8ACW/8	Genesee County RC	952-	AB-70- 6642
W4IOF/4	Atlanta Teenage RC	1013-	AB-25- 6261
K2USA/2	Fort Monmouth RC	1000-	B-22- 6000
W9FQ/9	Wheaton Community RA	734-	B-20- 4554
WA6GFY/6	Lockheed ARC	664-	AB-25- 4494
W9IKN/9	Elgin AR Soc	648-	AB-16- 4245
W6IAC/6	Escondido High School RC	524-	AB-14- 4083
K6GJ/6	Foothills AR Soc	427-	A-10- 3843
W8RNF/8	Lake-Geauga ARC	583-	AB-12- 3798
VE3MRC/3	Metro ARC	444-	AB-18- 3765
W4MQN/4	Atlanta RC	604-	ABC-14- 3360
W6ABZ/6	Palo Alto AR Assn	530-	AB-20- 3267
VE7ANW/7	Royal City AR Assn	401-	AB-18- 2757
W3OI/3	Lehigh Valley ARC	487-	ABC-16- 1983
K8SUL/8	Edison Employees AR Soc	243-	AB-10- 1815

Eight Transmitters Operated Simultaneously

K6DTA/6	West Valley RC	1328-	ABC-25-	9072
W9SWQ/9	Four Lakes ARC	1086-	AB-43-	7158
W6PW/6	San Francisco RC	1107-	AB-17-	7041
W6ULI/6	Fullerton RC	909-	AB- -	6495
W6ZRH/6	Livermore CD	713-	AB-16-	5202
W6PMK/6	Northern Peninsula Electronics Club	652-	AB-32-	4959
W3BN/3	Reading RC	646-	AB-40-	4863
K4IMS/4	Blue Grass ARC	678-	B-25-	4068

Nine Transmitters Operated Simultaneously

W1GLA/1	Framingham RC	963-	AB-34-	7623
W8HLD/8	Catalpa AR Soc	1165-	B-22-	7152
W9UVI/9	Peoria Area ARC	1044-	AB- -	6279
K2YCJ/2	Communications Club of New Rochelle	769-	AB-30-	5523
W9YH/9	Twin City ARC	686-	AB-28-	4635
W9FLP/9	West Allis RAC	682-	B-18-	4092
W4UCJ/4	Thomasville, Ga. ARC	406-	AB-20-	2679

Ten Transmitters Operated Simultaneously

W7HZ/7	Valley ARC	3390-	A-79-30,735
W6PMO/6	Associated R Amateurs of Long Beach	1974-	AB-45-13,716
W2G8A/2	Garden State AR Assn	1598-	AB-30-10,458
VE3NAR/3	Nortown ARC	1409-	AB-68- 9561
K6KGR/6	The Corona Gang	970-	A-10- 8955
W6UCS/6	Monterey Bay RC	1231-	ABC-26- 6798
K3IVO/3	Free State ARC	996-	AB-34- 6312
W7NCW/7	Lower Columbia AR Assn	610-	AB-23- 5529
WØW8V/Ø	Cedar Valley ARC	812-	AB- - 4908

Eleven Transmitters Operated Simultaneously

W6RW/6	(nonclub group)	2615-	A-35-23,535
W7DK/7	RC of Tacoma	2314-	A-75-21,051
W3RCN/3	Rock Creek AR Assn	1776-	AB-60-15,996
W5SC/5	San Antonio RC	1911-	AB-27-14,892
W9RK/9	North West RAC	1351-	ABC-31-10,428

Twelve Transmitters Operated Simultaneously

W2LI/2	Tri-County R Assn	2533-	A-50-23,022
W6UF/6	Elmac Gang RC	2498-	AB-40-15,738

CLASS B

Grouped in this listing are the scores of portable stations manned by one or two operators. Where two persons participated, the call of the other operator (if known) is given below that of the amateur whose call was used. Figures following the calls indicate number of contacts, power and final score.

One Transmitter

W9WNV/9	1139-	A-15,714
W9PWU		
W2JBQ/2	494-	A-7007
W2FBA		
K6QIK/6	400-	A-5751
KP4ARU/KP4	551-	A-4959
KP4ATG		
K7HNU/7	307-	A-4536
WØVXO/Ø	329-	A-4442
W3MSR/8	451-	A-4284
K5ATD/5	360-	A-3240
K5DRC		
K6TZH/6	324-	A-2916
K6ERZ		
W6BAM/6	290-	A-2835
K6LWN		

These energetic lads go to it in the one transmitter class from WØLUX/Ø, the Winona ARC. Coming from back to foreground we have KØs QPG, GIW, DHH, RHN, and LWF.

WA2IOG/2	263-	A-2592
K2AZJ		
W8UDH/8	259-	A-2556
K8KFK		
W6ANB/6[2]	283-	A-2537
K6SDR/6	166-	A-2241
K6RYJ		
K9KLR/9	220-	A-2205
K9JZZ		
K8GJM/8	243-	A-2187
K8PLJ		
W4YE/4	238-	A-2142
K2MBU/2	130-	A-2093
K2MKC		
K6MPX/6	216-	AB-2070
W6MUG		
W7JBD/7	328-	B-1968
W7FKF		
WØNKG/Ø	275-	AB-1818
KØJIY		
KØIJL/Ø	175-	A-1800
W9ISJ		
W4IPV/4	298-	B-1788
W4DMB		
K8LGX/8	173-	A-1782
K8HVV		
W5US/5[3]	244-	B-1734
K8NGQ/8	103-	A-1728
W8VWY		
W2AC/2	101-	A-1701
W2KDC		
VE3CLU/3[2]	160-	A-1665
W6NAT/6[2]	178-	A-1602
W6QYO/6	178-	A-1602
K6LQY		
K2AUW/2	235-	B-1560
K2QDT		
W9UXT/Ø	255-	B-1530
KØAQO		
K2HVI/2	192-	AB-1501
K2SYS		
W5NITL/5	249-	B-1494
W5AJA		
K6AZW/6	166-	A-1494
W6HKF		
K1DRX/1	148-	AB-1416
K1BAB		
W7TLZ/7	155-	A-1395
K7KGP		
K1ITU/1	191-	B-1296
W1RWR		
W3WDK/3	208-	B-1248
W3ZNY		
W8WGR/8	415-	A-1239
K3GBU/3	202-	B-1212
K3GVK		
W4SLT/4	199-	B-1194
W4RIM		
K9LBH/9	193-	B-1158
K9OBM		
VE3EIM/3	102-	A-1152
KØGVW/Ø	103-	A-1152
KØRUW		
W7JBN/7	96-	A-1089
W7JBE		
K4LDR/4	94-	A-1071
W4WHK		
K5HBO/5	114-	A-1026
KN5WUE		
W9OHU/8	50-	A-1013
W9OEY		
K4RTA/4	138-	B- 978
K4RIN/4	325-	A- 975
K4MUJ		
W9YAE/9[2]	146-	B- 876
KØMGG/Ø	146-	B- 876
KØEKR		
K2BBX/2	93-	A- 837
K2ZPD		
K6YIK/6	89-	A- 801
WA6GZX		
K4QPJ/4	108-	B- 798
KN4WYN		
W6VIV/6	57-	A- 770
VE3CTT/3	84-	A- 756
VE3DVY		

This 40 and 20 meter position is shown here busy racking contacts for the Mahanoy Valley Brass Pounders Klub, W3DUI/3. Seated are K3KNO, K3KNP, and W3FWD; standing is E. Penna. SEC, W3DUI.

K9INC/9	80-	A-	720
K9SF8			
K8JOS/8	79-	AB-	708
K8NHR			
K3LNZ/3	53-	A-	702
W8KMX			
KØCQA/Ø	116-	B-	696
KØCPN			
W5KHP/5	84-	B-	654
W4GTS/4	108-	B-	648
W4ELO			
KØHZA/Ø	47-	AB-	642
KØRVY			
WA6AJD/6	79-	B-	624
K6RTO			
K8RJF/8	100-	B-	600
K8KNI			
W2UJS/2[2]	35-	A-	540
W5QK/5	88-	B-	528
W4ONU/4[3]	63-	B-	528
W8MTI/8[4]	29-	A-	486
K7IQA/7	80-	B-	480
VE6SE			
K4SZF/4	54-	B-	474
K4FPP			
K1JEL/1[5]	76-	B-	456
W7VOU/7	50-	A-	450
VE4XJ/4	74-	B-	444
VE4SX			
K6GGP/6	71-	B-	426
K6QFS			
K1JAO/1	71-	B-	426
KN3KHK/3	30-	A-	405
W5GH/5	29-	A-	392
WA2CCF/1	1-	A-	365
WA6AFX/6	38-	A-	342
WA6GTW			
K7GQG/7	164-	B-	328
W7WLB			
K8NIN/8	163-	B-	326
KN8TND			
K7DVO/7	52-	A-	312
WA6DNM/6	75-	A-	300
K6ELX/7	26-	AB-	279
W6ZRJ/6	18-	A-	243
W6VZT			
K4FYA/4	40-	B-	240
K7KME/7	112-	B-	224
K3HRF/3	35-	B-	210
KN9UOV/9	67-	A-	201
KN9YDJ			
K4CTX/4	83-	B-	166
K4FQC			
W8QIW/8[2]	27-	B-	162
W3ML/4	76-	B-	152
KØVBU/Ø	48-	B-	146
KØUTX			
KN8SHR/8	16-	A-	144
K2HMG/2	15-	A-	135
K7HVF/7	38-	B-	126
K7BHE			
K8KXK/8	45-	AB-	116
K8KXJ			
KØUJJ/Ø	50-	B-	100
K3GHH/3	33-	A-	99
K3HWL			
KN8BRH/9	32-	A-	96
W1HDQ/1	7-	A-	95
KØRPS/Ø[2]	27-	B-	54
K7LVU/7	26-	B-	52
K3HKR/3	25-	AB-	52
K3JZD			
WA6AFA/6	17-	A-	51
KN8RBD/8	7-	B-	42
K9UBK/8	16-	AB-	34
KN9VWK			
W5GI/5	5-	B-	30
K2RHD/2	1-	B-	6
K2UWF/2	1-	B-	6

Two Transmitters

K6SXA/6	1007-	A-	9563
K6EIL			
K5LSH/5	199-	A-	2016
K5WGU			
KØVRB/Ø	310-	B-	2010
KØORG			
K9UHH/9	154-	A-	1386
KN9WKO			
W2MTA/9	225-	B-	1350
K2IVK			
K6KHZ/6[6]	130-	AB-	924
W9RXJ/9	148-	B-	888
K9EBO			
K6MSK/6	107-	B-	792
WV6HEH			
K3BST/3	102-	AB-	753
K3LDY			
K7AXM/7[6]	142-	B-	284

CLASS C

Grouped in this tabulation are the scores of entrants in the mobile class. Figures following the call indicate number of contacts, power and final score.

W8PVC/8	235-	A-	4293
K6EPC/6[7]	201-	A-	3051
K6RRD/6	158-	A-	3011
K6QPX/6	115-	A-	2430
K2TOM/2[8]	150-	A-	2363
W6GTG/6	109-	A-	2349
W8GHO/8	79-	A-	2187
K6UVE/6	93-	A-	2133
W6QHP/6	85-	A-	2106
W8LEX/8	73-	A-	2106
K6UKH/6	88-	A-	2066
K8MVA/8	68-	A-	2025
W8QAV/8	66-	A-	2012
W8MWE/8	66-	A-	2012
K8AAG/8	63-	A-	1971
W8AEU/8	61-	A-	1944
W8AGA/8	60-	A-	1931
W3DSG/3	118-	A-	1930
W8ZEU/8	58-	A-	1904
W8GMK/8	66-	A-	1904
K8GVK/8	58-	A-	1904
K8DFY/8	56-	A-	1877
W8WZS/8	56-	A-	1877
W8WAG/8	56-	A-	1877
W8QYS/8	56-	A-	1877
K8PZM/8	56-	A-	1877
W8AIL/8	56-	A-	1877
W8OHA/8	56-	A-	1877
W8BDZ/8	56-	A-	1877
K8CFH/8	56-	A-	1877
W8AJH/8	56-	A-	1877
W8ZJQ/8	56-	A-	1877
W6OOR/6	45-	A-	1850
W8SDV/8	54-	A-	1850
W3RQZ/3	170-	A-	1818
K3CRU/3[9]	102-	A-	1715
K6VUZ/6	57-	A-	1647
W6OPY/6	51-	A-	1620
K6BJU/6	45-	A-	1590
K6ICY/6	64-	A-	1526
K8JIC/8	30-	A-	1526
K6UML/6	48-	A-	1526
W6VHT/6	47-	A-	1512
W8RAK/8	29-	A-	1512
W3SRU/3	82-	A-	1445
K6OWS/6	38-	A-	1445
W6EPN/6	35-	A-	1404
K6JNV/6	36-	A-	1364
WA6DGH/6	30-	A-	1283
W3IJW/3	70-	A-	1282
K6SEA/6	23-	A-	1269
K6LWR/6	29-	A-	1269
K6SBL/6	23-	A-	1266
W3YHV/3	65-	A-	1215
K8PZQ/9	63-	A-	1188
K6IXU/6	21-	A-	1188
VE3BLT/3	62-	A-	1175
K6TYJ/6	21-	A-	1160
W6EPG/6	21-	A-	1161
K6GUU/6	21-	A-	1161
K3GNM/3	59-	A-	1134
K6TJG/6	57-	A-	1107
W9TIL/9	57-	A-	1107
W9AYU/9	57-	A-	1107
W6ENR/6	81-	A-	1094
K9UTI/9[10]	153-	B-	1068
W3QQH/3	54-	A-	1067
K3DJE/3	53-	A-	1053
K6CPX/6	26-	A-	1013
K6TQI/6	26-	A-	1013
W3GOW/3	50-	A-	1012
W6IMT/6	25-	A-	999
K6OSD/6	25-	A-	999
K6YFG/6	25-	A-	999
K6IPJ/6	25-	A-	999
K6KND/6	25-	A-	999
W6GAU/6	25-	A-	999
K6RYQ/6	25-	A-	999
K6PQZ/6	25-	A-	999
K6VPP/6	25-	A-	999
K6OSC/6	25-	A-	999
K3GNJ/3	47-	A-	972
W3AHX/3	39-	A-	918
K9MNF/9	43-	A-	918
W3PWG/3	42-	A-	904
W3VV8/3	41-	A-	891
K3CJC/3	41-	A-	891
K6CBQ/9	41-	A-	891
W3AJO/3	47-	A-	837
WA6CGV/6[2]	62-	A-	837
WA6FKN/6[11]	33-	A-	783
W3HAU/3	27-	A-	756
W3UMK/3	31-	A-	756
W3WNC/3	30-	A-	742
K3ADH/3	27-	A-	702
W3FOC/3	26-	A-	688
K3HIJ/3	26-	A-	688
W3LNQ/3	25-	A-	675
W3ZPF/3	25-	A-	675
W3IVD/3	24-	A-	662
W3QZO/3	24-	A-	661
K3BGA/3	48-	A-	648
W3LEM/3	21-	A-	621
VE3NG/3	15-	A-	540
W1DMH/4	35-	B-	540
W3FWI/3	13-	A-	513
W3DJV/3	13-	A-	513
K9MAD/9	12-	A-	500
W9MYI/9	12-	A-	500
K5MQT/5	11-	A-	486
W8CU/8	7-	A-	459
W8MPZ/8	7-	A-	459
W8HAI/8	7-	A-	459
W8CEY/8	7-	A-	459
W8HHV/8	7-	A-	459
W8CBM/8	7-	A-	459
W8ZRZ/8	7-	A-	459
W3HQJ/3	6-	A-	418
K6MBQ/6	69-	B-	414
W3EXY/3	5-	A-	405
K1IWY/1	30-	A-	405
K9SBL/9	29-	A-	392
W3EQV/3	4-	A-	391
KH6IJ/3/4/8	27-	A-	365
W3HAS/3	2-	A-	365
K9LTC/5	27-	A-	365
W9EXR/9	1-	A-	351
K6KCU/6	26-	B-	234
VE3BMS/3	15-	A-	202
WØBPO/4	14-	A-	189
W3LKI/3	18-	B-	162
VE3BRQ/3	11-	A-	148
VE3DXS/3	10-	A-	135
W3ADV/3	21-	B-	132
VE3KL/3	13-	B-	117
K8ERZ/8	11-	B-	99
K9MAE/9	6-	A-	81
W9DIK/3	4-	A-	54
K9OJV/9	5-	B-	45
K9DWR/7	3-	A-	41
W4BUU/4	2-	A-	27

CLASS D

Grouped in this tabulation are the scores of home stations operated from emergency power.

KP4FAC[12] 1358, W4FYY[13] 483, K5KUA[14] 462, KØZPC[15] 381, KØUDM[16] 309, W5HPI[17] 236, WA2EBV[18] 230, W5KIR[19] 211, W8ELR[20] 173, K9WBT[8] 167, W8BMN[21] 163, W5RIN[22] 162, K5TFG/5 136, W9BGX[18] 135, W5ABF[23] 120, W6NKR 118, WA6LET[24] 63, W2WCR[25] 50, K3GXP[26] 47, W6PFE 47, W4ZK 29.

CLASS E

Grouped in this tabulation are the scores of home stations operated from commercial power sources.

K4VLY[17] 495, W3KLA 473, W9QQQ 398, W3ZNH 341, K5SVC 294, K6RTK 257, W3MOZ/3[12] 241, K3DCC[27] 226, WA2CAW[28] 225, K9IUF 222, W4HGH 219, K4IEX 217, K9TYM 203, KØLIR[21] 186, K2GTC 181, K1MEM 168, WA2AFT[2] 168, WA2BAH 161, WA6BKR 158, K9GDF 156, WA2CZG 153, W4KFC 146, K8OCO 146, WA6AKE 137, WA6IJG[29] 134, K4ZIW 133, KØTLJ/Ø[8] 130, W1ETF 126, K4MWB 123, WA2DFF 117, K8EWI/8 117, WØKCG 113, W3RNY 106, K2AMP 105, WIAW[2] 105, WA6IRN 104, W4DTU 100, W5YLN[30] 100, K1IVR 99, K2RBD 98, WA2-DHF[19] 98, W2LHL 93, K9ELT 90, WA2FNA 88, W9RNC/9[8] 86, W2DUN 85, W4DS 84, K9MAB 83, K6SUC 82, K2SBW 80, K1GLL 79, WV2IOU 75, W6GEB 73, KG4AD 72, W3JRX 70, WA6FOL 70, K9TOK 70, WA2BWT 68, W2ORV 68, KØLNB 68, K2VAR 67, K1CAK 65, K9TID[2] 64, W3IWJ 61, K3JYZ 61, KØVSH[15] 53, WA2EFU 49, WA6JMQ 48, K3GJE 47, KØADI 47, KP4AOV 47, K8MST 46, K4DOF 43, K5HIM 43, WA6EFI 43, VE5DZ 40, KN5ZOX 36, K1ACQ 35, K1JYN[31] 35, K3JIQ 35, WA2BJA[2] 34, W6FYW 33, K6HOV 31, K3KFI[32] 31, W4HYW 30, W4GJR 29, K9SRR 29, WA6DCF 27, WA6CRX 26, K9PCG 25, W4NFD/3 23, K3GNO[8] 23, K6COP 20, K8QYG 20, K9OCU 19, WV6IVN 18, WA6GDM 17, K8IAS 17, KN1OAV 16, K3HFU 16, W4JUK 16, K6TIP 16, K1OOV 15, W8IBX 15, K1IIK 14, W4PY 14, W8HFR 13, W9HOA 13, K7HPF 12, W9AEM 11, W9QGA 11, W3LNX 10, WA6ENC 10, KN7KDC 8, KN9UCG[33] 8, KN8TLL 7, K7GFH 6, KN9UIY 6, KØPFV 6, W3RHT 5, KN3KRF 4, W3UIU 4, K4JYN 4, W7LNG 4, KN3LZF 3, WV6LSS 1.

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[1] K6QHZ, K6EXO oprs. [2] 2 oprs. [3] K5PFO, K5DIY oprs. [4] K8EXF, K8MJZ oprs. [5] K6LGU, K6RFT oprs. [6] K7BKR, W7IYJ oprs. [7] W6HBF 2nd opr. [8] 4 oprs. [9] K3GAY 2nd opr. [10] 7 oprs. [11] WA6FLC 2nd opr. [12] 3 rigs, 10 oprs. [13] 3 rigs. [14] 3 rigs, 15 oprs. [15] 2 rigs, 20 oprs. [16] 15 oprs. [17] 3 rigs, 9 oprs. [18] 3 rigs, 5 oprs. [19] 3 oprs. [20] 5 rigs, 7 oprs. [21] 3 rigs, 7 oprs. [22] 2 rigs, 14 oprs. [23] 6 rigs, 12 oprs. [24] 3 rigs, 6 oprs. [25] W2MHM opr. [26] 10 oprs. [27] K3DCB 2nd opr. [28] WA2ALG 2nd opr. [29] WA6IJH 2nd opr. [30] W5AKT 2nd opr. [31] K1KWN 2nd opr. [32] K2SIR 2nd opr. [33] KN9VKM 2nd opr.

Strays

The Third U. S. Army Technical and Training Net continues at 1900 each Friday local time on 5850 kc. During December the schedules will discuss good operating and good net operations.

— • • • —

Air Force MARS Eastern Technical Net meets Sundays from 1400 to 1600 local time on 3295, 7540, and 15,715 kc., except that there will be no broadcasts on Christmas or New Years.

— • • • —

TF2WFF worked TF2WFF in the early part of October. Seems that the Icelandic Post and Telegraph Administration issued the duplicate calls in error last June, and it wasn't until October that the two fellows, whose stateside calls are WA6HZH and K4APM, worked each other and the error was discovered. They serve at posts about 250 miles apart.

Happenings of the Month

ITU BAN LIST

In July, 1955, FCC announced that Laos had notified ITU it no longer objected to communications between its amateurs and amateurs elsewhere; consequently, Laos was removed from the banned countries list. It now develops that there was an international misunderstanding, and that Laos still has its objections to international amateur communications on file at ITU headquarters in Geneva. Therefore, in keeping with U. S. policy, FCC-licensed amateurs are again prohibited from communicating with amateurs in Laos (XW8), along with those in Cambodia (XU/XV) Viet Nam (XV/3W) and Indonesia (PK).

PARAGUAYAN 3RD PARTY TRAFFIC

Effective November 5, an exchange of notes between the governments of Paraguay and the United States was concluded providing that amateurs of each country may exchange messages on behalf of third parties. The agreement contains the usual broad restrictions limiting conversations or messages to purely personal and relatively unimportant matters — except, of course, in actual emergency. The full list of countries with which U. S. amateurs may freely handle such personal unimportant traffic internationally is: Canada, Chile, Costa Rica, Cuba, Ecuador, Haiti, Honduras, Liberia, Mexico, Nicaragua, Panama, Paraguay, Peru and Venezuela.

GENEVA RADIO REGULATIONS

The final documents of the Administrative Radio Conference, concluded at Geneva, Switzerland, a year ago, are now available from the International Telecommunications Union (at Geneva). The Radio Regulations volume is approximately ARRL *Handbook* size and the price is 19 Swiss francs (roughly, $4.50), postpaid.

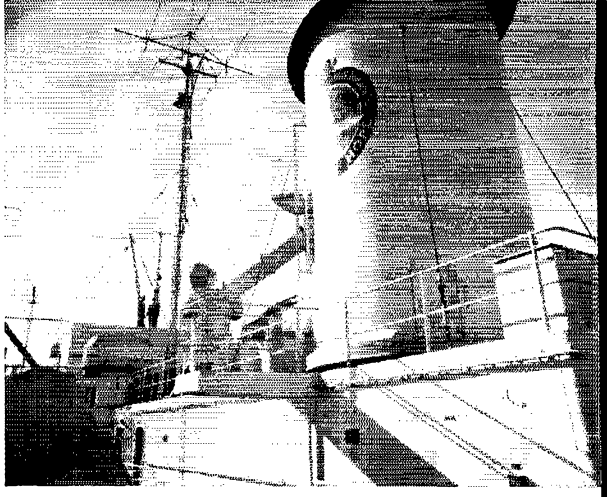
1960 MERIT AWARD

For pioneering 144-Mc. and 220-Mc. tropospheric propagation, John T. Chambers, W6NLZ, and Ralph E. Thomas, KH6UK, were presented the 1960 ARRL Merit Award. The Award, in the form of a plaque, is made each year for "outstanding contributions to the art of amateur radio communication."

The 1960 citation reads:

"For having demonstrated, through persistent effort in the best amateur tradition, that signals on the 144-Mc. and 220-Mc. bands could be propagated over distances previously considered impossible."

Announcement of the 1960 Merit Award was made by Director Harry Engwicht, W6HC, at the Pacific Division Convention at San Mateo, Calif., in September. Engwicht is a member of the Merit and Awards Committee of the ARRL Board of Directors which chooses the award recipient.



Here are the antennas installed on the SS *Hope* before she set sail to the Far East with Ralph Charbeneau, W8OLJ, on board operating maritime mobile. The *Hope* arrived in Djakarta, Java, Indonesia, on Oct. 18. On the 14-Mc. band W8OLJ has shifted from 14,345 to 14,235 kc., because of interference from Far East stations. The 10- and 15-meter frequencies remain 28,650 and 21,445 kc. Those who work the *Hope* may obtain QSLs by writing to Project Hope, P. O. Box 9808, Washington 15, D. C.

In achieving the unbelievable v.h.f. records, Chambers and Thomas established two-way amateur work over a 2540-mile path between Palos Verdes, Calif., and Hawaii — first at 144 Mc., on July 8, 1957, and again at 220 Mc., on June 22, 1959. Much of the equipment on both ends was home brew. Still, to prove it could be done on even the higher bands, Thomas and Chambers last summer sought two-way contacts on 432 Mc. Consistent, day-after-day schedules were kept, with 14,095 kc. used as a liaison frequency. W6NLZ heard KH6UK's u.h.f. signal, but equipment failure at the other end prevented an actual completion of another record.

In 1955, Thomas, then W2UK, and Paul M. Wilson, W4HHK, received the Merit Award for their two-year work on communications by meteor-trail reflections at 144 Mc. QST

Strays

We rather expect violent thunderstorms in New England during the summer months, but read what happened to W1CTW on the morning of Oct. 25:

"While we were eating breakfast last Monday, my triband groundplane took a direct hit by lightning. It followed the coax to the transmitter, and thence to ground via the wall plug and fuse boxes. The wall plug was blown to bits, and pieces of the main fuse box were scattered halfway across the cellar. Fortunately there was no fire, but I have a hole in the house, and a complete a.c. rewiring job must be done. We have a temporary a.c. connection to the refrigerator, oil burner, and one plug in the kitchen, but it looks as if I'll be off the air for a while. The telephone installation had to be completely replaced, all the way out to the pole!"

14th V.H.F. Sweepstakes, Jan. 7 and 8

Help Your Club Shoot for Gavel

CQ SWEEPSTAKES will ring on 50 Mc. and above on January 7 and 8, 1961, marking the ARRL V.H.F. Sweepstakes contest. Such a call or answering such a call and exchanging information shown at the top of the facing page will get you started. The exchange follows along the lines of a standard message preamble. You can work stations once per band for score, so band versatility will pay off.

The rules are the same as last year (exception: no Technician award). Contacts count only when the contest is in progress at both ends of the QSO. Suppose K1CRQ starts right out at the beginning of the contest at 1400 (2:00 P.M.) local standard time. During the first hour only stations in the Eastern time belt count for score; during the second hour stations on CST can now be worked as well. By the fourth hour stations in the far west on PST can be worked and counted.

Scoring is exactly as last year. The multiplier is the number of different sections worked, *plus ten*. You do not get an additional multiplier reworking a station on a different band, although it does count 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.

Here is an example for figuring the final score. Suppose K5TKR 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)

The top single-op scorer in each section earns a certificate. Where at least three Novice entries from a given section are received, the top one receives an award. The club with the highest aggregate score will receive a cocobolo gavel with a sterling silver band engraved with the name of the winning club.

ARRL now has contest forms. These log sheets will be sent to you free on request. Follow the log sample shown in this announcement if you make your own forms

All v.h.f. people are urged to participate, particularly to help increase your club's total score. Mark your calendar now for the V.H.F. Sweepstakes, January 7 and 8.

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.

SUMMARY OF A.R.R.L. V.H.F. SWEEPSTAKES EXCHANGES

Station..... ARRL Section.....

	SENT (1 point)						*RECEIVED (1 point)*							
Freq. Band (Mc.)	*NR*	*Stn.*	*CK-RST*	*Section*	*Time*	*Date (Jan.)*	*NR*	*Stn.*	*CK-RST*	*Section*	*Time*	*Date (Jan.)*	*Number of Each Different New Section as Worked*	
50	1	W1AW	57	Conn.	1615	7	3	W1RJA	47	Conn.	1615	7	1	2
50	2		43		1635	7	7	W1PHR	59	Conn.	1640	7	..	2
50	3		58		2109	7	6	W1WTR	359	R. I.	2111	7	2	2
144	4		49		2130	7	32	W1OOP	58	E. Mass.	2136	7	3	2
144	5		57		2150	7	15	KN1MQW	58	Conn.	2146	7	..	2
50	6		54		2330	7	11	W2YHP	48	N. Y. C.-L. I.	2332	7	4	2
420	7		58		2335	7	30	W1RJA	57	Conn.	2335	7	..	2
144	8		57		2345	7	21	W3CGV	59	Md.-Del.-D. C.	2356	7	5	2
144	..	...	...	...		..	18	W9WOK	449	Ill.	2359	7	6	1
144	9	W1AW	24	Conn.	0850	8	7	W1RFU	59	W. Mass.	0847	8	7	2
50	10		479		0918	8	12	W6AJF	379x	S. F.	0620	8	8	2
50	11		589		1040	8	20	VE3AIB	569	Ontario	1035	8	9	2

Claimed score: 23 points × 19 (9 + 10) = 437. Bands Used: 50 144 and 420 Mc. 9 sections worked

Names and calls of operators having share in above work.....

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

I hereby state that score and points set forth in the above summary are correct and true.

Equipment..... *Signature*.....

Number of QSOs..... *Address*.....

EXPLANATION OF V.H.F. SS CONTEST EXCHANGES

Send Like Standard NR Msg. Preamble		*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
Purpose	QSO NR tells how you are doing	Identification	RS or RST report	See page six for section list	Time and date must fall in contest period	
Sample	NR 1	W1AW	57	CONN	1615	JAN 7

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. 7, 1961, and ends at midnight, Sunday, Jan. 8, 1961. 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 W1RFU 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 Jan. 27, 1961, to be considered for awards. QST

Strays

By golly, some people do plan ahead. Way back in late September the fellows in Washington who are responsible for Armed Forces Day amateur activities in May started making plans for the 1961 celebration. Here we have, left to right, Mr. Ed Liscombe (K4KNB), Army MARS; Major Sidney Rexford (W2TBZ), Army MARS; Commander A. B. Kunz, Officer in Charge, K4NAA; Capt. W. E. Bettis (W4LUY), Air Force MARS; MSgt. Herman Philbeck (W4LWG), Air Force MARS; and Lieutenant Commander C. R. Winnette, Assistant Officer in Charge, K4NAA.

Armed Forces Day 1961 will be observed on May 20.

September V.h.f. Party Summary

Nearly 500 Stations Report Lively Week End

TROPOSPHERIC propagation was good along the northeastern seaboard Saturday night, and there was a short period of aurora for the northeast and Great Lakes areas, but on the whole the week end of September 17 and 18 was just about normal for that time of year. Despite this, v.h.f. activity was at a high level, and we have 494 entries in our final tabulation for the September V.H.F. Party.

Scores kept pace with the increased activity, and v.h.f. party totals look more like our lower-frequency contest scores all the time. One station made 786 contacts, another 652, and dozens went over the 400-contact figure, once considered all but unattainable in a v.h.f. affair. Entries came in from 53 ARRL Sections.

As always, the Party took on a Field Day character, with 84 of the stations reporting being portables. Some of these groups went all-out, carrying home-station type setups and antennas to the high spots, and pouring it on full-blast. W2PEZ/2, manned by the 6220 V.h.f. Group, involved much hauling and ¾ mile of hiking, but the labor paid off with the country's leading score: 786 QSOs on 4 bands, for 37,485 points. The Copperhead V.h.f. Society of Washington, D. C., toted kilowatt transmitters, and the best in receivers and antenna systems, up to Foxville Fire Tower, near the presidential retreat at Camp David, Md., and worked 652 stations on 4 bands, for 32,432 points with W3JZY/3. Other high-ranking eastern portable stations included W1BJ/1, Mt. Kearsarge, N. H., and W2LWI/2, Overlook Mountain, in the Catskills, and many others.

With little or no DX to build up section multipliers, stations out of range of the crowded East did not make so many points, but they worked plenty of stations. (Perhaps we should reiterate here that these country-wide rankings we mention are entirely mythical. There is no national award of any kind; you compete only with other stations in your own ARRL Section for certificate awards.) A spring-and-fall regular, the Southern Peninsula Old-timers Society, K6TJL/6, took it in comparative ease this time. After several bouts with snow and cold weather in higher elevations, they chose 2000-Skegg's Point, in the Santa Clara Valley Section this time, and it proved good enough for 304 contacts on 4 bands, for 6848 points.

W6ZOP/6 led the single-operator stations of the West, with 368 contacts on 50, 144 and 220 Mc., for 4114 points and the San Diego Section award. The West's top effort was the work of WA6DJB, Los Angeles: 453 QSOs on 4 bands, for 7020 points.

The country's leading single-operator score was turned in by W1RJA, Milford, Conn. Ed worked 410 stations on 50 and 144 Mc., coming up with an impressive section multiplier of 32, for 13,120 points, and the Connecticut Section wallpaper. Close behind was W1QXX, Arlington, Mass., who lead the Eastern Massachusetts Section with 309 on 4 bands, for 12,432 points. Many fine efforts are missed if you merely scan the tabulation for high scores. Examples: W7RT, Seattle, with 131 QSOs for 1048 points, and K7HRW, Reno, Nevada, with 102 on 50 and 144 Mc., for 1224.

One-band work is getting rarer all the time, but some nice scores were made on both 50 and 144 Mc. by one-band operators. W2PUO/2 managed 218 contacts on 50 Mc., and K2VZA 187. A higher section total gave K2VZA a 2-point edge among 6-meter operators, at 2618 points to W2PUO's 2616. Best 2-meter effort was by WA2INB: 177 in 12, for 2301 points. The Northern New Jersey award was won by W2DWJ without using 50 Mc., but he did right well on 220 and 420, as well as 144 Mc. W2KIB, second in NNJ, ran up a section total of 31 the hard way on 50, 144 and 220 Mc. Jim has no modulator! One-banders took 10 section awards, 5 each on 50 and 144 Mc., the best of these being K8KCI's leading effort in Ohio: 173 QSOs on 50 Mc., for 1038 points.

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

E. Pennsylvania

W3DJW 3388-242-14-AB
K3ECF 2736-171-16-AB
K3HNP 2024-184-11-A
W3ARW 1606- 57-22-BCD
W3GCL 1582-113-14-AB
W3SAO 1248- 96-13-AB
K3IPM/3 1240-124-10-A
K3GZU 1224-136- 9-A
W3WJC 1183- 91-13-AB
W3FEY 1131- 61-13-ABCD
W3JXT 1125- 75-15-AB
K3LLI 1111-101-11-A
K3HRF/3 1079- 83-13-AB
W3ETB 1044-116- 9-A
K3LDL 1030-103-10-A
K3IUV 882- 63-14-AB
W3AZE 840- 84-10-AB
K3ATL 680- 85- 8-A
K3JHE 476- 68- 7-A
K3DJL 292- 47- 6-B
K3HNG 172- 43- 4-A
W3LDA/3 120- 20- 6-AB
K3HMV 96- 24- 4-A
K3IXD 87- 29- 3-A
K3CNN 9- 9- 1-B
W3KX/3! (8 oprs.) 14,490-307-42-ABCD
W3BPZ/3 (7 oprs.) 13,032-353-36-ABC
W3QQB/3 (4 oprs.) 5670-270-21-AB
W38NM (4 oprs.) 5566-236-23-ABC
K3BUZ/3 (8 oprs.) 5566-253-22-AB
W3OID/3 (4 oprs.) 4584-191-24-AB
W3EYN/3 (W3s EYN ITH, KN3LWN) 2560-160-16-AB
W3WZT/3 (W3s WZT ZKU, KN3MYO) 2352-168-14-AB
K3DLK/3 (6 oprs.) 2226-159-14-AB
W3JMP/3 (K3s CSL DFY, W3JMP) 1560-156-10-A
W3KEL/3 (4 oprs.) 225- 45- 5-A

Md.-Del.-D. C.

W3CGV 2420- 92-22-ABCD
K3AZH 1161-129- 9-A
W3LCC 1110- 58-15-ABCD
W3MSR 553- 79- 7-B
W3TFA 528- 88- 6-AB
W3HB 204- 51- 4-B
K3IEV 176- 44- 4-A
K3JAN 144- 36- 4-A
KN3NEE 90- 30- 3-B
K3MDL 81- 27- 3-A
W3UCR 70- 35- 2-B
K3DQA 64- 16- 4-AB
W3OTC 42- 14- 3-A
W3JZY/3! (11 oprs.) 32,430-652-46-ABCD
K3CEZ (7 oprs.) 4693-241-19-ABC
K3EIW (K3s EIW JZS, W4-UBE) 2112-176-12-AB
W3DHQ (W3s DHQ KDZ) 612- 68- 9-AB
W3CBW (K3ELN, KN3LEO) 246- 82- 3-B

S. New Jersey

W2N8F 3420-180-19-AB
WA2EMB 2432-152-16-AB
W2BLV 1400- 50-25-ABD
K2ITP 858- 78-11-A
WA2KLZ 352- 44- 8-B
WA2ICW 296- 37- 8-B
WV2NXV 72- 24- 3-B

Western New York

K2ERQ[2] 2970-165-18-AB
K2PBU 1430-110-13-AB
K2DBB 1391-107-13-AB
K2LMG 1258- 74-17-B
K2GUG 1152- 89-12-ABC
K2YCO 1023- 93-11-AB
W2RPO 504- 84- 6-AB
W2QMK 315- 35- 9-B
K2QVC 284- 67- 4-AC
WA2KND 272- 68- 4-AB
K2RUM 268- 67- 4-B
K2MLF 230- 46- 5-A
WA2LFA 144- 48- 3-A
K2LRI 123- 41- 3-B
WV2KDI 58- 29- 2-B
WA2HTW 30- 10- 3-A
K2RRM/2[2] (10 oprs.)
6760-256-26-ABC
K2IXJ/2 (4 oprs.)
4698-168-27-ABC
K2HWZ/2 (10 oprs.)
3591-167-21-ABC
W2ZKE (7 oprs.)
2662-115-22-ABC
K2DUR (K2s DUR VKR, W2SBY)
1068- 89-12-AB
W2PST/2 (K2SKH, W2PST)
252- 36- 7-AB
K2DYC/2 (K2[illegible]YC, WA2-JTU 57- 19- 3-A

Western Pennsylvania

W3RUE 1826- 77-22-ABC
K3CHC 1030-103-10-A
W3BWU 900- 89-10-ABD
K3JTH 896-112- 8-A
W3LST 60- 15- 4-B
W3NRG 42- 14- 3-B
W3UHN 21- 7- 3-A
W3ZQU (5 oprs.)
1378-106-13-AB

CENTRAL DIVISION

Illinois

K9IXY 1199-109-11-AB
W9RVQ 540-135- 4-A
K9LBQ 424- 53- 8-A
K9PLM 336- 84- 4-A
K9DWR 324- 81- 4-A
K9EEC 308- 77- 4-B
K9AAJ 288- 30- 9-BD
W9TOY 280- 70- 4-B
K9UTP 261- 87- 3-A
KN9VVX[3] 256- 64- 4-B
KN9VEY 228- 57- 4-B
W9CRN 228- 57- 4-B
K9ZOO/9 220- 55- 4-A
K9YLS 220- 55- 4-B
W9PBP 150- 25- 6-B
W9HCV 144- 24- 6-A
K9VXY 132- 33- 4-AB
W9UNN 120- 24- 5-B
W9KBP 84- 14- 6-AB
K9BQW 78- 26- 3-B
K9HWC 75- 25- 3-A
K9QOQ 34- 17- 2-B
W9PNE 30- 6- 5-A
KN9YEN 25- 25- 1-B
W9ADO 20- 10- 2-B
K9RUJ 20- 10- 2-A
K9PUF 16- 8- 2-B
K9IEB 12- 12- 1-B
K9HDE (K9s HDE OQV)
1127-161- 7-AB
K9TDQ (K9TDQ, W9WFR)
200- 40- 5 B

Indiana

K9MMH 2639-200-13-ABC
K9MZV 553- 78- 7-ABC
W9MHP 520- 64- 8-ABC
W9TWU/9[1] (13 oprs.)
1872-141-13-ABC
K9DXQ (K9s DXQ DWT)
1616-202- 8-AB
K9PED (K9s LNT PED)
1323-147- 9-A

Wisconsin

W9JOT 287- 41- 7-AB
W9TQ 208- 26- 8-AB
W9IXF 128- 32- 4-B
W2MTA/9 112- 28- 4-A
W9WAQ 84- 21- 4-A
K9MWQ 10- 5- 2-B
W9JCI (W9s JCI JFP)
602- 86- 7-AB
K8IFL/9 (4 oprs.)
48- 12- 4-AB

DAKOTA DIVISION

South Dakota

K0GRP 64- 16- 4-AB
W0ENC 48- 12- 4-AB
K0EIC 22- 11- 2-AB

DELTA DIVISION

Arkansas

K5QYH 66- 22- 3-AB

Tennessee

K4VIT 476- 68- 7-AB
W4HHK 180- 19- 9-ABD
K4KTC 81- 27- 3-A
W4LOJ 45- 9- 5-B

GREAT LAKES DIVISION

Kentucky

K4HZO 648-108- 6-A
K4VEZ 301- 43- 7-AB
K4VTS 185- 37- 5-A
K4BPY 24- 8- 3-A

Michigan

W8BAN 3150-210-15-AB
W8NOH 2240-105-20-ABC
K8HGZ 1651-127-13-AB
KP4AOO/8
1476-123-12-AB
K8ILO 1036-148- 7-A
W8CVQ 784- 93- 8-ABC
K8PBA 651- 93- 7-B
K8ACC 488- 61- 8-AB
K8GKX 420- 60- 7-A
W8ZSX 396- 66- 6-B
W8PYQ 330- 52- 6-ABC
K8LWP 204- 51- 4-B
W8VRH 195- 39- 5-B
KN8TCA 148- 37- 4-B
K8MPT 72- 36- 2-B
K8QMX[1] (K8s NOS QMX, KN8VPH)
2387-217-11-AB
K8USC (K8s PEJ USC)
999-111- 9-AB
W8USA/8 (K8s QJL GMX)
876-146- 6-A
K8DKR (K8s DKR VVQ)
612-102- 6-A
W8JXU/8 (K8s AMG AXR, W8JXU)
378- 63- 6-AB

Ohio

K8KCI 1038-173- 6-A
W8UNB 973-139- 7-A
W8BAX 770- 63-11-ABCDE
K8BSK 762-127- 6-A
K8QIB 686- 98- 7-A
W8EDS 610- 56-10-BC
K8KOL/8 208- 52- 4-A
W8BMO 188- 47- 4-AB
K8RPX 152- 38- 4-A
K8BSF 126- 42- 3-A
W8WEN 124- 62- 2-B
K8LEN 24- 10- 2-BD
W8TCO 24- 5- 4-ABC
KN8RXD 7- 7- 1-B
K8JPF 4- 2- 2-D
K8NMD/8[1] (4 oprs.)
3322-301-11-ABC
K8DJB/8 (K8s MMM VDB)
2540-254-10-A
K8NYM (K8s NYM QIO)
972-162- 6-A

HUDSON DIVISION

Eastern New York

WA2HAH 1600-100-16-AB
K2CVG 1428- 66-21-ABC
K2GSF 1089- 99-11-B
WA2ALJ 858- 78-11-B
WA2JTI/2 516- 43-12-AB
WA2FYE 480- 60- 8-B
WA2KCB 364- 52- 7-AB
WV2IMG 315- 45- 7-B
K2ZCZ 280- 40- 7-B
K2YAZ 280- 40- 7-B
W2ITKA 88- 22- 4-A
W2IP 75- 15- 5-B
W2LWI/2[1] (9 oprs.)
28,930-458-55-ABCD
K2LZF/2 (13 oprs.)
12,936-284-42-ABCD
K2CQG/2 (6 oprs.)
8352-249-32-ABC
W2NQW/2 (5 oprs.)
6615-245-27-AB
K2YVE/2 (8 oprs.)
4998-238-21-AB
K2YOU/2 (5 oprs.)
340- 31-10-ABC

N.Y.C.-L.I.

W2YHP 5902-226-26-ABC
K2ILZ 2205-147-15-AB
WA2FBA 1785-105-17-AB
K2YGM 1449-161- 9-A
WA2KOW 1000-100-10-AB
K2DUX 988- 76-13-AB
K2QJQ 962- 37-13-C
WA2IKR 891- 63-13-AB
K2JWT 784- 40-16-BC
W2CLE/2 707-101- 7-A
K2PQY 594- 66- 9-A
K2RTH 576- 48-12-B
W2SMX 375- 25-15-B
W2EZL 352- 44- 8-A
WA2EXL 290- 58- 5-A
K2AZT 282- 47- 6-AB
W2KXG 156- 26- 6-B
WA2DLL 120- 30- 4-B
W2LRJ 70- 7- 5-CD
WV2JVG 42- 21- 2-B
WA2BOY 39- 13- 3-A
W2JBQ 32- 16- 2-B
K2OST 15- 5- 3-B
W2RED[1] (W2RED, WA2-CHP) 2682-149-18-AB
K2VZA (K2s VZA UEB, WA2-DVA) 2618-187-14-A
WA2IDC (WA2s IDC KDX)
1680-112-15-AB

Northern New Jersey

W2DWJ 4030-110-26-BCD
K2KIB 3689- 98-31-ABC
K2OWR 3036-167-18-AB
W2PUO/2 2616 218-12-A
WA2INB 2301-177-13-B
K2LNS 1452-121-12-B
WA2JAM 1428-119-12-B
W2IDZA 1105- 48-17-ABCD
WA2HFI 1020- 68-15-AB
K2CCF 970- 97-10-B
K2IUK 660- 60-11-B
WA2BDP 616- 77- 8-A
W2MQF 603- 67- 9-B
WA2EMA 583- 53-11-AB
W2GKR 513- 57- 9-AB
WA2BSW 420- 60- 7-A
K2RMD 272- 29- 8-ABC
K2MHP 270- 45- 6-B
WA2JNU 234- 26- 9-A
WV2NMX 60- 20- 3-B
W2PEZ/2[1] (8 oprs.)
37,185-786-45-ABCD
K2BJP/2 (13 oprs.)
11,392-322-32-ABCD
W2VDJ/2 (11 oprs.)
10,724-383-28-AB
W2GZF (4 oprs.)
3740-170-22-AB
K2UWN (K2UWN, WA2-AGX) 3258-181-18-AB
K2BEV/2 (K2BEV, WA2-FVL) 2156-154-14-AB
WA2GVT (K2s LSX OJD)
1001- 77-13-B
WA2CCF (WA2s CCF JHR, WV2OGS) 11- 11- 1-B

MIDWEST DIVISION

Iowa

WØAXU 700- 50-14-AB
KØHBP 133- 19- 7-B
KØVQM/Ø 1- 1- 1-A

Kansas

KØAQJ 147- 49- 3-B
WØWPQ 135- 45- 3-B
WØWGM 120- 40- 3-B
KØGIA 108- 36- 3-AB
KØGIC 105- 35- 3-AB
WØHNG 20- 10- 2-B
KØVSP 5- 5- 1-B

Missouri

WØRBM 413- 59- 7-AB
KØRMQ (KØs RMQ JNH)
336- 84- 4-AB
KØSBJ/Ø (KØs SBJ ONG YWK) 112- 56- 2 A

Nebraska

KØSBV 188- 47- 4-AB
WØWRT 112- 28- 4-AB
KØVNC 56- 28- 2-A

NEW ENGLAND DIVISION

Connecticut

W1RJA 13,120-410-32-AB
W1QVF 6670-227-29-ABD
W1MEH 3336-139-24-AB
K1HMU/1
3140-154-20-ABC
W1HDQ[4] 3128- 75-34-ABCE
K1IED 2805-187-15-B
W1PHR 2394-114-21-AB
W1YDS 2304- 99-24-ABC
K1DCX 2032-127-16-AB
W1MFT 1026- 36-19-ABCD
KN1PAN[3] 1512-108-14-B
W1FTX 1152- 72-16-AB
W1VNO 1120- 80-14-AB
KN1PKQ/1
756- 84- 9-B
W1HNF 720- 45-16-B
KN1PRV 710- 71-10-B
W1BYX 627- 57-11-A
W1AW[4,5] 546- 42-13-AB
W1WHL 477- 53- 9-A
W1RFJ 312- 52- 6-AB
K1KKK 258- 43- 6-AB
W1PHT 147- 21- 7-B
K1GDW 140- 20- 7-B
KN1MQW 50- 25- 2-B
K1MNX 48- 24- 2-B
KN1OAV 33- 11- 3-B
K1IEK 32- 16- 2-B
KN1PTK/1 9- 9- 1-B
K1MJC/1 4- 2- 2-A
W1KAC/1[1] (5 oprs.)
9773-333-29-ABD
W1BGT/1 (4 oprs.)
3388-154-22-AB
K1EEW/1 (6 oprs.)
1503-149-18-B
K1BCI/1 (5 oprs.)
1456- 91-16-AB

Maine

W1ZEN/1 923- 71-13-AB
K1IZT/1 540- 45-12-AB
W1PLX/1 360- 45- 8-B
K1INL 224- 28- 8-AB
W1EHF/1 (W1EHF, K1AIC)
5697-174-27-BCD

Eastern Massachusetts

W1QXX 12,432-309-37-ABCD
W1EUJ 5252-202-26-AB
W1AQE 4431-211-21-AB
W1OOP 3136- 81-28-BCD
W1JSM 1952-122-16-B
K1KTK 1170- 90-13-AB
W1LMZ 726- 66-11-B
W1EZV 672- 42-16-AB
K1GNW 630- 63-10-B
K1HDY/1 567- 81- 7-B
W1AHE 500- 50-10-B
K1KKS 497- 71- 7-A
K1OOM[5] 385- 55- 7-A
KN1NGI[3] 360- 45- 8-B
KN1NVE 102- 17- 6-B
KN1PFI 95- 19- 5-B
K1AIO 72- 18- 4-B
W1ZSS 26- 13- 2-B
KN1OZN 8- 8- 1-B
K1AII/1[1] (K1s AII GRP, W1-BVP) 8280-276-30-AB
K1CFV (K1s CFV NJX)
1245- 83-15-AB
K1MVN (K1MVN, KN1-PUR) 175- 35- 5-B

Western Massachusetts

W2BVU/1
10,452-235-39-ABCD
W1HDQ/1[4]
333- 37- 9-AB
W1WLE 224- 28- 8-B
W1UCR 140- 14-10-AB
W1NBN/1 (K1s BZT DIR)
10,692-396-27-AB
K1DIR/1 (K1s DIR HVV)
45- 9- 5-B

New Hampshire

W1FZ 3969-147-27-ABCD
K1JLJ 1148- 82-14-AB
K1ATL 1078- 77-14-AB
K1NXI/1 804- 67-12-AB
KN1OGR[3] 616- 77- 8-B
W1IQD 456- 38-12-AC
K1KRR 423- 47- 9-B
KN1OMC/1
414- 46- 9-B
KN1NXV 320- 40- 8-B
W1BJ/1 (4 oprs.)
23,350-420-50-ABCL
W1YQH/1 (W1s TNO YQH)
2620-131-20-AB

Rhode Island

W1AJR 9240-210-44-ABCD
K1CRN 2115-141-15-B
K1HMN 1200-120-10-A
W1TXL 810- 81-10-A
K1DKF 300- 50- 6-A
K1BZA 192- 24- 8-B
W1VXL/1 (4 oprs.)
9632-344-28-AB
K1OUI (K1OUI, WA6FGU)
583- 53-11-A

Vermont

W1MMN 91- 13- 7-B
W1IPJ/1[1] (11 oprs.)
7412-198-34-ABCD
K2RZR/1 (W1PRX, K2-RZR) 5430-167-30-ABCD
K2MMX/1 (K2MMX, W2-GPQ) 590- 59-10-B

NORTHWESTERN DIVISION

Oregon

W7INX 136- 34- 4-AB
K7JSJ 75- 25- 3-AB
W7HBH 40- 10- 4-AB
K7EYW 22- 11- 2-A

Washington

W7RT 1048-131- 8-AB
W7PUA 522- 87- 6-AB
K7GAF 400-100- 4-AB
K7BBO 345-115- 3-A
K7GKK 186- 62- 3-A
K7JZP 96- 48- 2-A
W7ANI 70- 35- 2-A
K7IVC 29- 28- 1-A

PACIFIC DIVISION

Nevada

K7HRW 1224-102-12-AB

Santa Clara Valley

W6ASH 1992-157-12-ABC
W6GGV 1608-111-12-BCD
K6KOP 1166-106-11-AB
W6BDN 1144-104-11-AB
WA6BYA 270- 45- 6-A
K6TJL/6 (5 oprs.)
6846-304-21-ABCD
W6VMY/6 (4 oprs.)
1812-151-12-AB

East Bay

K6RNQ 1250-109-10-AC
K6KLY 720- 76- 9-ABC
K6DLY/6 186- 31- 6-B
W6WLI 75- 15- 5-B
W6JOX/6 (4 oprs.) 4556-251-17-ABCD
WA6CFA/6 (WA6CFA, K6DLY, WV6JQV) 896-112- 8-AB

San Francisco

K6VXI 603- 67- 9-AB
W6PFK 204- 51- 4-B

Sacramento Valley

K6YII 792- 72-11-AB

San Joaquin Valley

W6GQZ 504- 42-12-AB
W6FZA 351- 23-13-ABC
K6OZI 259- 37- 7-A

ROANOKE DIVISION

North Carolina

W4VHH 78- 13- 6-B
W4BUU 2- 2- 1-B
W4GNF/4 (4 oprs.) 603- 67- 9-AB

South Carolina

W4TLC 213- 26- 9-ABC
K4YUX 24- 6- 4-AB
W4V1W 8- 4- 2-B

Virginia

K4VWH 598- 46-13-AB
W4KJH 594- 66- 9-AB
K4EUS 210- 30- 7-AB
W4AO[1] (4 oprs.) 16,277-384-41-ABC
K4UKQ/4 (6 oprs.) 13,082-396-31-ABC
W4DOE (K4s AJA AJE, W4DOE) 1904-119-16-AB
W4KDH (5 oprs.) 640- 64-10-AB

West Virginia

K8BLR 220- 44- 5-A

ROCKY MOUNTAIN DIVISION

Colorado

WØAZT 75- 15- 5-AB
WØIUF 48- 24- 2-AB
KØTSD 40- 40- 1-A
KØCLJ 38- 19- 2-AB
KØRMY 34- 34- 1-A
KNØCYQ 12- 12- 1-B

Utah

W7QDJ/7 21- 7- 3-AB

New Mexico

K5IQL 24- 8- 3-AB

SOUTHEASTERN DIVISION

Alabama

K4BEI/4 (K4BEL, W4AKX) 320- 80- 4-A

Eastern Florida

K4RCX 420- 70- 6-AB
K4RNG 172- 86- 2-AB
K4PPX 134- 67- 2-AB
W4RMU 96- 12- 8-AB

Georgia

K4YFU/4 800-100- 8-AB
K4YGK/4 800-100- 8-AB
W4BGE 282- 47- 6-AB
K4KLD 258- 43- 6-AB
W4LNG 246- 41- 6-AB
K4JPD 235- 47- 5-A
W4TO 160- 40- 4-AB
W4MDS 156- 39- 4-A
K4HSA 136- 34- 4-A
W4GIS 136- 34- 4-AB
K4FNZ 120- 30- 4-A
W4BSJ 90- 18- 5-B
K4FNY 84- 28- 3-A
K4MRR 81- 27- 3-A
K4SJF 56- 14- 4-B
K4RAH 46- 23- 2-A
K4UPK 45- 15- 3-A
K4EEJ 36- 12- 3-A
K4TDU 32- 16- 2-A
K4SHS 26- 26- 1-A

SOUTHWESTERN DIVISION

Los Angeles

W6PUZ 2190-209-10-ABCE
W6NLZ 1843-76-19-ABCDE
WA6KVS 172- 43- 4-A
WV6IIJ 114- 38- 3-B
K6QPH 112- 28- 4-A
WA6NMT 54- 18- 3-B
WA6DJB (WA6 DJB AJT) 7020-453-15-ABCD
WA6BGA/6 (WA6s BGA DOD) 210- 70- 3-B

Arizona

W7PXE/7 50- 50- 1-A
W7QLZ/7 18- 18- 1-A

San Diego

W6ZOP/6 4114-368-11-ABC
WA6JMQ 658- 94- 7-AB
K6HMS 612-153- 4-B
WV6KHG 99- 33- 3-B

Santa Barbara

W6PFE (4 oprs.) 2610-251-10-ABC

WEST GULF DIVISION

Northern Texas

K5TKR 180- 90- 2-AB
K5GHR 170- 85- 2-AB
K5WUY 116-116- 1-A
K5UTJ 109-109- 1-A
K5RBN 104- 52- 2-AB
W5AQS 74- 37- 2-AB
K5ZPC 64- 64- 1-A
W5YQZ 60- 60- 1-A
K5KVE 50- 50- 1-A
K5WMD 49- 49- 1-A
K5PWD/5 35- 35- 1-A
K5PDB 30- 30- 1-A
K5YKX 30- 30- 1-A
K5TXX 26- 13- 2-AB
W5TPU 26- 18- 2-AB
K5DCQ/5 22- 22- 1-A
K5BDL 19- 19- 1-A
K5RJU 18- 18- 1-A
K5YDS 17- 17- 1-A
W5FFG 14- 14- 1-A
K5QJT 13- 13- 1-A

Oklahoma

W5NDE 92- 23- 4-AB
K5YZQ 76- 38- 2-A
W5PZ 45- 15- 3-B

Southern Texas

W5ND (10 oprs.) 260- 65- 4-AB

CANADIAN DIVISION

Quebec

VE2TT 767- 59-13-B
VE2AIO 372- 31-12-A

Ontario

VE3DIR 1786- 91-19-ABC
VE3AIR 1034- 87-11-ABC
VE3CIK 828- 92- 9-AB
VE3AQG 784-112- 7-B
VE3RM 520- 40-13-AB
VE3DUU 504- 56- 9-AB
VE3BCF 228- 57- 4-B
VE3BPB 135- 27- 5-B
VE3CUG 68- 17- 4-B
VE3ESS (VE3s DNK MR) 375- 75- 5-B

British Columbia

VE7ACQ/7 26- 13- 2-B

December 1935

. . . The big DX news was the making of 28-Mc. WAC by W3FAR, ZS1H, and W7AMX — in that order.

. . . Mims described one of his famous Signal Squirters, a 14-Mc. beam. And there were articles on inexpensive racks, oscillators using 14-Mc. quartz crystals, a self-regulating grid-bias supply for multi-stage transmitters, class-B carrier control in the low-power phone, and the usual collection of hints and kinks for the experimenter.

. . . Ross Hull continued his discussion of a new receiving system for the ultra-high frequencies.

. . . The Radio Society of Great Britain announced a series of transatlantic tests on 3.5 Mc.

. . . W1LZ received a shipment of 402 cards from the first district QSL manager!

The answer to last month's quiz is that when the switch is closed the lamp will burn brightly and the meter reading will drop to zero. The reason is that when the inductance is added to the circuit the energy stored in the choke during the half of the cycle the rectifier conducts is returned to the circuit (lamp and meter) during the nonconductive half cycle. With more energy the lamp is brighter, but a.c. (instead of pulsating d.c.) though the meter gives no reading.

Silent Keys

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

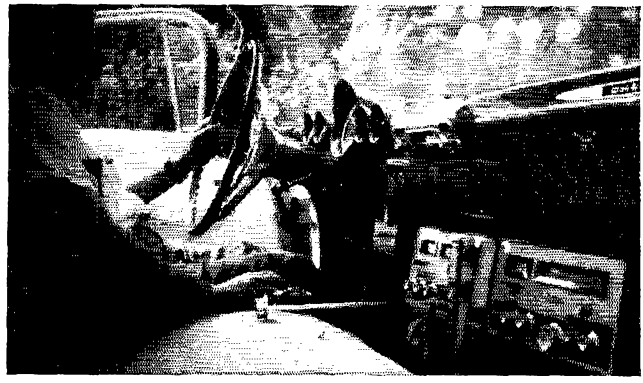
W1EQA, Chester T. Venstrom, Malden, Mass.
W2CGJ, Fred DeJaager, Ridgewood, N. J.
ex-W2DGD, Anthony Fraumeni, Woodhaven, L. I.
W2KDJ, ex-W8LUJ, Wilson P. Foy, Manilus, N. Y.
W2PWX, William T. Scott, Oceanport, N. J.
K3HPH, Melvin A. Butts, Hagerstown, Md.
W3NWV, W4DYA, Joseph C. Burwell, Uniontown, Pa., and West Palm Beach, Fla.
W3UEM, Harold W. McConnell, Washington, Pa.
W4AKK, William E. Raye, Wadesboro, N. C.
W4GLR, Edwin A. Rose, Birmingham, Ala.
W4OIS, Joseph Sutherland, Miami, Fla.
K5ABR, William G. Hall, Idabel, Okla.
K5JLO, Claude W. Kurtz, Kenner, La.
W6IQI, Rev. Jas. Reilly, Los Angeles, Calif.
W7NZJ, Robert A. Eastman, Great Falls, Montana
W7VRT/KC6PE, Carl G. Wells, Eatonville, Washington
W9HKQ, Ivan Cleever, DeMott, Ind.
K9RZF, Lawrence Pittman, Indianapolis, Ind.
W0GYE, Ruth A. Jorgensen, Milford, Iowa
ON4GM, Gunter Meyerheim, Brussels, Belgium
VE2HM, William Meredith, Montreal, Quebec
VE7AIO, J. S. Lowcay, Kimberley, B. C.

MEMBERSHIP CHANGES OF ADDRESS

Four week's notice is required to effect change of address. When notifying, please give old as well as new address. Advise promptly so that you will receive every issue of *QST* without interruption.

Mobile C.W.

BY KATASHI NOSE,* KH6IJ/1



THE superiority of s.s.b. over a.m. in mobile work is demonstrated in theory and practice, but for those of us who lack s.s.b. facilities why not try c.w. — and I mean c.w. while in motion.

ARRL Director Robert Denniston, WØNWX, is a confirmed c.w. mobilist, and no doubt there must be many more. However, many hams think that mobile c.w. is a gag or stunt.

For long-haul communication in crowded bands, c.w. mobile is hard to beat. Many years of c.w. mobiling from Hawaii, and lately, 25,000 miles of mobiling on turnpikes, mountain roads, country roads, and city traffic on the mainland, have convinced the author that communication-wise, c.w. mobile is vastly superior to a.m. phone.

For those who may want to try it, some preparation is in order — such as:

1. Thorough mastery of c.w. If you need to concentrate to read or send c.w., forget this business. But, if you find yourself carrying on snatches of conversation while driving and copying c.w., you are ready for it.
2. The v.f.o. must be mechanically stable. In a.m. mobile phones, v.f.o. mechanical instability is mistaken for hum or n.b.f.m. But, in c.w. or s.s.b., such a signal makes you sound as if you were gargling your throat. Test transmitter stability by vigorously pounding v.f.o. while listening to the receiver with b.f.o. on.
3. Use good judgment. Even the best of c.w. men get sidetracked when making a left turn in a strange city in a car with stick shift in heavy traffic, and all the while being berated by the XYL in the back seat for making the wrong turn. Lay off while in unfamiliar traffic.

The following aids have been found invaluable in making c.w. mobiling a pleasure:

1. Mount the key on the end of a narrow stick one foot long and 2 inches wide. Place this stick under your thigh above your knee so that the key sits sidewise next to you on the seat.

   This position was found to be more desirable than permanently strapping the key to some fixed object, i.e., the steering column. It was also found to be better than the familiar "knee key" used by the armed forces.
2. Use extra wide contact spacing and work the key in the manner of a "pump handle" key of early wireless. Extra wide spacing enables you to monitor your sending by audible clicking of the contacts, thus making monitoring circuits unnecessary. With a little practice you can do about 18 w.p.m. Another trick which may prove helpful is to slap the key instead of using the conventional grip on the knob.

   If you need a monitor in spite of all this, listen to key thumps on the broadcast auto radio.
3. Replace the tuning knob on the receiver with a universal joint (Millen) with a 12-inch plastic rod or tubing with a tuning knob on the end.

   Tuning the receiver then can be accomplished from any position up through a 45° angle. A convenient position for the tuning knob is to have it resting on the seat next to your knee, from which position you can tune the receiver without shifting from normal driving position.

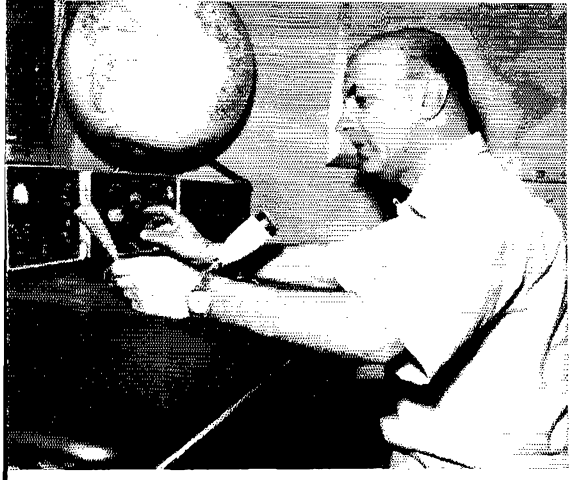
   Conceivably, even passengers in the back seat can tune the receiver by having an extension long enough. Knob and extension can be pushed out of the way like an old-fashioned gear shift [1] and stays put by the friction of the universal joint.
4. Another convenience is a hearing aid dynamic earphone of the type which plugs into the ear. With this accessory, your family can listen to the broadcast set while you ham on long drives.

With these conveniences the 1960 ARRL Field Day was worked while driving through 12 eastern states. Hawaii was contacted on 14 Mc. through heavy field day QRM, while in motion. CT2BO in the Azores answered our CQ, but, of course, being a KH6 mobile in Delaware helped!

However, the most discouraging contacts were those in which the W station would insist on calling me K5BIJ or K4HIJ, and why not? You wouldn't expect a KH6 to be mobiling on c.w. at 70 m.p.h. (Maine Turnpike) and coming through at an odd hour! QST

* Now back in KH6-land.

[1] Like on the 1929 Ford, eh? — *Ed.*



The author at his station. Before being sent down to the Congo, he was assistant MARS Director for U. S. Army forces in Europe, and parts of this story are adapted from an account in the September, 1960, MARS Bulletin published by USAREUR. Besides W4UMO and 9Q5US, he has held the call DL4GA.

The Congo Story

BY SGT. EDOUARD D. COURNOYER,* 9Q5US, W4UMO

DURING the early part of July when hostilities began in the Congo, the Embassy of the United States at Leopoldville placed a call to General Clyde C. Eddleman, Headquarters USAREUR, for a communications man to be sent down to the Embassy for the purpose of setting up communications with missionaries throughout the Congo. This was no ordinary expedition or safari such as you read about from time to time, but for me — the man chosen — was the shot heard around the amateur radio world.

After the usual series of shots by the medics, we took off in the modern version of a magic carpet — a C-124 loaded with boxes of communications gear. They even put a PE-95 power unit aboard to keep the tail from bouncing! We arrived at Leopoldville, Republic of the Congo, circled a small airstrip below, and leveled off for a landing. When the wheels touched the ground, we acknowledged to the tower that we were down. The tower came back shouting, "I don't see you, are you sure you're on the ground?" We told them we were quite sure, as we were taxiing around. Then, suddenly, all hell broke loose. The natives came rushing at us from all directions — we had landed in Congolese territory! This was no time for explanation! The pilot headed the big bird towards the wind, and zoomed off with all the thrust those four engines had left.

After climbing about two thousand feet, there across the Congo river was the longest air strip in the world, surrounded by Belgian troops. We circled and waited for instructions, and were told to change to civilian clothes immediately. Upon landing, photographers and newsmen came from all sides. We were the first plane to land and in order to divert their attention, the pilot gave instructions to his crew to lower the lift which had the PE-95 on it. This ruse worked and I was immediately whisked away in a flag-draped staff car to the Embassy.

Arriving in downtown Leopoldville, I was escorted to Mr. Timberlake. I was immediately given instructions to set up communications with American missionaries throughout the Congo, to determine their needs and the number of people to be evacuated by air. It wasn't long afterward that trucks were unloading the needed equipment to start the ball rolling. I managed to dig out a KWM-1 from the mountain of signal equipment. With the help of a few natives, I had one antenna set up. I looked for a manual, but none could be reached for the moment. However, connections were made to the power supply and microphone, all connections were checked, and everything seemed to be ready. Now for a radio room . . . what used to be a "language room" and a storage room for food became the room for 9Q5US.

Right next door was the library; we moved in a metal desk, chairs, and whatever supplies were needed to set us up in business. A typewriter was brought in, dark curtains drawn over the windows, a clock was set up on the wall, and last but not least, a 7500-watt generator was hooked up to give us the needed 110 a.c. supply for the equipment.

About 1930 hours that evening, after turning a few knobs, all of a sudden around 21,322 kc. I heard, "Hey, Frenchman, can you hear me? This

* USA Signal Operating Unit, APO 403, N. Y., N.Y.

is Mike, DL4GJ." I came back, astonished. "Hey, Mike! I hear you loud and clear. Tell me, how do you tune this contraption?"

"Listen, Frenchy," Mike went on, "what call are you using down there?" "I never gave this a thought," I explained. "How about 9Q5GA?"

"That sounds all right," came the voice from the other end. Thus, the Congo Story was beginning to take shape. Later, through the facilities of the local Postal Telegraph and Telephone Company, the call was changed to 9Q5US.

Later in the evening, the Naval Attache brought in a KWM-2. Other antennas were made up, and we had three of them on top of the embassy ready to tune any frequency called upon. It was then that I found out I was supposed to use this equipment to keep in contact with the Carrier *Wasp* anchored some 200 miles off the coast. Names like "Grogan" or "Wheels" (common names used by the Navy) were part of my daily routine.

Captain DuBois (the Naval Attache) often reminded me, during my conversations about this particular carrier, to refrain from calling it a "battle-wagon, tub, battleship, or what-have-you", but to call it a "carrier." So, after a few hours of operation with the *Wasp* I managed to get things like the Navy wants them. "Sir, I'm in contact with that battleship of yours . . . I mean the carrier *Wasp* . . . Any instructions?"

This dual role (Army and Navy) left me very little time to catch a few winks, as the Navy was utilizing me in the day time, and the Army at night. It's a good thing I was wearing civilian clothes; otherwise I'd probably be wearing a khaki shirt with bell-bottom trousers.

It was the night of the 19th that things began to happen. All local communications facilities failed. Every Belgian in the city was quitting his post. Mr. Timberlake came to the radio room and asked if it was possible to get hold of General Eddleman, in USAREUR. Capt. Mike Fiorelli, DL4GJ, broke in then and told me he had the General on the line. Upon completion, he was piped to EUCOM Headquarters to General Norstad, with General Palmer also giving needed instructions, which at the time were considered to be an emergency. Upon completion of these calls, Mr. Timberlake was in contact with Ambassador Burnie, in Brussels. The most important

Frenchy works on the gasoline generator which was ferried down on the "magic carpet" and which furnished power for the operation.

call to wind up the evening was to the United Nations in New York City, for the assistant secretary, Dr. Ralph Bunche. The vice president of the Radio Corporation of America, Lloyd, W2CAA, takes the credit on that one and many other calls throughout New York City.

You would think, by then, that my evening's work was just about caught up. It was just beginning! I was asked by Captain DuBois if it was possible to get the Pentagon at this stage of the game.

I have read plenty of fiction stories about how easy it was for the hero to overcome his obstacles, but I was no Aladdin, and I didn't possess a magic lamp, either. At this point, I remember, I made a remark such as, "Nothing is impossible — not even in radio."

So, I flipped the band switch to 14 Mc., and — lo and behold — there she was, beautiful America in all its pride and glory, just waiting for me to give it a shout. "CQ Stateside, Washington, D. C., with emergency traffic . . . this is 9Q5US . . ."

What hit me? Take it easy, fellows . . . one at a time!

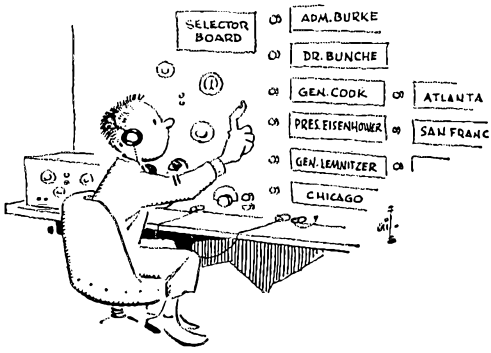
"W4GGA, this is 9Q5US, are you in Washington?"

"This is W4GGA, and I'm in Washington. The handle here is Ken, and you're five and nine plus, beautiful signal, how do you copy me? Over."

"This is 9Q5US. Read you 5 by 9, handle here is Frenchy, can you get hold of the CNO at the Pentagon?" I asked.

"Wait one, Frenchy" . . . "Go ahead, I have Admiral Burke on."

"This is Captain DuBois . . ." Momentarily, I was stunned while I was working the send and receive switch. I was gazing at my Bible resting on top of the console. That was the answer to this unbelievable story that was taking place. If I ever had any faith in the past, it wasn't anything like this. I gazed at my chief, Col. Sharpe, the Army's representative, sitting by my side. He whispered that he was going to buy me a steak dinner for this!



After Captain DuBois completed his talk with the Pentagon, Mr. Timberlake asked to speak to the Chief of Staff. General Lemnitzer handled the call from the Pentagon. While this was going on, Col. Steve Cerwin, K6OJO/4, was keeping the channel clear with his linear while Col. Ken Keyte, W4GGA, was making the calls and getting the message channels ready. The team work on the part of these two individuals was fantastic. Nothing like this ever did happen to me during my 27 years as a ham.

This went on and on for 30 days, around the clock; no let-up, no propagation difficulties, solid contacts night after night. Bill at K4NAA, the Navy's "bird dog", made sure every night that Ken and Steve would get on by calling them up and letting them know that the "Frenchman" was looking for them. Anyone in the Embassy who had relatives in the States had direct conversations with their loved ones. At this stage of the game nothing was impossible. Chicago, Philadelphia, Boston, Atlanta, etc., came rolling in one after the other.

Summing up this story, Ambassador Timberlake during his trip to Washington kept us abreast of all instructions he had for his people at the Embassy in Leopoldville through the facilities of W4GGA. While in the Congo he shared my operations till the wee hours in the morning in order that he could talk to his family in Michigan through the help of W8DNY, DL4GJ, DL4MK, AE1US, DL4SD, W2CAA, W4GGA, K6OJO/4, K4NAA, and DL4NAC, as well as hundreds of operators too numerous to mention here, deserve credit for helping us out. I was informed that all QSL cards were to be honored by the Embassy during September.

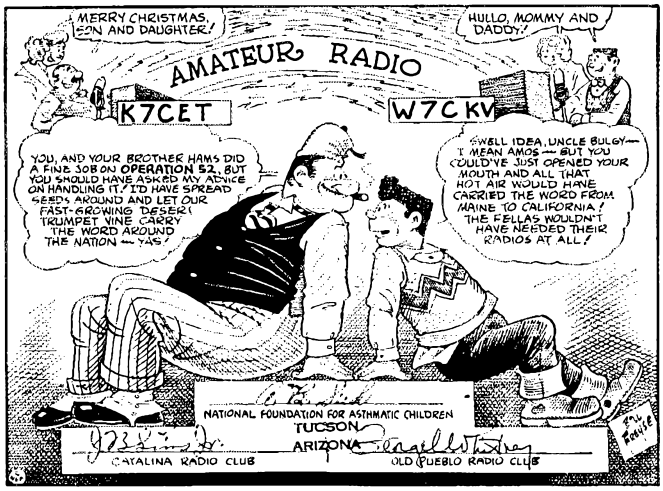
In conclusion, I want to thank each and every one of you who helped make this story possible. If it hadn't been for you, I couldn't have made this dream come true. The Bible was a coincidence; it was used on the 20th of July for a good purpose — you see, that's the day the Ambassador was sworn in. It reads:

. . . "Thanks to Frenchy, for the use of his Bible. On this day, 20 July 1960, I was sworn in as Ambassador of the United States of America . . ."

(signed) *Clare M. Timberlake*

QST

Strays



Each Christmas day the Old Pueblo and the Catalina Radio Clubs in Tucson sponsor Operation 52, so that children at the National Foundation for Asthmatic Children may talk by ham radio to their parents all over the country. If you would like to help out in this project, write to W. F. McCaughey, K7CET, 2549 Florence Drive, Tucson, Arizona. Also, monitor these frequencies on Christmas Day—28,680, 29,280, 29,300, 29,320, 21,330, 21,390, 14,245, 14,290, 7205 and 7245 kc. The call to listen for is W7GV portable Tucson. If you monitor these same frequencies prior to Christmas Day, you may be able to arrange schedules ahead of time. Last year some 90 amateurs participated in this project, and each one received a copy of the certificate shown at the left.

I.A.R.U. News

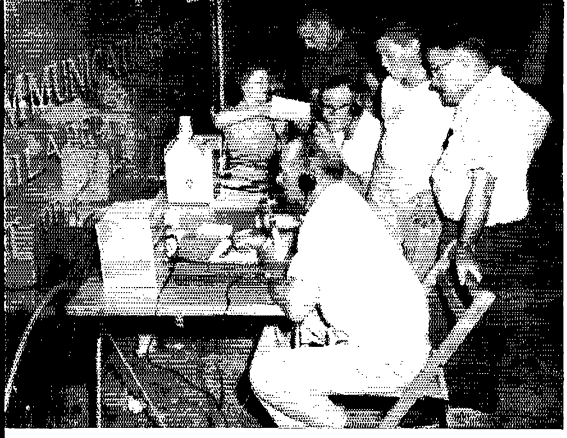
QSL BUREAUS OF THE WORLD

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 1/9, Box 999**
Azores: Via Portugal
Bahamas: C.N. Albury, Telecommunications Dept., Nassau
Barbados: Arthur St.C. Farmer, Storms Gift, Brandons, Deacons Road, St. Michael
Belgium: U.B.A., Postbox 634, Brussels
Bermuda: R.S.B. P.O. Box 275, Hamilton
Bolivia: R.C.B., Casilla 2111, La Paz
Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro
British Guiana: D. E. Yong, VP3YG, Box 325 Georgetown
British Honduras: L. H. Alpuche, VP1HA, P.O. Box 1, El Cayo
Bulgaria: Box 830, Sofia
Burma: B.A.R.S. % Tara Singh, 187 Eden St., Rangoon, Burma
Canton Island: Charles Singletary, KB6BH, % FAA, USPO 06-50,000, Canton Island, Phoenix Group, South Pacific
Ceylon: P.O. Box 907, Colombo
Chile: Radio Club de Chile, Casilla 761, Santiago
China: M. T. Young, P.O. Box 16, Taichung, Formosa
Colombia: L.C.R.A., P.O. Box 584, Bogotá
Congo: U.C.A.R. QSL Bureau, P.O. Box 3748, Elisabethville
Cook Islands: Bill Scarborough, % Radio Station Rarotonga
Costa Rica: Radio Club of Costa Rica, Box 2412, San Jose
Cuba: Radio Club de Cuba, QSL Bureau, Ayestaran 629, Altos Cerro, Habana
Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol
Czechoslowakia: C.A.V., P.O. Box 69, Prague I
Denmark: **E.D.R. QSL Bureau, Ingstrup**
Dominica: VP2DA, Box 64 Roseau, Dominica, Windward Islands
Dominican Republic: Jose de les S. Perkins, P.O. Box 157, Ciudad Trujillo
East Africa: (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony
Ecuador: Guayaquil Radio Club, **P.O. Box 5757,** Guayaquil
Ethiopia: Telecommunications Amateur Radio Club, P.O. Box 1047, Addis Ababa
Fiji: S. H. Mayne, VR2AS Victoria Parade, Suva
Finland: SRAL, Box 306, Helsinki
Formosa: Hq MAAG, APO 63, San Francisco, California
France: R.E.F. BP 26, Versailles (S & O).
France: (F7 only): F7 QSL Bureau, MARS, Headquarters U. S. European Command, APO 128, New York, N. Y.
Germany (DL2 calls only): G. E. Verrill, G3IEC, 10 Seahorse St., Gosport, Hants, England
Germany (DL4 calls only): DL4 QSL Bureau, % DL4HAB, 50th Comm., APO 109, N. Y., N. Y.
Germany (DL5 calls only): Via France
Germany (other than above): D.A.R.C., Box 99, Munich 27
Gibraltar: E. D. Wills, ZB2I, 9 Naval Hospital Road
Ghana: 9G1AB, John Burton, Telecommunication School, Post & Tellecommunication Dept., Accra
Great Britain (and British Empire): A. Milne, 29 Kechill Gardens, Hayes, Bromley, Kent.
Greece: George Zaralis, P.O. Box 564, Athens
Greece (Unlisted SVØs only): USASG, APO 206, New York, N. Y.
Greenland (OXs only): Via Denmark
Greenland: (KG1s only): MARS Director, Directorate of Operations, Hq. 8th Air Force, Westover A.F.B., Mass.
Grenada: VP2GE, St. Georges
Guam: M.A.R.C., Box 145, Agana, Guam, Marianas Islands
Guantanamo Bay: Guantanamo Amateur Radio Club, Box 55, NAS, Navy 115, F.P.O., New York, N. Y.
Guatemala: C.R.A.G., P.O. Box 115, Guatemala City
Haiti: Radio Club d'Haiti, Box 943, Port-au-Prince
Honduras: O. A. Trochez, P.O. Box 244, Tegucigalpa, D. C.
Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong
Hungary: H.S.R.L., Postbox 185, Budapest 4
Iceland: Islenzkir Radio Amatorar, Box 1058, Reykjavik
India: P.O. Box 534, New Delhi
Ireland: I.R.T.S. QSL Bureau, 39 Booterstown Ave., Blackrock, Co. Dublin
Israel: L.A.R.C., P.O. Box 4099, Tel-Aviv
Italy: A.R.I. Viale Vittorio Veneto 12, Milano, Italy
Jamaica: Ruel Samuels, VP5RS, 34 Port Royal Street, Kingston
Japan (JA): J.A.R.L., Box 377, Tokyo
Japan (KA): F.E.A.R.L., A.P.O. 994, % Postmaster, San Francisco, Calif.
Kenya: East Africa QSL Bureau, Box 1313, Nairobi
Korea: Korea Amateur Radio League, Central Box 162, Seoul, Korea
Kuwait: William N. Burgess, 9K2AZ, % Kuwait Oil Co. 14 — 5th St. North, Kuwait, Persian Gulf
Lebanon: R.A.L., Ahmadi, B.P. 3245, Beyrouth
Liberia: (EL1s only) HARC, P.O. Box 32, Harbel
Libya: 4A2TZ, Box 372, Tripoli
Liechtenstein: via Switzerland
Luxembourg: R. Schott, 35 rue Batty Weber, Esch/Alz. Luxembourg
Macao: Via Hong Kong
Madagascar: P.O. Box 587, Tannarive
Madeira Island: P.O. Box 257, Funchal
Malaya: QSL Manager, Box 777, Kuala Lumpur
Malta: R. F. Galea, ZB1E, "Casa Galea," Railway Road, Birkirkara
Mauritius: Paul Caboche, VQ8AD, Box 467, Port Louis
Mexico: L.M.R.E., **P.O. Box 907, Mexico, D.F.**
Midway Island: KM6BI, AIRBARSRON Two Detachment, Midway Navy #3080, F.P.O. San Francisco, Calif.
Monaco: 3A2CN, Anderhalt Pierre
Montserrat: VP2MY, Plymouth
Morocco: A.A.E.M., P.O. Box 2060, Casablanca
Mozambique: Liga dos Radio-Emissores de Mocambique, P.O. Box 812, Lourenco Marques
Netherlands: V.E.R.O.N., Postbox 400, Rotterdam
Netherlands Antilles (Aruba): Verona, Postbox 392, San Nicolas, Aruba
Netherlands Antilles (Curacao): Verona, Postbox 383, Willemstad, Curacao
New Guinea: Via Papua
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington C1
Nicaragua: Club de Radio Experimentadores de Nicaragua, Apartado Postal 925, Managua
Nigeria: **Dr. M. Dransfield, ZD2JKO, Regional Research Station, Samaru, Zaria, Northern Nigeria**
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe

(Continued on page 192)



Outside the communications trailer K2DEI set up his v.h.f. station on 6 and 2. Seated in this picture are Edith Rosner, W3AAU; George Ryan, K2DEI; and Bob Stanley, WA2HJI. Standing are two Boy Scout runners and Lionel Miller, W3YPT.

Project Scouting

BY EDITH ROSNER,* W3AAU

EARLY this year a member of the Short Skip Radio Club was asked to supply communications for the Boy Scout Camporall in July. Because of the number of operating personnel and the number of rigs required, Short Skip could not handle the job alone and took the matter to the Council of Delaware Valley Radio Amateurs. Would the member Clubs of the Council be interested? The answer was "yes", and President Harold Carr, W3JFI, appointed Dick Berens, W3UMK, and Edith Rosner, W3AAU, co-chairmen of "Project Scouting."

The Boy Scouts were celebrating the 50th anniversary of scouting in America, and Scout Headquarters had requested that we supply both local communications within the compound and DX communications to the National Jamboree in Colorado Springs, from July 22 to July 24.

Meetings held with the representatives of the participating clubs and the Boy Scout officials produced the idea that this project could best be handled as a cross between Field Day and CD operations, so all our plans were laid with that in mind. In past years the Scouts had used land lines or "wig-wag". Wig-wag was inefficient, and land lines were both inefficient and expensive. Ham radio could do what land lines couldn't — at least, here was a chance to try to prove it. Besides, the Scouts have a merit badge for communications, and we would also have the opportunity of arousing interest in ham radio as a hobby.

We were fortunate from the beginning in that our contact with Scout Headquarters and with Chief Edgar Grimm, who is Communications Chief for the City, would be Tony Repici. Tony is W3FGN, as well as a member of Chief Grimm's staff and an active participant in scouting. For this event, Chief Grimm would be in charge of communications and Tony his liaison officer.

The plans worked out by "Project Scouting" resulted in the following lineup. Either 2 or 6 meters would be used at the seven field sites, and rigs for both frequencies would be in operation at Communications Headquarters. A ten-meter station and a rig for DX on 20 meters would also be in operation at headquarters. Since the field stations would be a mile apart, 6 and 2 would be perfect and ten would be our link with the outside world. The city provided an antenna tower and a flag pole on which to mount the 20-meter beam and the high-frequency antennas, plus the man power to raise all the antennas. Particular clubs would be assigned to specified areas, bringing in their own equipment for either 6 or 2, maintaining their own stations and providing their own operating personnel. They would have relief and mobile back-up from the clubs who did not supply equipment, since in all cases but one each field station would be handling communications for from two to four Scout Districts, varying in size.

On the afternoon of July 22, headquarters station K2AA/3 went on the air on both 2 and 6 and special event station K3BSA pounded out its first CQ on 20. The field stations using their club calls checked in with headquarters one by one. All headquarters stations were housed in a city-owned communications trailer, but the wonderful weather and close proximity of operation caused George Ryan, K2DEI, to move the 6- and 2-meter stations to a table outside of the trailer, leaving Jon Balch, K3HWX, with the Pacemaker and NC-300 in the van looking for the special event call in Colorado Springs — KØBSA.

Then the trouble started. Two field rigs went out of order and our back-up gear had to be put into immediate operation. Using mobiles, Dick Custer, K3KDP, and Dick Berens, W3UMK, held down the sites until the fixed stations were back on the air, and for the rest of the week end the two Dicks and W3DJW, Jack Mahoney, chased all over the place supplying tanks of propane and cans of oil for the 1250-watt a.c. generators loaned to us by the Bell Telephone Co. through Bill Burnet, W3UFW. Bill had checked out the generators beforehand, and thanks to his foresight the propane tanks supplied us were good for 13 to 27 hours operating time. This saved us from having to lug in any big generator, as well as solving the possible problem of operating entirely from batteries.

The next problem to develop was interference on 146 Mc. This was traced to a city fire radio unit operating from the trailer. So a bunch of Lower Merion Township RACES crystals for 147 Mc. were quickly supplied by their Radio Officer, George Walker, K3EZJ.

* 645 Artwood Drive, Philadelphia 11.

The Phil-Mont Communications truck moved into place to provide a link with the outside via 2 and 10 and Mt. Airy VHF did the same on 6 meters.

In less than two hours, the communications problems smoothed themselves out and traffic commenced. We supplied the scout trading posts with soft drinks (and ice), scout neckerchiefs, and located lost boys and missing parents. But the bulk of our operations came from a source we did not think would keep us so busy. Accidents. We had everything from a splinter in the finger to compound fractures. There were cases of poison ivy, insect bites, stomach aches, heat prostration, and the usual assortment of major and minor ills that one might find in a camp of 5000 scouts, their scout leaders, parents, relatives and any curious or interested parties that showed up during the day. To cover these emergencies, the station farthest from headquarters and the headquarters station were kept in operation all night. All other stations operated from 6 A.M. until 10 P.M. While K3EZJ monitored his all-night station, sleeping in his car, K2DEI at headquarters spent the first night sleeping on a table and the second on a cot beside the rig.

With any event of this type there is bound to be at least one irritating difficulty. Ours was the absence of parking immediately adjacent to headquarters. In fact, we got moved from one place to another half a dozen times a day. Even the co-chairmen were not immune. One park guard refused to believe that a YL could have anything to do with the communications, so I had to sit on the road until Dick Custer came out and convinced the guard that since I was trustee of K3BSA, the station couldn't operate without my presence. What Dick failed to tell the guard was that Jon Balch who was doing the operating had the ticket in the operating shack. Dick Berens had his troubles with the guards, too. He had been in and out of a fairly inaccessible site half a dozen times one day, when finally a guard refused to let him back in. Dick found an opening to drive through that the guard couldn't watch.

Then, when the hospital tent located at headquarters, got busy, orders went out that only the special ambulances assigned to site could pick up the injured, and then only at the direction of the doctor in charge. Mobiles were no longer allowed to bring any patients into the hospital. A few hours later, the decision was reversed and two mobiles, one on 6 and the other on 2, had ambulance signs on the windshield, and were on their way to the rescue. The only trouble was that the guards had not been told, and the Hambulances had their troubles getting into the sites. The guards ignored the signs — they had their orders that no cars were to go through that road! Yet, this is where ham radio proved its versatility. We had direct contact with the two Hambulances. Direct contact with the regular ambulances was not available. Information handed down to us after the event was over indicated that on Saturday, the biggest day of the event, 39 calls came in for ambulance service alone. This does not include the requests that were radioed into headquarters for the advice of the doctor.

Some of the gang from Mt. Airy VHF Club. Left to right are Alan Vincent, W3OR; Francis Brick, W3SAO; Allen Boblitt, K3EOD; Alan Ruebin, K3AUH; Albert Obenland, K3LBT; and John Harris, W3AYG.

On Sunday afternoon all the stations remained on the air while the camp sites folded up, and reported to headquarters on the final official check out of each camp site. Then, as the Bell Telephone Co. truck moved the generators out, the 10-meter mobiles moved in to maintain communications for the final countdown.

One wonders at this point if we had known in advance the beating both we and our equipment would take, would we have gone through with it. Would we do it again? All you have to do is ask.

The Delaware Valley Council of Radio Amateurs is appreciative of the participation of the members of the following clubs.

Bucks County
Bucks-Mont Teen-agers
Delco
Eastern Penna.
Main Line VHF
Mobile Sixers
Mount Airy VHF
North Penn
Oxfor Circle
Penn-Jersey YL's
Phil-Mont Mobile
Short Skip
South Jersey
South Phila.
West Phila.
807 Society of Central High

QST

Inside the communications trailer are, seated, Jon Balch, K3HWX, and Edith Rosner, W3AAU. Standing are Dick Custer, K3KDP, and Toni Bayliss, K3CJC.

Those Crowded W1AW Code Practice Frequencies

A New Ham Speaks His Piece

BY WILLIAM F. BENNETT,* HC1WB

THE writer has seen very little written on what must be a major problem for Novices and newly-licensed hams — the difficulty we have in working the W1AW code practice frequencies to improve our speed, because of the QRM from other stations.

I'm a new ham, licensed only a couple of months, and perhaps I shouldn't speak up in church yet, but someone should give voice to this practice problem on behalf of several thousand of us, who have that all-consuming ambition to reach the proud goal of being able to copy 20 w.p.m., and to get a certificate from ARRL to prove it.

As a newcomer to ARRL, this situation puzzles me. I joined the League with a considerable degree of awe and respect for the League and its members. I felt that W1AW's nightly code practice was one of the League's most valuable services.

I had assumed that with most hams aware that ARRL was going to considerable expense and effort to provide such a service, and with the code of mutual helpfulness that characterizes ham radio, there would exist an unwritten gentlemen's agreement among hams to stay clear of W1AW's practice frequencies during the one hour nightly that the code transmissions were under way, to give the novices a break.

As those of more experience than myself well know, I had a shockingly rude awakening when I started attempting to copy W1AW regularly three months ago. Every time I fired up my receiver, it sounded as if every station in the world had a schedule promptly at 0130 GMT, and they operated as if there were a law requiring them to stay exactly on 3555, 7080, 14,100, 21,075, and 28,080, W1AW's practice frequencies all across the bands. Of course, all of us have tried many other methods of improving our code skill, working other c.w. operators, practice buzzers, etc. I chose to use W1AW after considerable thought, because of three advantages it offered:

(1) Its practice sessions are under actual conditions, on the air, with the usual — I thought — normal QRM, so that an apprentice would automatically learn to read code through interference.

(2) W1AW transmissions enabled an amateur to learn to recognize an accepted standard of proper spacing of words and letters, so that his own sending could be modeled on that same crispness and tempo, and all this for free.

(3) Because the ARRL qualification certificate serves as a real incentive for an amateur to continue increasing his speed, and provides a visible


The American Radio Relay League, Inc.

Certificate of Proficiency in Reception of the Continental Code

HC1WB

symbol of his achievement, so he has an accurate objective measurement of his progress. To me, this was an important factor in keeping at the grind of practice.

So, for three consecutive months, I have endeavored to copy enough of W1AW's qualifying transmissions to obtain a certificate. In the beginning, I thought it would be simple.

My QTH is Quito, Ecuador, which we regard as the amateur's dream of a ham location. We are on the equator, on top of the Andes mountain. My own antenna is 9665 feet above sea level, near a mountain top, and 50 feet above an almost ideal ground plane. It is the highest in Quito, and, I believe, one of the highest between Peru and Alaska. There is little local interference. Propagation is straight into the wild blue yonder, in any direction.

So every night, I have gulped my dinner, pretended I didn't hear the XYL's hopeful suggestion that there was a good movie on, and adjourned to my shack, to get the rig thoroughly warmed up before that fatal hour of 0130 GMT (0230 from November through April), when the long count began and W1AW was on the air.

Then began an hour that no human being should be compelled to suffer through. An hour that ran the full gamut of emotions; hope, disappointment, irritation, anger, shock, frustration, and a general dissillusionment with fellow hams in general. I was willing to take an oath there is more QRM on W1AW's five frequencies than on all the rest of the bands combined. I was never able to copy more than bits and pieces of practice sessions, and no qualifying runs.

The climax came on the night of September 21. I was determined to catch the qualifying run that night and prepared for it.

I tied my old home brew receiver to a 40-meter dipole. My Heathkit Mohawk was hooked to a

* American Embassy, Quito, Ecuador.

separate 20-meter dipole. My Collins 51J-4 was hitched to a Mosley T-33, jr. beam, and all of this array was centered on Hartford, Conn., U. S. A.

Everything started beautifully. I got the long, clear call 5-8-8. I had the signal tuned in on 10, 15, 20 and 40 meters. It was cornered on all bands but the 80, with two speakers and my earphones singing out loud and clear. I settled down triumphantly to my typewriter, confident I couldn't miss.

Here it came, the 10 w.p.m. qualifying run:

"W1AW nw — through it the American boy today knows more about electricity and its use —"

"Bang!" I had heard it coming, the howl of a carrier as a station tuned up exactly on my earphone 40-meter frequency, then a W2 near New York came crashing through with a full kilowatt, blithely calling CQ. I could picture a thousand of us neophytes frantically reaching for our dials with words for which there are no Q signals.

I jerked off my earphones, flicked off the homebrew rig, turned up the gain on the Mohawk, and prayed I hadn't missed much copy. By that time a W4 was pounding merrily away on 20. But in 30 seconds he was clobbered by a high-speed bug, who was sending so fast I could still read copy through him. So I caught:

"often owns up soft and lost generation. I have —"

And so help me, another bland soul came along, sending at the same speed as W1AW, on the same frequency. He was ruinous. I managed to catch:

"The past year somewhat extended this wave band." Then it was hopeless. I flipped to the 15-meter band. There W1AW was buried three deep (I counted them) but the Collins could weed them out enough so I could faintly hear my signal. I thought I caught:

"Shows that this conference may dismiss the objections that have been raised to this action."

Then my Latin friends got into the act. Two Colombian phone stations came on simultaneously on the same frequency, with "Say coo, say coo, say coo" and my qualification session was finished.

I sat a moment looking silently at all my gear, in deep and bitter frustration. My XYL came in and listened to all the receivers chirping away.

"Sounds like a pond full of bull frogs, doesn't it?" she commented. I didn't answer, but after thinking a moment, I concluded she was more right than she knew.

I wonder whether veteran brass pounders are aware of the way some of their operating methods are hampering the efforts of their own League to help us newcomers become proficient c.w. men ourselves. There are still many of us who prefer c.w. to phone, and we need opportunity to work W1AW for an hour a night if we are to learn.

For myself, I intend to keep trying, in the hope that by some odd chance some qualifying night, the bands will be clear enough for me to earn that prized certificate. On behalf of all those working for proficiency and Certification of Code Speed may we ask for cooperation in giving W1AW a clearer channel in the period starting at 0130 GMT each evening! QST

Strays

Is this a first? W5UTL, operating K5YGT mobile, worked K5PYS who was on a ferris wheel set up at the Mississippi-Alabama State Fair. Both stations were using surplus walkie-talkies on 75-meter phone. Hmmmm — was K5PYS mobile or portable? See also the item on page 10, this issue.

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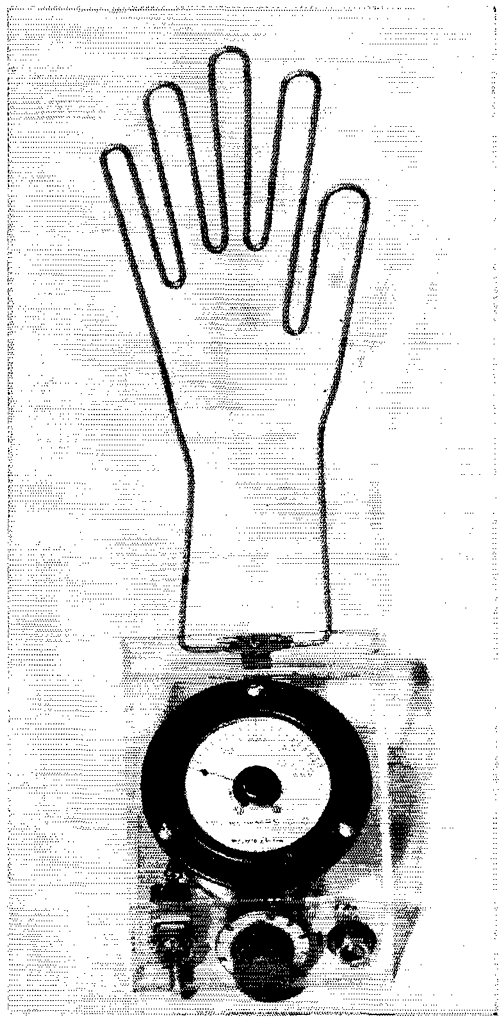


W1LIG built himself a field-strength meter and straightened out a coat-hanger to use as an antenna. But W1UWY (a YL) decided that a glove dryer would present a much more arresting appearance to any r.f. floating around. So, instead of an "r.f. sniffer," W1LIG has an "r.f. grabber."

Summary of Rules—1961 ARRL DX Contest

ALL amateur radio operators throughout the world are invited to participate in the 27th 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 1961 ARRL DX Contest.

1. DATES:

This 1961 DX Contest will be held two week ends for c.w. and two week ends for phone as follows:

PHONE: February 3–5 and March 3–5
C.W.: February 17–19 and March 17–19

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 — CONN MAINE MASS NH RI VT
W2 — NJ NY
W3 — DEL MD PA DC
W4 — ALA FLA GA KY NC SC TENN VA
W5 — ARK LA MISS NMEX OKLA TEXAS
W6 — CAL
KH6 — HAWAII
W7 — ARIZ IDAHO MONT NEV ORE UTAH WASH WYO
KL7 — ALASKA
W8 — MICH OHIO WVA
W9 — ILL IND WIS
W0 — 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:

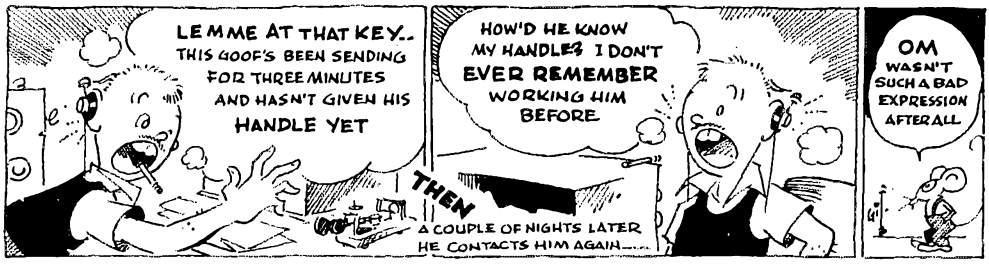
Repeat QSOs on additional bands are permitted. Your multiplier is the total call areas (not states) QSOed *on each band* (maximum of 21 *per band*). The 21 call areas are listed above. Each completed QSO counts three (3) points. For DX stations incomplete contacts count two (2) points. FINAL SCORE is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

ARRL DX CONTEST
38 LASALLE ROAD
WEST HARTFORD 7, CONN., U. S. A.

Your entry must be postmarked by April 29, 1961 to be eligible.



How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

'Twas the night before Christmas and all through the house strode Alvis Readinquist, feeling much relieved after posting his latest lament to ARRL Hq. The theme: Alvis had beaten himself to a pulp and had alienated his loved ones in a struggle to the 250-country mark; *i.e.*, DXCC is too hard and the Countries List is too short. It was the third such letter he had mailed this week. He thought it by far his best, for he was beginning to get the hang of it. Alvis doffed his duds, put a few finishing touches on the arrangement of presents under his Christmas tree, and was fast asleep almost before he hit the pillow. . . .

. . . That last outburst to Hq. must have been a masterpiece, he mused, now heading for his cozy cellar hamshack. Action? Did Alvis Readinquist get action! The Awards Committee had immediately added Brooklyn, Capistrano and the King ranch to the List. Not only that; DXpeditions had been acknowledged to be quite inconvenient in some cases, so ARRL had seeded all inaccessible countries with *Courier*-type satellite transceivers that automatically handle pile-ups and transmit daily log transcripts to West Hartford for immediate QSL issuance by IBM servos. No need to worry about those old bothers, skip and sunspots, either, because the sky had been filled with signal-reflecting ARRL balloons. But this automation angle is only half the story.

Because the time, skill and diligence required to qualify for the DX Century Club were deemed a hardship by some amateurs, installment-plan DXCC had been introduced. Now, through arrangement with Friendly Freddy of the Long-haul Acceptance Corporation, DXCC certificates are issued to all amateurs as soon as they get their licenses. No countries down, and easy payments of, say, five countries per month. Moreover, a DXer whose credit-rating check turns up a mountaintop QTH, a six-element beam and unlimited operating time can obtain his DXCC-400 endorsement on quite reasonable terms. (Default of payment, by the way, results in a large endorsement sticker marked VOID.)

Then, too, there's the Country of the Week Club for eligible (alive) subscribers, the Hertzian Rent-a-QSL Corporation, Supervalue Stamps for free-gift country premiums — man, the gang's DX standard of living is *soaring*. Alvis and his DX buddies are convinced they never had it so good. Yet, strangely, Al is not exactly overjoyed. In fact, Al is worried. Now he nervously tunes 20 to dig up another new one to complete this month's payment to LAC on his chrome-plated DXCC-550 sticker. Hey! No signals at all. *Fadeout* — reflector balloons riddled by meteor shower! (If you get that VOID stamp, brother, you keep paying.) . . .

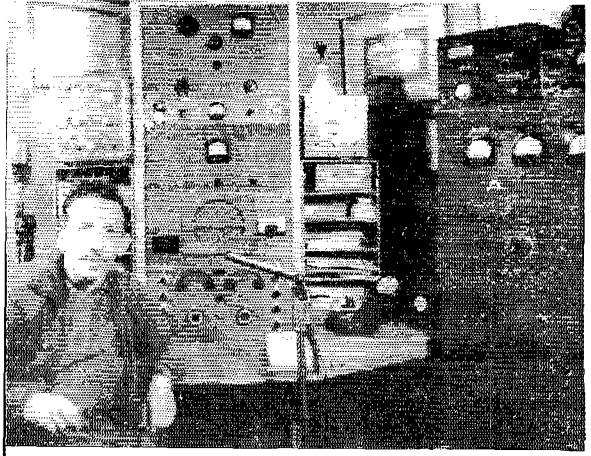
. . . Alvis Readinquist leaped out of bed on Christmas morning in a cold sweat, pulled on some clothes and raced for the shack. Maybe there is a Santa Claus, but he had to work a new country fast or that dreaded VOID sticker would place him in *QST's* DXCC Dishonor Roll. . . . *Whammo!* He was tackled near the Christmas tree by the XYL and kiddies who happily hugged him and presented him with a brand new set of 833-As. By gosh, the family wasn't really sore at him after all. He had imagined it, just as he had dreamed up that DX golden age. Alvis Readinquist relaxed, continued downstairs and gazed fondly at his prized DXCC diploma. All paid for, fully earned.

What:

Well! Now that another uproarious ARRL Sweepstakes is history DX men can sneak back down into the fourth layer without imminent danger of shell shock. And we enter 1960's home stretch with plenty of DX action afoot from 10 through 160 meters. Let's get this month's intercontinental activity analysis under way with a look at

40 c.w., a congested slot now called upon to support more and more international nighttime communication as higher frequencies gradually soften. Our informants, K2JXX, W3LOS, K4s LRO MPE, W6RCV, K6s CJF LAE, W7s DJU LZF, K7KPM, K8NHC, W9JJN, K9MMS, KH6DVG, plus the members of ISWL, NCDXC and VERON, stress the 7-Mc. c.w. availability of CM2UZ, CN8MB, CT2BO, EL4A, FG7XF (7010 *kc.*) 23 hours *GMT*, GC2FZC, HC2s IU VT, K4CDZ/VE8 (5) 3-4 on Resolution isle, KØTFP/KW6 9, KV4CI, LA7RF/mm 5, LU6DBQ, LX1BG, LZ2KSK, MP4BCV (25) 19, OAs 1DY 4FA (17) 5, PYs 1ADA 1LV 4GA 7SW, PZ1UB, UAs 3KGA 6KEB 9BG 9KAB ØAG, UC2BG, UD6AG (7) 5, UF6FN (35) 18, UL7s CG (30) 16-17, FA KKB, UN1AZ, UR2KAE, VKs 9UX (35) 20, ØPM, VPs 2AR 3RS 4LE 8EH 9BO (20) 0, VQs 2HR (30) 22, 4CC (35) 20-21,

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



HK3TZ took enough time out from DX pursuits to qualify for the *ARRL Rag Chewers Club through member* TI2AL and sent this photo along to the Old Sock at Hq. Gillermo's Bogota layout regularly booms through on 20 phone.

VR2DK, VS9OA, VU2XG (35) 7, XEs 1AX 2KH 4, ØANP 4, YOs 2BB 3AC, a batch of YUs, YV4AS, ZC4s KV ZB, ZE5JT (25) 4, ZK1BS/mm 8, 5A2CV, 6O2GM (25) (25) 18-19 and this economy-size group of Japanese 40-meter hounds: JA1s ANO BI BLD BNB BTG CG COO CRS CS CUM CVD CXW CXX DCY DGN DMX EVV FOF FTL FTQ, JA2s AMD/mm ANA ASZ AYX BCD BGN BP UA, JA3s ALY AUU AVD BEK BFX BGP BWM BXZ CAF CCQ IL, JA4s OK/7 PE YC, JA6AHY/mm, JA7s AB AHR AKC LK NX TK XF XP, JA8s AAA AE CD FC FO HO KP PO UY VM WN XR ZC, JA9s MV NW RR and XG, all near the low edge around 8-12 hours. . . . . Novice diggers on 40 be apprised that VK3XB, in a note to K3KHK, seeks contact with WN/KNs in New Hampshire, North Dakota and Utah near 7148 kc., 0300-0430 GMT, to clinch his 7-Mc. Novice WAS. Not only that; JA2BP tells K6CJF he calls U. S. Novices daily around 1100 GMT, transmitting somewhere between 7000 and 7050 kc. Swing on down and give Kei a tumble, lads . . . . . Forty-meter **phones** like CT2AI, several DJ/DLs, GB2CAM of Cambridge U., HK1PK, IS1SMB, JA1CE*, numerous KH6s, OY5S (91) 9, UA1DZ* 5, VPs 2AB 2DA 2GV 4LP 4MM, YV5ADE and ZL3ID* are specified by K2TDI*, W5CFJ, WA6IVM, NCDXC and ISWL DX-cavators. (Asterisks represent s.s.b.ers.)

10 phone's DX momentum carries the short-antenna set forward although the dead days grow more frequent. K2YFE (100/55 worked/confirmed on 28 Mc.), WA2s CXO EGK, W4LJV, W5CFJ, K5s AHX VTA, K8JCB, GC2RS, DL9LI and observer R. Kemp specify CE3AGI, CN2AX, CO2s JK (487) 21, UM (420) 17, CP5EA, CRs 4AX (308) 15, 6CN 19, 6AT 6LA 16, 7CR (425) 18, 7EA (416), 17, CTs IAP ICL 1HX 1JG 1QF 1SX 2AH 21, CXs 1BY 5BR 8BE, ELs 2C 14, 4A, FF7AB 20, HCs 1EM (373), 7SC (910) 21, HE9LAA 13, HH2JK (480) 21, HI8s DGH (495) 17, JSM, HK4JB 23, HP1AP, IT1AQ 17, JAs 1GI 2KX 3EK 3TC 6CY 7NZ 8NB, KB6BH 1, KG4AQ (998) 0, OAs 4GG 4HK 4KF 4LB 8B (812) 23, 8D 16, PJs 2AL 22, 3AC 3AD 22, PZ1AY, TGs 5HC 9BK 22, TIs 2OE 3EM 22, UAs 1AFP IAP 3KET 3KPV, UB5s BZB MZ NCN YQ 17, UD6KAR (350) 12, UP2s NAE NKI 14, NMY 15, VK9CK 1, VPs 1BS (360) 14, 2GU 3MC (220) 22, 6AM 21, 6FO 16, 6JC 6RG, VQs 2EZ 19, 2HR 19, 2SB 20, 3GL 3HH 19, 4RF (620) 20, VU2BK, XEs 1IQ 21, 2DO 2IL 2RN 3CP ØNHD* (630) 22, YN1MW, YO2BM 17, YS1IM 17, YU3OV, YVs 3BT 23, 3DV 4CI, ZEs 1JA 18, 4JZ 7JV (450) 19, 7JZ 8JD 19, a flock of ZLs, ZSs 3L 3R 3S 3X 19, 7L, 4X4s FR HK 16, 9G1CW 17, 9Q5DD 18, 9U5s DM (381) 21, KU 19, PD (460) 19 and VS 19.

10 c.w. really cooks when a good week end comes along, according to W1OPB, K2s UYG YFE, WA2s EGK KMY, W5CFJ, K6s CJF ROU, W6RCV, WA6IVM, K8JCB, K9OZM, KØs OSV OSW TKN, KZ5TD, DL9LI and I1ER who pass the word along on CE4EI, CR7BC, CT1JY, CX2s AZ BT, DM3IGY (1) 19, EL4A, FQ8HO (85), HK7ZT (25) 23, JA1-2-3s galore, JAs 4LG 4MH 5GS 5HD 5KF 6ADA 6ADZ 6AOZ 6DH 8BP 8MP 8XR ØCE ØKA, KØSLD/KW6, OA4KF (80) 18, SP7AZ, TI2DL, UAs 1AU 1KAG 3LI 4PS, UB5s FG KWH, UC2AG (50), UN1AB UP2s ACE NMV, XEØNHD (40) 22, YU2AJ, ZC4HJ, ZD2JKO and 5A2CV (10).

15 phone naturally falls in step with 10. Reporters K2TDI*, W4LJV, K4LRO, W5CFJ, K5s VTA YNA (92), W6JQB, WA6JVD, K7KPM, K8JCB, W9LNQ, K9s ORC UTM, GC2RS, KZ5TD, VE3PV and Mr. Kemp accumulate AP2CR*, CEs 2IS 3TN 3VU (252) 0, CN8EF (233) 17, CO2QH (245) 22, CPs 5EL 6FB (264) 18, CRs 4AD (231) 23, 6BJ 6BX (245) 21, 6DU, CTs 1KI 2AC, CX4AW, DL5BV 15, ELs 2Q 2U 2V, FFs 4AB (251) 21, 7AG 21, FG7XA (233) 17, FO8AK (225) 22, GD3IYS (189) 17, HCs 1KA* (434) 4, 2ND* (434) 4, 4JL 5AC 22, HI8DGC, HKs 1OI 3LX 3QV, HP1AC 16, HRs 2JD 3PD 17, KG1AA* (432) 4, KS6AK, KW6CS (340) 4-5, MP4BBA (230) 6, OAs 1W 4AH 4GP 0, 5C, OX3DL, PJ3s AI AK, SP5XM, TGs 5HC 9BK, TIs 2RO 5RV 22, UR2KAE 11, VE8XM, VK8OW*, VPs 2AB 2GAQ 2IS (354) 20, 2SL 5AK 5BB 5DX 16, 6AM (230) 23, 6TR (226) 0, 6ZX 7NA 7NY 9BO 9EI, VQs 2DC (218) 19, 4OSC (195) 18, 5HR 3, VR3L (250) 5-6, VS9s ADL (198) 18, AJW (250) 19-23, VU2CQ (230) 17, XEs 1XM 2, 9ALP 9JZK, YA1BW (210) 6, YN1s EDA EDB (299) 22, YO9IF, YS1RO, YVs 3DV 3EJ 5BX 5EX, ZB1FA 21, ZC4MO (255) 5, ZDs 1AW (225) 23, 2AMS 23, 2DCP, ZK1BS, ZP5CF, ZS4LT* (440) 19, 4X4s FU 23, MG (230) 21-22, 5As 2CV (235) 22, 3TL 3TX* 5TA (218) 15, 6O1TUF (190) 18, 9G1CW, 9Q5s HF US*, 9U5s DM FW (250) 21 and a wide assortment of less exotic entries.

15 c.w., under heavy DX attack all autumn, finds W1OPB (127/103), K1s JTL MOD, W2GVZ, WA2KMY, K3KHK, K4s LRO MPE (98/61), K5s VTA YNA, W6s JQB RCV, K6s CJF ROU, WA6s FCX JVD, W7DJU, K7KPM, W8s KX YGR, K8s JCB NHC QEX, W9LNQ, K9s MMS ORC UTM, KØs OSV OSW, KH6DVG, KZ5TD, I1ER, DL9LI and KL7PI on the trail of CEs IAD IBD 2JW 3AG 3TN 4EC 4EI, CP5EK, CR5AE, CT1QN, CXs 1FB (50) 23, 2FD, DUs 3TQ (45) 6-7, 7SV, EA6AM, EL4A, ET3AZ (63) 21, FA2VC, FB8XX (76) 12, FF7AG 20, FQ8HP (70) 19, FR7ZD 17, GD3FXN, HAs 3MA (65) 19, 4YB 5KAG, HH2s AR (40) 16, CB (95) 20, HK7ZT, JAs 5AF 5FQ 6PA (64) 23, 7AD 7KX 8AQ 8FC 8HO 8LN 8UJ ØMK (40) 4-5, K4CDZ/VE8, KØs SLD/KW6 TFP/KW6, KGs 1FD (40) 23, 4AO (75) 1, KR6LJ, KV4AA, KX6CA, LZ1KNB, MP4s BBL (80) 6-7, BCV, OD5CQ, OEs 1ER 3VP (45), 6AI, OH0s NC NE, PJ3AD, PYs 4ZG 7LJ of Fernando de Noronha, PZ1BR, SL5AB of Sweden, SV0WZ 20 of Crete, TF2WFF, TI2DL, UA9s DT (48) 18, KOA KOG, UA0s EH FE GF KAR (30) 18, KFG JIA SK (35) 14, UB5s FJ KE, UC2s BB KAR, UL7HB, UQ2NK, UR2s AT KAE, VP8s EG EH (50) 23, 9D 9EU (60) 22, VQs 3HZ (85) 17-18, 4GQ 4JT 4ST, VR3L (50), VU2RM (70) 17, WH6DPF, WP4AWM, XE1H (63), YU7LAA (15), ZB1s FA 17, HC (45) 19, ZC4AK 19, ZD2s ATU 21, JKO, ZEs 2JH 21, 3JO 6JS, ZK1AR, ZP5LS (75) 1, ZSs 3DM 15, 7R (55) 18, 3V8CA 21, 4X4s FU 18, GT, 5As 2AE 2CV (10) 20, 5TA, 6O2s AB GM (40) 18, 7G1A 17, 9M2FR (50) 16 and 9Q5US 20.

15 Novice prefix-hunters KN1MOD, WV2KZV, KN3KHK (64/50) and KN8TMD unleashed QSLs toward DLs 3BJ 4ADK 4MG 4QC 5AY, DM2s AQB AUA, EI3R, Fs 2LG 3DM 7HC 9FZ 9XL, Gs 2FFV 2KGL 2YK 3LUG 3MQY, HA5s BU KWE, HB9ZT, HK3TH, KH6DNY, KL7BZO, KP4KD, LA8YF/mm, OEs 7BL 7GF 9EJ, OHs 1NQ 6OR, ON4s BV IZ RN RX TE, PA0s DB QT, SL4CN, SMs 3VE 7BIR, SPs 2BA 4JF 6WM, UR2AK, VP8EH, VQ8SW, WP4AVF, YV5AEJ, ZS1UL, 4X4s IIJ and JU, KNs 1MOD and 3KHK now have embarked on General DX careers.

20 phone receives the attentions of K1JFF, K2TDI*, K4s KYB LRO, W4LJV, K6LAE, K8s DXU JCB, W9LNQ, KH6s AHZ DVG* and s.w.l. Kemp, plus NCDXC, NNRC, VERON and WGDXC supporters who deal with AP2CR* (325) 18, BV1s US USC (327) 13, CE2CC 5, CN8s AQ AR* (335) 20, HX*, CO8LS 18, CP5EL*, CRs 6CA* (345) 23, 9AH (177) 14, CT1s CL EX* (180) 23, CT3AV*, DU6TY, EA0AC* (311) 11, ELs 1K* 5, EP5X (320) 18-19, EQ2AT (325) 18, ET2US (340) 20, FA8HW (174) 6, FB8CM* (317) 17-18, FQ8AE (115) 22, HA8AS*, HC5AC 2, HHs 2AR 2JK 15, 5MV 4, 9DS* 3, HI8s DGC DGH MAR 2, HK3LX 6, HMØHQ, HP1s ME* TS 0, HRs 2BD 2, 3PD, HS2A*, HV1CN*, HZ1AB* (330) 21, JA7AB* (315) 11, KØSLD/KW6*, KAs 2SC (315) 19, 7DM* 8CK 7, KB6BV*, KC4s USA USB (274) 3-4, USH* (320) 6-7, USN* USV (343) 4, KGs 1BA (345) 19, 1FR (393) 3, 6AKA (230), 6FAE (320) 17, 6NAB (320) 18, KJ6BV*, KM6s BV BI, KR6s CP (340) 19-20, CS (164) 14, DO (111) 12, IQ, KV4BQ (310) 20, KW6s CL* CV* DB*, KX6BQ 15, LAs 1LG/p (175) 19 of J.M., 8LF/mm*, LU9ZX*, MP4BBW*, OAs 1W* (345) 23, 4GJ 4, 5G* (310) 6, OD5CV*, OH0NC (315) 8-9 of the Aland islands, OK1TH*, OY7ML* (343) 23, PJ3s AJ AK 4, PZ1s AX (325) 21, BJ (341), SU1AE*, SVs 1AE 16, 1AJ* (330) 17, ØWO (186) 5, ØWV (320) 18, TF2WEZ*, TGs 5HC 3, 9MT, TI2s AJ 14, EH* LT 4, UAs 4CB (335) 4, 9CM (294) 2, UB5s FJ* (346) 23, WF*, UP2KCK, UR2s AK AP (308) 13, VEs 3ELO/9Q5 6AAE/SU (175) 3, VK9s NT* RM (160) 12, VPs 1RT 5, 2AB (303) 23, 2AR (177) 4, 2DA (175) 12, VQs 2SB 4ERR (330) 14, 4FL (345) 18, 4OO* (320) 20, 5FS* (315) 19, 9TED* (325) 17, VR1s B* D* G* (318) 11, VSs 1JO* (340) 17, 1JV* 1JW 6AZ*, VU2s NR (295) 12, RM*, T-3's W9DVM/mm, XEs 1CCP 18, 2KH 5,

3CW, XZ2SY* (315) 18, YK1AT*, YNs 1JW 5, 6HH 3, YO3GK*, YVs 1CD 1, 5AEU* 5, 5ANG 5AQC 6, ZC4s AK 4 (see "Whence"), IP, ZEs 5JU 7JZ, ZK1BS 6, ZSs 3E* 3S* (325) 19-20, 7P* (330) 18, 3V8CA*, 4S7YL (124) 12, 4X4s CX* IX (295) 16, 9G1BQ*, 9K2s AG (245) 14, AM* (300) 19, 9M2s FX (120) 13, GA GV, 9N1s CJ* (295), MD (323) 13, MM (310) 13, SM* WW (210) 6, 9Q5s RU and US*.

20 c.w. treats K1s JFF (85/22), JTL, W2GVZ (264/248), K2s TDI UYG, WA2s CXO KMY (105/72), W3LOS, K4s KYB LRA LRO (86), W5CFJ, K5s STL (58/15), VTA (49/16), W6s JQB RCV, K6s CJF (113/104), LAE (182/171), ROU (92/43), STZ, WA6s FCX (77/42), JVD, W7DJU, K7KPM, W8s JSU (241/230), KX (193/183), YGR, K8s JCB (139/115), QEX (89/53), NHC (75/45), W9LNQ, K9s MMS UHH, KØs OSV OSW WQI (163/92), HER, KH6s AHZ DVG, KL7PI and KZ5TD (144/101) to this absorbing assortment: **AC3AZ**, persistent "AP5B", **BV1s** US USE, **BY1PK** (6) 13 of mainland China, **CEs** 1AD 3AGI 9AJ (26) 1 on Grahamland, **CM2QN**, **CN9CK**, **CP1BE**, **CRs** 4AX 5AE (20) 17, 7CI (50) 13, 9AH, **CTs** 1ID (50) 22, 3AV (45) 0, **DL8s** BB CM, **DMs** 2AFC 2BGO 3UDA, **DUs** 1OR (80) 13, 7SV (20) 9-11, 9AC, **ELs** 2U 3B (44) 22, 4A, **EPs** 1AD 2 5X (1-8) 3-4, **ETs** 2US 3AZ 23, **FB8s** CP XX ZZ, **FG7s** XC XF (12) 3, XG (7) 23, **FM7WX** 13, **FO8s** AC AU, many transient FP8s, **FQ8s** AG (22) 20, AX HP HV HW (20) 21, **FR7ZD**, **FY7s** YE YF YI (50) 2, **GC2FZC**, **GD3UB** (66) 23, **HA1s** KSA KZA, **HC1s** JU (30) 2-4, LE (11) 1, **HH2OT**, **HKs** 1IV 3RQ (10) 6, 4JC 2, 4PZ, **HL9KT** (14) 14, **HP1BR**, **HRs** 1MM (70), 1NX 2FG, **HZ1AB** (35), **IS1s** DKL MM (45) 23, IT1ZND (10) 0, JA1-2-3s in quantity, **JA4s** AG LJ PE, JAs 5AI 6AO 6ZB 7AD 7BO 9AA, **JT1AC** (60) 14-15, **JZØPO** (60) 17, KØs SLD/**KW6** 12, TFP/**KW6**, **KAs** 2KC 9CG, **KC6s** JB KR, **KGs** 1BX 4AB 6AJT (24) 9-11, **6FAE**, **KM6s** BI (15) 11, BT, **KR6s** CGA IQ IW KU, **KV4s** AA (81) 20-21, BH, LA1BF/p (60) 0 on Bear isle, **LUs** 2ZA 4ZL 5, 5ZL (76) 0, **LZ2KSK**, **OA4s** FN (40) 2, KF, **OD5s** AR LX, **OHØNC**, **OR4TX** of Belgium's antarctic holdings, **OX3s** JI UD (70) 16, **PY4ZG** (82) 2, **PJs** 2AE (20) 12, 2AS 2ME 3AK (58) 6, **PZ1BP**, **SL5AB** of Sweden's military, **SM1BVQ**, **ST2AR** (54) 1, **SU1AL**, **SVØWI** (55) 5, **TFs** 2WEZ 2WFF 3AB 3MB (8) 23, 5IP, **TI2s** CME DL (75) 3, PZ, UA1KAE/6 of U.S.S.R. antarctic doings, **UA9s** AC BT (18), DM DN DR KCB KCT KSZ MC SA (4) 4, **UA0s** AG AU (50) 1, BN (38) 14, BP EH JB, KFM KID (24) 14, KKD KQB KYA LN OK TN, **UB5s** IF JX KBO KKK MZ NM, **UC2s** AX AZ KAC (60) 16, **UD6GW**, **UF6s** FB KAF, **UG6AW**, **UH8s** BI DA (68) 22, KBA, **UI8s** AC AK DV KAA, **UJ8s** AC (18), KAA, **UL7s** AW HB KAA (58) 14, UPOL-8, **UP2KBA** (70) 16, **UQ2s** BP (40), KBA, **UTs** 5BK ØAA, **VEs** 1AD (65) 23 of P.E.I., 8DM 8RW ØNI (18) 21, ØNM, **VKs** 1JE (50) 11, 1YL (32), **0AB** **0BH** (62) 20, **0IT** 4, **0PM**, **VPs** 2AR 2MB 22, 2VA 3RS 5AR 2, 6RG 9FP, **VQs** 2EW (40) 14, 3HZ (38) 14, 4IT (18), 4IA, **VRs** 2DK 3L (20) 12, **VSs** 1ED 1GZ (69) 14-16, 5GS 14, 6EN, **VU2s** MD 17, NR, **XEs** 1H 1PJ 3BL ØNHD, YA1s AO (80) 19, BW (65) 13, **YOs** 2BU 3FD (60) 23, 3LM, YS1O, **YVs** 1EM 4BE 4CI (55) 7, 5ANI 5APR 5EZ (40) 2, **ZB1FT**, **ZCs** 4AK 5AE (67) 12-13, **ZDs** 1AW 2GUP (55) 17, 2JKO 2, 2JM, **ZEs** 3JO 15, 8JB 8JJ (84) 5, ZK1AK, ZP5AY, **ZSs** 3APY (65) 3DM 20, 7L (71) 20, 7M 7R, 3V8CA (W8UTQ), 4S7EC, **4X4s** BN (95) 0, GF II JU KK YL, 5A2CV, **6Os** 1TUF (14) 15, 2AB 2GM (100), 9G1AQ 2, **9M2s** FR (50) 16, GT, **9Q5s** LL and SF (32) 1.

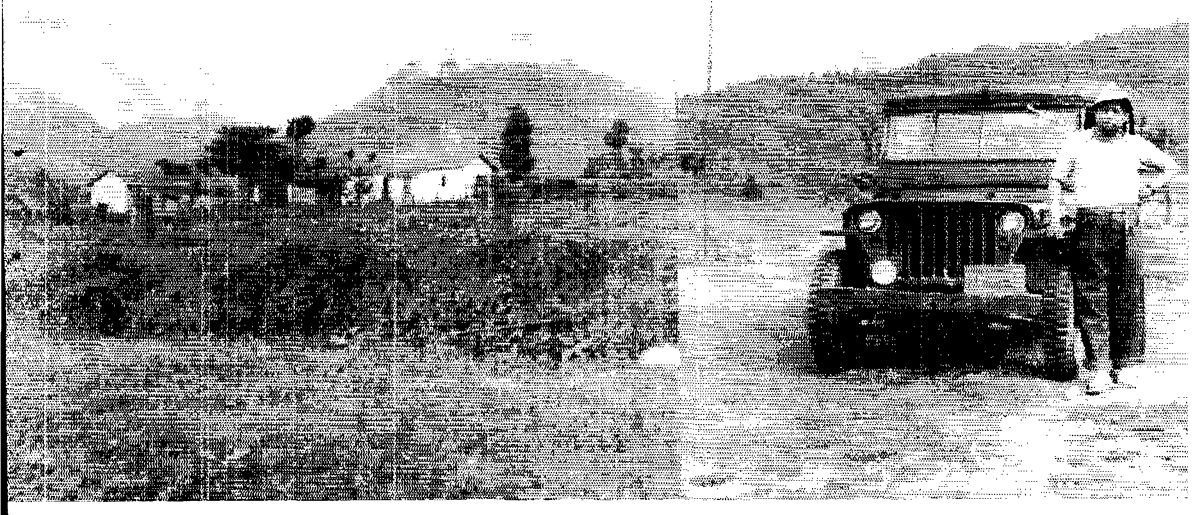
160 c.w. gets its seasonal fillip from W1BB's Annual Transatlantic & World-Wide 160-Meter Tests announcement. Mark off December 4th and 18th, January 8th and 22nd, February 5th and 19th, and concentrate your 1.8-Mc. DX efforts between 0500 and 0730 GMT on those dates. "Band conditions, predicted to improve with reduced sunspot activity, already are showing considerable improvement," declares W1BB. International Short Wave League reports W1AW, K8s HBR/8 and OPK getting across to England in early autumn, and our G-GI-GM-GW friends are all set for the show. Pray keep W1BB and this department apprised of *your* 160-meter DX developments and observations.

Where:

Asia — "All QSLs for this station should be sent to W5OZI, my home address," writes HS1R, formerly K4ADL-DL4FL. "Self-addressed stamped envelopes are appreciated. I intend to QSL 100 per cent via bureaus once every two or three months to all stations from whom I haven't received cards." W6RCV understands that non-North Americans can reach Pat c/o 5th RCT (RTA), Nakorn Srithamaraj, South Thailand . . . . . K5MWH of WGDXC learns that the real 4X4RE has been inactive for over a year. The Gulf club's *DX Bulletin* also reports some outbound MP4TAF QSL shipments gone astray; you can reapply to Derrick at the address in the list to follow. And by the way, WA2ICQ denies influence in MP4 QSL matters . . . . . VS6DV "worked" 134 stations in 18 countries on 14 Mc. last year while QRT. QSLs are being returned to senders. VS6ED's departure may keep this club station shut down for a spell until other interested licensees join the fold . . . . . Returning to the United Kingdom, ZC4GB tells WGDXC he has acknowledged all contacts . . . . . "HL9TA sent QSLs 100 per cent," declares a KARL (Korea) flyer, "but if there is anyone who has not received his card, please write HMØHQ, formerly HL9TA." . . . . . "I signed HL9KJ from April 1959 to April of this year," writes W8NYG, returning to our side. "Think I've QSLd everybody who asked for a card, but if anyone has been missed, contact me at 714 Preston Lane, Hatboro, Penna. Incidentally, I've received quite a few QSLs for supposed *HL9KJ contacts that don't jibe with my logs.*" Watch for Bill from W8NYG/3.

Africa — W1LVQ hears from 9Q5US operator W4UMO/DL4GA concerning that Congo station's QSL problem. Because the station's early operation was essentially emergency in nature, QSLs may be slow in coming. DL4GA will do his best to clear the board . . . . . ZS1s OU/ZS8 and

AC5CQ (VU2CQ) dashed off to Bhutan on September schedule but the elements throttled Mickey's QSO output. Monsoon winds, snow, fog—perhaps even some of those abominable snowmen—forced VU2CQ back to Bombay where he's regrouping his forces for another AC5 attempt. Recent news of disastrous East Pakistan floods underlines the severity of late-1960 weather in that part of the world.



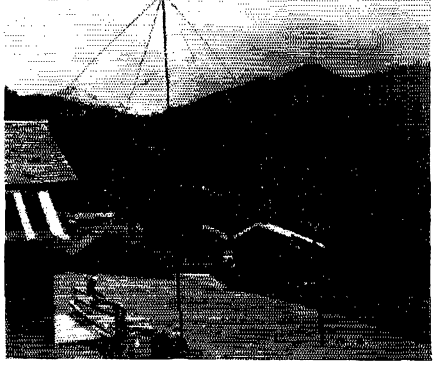
RM/ZS8 aren't anxious to receive W/K QSLs but they promise to make out cards for all contacts and ship the works to K2QXG for distribution. Yanks expecting QSLs from this October Basutoland DXpedition should file s.a.s.e. with Mac and stand by . . . . . "I am most concerned about my QSL situation," writes 6O2GM (ex-VQ6GM) to W8KX. "I've sent cards out for all those received and am now working back through the log to bring things up to 100 per cent — but people still write that they haven't received their 6O2GM QSLs. Is mail purloined because of colorful postage?" . . . . . "Just returned home to G3IHP," writes ex-ZD2IHP, "and I thank all my W/K friends for the QSLs found waiting for me. If anyone has not yet received confirmation of his ZD2IHP contact by now I'll be pleased to put things right. I will be off to VE1-land soon." . . . . . W1WPO confirms that CR5s CA and MA are one and the same station, the Sao Thome enterprise of CR6CA . . . . . VQ8BC, ex-DL2BE-ZB1BN-4S7AE, vows 100-per-cent response to QSLs in a letter to NCDXC's *DXer*. "I promise to remain very active here for the next two years and then probably will become G3JKI again." . . . . . "FF7AG answers QSLs thoroughly and very fast, but s.a.e. and IRCs are musts," advise VERON's *DXpress*. "Same goes for FF4AB." . . . . . Even a fellow with such a call as ZD1AW complains of poor QSL returns from rare DX, observes KZ5TD . . . . . "Just received more cards from the printers," cheers ex-ZD2HJG, "and I hope to confirm all contacts in the near future." He's reachable through RSGB.

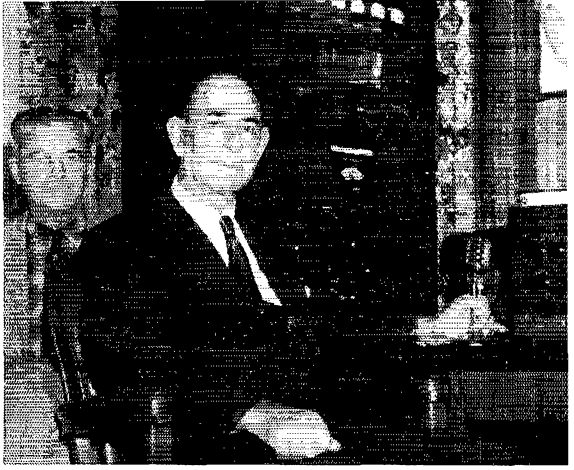
Oceania — "The XYL, new first harmonic and I arrived in Singapore a few weeks ago," states ex-VK9JF-9M2JF, lately of Cocos-Keeling. "My time since then has been pretty hectic with unpacking, taking over from the chap I relieved at Jurong Cable & Wireless, and generally setting up house. I unpacked some bundles of cards a few days ago; leafing through them brought back thoughts of QSOs on Cocos. As I was then (and really still am) quite a new amateur, looking back to my 'novice' days brings much pleasure. There may be some who still need deserved VK9JF QSLs. I'll be glad to take care of this if sufficient IRCs are included with requests. Searching through my old logbook I find that my first contact on Cocos-Keeling was a DL, then a UA. It took a couple of days before the W/Ks and ZSs got wind that I was on the air! I expect to be fairly busy here for a few more months before I get down to any hamming. Sold my rig before I left the islands some nine months ago, so will be starting from scratch again, probably with something really small and portable. Will be in Singapore for about three years and hope to do much operating as a VS1." Mike certainly composes an interesting commentary; his current QTH follows . . . . . ZM6AM, in sad lines to VE3PV, reports recent unauthorized use of his call. Bill hasn't been active for some time . . . . . An s.a.s.e. gets your KØSLD/KW6 confirmation in a jiffy, says W6RCV . . . . . K2QXG, QSL aide for VK9VM, finds a large percentage of incoming cards that do not check out. Same goes for JA5AI whose prefix is in fair demand. Wishful thinking or thoughtful wishing? . . . . . Ted of VR3L tells K6BX that the Christmas Island Amateur Radio Club will appreciate U.S. postage with each QSL instead of IRCs . . . . . Ws 1WPO and 3RIS point out that PAØZD of VERON may be able to give you "Where" tips concerning former Dutch East Indies *PK1s* AD AM AW BR CD HX IP LD LN MD MF OKL PK PW RW TC TM UA VHN VY, WW, *PK2s* AA DL ML VB ZZ, *PK3s* AA CW EJ GT JF LC MB MR PH PL SP UA UX WG WH, *PK4s* BR DA DG DM FS HB HO IP KS LL MJ LL OO PQ TO VD ZZ, *PK5s* AA AR HL LK RU VO, *PK6s* AQ AW CS LN SB TC VR XG XX XZ, *PK7s* EE and HR. Don't forget the obligatory s.a.e. and IRC with inquiry . . . . . Hint — K6LAE discovers that DU1SA and ZC5AE are stamp fans . . . . . W8KX affirms that VK9JM will QSL via bureaus upon return to New South Wales in March . . . . . VR2BC pens, "I used to forward all my W/K QSLs to W2HTI for local relay and he did a fine job of it. Eddie is uprooting himself from Jersey in favor of KH6-land, however, so I expect to be addressing the various bureaus henceforth."

Europe — K6GMC, in a clipping from San Gabriel Radio Club's bulletin forwarded by K6CJF, gives several pointers to DXers who would employ Moscow's Box 88 bureau: Use the plainest and simplest QSLs possible, little more specific than date and time of QSO, signal report, band and mode. Cards bearing illustrations, equipment descriptions, personal notes, etc., are said to have little chance of QSP . . . . . Via K6BX, DM3PBM of the DM3BM co-op reports almost total absence of *Call Books* in E. Germany. OK2KMB voices a similar regret over his way. K6BX has nearly a thousand other overseas requests for not-too-ancient *Call Books* as a result of his own good-will efforts. Don't throw those old *CBs* away; ship a letter to K6BX with self-addressed stamped envelope stating how many you have to ship overseas, and Clif will respond with calls and addresses of needy candidates . . . . . International Reply Coupons are neither needed nor desired by SVØWT of Crete, learns W1UED of ARRL Hq. SVØWT holds to the bureaus route . . . . . You may have noticed that the prefix DL5 no longer is restricted to French nationals in Germany. That's right; newer DL5s often are Yanks, so the old "via REF" DL5 QSL instruction does not necessarily apply. DL4PI advises that U.S.-style DL5s can be reached through the "DL4" bureau . . . . . K2UYG clarifies those numeral appendages on such U.S.S.R. Antarctic calls as UA1KAE/6. Numeral 1 stands for Dniegrosky base, 2 for Oaza, 3 for Pionierskaja, 4 Komsomolskaja, 6 Vostok and 7 Sovietskaja. UA1KAE, sans numeral, operates at the main Mirny base. How about "/5"? . . . . . SP4JF, in the NCDXC organ, declares that the menace of heavy QSL debts limits his appearances on DX bands. Any QSL-aid volunteers to help Tad out?

Hereabouts — From ZD2IJS, formerly VP2LO: "I've

This panel features several outstanding rare-DX personalities of the dying year. At left are W2AYN/EP-EP5X-EQ2AT and W3ZA/EP-OD5CT-etc., shown on the Caspian shore looking toward UH8-land . . . . . Center, Liechtenstein DXpeditioner HB9TU signed HB1TU/f1 with that triband quad and KWM-1 for some 600 sideband QSOs with 65 countries during a 10-day July junket . . . . . At right we meet PX1PF staffers DLs 9PF and 7AH who amassed 4712 midsummer Andorra contacts on several bands. Much credit goes to the performance of that generator, too.





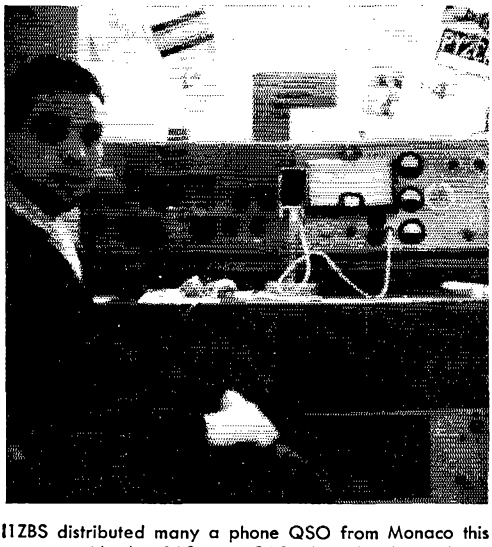
VR6AC visited W6RO (left) and other amateur friends in the States this summer. As luck would have it, Floyd walked off with an HT-37 at the ARRL Pacific Division Convention at San Mateo in September, so stand by for s.s.b. from rare Pitcairn in the coming year.

received a number of cards claiming contacts with VP2LO in this year's ARRL DX Competition. Unfortunately I closed down as VP2LO at the beginning of January, arriving in Nigeria in July after a spell in England. So far as I am aware, nobody has taken over my call and I can only surmise that chaps may have been misreading some other station, possibly VP2LD who was licensed late in '59. I have QSLd all contacts made by VP2LO, direct where IRC was received, otherwise via the relevant bureau. However, if anyone hasn't received a deserved card he can reach me through [the ZD2IJS address to follow] and I will acknowledge direct provided an IRC is enclosed." . . . . . DL1KV, second op at HK3AH, states, "A strict 100-per-cent QSL policy will be maintained, and cards will go only via bureaus. European QSLs will be received and answered via DL1JB of DARC, all others through LCRA at Bogota." . . . . . K6ANP, accompanied by W6HVN, racked up many XE0ANP QSOs south of the border this summer. "Tell the gang it will be a month or so before I can QSL because the cards are coming up through Mexico City. S.a.s.e. will merit QSL direct." . . . . . "I have departed Fletcher's Ice Island, KG1DT and KL7FLB," writes M/Sgt. Wm. H. Otto to W1WPO of the ARRL DXCC Desk. "I now await my F7 call at 1992 AACSRON, Box 166, APO 10, New York, N. Y." . . . . . K2VZJ began disseminating FP8BM QSLs on October 1st for the productive St. Pierre sortie of W2GKE, K2s LSU and OQA. S.a.s.e.s. are required, so if you are among the 500 who sent cards to Bill without providing the necessary return transportation, try again . . . . . KZ5TD rushed off a thousand QSLs in response to over-the-air PSE-QSLs but received only 235 in return. "Hereafter my policy is to *answer* all cards via bureau. I find the phone boys to be much better QSLers than the c.w. gang." . . . . . W4MCM, with much experience as a QSL agent for overseas DX, protests the number of Stateside applicants who *do not* (1) enclose self-addressed stamped envelopes with their QSLs, (2) take proper care in dating QSOs, and (3) use GMT, the only feasible international time reference. "I hate to complain, but I'm not about to shell out five or ten bucks monthly, in addition to the long hours required, to deal with jokers who don't bother to send return envelopes properly stamped and addressed. I'd rather be chasing DX myself!" W1OPB remarks on the same subject, "I've found Stateside QSL agents wonderfully helpful although a few can give little service. With the latter I believe the main fault lies with the DX station who makes QSOs but fails to keep his W/K QSL manager supplied with log data. A good system of liaison should be agreed upon before anyone takes on such a job." Anyway, K9SRR is another volunteer for rare-DX QSL assistance . . . . . W7DJU finds spotty DX conditions just the thing to help bring his QSL files and general station bookkeeping up to date. Perhaps we all need Old Sol's periodic moratorium on easy 'round-the-clock DX to bring order to QSL chaos . . . . . Say, W4TDW's QSL records were beset by combustion, resulting in the need for tracers on 1949 DX conquests ET3s AE AM, KP6AA, MF2AC, ZC6s RO and UNJ. Furthermore, W7LZF desires to catch up with ex-W5LSA who operated W5LSA/KJ6 and KJ6AB back in '48, W8FEM wants to know what ever happened to EA8AW of EA9DC Ifni sport, and W8YGR will settle for the current whereabouts of ex-KA2KS . . . . . Now let's see what benevolent W1s OPB UED WPO, K1s JTL LVW, W2s CKY GIP UMB, K2s TDI UYG YFE, WA2KMY, W3IWJ, K3KHK, W4LJV, K4MPE, K5s AHX LGH STL, W6s JQB RCV, K6s BX LAE OZL ROU STZ, WA6FCX, W7s LZF UVR, K7KPM, W8s JSU KX, K8s DXU NHC QEX, W9LNQ, K9UHH, DLs 4BS 9LI, KH6AHZ (ex-W7EYS), KV4CI, KZ5TD, VE3PV, ZD2IJS, Hong Kong Amateur Radio Transmitters Society, International Short Wave League, Japan DX Radio Club, Kanawha (W. Va.) Radio Club, Newark News Radio Club, No. California DX Club, Ohio Valley Amateur Radio Association, Universal Radio DX Club, VERON of Holland and West Gulf DX Club have come up with in the line of postal patter:

AC4AX, D. Seal, Box 1, Munnar, Travancore, India
CR5AE, Jose Coelho, Box 77, Bissau, Portuguese Guinea
CR5s CA MA (to CR6CA)
CR9AN, Rue Bispo Mederios 30b, Macao
CX0M (via RCU)
DL4PI, SFC R. Mason, Qtrs. 9F, New York Rd., American Housing Area, Butzbach, Germany
DL5BV, APO 123, New York, N. Y.
DM3PBM, P. Sasse, Wolfshainer Str. 26k, Sweenfurth via Leipzig C2, Germany (D.D.R.)
EL2Q (to K9ECE)
EL2W, Liberian Air Taxi, P. O. Box 183, Monrovia, Liberia
EL4B, S. Peterson, Box 80, Monrovia, Liberia
EQ2AT, F. Borsody (W2AYN) c/o Interpol, Tehran, Iran
FF7AB, A. Dubois, Telecommunications, Nouakchott, Mauritania
FF7AG, L. de Faultrier, Telecommunications, Nouakchott, Mauritania
FQ8AQ, P. Guillard, c/o Citra, Box 233, Dolisie, Gabon Rep.
FQ8HL, P. O. Box 449, Ft. Lamy, Tchad
FQ8HO, P. O. Box 138, Ft. Archambault, U.C.A.R.
FQ8HP, Box 41, Brazzaville, Rep. of Congo
FY7YE (via W5JLU)
HC1RB, R. Brandt, c/o U. S. Embassy, Quito, Ecuador
HC5AC, P. O. Box 109, Cuenca, Ecuador
HK3AH (see preceding text)
HK0AI (via W9WHM)
HL9KJ (see preceding text)
HM1s AA AB (via W1MQV)
HR3PD, P. O. Box 8, La Ceiba, Honduras
HS1R (to W5OZI; see preceding text)
JZ0PO, c/o Postmaster, Merauke, Netherlands New Guinea (or via W2CTN)
K4CDZ/VE8 (to K4CDZ)
K6PXQ/KH6 (to KH6DVG)
K0SLD/KW6, Layne La Baume, P. O. Box 68, Wake Island
KØTFP/KW6, Leray La Baume, P. O. Box 68, Wake Island
ex-KG1DT-KL7FLB (see preceding text)
KH6DVG, J. Montague, 1108 Kukila Pl., Honolulu, Hawaii
KR6KU, B. Rosenberg, c/o OARC, APO 331, San Francisco, Calif.
KZ5EJ, P. O. Box 1749, Balboa, C. Z.
LA8YF/mm (via NRRL)
LZ1KBA, Radio Club, Box 754, Sofia, Bulgaria
MP4BCV (via MP4BBW)
ex-MP4TAF-VS9ADL, Sgt. D. Leese, Royals, Camp Ncesoon, Singapore
OA4GP (via RCP)
ex-OQ5FH, Mrs. M. de Roeck, 69 rue J. B. Coligns, Brussels XI, Belgium
RA0CAE, S. Komsomalsk on Amur, E. Siberia, U. S. S. R.
RB5KIA, Polytechnical School of Communication, Kiev, Ukranian S. S. R., U. S. S. R.
RH8ABF, Charjou, Turkoman S. S. R., U. S. S. R.
RP2KCK, Kelme, Lithuanian S. S. R., U. S. S. R.
SM5KV/9Q5 (to SM5KV)
SV0WO (via SV1AA)
TI5RV, R. Valverde, Quesada, Costa Rica
UA4KED, Polytechnical Institute, Penza, U. S. S. R.
UB5FJ, Box 52, Odessa, Ukrainian S. S. R., U. S. S. R.
UI8AG, Tashkent, Uzbek S. S. R., U. S. S. R.
VK2GP (via RSGB)
ex-VK9JF-9M2JF, J. M. Fulton, c/o Cable & Wireless, Jurong, Singapore 22
VK0PM (via VK2AZM)
VP2LD, c/o Vigie Airport, St. Lucia, W. I.
ex-VP2LO (to ZD2IJS)
VP2MB, Box 219 Montserrat, W. I. (or via W4CKB)
VP7NY, Box 1007, Nassau, Bahamas
ex-VQ3EX (to ZD2IJS)
VQ8BM, Milton, Vacoas, Mauritius
ex-VR3B (to VK3AMI)
VR3L, Christmas Island ARC, BPO 170, c/o Postmaster, Honolulu, Hawaii
VS1KG, S. Newton, RAF Tengah, Singapore
VS5ES, G. Scott, Box 300, Brunei, Brunei
ex-VS6ED (to G3MDD)
WV4CJ, Mrs. Pat Miller (to KV4CI)
XE0ANP (to K6ANP)
XW8AO (via REF)

YA1BW (via DL8AX)
YN1s EDA EDB, c/o U. S. Embassy, Managua, Nicaragua
YS1AP, Flight Information Office, International Airport, Ilopango, El Salvador (W/Ks via K4KYB)
YU7LAA (via YU2IU)
YV1EQ, Box 154, Maracaibo, Venezuela
YV3EJ, Box 163, Barquisemeto, Venezuela
YV5AEJ (via RCV)
YV5AQC (via RCV)
ex-ZB2N, R. Milton, GM3OEV, 5 Salmond St., RAF Kinloss, Morayshire, Scotland
ex-ZD2IHP (to G3IHP)
ZD2IJS, J. F. Stratfull (G3IJS), Audit Dept., Northern Region, Kaduna, Nigeria
ex-ZP5KA (to HC1RB)
ZS1AB, B. Joel, P. O. Box 951, Capetown, C. P., S. Afr.
ZS1s OU/ZS8 RM/ZS8 (see preceding text)
ZS2NS, L. Colson, 85 de Chavonnes St., Kabega Pk., Port Elizabeth, S. Afr.
ZS3DM, D. Moir, P. O. Box 1601, Windhoek, Southwest Africa
ZS4LT, 6 Clarens St., Bloemfontein, O.F.S., S. Afr.
ZS6AYF, P. O., Klipriver, Transvaal, S. Afr.
3A2AV (to I1ZBS or via K4KYB)
4X4GB (via SM5AIHK)
7G1A (via CAV, attn. OK1PD)
9G1CC, P. Lorden, P. O. Box 746, Accra, Ghana
9K2AD, D. McManus, Box 402, Kuwait, Persian Gulf
ex-9M2EB (to G3IJU)
9Q5KW (via 9Q5PS)
9Q5MP, F. Feyer, P. O. Box 1612, Bukavu, Congo Rep.
9Q5PS, E. Protois, Box 1071, Stanleyville, Congo Rep.
9U5DM, R. Dethier, Box 1, Usumbura, Ruanda-Urundi
9U5FW (via UBA of Belgium)
9U5PD, Dr. Duren, Box 110, Astrida, Ruanda-Urundi

NOTE: Positive and glorious results from the forerunning directory are possible but not guaranteed. Beats just sittin' and waitin'.



I1ZBS distributed many a phone QSO from Monaco this summer with the 100-watt 3A2AV outfit shown here. Monti had intended to follow up with a c.w. session from the Monte Carlo last month. *(Photo via K4KYB)*

Whence:

Asia — Iranian chatter via Ws 1BDI 2AYN and 8KX: "W3ZA and I worked some s.s.b. from a hotel room in Sari on the Caspian sea, making a few Stateside QSOs," writes EP5X (W2AYN). "Rundy left the KWM-1 with me in Tehran and I've been active with it. Also awaiting a GSB-100, power amplifier and Gonset receiver." W1BDI and ZL2ARL note not a few over-eager brethren falling off the low 14-Mc. band edge when an EP-EQ lugs 14,000 kc. too closely. Reminds us of the prewar 14,400-kc. goings-on; but this is 1960, fellows, and 13,999-kc. hamming is detrimental to the game. EP1AD (K4ORQ) writes W8KX, "I try work all stations QRP to QRO. EP2AT (W7GMZ) also helps keep W/Ks happy. I use an Apache and dipole." EP1AD hints that TA1DB *is* in Turkey operating on an "unofficially legal" basis . . . . . "Finally got going here," writes HS1R (W5OZD). "Having a ball around 14,016 kc. almost nightly, 1300-1700 GMT. We use a DX-35, 51J-3 and two-element beam fixed on the U. S. A., intending to expand facilities later and get on s.s.b." Pat is intrigued by DXpeditionary possibilities involving Bhutan, East Pakistan, the Laccadives and Sikkim . . . . . DL9LI reports the consistent availability of UD6KAR's 40 watts and beam on c.w. or phone around 28,350 kc. . . . . It's Japan and/or Korea for militiaman WA6HXM. Peter aims to try 10, 15 and 20 meters from the juicy end . . . . . In contact with K4KYB, KR6IQ mentions a grievous shortage of old ARRL *Handbooks* in his area . . . . . "My work-Japan project now stands at 290 stations QSOd and 160 confirmed in 36 prefectures and 85 cities," estimates K6CJF. "I've even learned to decipher the addresses on their cards!" . . . . . K2UYG notes Tannu Tuva activity by UAØKYA, c.w. and phone on 15 and 20 meters; UAØKYE, 10 phone around 0700 GMT; and RAØYAA near 28,565 kc., phone. Bill hears that CR8AC is at it again around 1800 GMT, 21,150-kc. phone, also that 9N1GW's tour is terminated . . . . . K6OZL has it that ex-9M2EB will be greeting on-the-air buddies from G3IJU next month . . . . . Further Asianisms courtesy NCDXC, VERON and WGDXC: VU2NR and W6LDD apparently aren't joshing about a Laccadives drive next month. . . . VS9AE is ready for action in Iran, and EP1AD states other EP-EQ candidates await their licenses. . . . ZC4AK, a multioperator RAF effort on 14- and 21-Mc. c.w. and s.s.b., claims to be established on British sovereign territory at Akrotiri Bay.

Africa — W8JSU (ex-W2RDK) paraphrases a missive from 9Q5PS: "Of about five thousand Europeans (including 21 amateurs) formerly in Stanleyville, less than 400 remain. Only 9Q5s KW and PS are left to represent the ham population and both are, temporarily at least, QRT." The 9Q5US command performance by DL4GA/W4UMO ran from July 16th through August 10th. W2CKY reports 9U5FW mobiling in South Africa . . . . . W8JSU compliments the Kenya gang's recent VQ1HT-VQ1SC effort. "Their operating was just top-drawer. If it took you more than one call, you just were too dense to comply with their calling instructions." WGDXC tabs their Zanzibar output at 3116 QSOs with eighty countries . . . . . From K2QXG's DX notebook: "ZS1s OU and RM fired up in Basutoland on October 7th. Poor band conditions hampered their results on 14,030 and 21,030 kc. but they did manage to get through to the mob." Marge added another mark to many a "YL-DXCC" total . . . . . CR5MA (CR6CA) tells W8JSU that CR5s were closed down at the end of October. Only temporarily, we trust . . . . . W3IWJ understands that ZS3DM goes to ZS4-land for a few months, then home to ZS6 . . . . . According to W8KX, increasing 14-Mc. vagaries turn ZS6IF's DX attentions toward 40 meters. This trend is far-reaching . . . . . "I was active at Calabar from September 23, 1959, to January 31, 1960, then again 100 miles southwest of Port Harcourt from June 19 to August 4, 1960," clarifies ex-ZD2IJG, now moving toward Libya and a 5A-style call. This subtracts some activity from the Nigerian scene but ex-VP2LO-VQ3EX showed up in Kaduna to become ZD2IJS: "For the time being I shall be restricted to 7 Mc. but I hope to have the rig on higher bands in a couple of months." . . . . . VQ8-hunters are busied by VQ8s BC and BM on 20 code, and K2UYG finds the Mauritius phone situation well in hand with VQ8AD on 15 around 1600 GMT, VQ8AV on 10 meters at 1200-1700 . . . . . K6BX calls attention to a certification offered by the Bancroft Radio Club, P.O. Box 239, Bancroft, Northern Rhodesia, for QSOs with three members since April 1, 1960. Possibilities include VQ2s AV DC JS TM and TV; apply with log data and five IRCs . . . . . NCDXC, VERON and WGDXC supply other African tidbits: FR7ZD still likes 21-Mc. a.m. around 1700 GMT, while neighbor FR7ZE cruises 20 c.w. with 600 watts and a ground-plane. . . . Tchad seems well represented by FQ8s AA and IIL on 15 phone. FQ8HW on 14-Mc. c.w. FQ8HT's 21-Mc. phone is in much demand for U.C.A.R. credit. . . . The heat is on 9G1BQ who evidently is the only Ghana sideband remaining to bear the W/K brunt. . . . Well-traveled W3ZA has a tentative 20-s.s.b. FL8ZA date early this month.

Oceania — "Quite a number of amateurs in the Columbus area dropped coins into a hat," advises W8JSU, "As a result we have an Adventurer, crystals, a key, antenna insulators and some wire ready to ship to Fr. Tom, KC6TM, and his little band of would-be Micronesian amateurs. Contributors included v.h.f. men, TV experimenters, even s.w.l.s." Charlie refers to our September and October briefs concerning KC6TM's underequipped electronics students on Truk — well done, Eights! . . . . . VR6AC scheduled a stopover at KZ5LC last month before heading home to Pitcairn after a lively visit to North America. K6s BEQ KJN and VGP were among VR6AC's California hosts . . . . . "FK8AS will be active from Wallis by the end of the year if all goes well," hints K2UYG . . . . . K4LRA finds ZK1AR planning to feed his new 100-watt final into a freshly planted quad arrangement . . . . . W1OPB was QSO No. 27,000 for VK9XK. That's a lot of 73s, OM . . . . . Atrocious conditions in this year's VK/ZL Test, opines W7DJU. "Only the Fives and Sixes seemed to be making out." . . . . . K6s LAE and SED are Yanks that qualify for VR2BC's fifty-QSO certification. KR6BH, VPs 1EE 6ZX, ZLs 1KG and 2ANZ are other non-VR2s to work Greg fifty times. VR2BC reports recent visits by Ws

6AL and 8GZ . . . . . From ZM6AM via VE3PV: "My gear is on the blink here in Apia. The sea is less than twenty yards from my front door, so things have a very limited life due to corrosive humidity. I'll be going on leave to Australia within a year and I hope then to renew my equipment." . . . . . K6BX hears that VR3L expects to remain active on Christmas for another month or so, mainly single-sideband around 14,300 kc.

Europe — Word has it that Czechoslovakia's Central Radio Club has an International OK DX contest Dec. 4, 0000 to 1200 GMT. No details though . . . . . DL4PI and friends intimate an early sideband assault on Monaco . . . . . GC2RS, back on his favorite 28- and 21-Mc. phone ranges after a few weeks in France, reports the s.s.b. of GC3LXK in great demand . . . . . DM3PBM and his DM3BM colleagues are steady DX contributors to East Germany's *Funkamateur* journal . . . . . LA8YF/mm, with a c.w. 100-watter on 15 meters, rattled K3KHK's headset from the *Blago Viking* near Jamaica . . . . . W2UMB finds himself DL1PK's 649th QSO for 1960. Ws 2GYQ and 6HYG dropped in on DJ1IM this summer for a rousing personal three-way, and the CX3BHs *enjoyed* a visit to SM5RM's summer cottage in the Stockholm archipelago . . . . . OH2SB has come a long DX way since working his first Statesider, W7DJU, little more than a year *ago*. Rick writes Dale, "I now have had about 3500 QSOs with 137 countries using 70-130 watts on phone or c.w." Helsinki TVI inspired OH2SB to relocate rurally in March, a move that really paid off . . . . . VERON and WGDXC add this Continental comment: If all goes well MP4BDA should be concluding a successful Gibraltar sideband surge as you read this. . . . Regular hanfest on Jan Mayen nowadays with LA1LG/p on 20 phone, LA1NG/p on c.w., and LA8YB/p coming up.

South America — "I have just been granted the possibility of working as a second operator under the auspices of my friend HK3AH," communicates DL1KV from Bogota. "It is our intention to give HK contacts to as many DXers as possible on all bands from 3.5 through 28 Mc. For the rest of 1960 the power will be moderate, about 80 watts, and my own operation will be c.w. only. A new rig for single-sideband will be ready in a few months. We will be pleased to make schedules on 7 and 3.5 Mc. I will be in Bogota for quite some time and *I'm* really looking forward to this activity!" . . . . . HC1RB (ex-ZP5KA) writes from Quito: "I operated the only s.s.b. station in Paraguay and I don't believe another is yet active there. Plenty of single-sideband activity here in Ecuador, however." . . . . . LU9-ABI earned a dandy write-up in the Buenos Aires press after assisting Congo emergency nets in transatlantic fashion this summer . . . . . Via W6NVM, W2GIP hears that yacht *Alferez A. Campora* signs CX0M on a 'round-the-world voyage.

Hereabouts — "DXCC[2]" No. 34 is recorded by W4-BQY, meeting the requirements specified on p. 69, July 1959 *QST*. Who's next? . . . . . "VP2SL, now active with a GSB-100, is talking up a trip to Anguilla in spring or early summer," discloses K4LRA. Meanwhile, Jerry stirs up Navassa interest among K4s LFY and YCW . . . . . KZ5LC buzzed W1BDI from New York City where he collected some high-power apparatus and a 75A-4 to better deal with W/K DX harrassment . . . . . Judging from the *Call Book*, KV4CI is absolutely right. His wife Zora, WV4CJ, is the only Virgin Islands YL extant. After several coastal runs as a shipboard radiop, KV4CI is back at his favorite DX tack, 3.5- and 7-Mc. c.w. . . . . KP4KD becomes the second (after W8JIN) 150-certificate member of K6BX's Certificate Hunters Club. Clif may have to start measuring membership qualifications by the acre . . . . . August's FP8BM eruption by W2GKE, K2s LSU and OQA produced 1776 QSOs with 43 states and 50 countries on all continents . . . . . OVARA, VERON and WGDXC chorus local dispatches: After a pass at Clipperton the VP2VBs/mm and *Yasme III* intend a Marquesas call. . . . LMRE now finds Socorro DXpeditionary possibilities remote. . . . W9EVT's gang is sizing up Bajo Nuevo in case you missed HK0AA. . . W/K radioteletypers mingle with G3LET and ZS1FD around 21,085 kc.; VS6AZ and YV1EM like 14-Mc. beedle-beedling.

Before the ink was dry on last month's QST run DL1QT made good his No. 1 "WAS-DXCC" claim by forwarding the stipulated photographic evidence. This display represents Helmut's QSOs with ARRL DX Century Club members in all United States (the glare job is W7ACD's QSL). Easy? You'll find the bookwork as challenging as the QSO/QSL hunt.

Ten Years Ago in "How's DX?" — Jeeves has a simple R_x for sick DX in your December 1950 column kickoff . . . . . Our 160-meter DX season is off to a flying start, G6ZO making the *hop* to PY7WS . . . . . Eighty meters is fast coming to life with FY7YB, HR1AT, ZM6AK and others in demand . . . . . Daytime VKs and ZSs sprinkle 7 Mc. where C8KY FM8AD and VQ8CE also abound . . . . . Twenty c.w. is the lair of Cs 1RL 3DH 9AA, EK1FF, ET9X, FL8AM, HL1s US ZZ, 15ZC, MS4s A CIB, PJ1UF, PKs 1CI 1TM 4KS 5AA 6VK, ST2RD, TA3GVU, VRs 1C 1F 3A 4AD, W4LVV/FG8 and 3A2AB . . . . . If your forte is phone, 20 offers CS3AA, Iwo's JA0IJ, PK3CS, VK1RB, VR3C, YJ1AA and ZC6DH . . . . . Ten phone still comes through with EK1RW, MF2AA, MI3XX, PJ5FN, VQ9AA and ZD1SW . . . . . We note that MD7s become ZC4s . . . . . W1IKE salutes the Netherlands Antilles ham pioneering of PJ5RP with a sprightly vignette . . . . . Pictures of prominent LU8BF and EA6AF appear, while a perplexed Jeeves prepares to play the part of a propagational Paul Bunyan.

Strays

The little battery portable 50-Mc. rig described in March, 1960, *QST* has brought in about as much correspondence as anything in the v.h.f. line that has appeared in recent years. A source of much of this correspondence was the method used to prevent drain on the transistor battery during standby periods. With the original circuit a very small drain develops when everything is "turned off."

Two different cures for this were published as feedback items, but both introduced new standby drains and aggravated rather than cured the trouble. But now comes the sure (and simple) cure: It has been found that 9 volts is adequate for good modulation, and this eliminates the troublesome 9-volt tap on a 12-volt battery. Simply connect the minus 9 and minus 12-volt leads shown in Fig. 1, p. 12, to the negative end of the 9-volt battery.

A mercury battery is recommended when this is done, as it will hold its initial voltage substantially constant through its operating life.— *E.P.T.*

The World Above 50 Mc.

CONDUCTED BY SAM HARRIS,* W1FZJ

JUDGING from the information received, it would appear that there is a belief extant that the use of parametric amplifier techniques in the reception of v.h.f. signals is confined to such esoteric projects as moon-bouncing or satellite tracking. Nothing could be further from the truth. If one examines the history of the development of radio receiving techniques, he will find very few major steps forward in the art. Probably the first giant step was the development of the vacuum tube. The next important development was the superheterodyne receiver. Since this latter development, there have been no major steps in receiving techniques. Of course, there have been many minor triumphs such as the development of the close-spaced planar triodes, but until the invention of the maser a few years ago, no new method of amplifying radio signals was discovered. If we were still working only with maser techniques, one could understand why the v.h.f. fraternity was making slow progress in adapting to the new techniques. However, immediately following the development of the maser came the development of the parametric amplifier. Parametric amplifier techniques are not outside the realm of the average amateur. In fact, the use of parametric techniques requires no more expense and no more additional equipment than is normally found in an average v.h.f. installation. It would appear the only deterrent to general acceptance of parametric amplifiers is the somewhat sketchy dissemination of information concerning the art.

Furthermore, the erroneous belief that there is little to be gained by improving your noise figure on v.h.f. bands has dampened the enthusiasm of many potential users. The truth of the matter is that I have yet to see a converter on two meters which could not be audibly improved by the use of a parametric amplifier in front of it. Even on the six-meter band where antenna temperatures run considerably higher, there is almost always [1] a marked improvement in signal-to-noise ratio, and invariably a marked decrease in cross modulation problems when a parametric amplifier is used. On the frequencies above two meters, the improvement in signal-to-noise ratio is literally like night and day. On 420 Mc., signals which are absolutely undetectable in the noise of an average converter are perfectly readable when the paramp is installed.

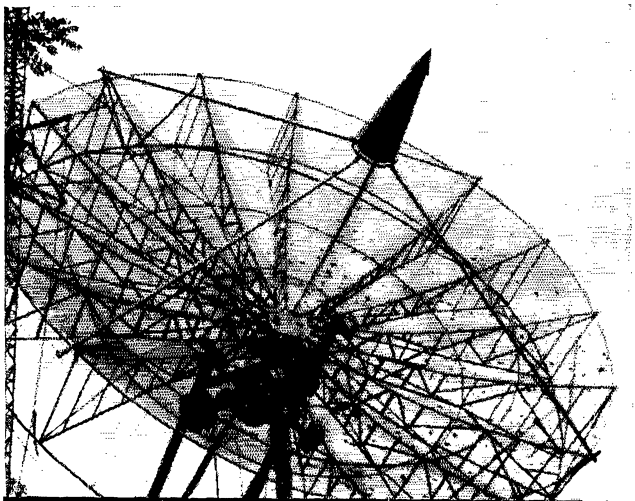
Now, if you are really convinced that parametric amplifier techniques are beyond your capability, let us consider the actual facts in the case. First, consider the fact that the first parametric amplifier used to receive "on the air" signals was built by a ham. Second, consider the fact that the ham who did this had never before worked with parametric amplifiers. Third, consider the fact that this paramp was built at home without the use of any exceptional equipment. Fourth, consider the fact that this first crude attempt at making a parametric amplifier gave astonishing results first on six meters, next on two meters, and then on 420 Mc. Furthermore, consider the fact that, crude though this amplifier was, no one has since developed a system capable of giving a lower noise figure. Now, while it is true that you can purchase parametric amplifiers commercially for the approximate price of a new Cadillac convertible, it is also true than an amateur can build a parametric amplifier at home for no more than it would cost to build a 417A-type converter. There is one thing you can be sure of, if you don't have a parametric amplifier in your v.h.f. layout, you are about as well equipped as a Model T Ford in a modern drag race.

If you have read this far, you are probably sitting there asking yourself, "What does he expect me to do now?" The answer is, I expect you to get to work, and prove that you do have the initiative, the ambition, or just plain gumption, to be listed as a member of the v.h.f. traternity.

Look around at your receiving setup. How much feedline loss do you have? If it's more than ½ a db., fix it. Do you have a tunable coaxial filter in front of your converter? If you don't, why not? The use of a coaxial filter in front of your converter almost invariably provides an

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

[1] This improvement may be masked, however, if you are not in a low-noise location. — *Ed.*



W8LIO's 20-foot parabola with "nose cone" receiver mount. Paramp and 1296-Mc. converter are mounted at the focus of the dish. Feedline loss is 0.1 db.

improvement in received signal-to-noise ratio. In addition, it filters out the commercial garbage generally experienced in the urban areas. And it provides the first step towards constructing your parametric amplifier. I don't suggest that you go out and buy a coaxial filter, but rather that you get busy and build one. The best test for a properly operating filter is to install it in front of your converter while listening to a weak signal. If the signal remains the same or improves slightly, your filter is doing its job. If the signal decreases in strength, one of two things is happening: (a) your filter is not working properly or (b) your converter is matched to the feed line better than any converter I have ever seen. In any event, with a perfectly-matched converter the coaxial filter loss should not exceed 0.2 db.

If you got this far and you still don't know how to build a parametric amplifier, and if you don't want to wait for a 1296-Mc. paramp being described in *QST* next month, I suggest you drop me a line stating your problem. When it comes to parametric amplifiers I am as full of helpful hints as Lew McCoy talking to a Novice.

Project Moon Bounce

Schedules with W8LIO on 1296-Mc. moon bounce during the past month have resulted in sufficient equipment improvement to allow reliable one-way c.w. transmissions. Jack is presently modifying his receiving setup in order to mount the parametric amplifier and converter at the focus of the dish. It is hoped that the improvement of 3 or 4 db. (due to decrease in feedline loss) will allow our first successful voice transmissions. The status of the various moon bounce efforts known to be in process are as follows. W8LIO, 20-foot parabolic dish mounted on a polar mount. Receiving equipment consists of parametric amplifier into home-built i.f. system. Transmitter under construction. W1BU, 18-foot parabolic dish on polar mount. Transmitter, 300 watts into antenna, sideband or c.w. Receiver is a parametric amplifier into home-built i.f. system. W9QXP, 16-foot diameter parabolic dish on polar mount. Receiver under construction, transmitter under construction. W7GRA, 30-foot parabolic dish under construction. Status of receiver and transmitter unknown. W2CXY, 16-foot dish not mounted as of last information. Transmitter, 300 watts output from c.w. klystron completed. Receiver is under construction. VK3ZDG, 30-foot parabolic dish under construction, parametric amplifier under construction; proposed transmitter to run 30 watts. DJ3FM, 10-foot parabolic dish on order, to be mounted on a polar mount. Receiver, to include parametric amplifier, is being designed. Transmitter proposes the use of the RCA 7650. These foregoing stations do not represent the total number of stations interested in moon bounce work, but rather represent those who have sent a status report on their projects in the last month. I am sure that if you have any words of encouragement for these hardy souls, they will certainly appreciate hearing from you.

KL7FLC

With KL7FLC probably back in the more temporate States at the time this appears in print, here come a couple more reports from stations hearing Bob while he was sojourning at Fletcher's Ice Island. From the log of Cliff, VE4TX, we learn that on September 13 he heard KL7FLC in QSO with VE8BY but they both disappeared after five minutes. Cliff heard Bob, KL7FLC, very briefly several times later that same date but had no luck in making another contact. September 14 Bob's code wheel was heard at 0445 (all times in GMT), called in vain at 0457. Heard him once again at 0504 working VE8BY and lost him at 0525. Last heard from KL7FLC in Manitoba was on September 15 when Cliff heard the code well for four minutes.

From KL-land to aurora with antenna aimed East, Cliff heard K2ZFV at 0210. At 0213 worked VE2AIO for five minutes. At 0228 heard K2DBB very weakly, and at 0258 raised VE8BY for a twenty-minute contact. On October 6 a spectacular corona was observed by Cliff while driving but no DX signals heard when he arrived at home a short time later. However, he learned that VE4SH had worked Ottawa, VE3BRW, with 5-9 signals both ways. On October 16 at 0100 VE4GN worked K5YLY, good for him but not so good for VE4TX who needs Mississippi. October 9, VE4SG worked VE3CJN and VE3DXH on phone with 5-9 reports both ways.

A letter from Bob Larkin, W7PUA, relates time he last heard KL7FLC was on September 5 at 2245 PST. He heard Bob for approximately six minutes, the signal peaked S9 with very little flutter but was beginning to fade out by the time KL7FLC changed from the code wheel to call a "CQ." Since that time W7PUA has erected a new 50-Mc. antenna, a 9-element Yagi on a 32-foot boom, 50 feet in the air, which seems to work at least as well as the old ten-element Sterba curtain.

Here and There on 6 and 2

News from Argentina, via LU3DCA, tells us that he needs only his QSL from W7QNV, Utah, for 50 Mc. WAS; and when HR2DK and VP5FP QSL him, he will have thirty countries confirmed on 50 Mc. (And we thought seventeen countries was good!) Mike suggests that all DXpeditions should carry 50 Mc. equipment, particularly during the DX season. We go along with this but the job is to convince the low-frequency DX-minded ham that DX on six meters is worth taking his time from the low frequencies. *We know that it is* but the low-frequency man needs convincing.

K1OAA in Huntington, Connecticut, (formerly W3OJU) reports good tropo conditions on September 25 and 26 when he worked North Carolina from his new QTH in Connecticut. Rick also worked Richmond, Virginia during this period and mentions that f.m. stations in Raleigh, N. C., and Roanoke, Va. were coming in with good limiting signals all day of the 25th and during the evening on the 26th. He has noticed that the f.m. band makes a fine indicator for exceptional conditions on six meters for ground wave. Also reported good conditions to South America on October 2 when commercials were coming in as high as 47 Mc., and the same thing on October 8.

More South American dope from Walt Piper, K5GPR, who worked LU4DFN, LU3DCA, LU3EX, LU9AT and

What beautiful 50-Mc. wallpaper! All these and a few more worked on six meters by Mike, LU3DCA.

220- and 420-Mc. STANDINGS

220 MC.

W1AJR	11	4	480
W1AZK	9	3	412
W1BDQ	11	5	450
W1OOP	12	4	400
W1RFU	15	5	480
W1UHE	11	4	385
W2AOC	13	5	450
K2AXQ	8	3	230
K2CBA	10	4	325
K2DIG	4	3	140
W2DWJ	15	6	740
W2DZA	12	5	410
K2KIB	10	3	300
W2LRJ	10	4	250
W2NTY	10	4	200
K2PPZ	11	4	190
W2LWI	11	4	400
K2QJQ	13	5	540
W3AHQ	4	3	180
W3FEY	10	4	296
W3KKN	10	4	255
W3LCC	8	5	300
W3LZD	15	5	425
W3RUE	9	5	450
W3UJG	13	5	400
W3ZRF	5	4	112
K4TFU	8	4	400
W4UYB	7	5	320
W4UMF	11	5	420
W5AJG	3	2	1050
W5RCI	8	5	700
W6NLZ	3	2	2540
K6GTG	2	1	240
W6MMU	2	2	225
K7IOW	1	1	250
K8AXU	10	5	1050
W8IJG	9	5	475
W8LPD	6	4	480
W8NRM	8	4	390
W8PT	10	5	660
W8SVI	6	4	520
W6AAG	9	4	600
W9EQC	11	5	740
W9JCS	5	2	340
W9JFP	9	4	540
W9OVL	6	3	475
W9UED	4	4	605
W9ZIH	10	5	500
K9DGU	3	3	425
K9ITF	6	3	515
KH6UK	1	1	2540
VE3AIB	7	4	450

420 MC.

W1HDQ	8	3	210
W1MFT	8	3	170
W1RFU	7	4	410
W1OOP	10	3	390
W1AJR	8	3	220
W1UHE	6	4	430
W2AOD	6	4	290
W2BLV	12	5	360
W2DWJ	9	4	196
K2CBA	5	3	225
W2DZA	5	3	130
W2NTY	3	2	100
W2OTA	9	3	200
K2UUR	7	3	175
K3EOF	6	3	250
W3FEY	7	2	225
W3RUE	2	2	96
W4HHK	3	3	550
W4VVE	6	4	410
W5HTZ	3	2	400
W6GTG	1	1	180
W5RCI	9	3	600
W7LHL	2	1	180
W8HCC	3	2	255
W8HRC	3	2	250
W8JLQ	4	2	275
W8NRM	3	2	390
W8RQI	4	2	270
W8PT	4	3	270
W9GAB	9	4	600
W9AAG	5	3	375

LU1MBJ on October 1. First contact was made at 1815 CST, and all signals were Q5 most of the time. According to Walt, LU4DFN worked into *KH* land about 30 minutes prior to his contact with Walt. Fine doings on six meters again; now if we'd just get some dope from the KH end of such contacts and find out what else they've been working it sure would be nice. Guess Helen will just have to spend twenty-five hours a day on 50 Mc. again to find out "what gives."

Texas also knew about the opening to South America, 'cause W5SFW, Phil, mentions that the band opened to S. A. on October 4 for him with commercials just outside the low end coming in at 40 db. over 9. Biggest aurora ever heard in Texas occurred on the evening of October 6 when WA6JTB/8 in North Michigan peaked 30 db. over 9 on phone. Others worked by Phil were KØPQP, KØCLJ, WØAJY and KØGOW, all worked on phone and all with S9 and over signals. Next day, October 7, six opened to South America once again when two LUs were heard very weakly, but none worked. However contacts were made with K5GKX, K7ALE, K6PXT and KØREE on back-scatter.

Joe, W8ESZ, makes comment that many of us have lost rare DX by failing to tune from 50 to 50.1 Mc. Remember when the complaint was that that was the only portion of the band so many of us did tune? Shades of days gone by! Anyway, Joe heard a strange signal at 50.02 Mc., called "CQ", tuned from 50 Mc., and who should come back at 50.02 but *HC1FS* with an S7 signal. Nice going, and here's hoping that good ole Fred gets lots of contacts in the States during the next few months. During August Joe worked VE6UV to give Ed his first Michigan contact, and at the present time W8ESZ lacks only VE2, VE7 and VE8 to complete all VE sections worked. He also reports that he lacks only four States for WAS — the second time around, that is.

A very quick one from W6QMN, Bob, advises everyone that he is looking for s.s.b. and c.w. schedules, both of which are sadly lacking in his area. Frequency is 50.103, using a kw. on week ends. Bob's only scatter contacts so far have been K7AAD and W6FZA.

Another report from California and Gib, W6BJI, sez that he had a fine auroral contact with W7INX on 50 Mc. on October 6 at 1717 PST. Later the same evening K6GOX worked K7BDU. According to Gib this was quite a violent auroral storm rivaling the one of April 30, although no visible effects were seen. (Probably because of broken clouds.)

The word is out that anyone visiting in St. Louis, Missouri, is to be sure to stop in at the "Holiday Inn Hotel" to visit K9EID presently employed there. Won't Bob be surprised when he is mobbed by visiting firemen! Bob is also looking for schedules on six and two, 50.18 and 145.01; he is using a 20A, P & H 600A and a rebuilt Gonset III and a pair of 4E27s on s.s.b. on 50 Mc. Also an 11-element Spiralray 90 feet high. On two meters the beam is a 24-element collinear 105 feet high.

V.h.f. DXers, Contest workers, take note! An offer from Brownie, W4ZZ/4, concerning the use of his be-oo-tiful location! You must be one of them thar "intrepid v.h.f men," have lots of will power, stamina, etc., if you'd like to take advantage of LeConte Lodge, in Gatlinburg, Tennessee. Taken from the literature of the "Lodge." "LeConte Lodge, the highest guest lodge in the Eastern United States, is situated on an open glade just below the summit of Mt. LeConte at an elevation of 6400 feet. The Lodge serves as a grandstand for the entire Park, and commands spectacular views of the Smokies. The Lodge can be reached only by hiking and horseback trails starting from points near the resort community of Gatlinburg." Shall we all move to Tennessee right now or should we just commute for contest periods? Surely sounds like a sure-fire v.h.f. location and wish we could take advantage of it.

Brownie points out that the hike is five miles and the riding trail is seven miles. If you are interested, get in touch with him, but don't figure on taking a carload or two of equipment as pack horses will be used to haul the gear. Seems the idea worked out well this past season but would probably be much better during the "off-season" from November through April, when conditions and time are better for all.

Because time is of the essence in his business, W4ZZ/4 has had little time to operate but has worked Ohio (which is local), Indianapolis, Pittsburgh, Winston-Salem and Louisville. Rig consisting of an 829-B at 75 watts and a 4-element wide-spaced beam.

A report from Auburn, Maine, via Dick Huntress, K1CXX, reports the very good aurora of September 3, when he had to work above 50.5 because of the heavy QRM beneath that frequency. At 0400 the following morning aurora was still going strong.

Although Maine is one of the "hard to get" states, Dick sez that the v.h.f. contest was a flop as far as he was concerned. He worked four other Maine stations and all agreed that most of the guys to the south never did get their beams off W2 land and up into the Northeast at all.

Clubs and Nets

When conditions seem to be good, or even when they don't seem to be good, and you'd like to know whether the band is open toward Cuba, turn your beam that way and listen on 50.4 for the Havana Net gang. These boys, CO2RR, CO2DL, CO2GS, CO2WS and CO2ZX occupy this frequency practically twenty-four hours a day. Whenever any of these boys are at home they call on the frequency and if they receive no answer from a net member, they leave the receiver on frequency so that when the next member calls in he is sure to get in contact. In this manner there is almost always someone of the gang monitoring the 50.4 frequency. The Net has no definite day or time for net sessions on the air as it just works out that there is someone there at all times.

Gus, CO2ZX tells us that the boys are using vertical antennas for local coverage and less TVI.

On July 31 in the Portland, Oregon area, the Columbia River VHF Society and the AREC held a picnic followed by a business meeting. At the meeting incorporation was discussed, voted on and passed and the "VHF-AREC 6 Meter Net" came into being.

144 Mc.

The October 6 aurora found Dallas, W9AAG, ready and waiting. In addition to hearing a solid mass of QRM for the first 200 kilocycles, Dallas managed to work W4LNG for state number 33. He also said hello to W5JWL, W4EQM and WØIC. Dallas still needs Vermont, Maine, Massachusetts and Delaware. I'll bet if he promises to look over above 144.300, there are some fellows in New England who will promise to work above that frequency. Rex, W5RCI, will promise to work above that frequency.

Rex, W5RCI, caught the same aurora and failed to pick up Massachusetts. His signals were heard by W1AZK at this time, however; indicating a fairly wide spread aurora putting signals into Mississippi from east coast to WØ land. Bob W3SGA, benefited from Rex's alertness by picking up Mis

sissippi for his state number 31. Bob also heard Minnesota talking to Minnesota. The same session brought W8BAX up to 32 states when he added Arkansas and Louisiana to his growing list.

A few comments from Rudy, W4LNG, anent this aurora opening. "The lowest signal heard was Walt, W2CXY on 144.005. The highest was W9EHX on 144.382. Occasionally I tune up to 145.5 but have never heard anything there except our own local net. My chief complaints during auroras are the use of bugs and keys at high speed, that just run together; and the non-uniform band tuning." These comments on aurora are heard on all sides; everyone complains about it but no one appears willing to do anything about it.

Pres, W3BYF, battled the QRM for three more states, giving him a total of 28 on two meters. He suggests shorter contacts on aurora when so many are waiting for rare states. Missouri was not missing in this auroral opening, W0IHD made what is probably the first Georgia-Missouri contact with W4LNG. He went on to contact K3KPT Pennsylvania, W3SGA Pennsylvania, W4EQM Alabama, W4VVE Virginia, W4GSH Kentucky, W0IC Boulder, Colorado, W0MOX Denver, and W0AXU in Iowa. Charley's first intimation that an aurora was on was from K2GQI in New Jersey who he called and did not raise. All in all he worked sixteen states. Incidentally, Charley needs Maine, Vermont, Massachusetts, Connecticut, Delaware and North and South Carolina in case any one is looking for schedules. Rudy, W4LNG, picked up one new state in this opening. In return he passed out a new state for seven other two-meter operators, one of which was W8SFG. Stan has moved up to 34 states this year picking up four new ones on the combination of aurora and tropos.

In case you are looking for W7VMP, you might take a listen for W0AXU which is Dick's new call in Marion, Iowa. What was probably the longest and strongest coastal tropo opening of the past several years was reported by W1AZK as follows: "North Chichester to Jacksonville direct on 144 Mc.! What an opening! Worked W4RMU at 0030 EST, September 27. Signals were S5 both ways with some QSB. W4AIB was S8 here for hours both on the 25th and 26th. He was S7–8 on s.s.b. on the evening of the 26th. K4YUX was like a local on s.s.b. Monday nights, also K8AXU portable 8 in Elkins, West Virginia, was peaking up to S6 here on c.w. W4VVH in Charlotte, North Carolina, came through both evenings."

K8AXU/8 in Elkins, West Virginia, says "The whole east coast was coming in here. Got W4AIB, South Carolina, S4 c.w., was hearing from South Carolina, Michigan and New Hampshire on the nights of the 25th and 26th."

K4YUX at Shaw A.F.B. South Carolina says "Our first contact was with K1AOX in Hartford, from that time until 0122 EST when I finished up with K1JIX in Harvard, Mass., we really had a field day. It was gratifying to see how well our s.s.b. worked out. We worked seven states which included Virginia, Maryland, Pennsylvania, New York, Connecticut, Massachusetts, New Jersey. We tried to pass out as many confirmations as we could and any of the fellows we missed I will be glad to set up skeds now that I have a rig back in first-class condition. We are running 500 watts input, upper sideband to a 4X250B in the final." (K1LSY please note.) K4YUX normally operates 144.110 upper sideband.

On the same tropo opening W4AIB, Aiken, South Carolina, managed to contact 44 stations including 18 W1s, 16 W2s, 4 W3s, 6 W4s. One of these was even a new state, W1AZK, New Hampshire. From the southern end of the tropo W4RMU reports "band opened up to the northeast with longest tropo for two meters. On September 26 at 2200, K4EUS in Chatham, Virginia, was heard calling CQ with 5–4–9X signals, this was followed about a half hour later with QSO with K4EUS, W2AMJ, W2QHZ, W2AZL, W4LTU, W1AZK and W2SJX. The opening lasted until about 0200 EST the following morning. The stations above Virginia were in and out, no one period lasting for over a few minutes. W1AZK's signals were 5–4–9X.

220 Mc. and Up

Good 420 Mc. conditions on the night of September 27 made possible many contacts in the coastal area. W1OOP, W1WAS, W1UHE, W3FEY, W1MFT, W1IO, W1VNH, W2DWJ, W2BLD, K3EH, K2DZM, W3CGV, all participated in what turned out to be a 432-Mc. field day. This of course was the same opening which was apparent on two meters and was also evident on 220 Mc. W4KDH for instance, was hearing W3RUE. W8PT caught the September 7 opening on 432 working W0DEN in Iowa with well over S9 signals on phone, as Jack says "None of this weak signal stuff on 432 Mc." W2LWI is still looking for aurora contacts on 220 Mc. He managed to contact W8CSW near Columbus, Ohio, a distance of 475 miles from his location on aurora the 4th of September. The only active stations that Bob heard on this opening were W3UJG, K2QJQ, W1OSQ. Looks like too many people were looking for new states on two meters to get on. W1AJR worked W8SFG in Hubbard, Ohio, on 220 on August 26. I still don't know Andy's frequency but if you drop him a card he'll be glad to tell you and probably he'll give you a schedule besides if you're looking for Rhode Island on 220.

2-METER STANDINGS

W1REZ	32	8	1300	W5UNH	6	3	1200
W1AZK	28	8	1205	W5YYO	4	3	1330
W1KOS	24	7	1150				
W1RFU	23	7	1120	W6W8Q	14	5	1390
W1AJR	23	7	1130	W6NLZ	12	5	2540
W1MMN	21	7	1090	W6DNG	9	5	1040
W1HDQ	22	6	1020	W6AJF	6	3	800
W1IZY	20	7	1180	W6ZL	5	3	1400
K1CRQ	19	6	800	K6GTG	4	2	800
W1AFO	17	6	920	W6MMU	3	2	950
K1AFR	17	5	450				
				W7JRG	13	4	1040
W2NLY	37	8	1390	W7CJM	5	2	670
W2CXY	37	8	1360	W7LHL	4	2	1050
W2ORI	37	8	1320	W7JIP	4	2	900
K2GQI	33	8	1200	W7JU	4	2	253
W2AZL	29	8	1050				
K2UFJ	27	8	1060	W8KAY	38	8	1020
W2BLV	30	8	1020	W8SDJ	35	8	990
W2AMJ	25	6	960	W8PT	35	9	1250
W2DWJ	23	6	860	W8IFX	34	8	908
K2HOD	23	7	950	W8LOF	33	8	1060
W2PAU	23	6	753	W8SFG	34	8	1040
W2ALR	23	7	960	W8RMH	32	6	910
W2RXG	23	8	1200	W8GGH	32	8	1180
W2SMX	23	7	1090	W8SVI	30	8	1080
K2CEH	22	6	940	W8EHW	30	8	860
K2LMG	22	8	1160	W8LPD	29	8	850
W2LWI	21	6	700	W8WRN	28	8	680
W2ESX	20	6	750	W8BAX	32	8	960
W2WZR	19	7	1040	K8AXU	29	8	1050
W2UTH	19	7	880	W8NOH	26	8	975
W2RGV	19	6	720	W8DX	26	8	720
K2RLG	17	6	980	W8ILC	25	8	800
				W8JWV	25	8	940
W3RUE	33	8	1100	W8GEN	23	8	540
W3GKP	31	8	1180	W8LCY	22	7	680
W3SGA	31	8	1070	W8BLN	21	7	610
W3TDF	30	8	1125	W8GTK	17	7	550
W3KCA	28	8	1110	W8NRM	17	7	550
W3SGA	31	7	700				
W3EPH	22	8	1000	W9KLR	41	9	1160
W3BYF	28	8	1070	W9WOK	40	9	1170
W3LNA	21	7	720	W9GAB	34	9	1075
W3NKM	20	7	730	W9AAG	33	8	1050
W3LZD	20	7	650	W9REM	31	8	850
				W9ZIH	30	8	830
W4HJQ	38	8	1150	K9AAJ	27	8	1070
W4HHK	36	9	1280	W9LVC	27	8	950
W4ZXI	34	8	950	W9EQC	27	8	820
W4LTU	34	8	1160	W9PBP	27	8	820
W4AO	30	8	1120	W9OJI	26	8	910
W4MKJ	28	8	850	W9ZHL	25	8	700
W4UMF	28	8	1110	W9BPV	25	7	1030
W4VLA	26	8	1000	K9AQF	24	7	900
W4EQM	25	8	1040	W8LF	22	7	825
W4WNH	24	8	850	W9KPS	22	7	690
K4EUS	24	6	765	W9CUX	21	7	800
W4JCJ	23	6	725	W9OEV	20	7	850
W4VVE	21	6	720	W9PMN	16	6	800
W4RMU	20	7	1080	W9ALU	18	7	800
W4TLV	20	7	1000	W0BFB	32	9	1180
W4IKZ	20	6	720	W0SMJ	29	9	1075
W4OLZ	20	6	720	W0IHD	31	8	1030
W4AIB	22	7	880	W0QDH	24	9	1300
W4CPZ	18	6	650	W0RUF	23	7	900
W4RFR	18	7	820	W0INI	21	6	830
W4MDA	17	6	750	W0TGC	21	7	870
K4YUX	18	8	830	W0RYG	20	8	925
W4LNG	18	7	1080	W0IC	19	7	1245
				W0JAS	18	6	1130
W5RCI	35	9	1215	K0AQJ	16	6	1120
W5AJG	29	9	1360	W0IFS	16	6	1100
W5DFU	28	9	1300	WQAZT	9	4	900
W5LPG	25	7	1000				
W5PZ	27	8	1300	VE3DIR	30	8	1330
W5FYZ	23	9	1250	VE3AIB	28	8	1340
W5KTD	23	8	1200	VE3PQN	19	7	790
W5JWL	19	7	1150	VE3DER	17	8	1340
W5ML	16	5	700	VE3AQG	18	8	1300
W5FSC	12	5	1390	VE3HW	15	7	1350
W5HEZ	12	5	1250	VE2AOK	13	5	550
W5CVW	11	5	1180	VE3BPH	14	6	715
W5NDE	11	5	625	VE7FJ	2	1	365
W5VY	10	3	1200				
W5SWV	10	3	600	KH6UK	1	2	2540

A signal bounced off the moon was used to trip these scissors and cut the tape opening the Hudson Amateur Radio Council's convention in New York City. Watching the moon being put to work by hams are, left to right, Harry Dannals, W2TUK, president of the HARC, Sam Harris, W1FZJ, whose transmitter in Medfield, Mass., sent out the moon-bounce signal, and Chester Drexler, K2EAF, convention chairman. W1FRR stayed home and operated Sam's 1296-megacycle rig for the event.

OES Notes

K5UYF — Operated from Cleon Peak during the September V.H.F. contest along with 5HMN, 5FAG and W7OBT. Had lots of rig and generator trouble, made few QSOs on six and two.

K4DZP — Working on two-meter parametric preamplifier. All suggestions cheerfully accepted.

K8PBA — Working on automatic time delay for cooling 416B preamp.

K8BGZ — Maintaining six-meter c.w. schedules five nights per week with W8GHX. (Drop him a line for frequency and time.)

K3KHN — Working on new six-meter converter for use with SX99.

K3IZM — Preparing to take advantage of the artificial ionosphere planned by the Air Force.

K3ADS — Installed a 5-over-5 six-meter beam. Looking for skeds.

K3MDL — Working on 19-element 5800-Mc. beam. (Drop him a card for details.)

K9UOF — Plotting nightly groundwave conditions on six and two meters.

K8NEY — Experimenting with 6CW4 nuvistors. Can't find any sockets, anyone help him?

K8HNQ — Converting BC-733 for two meters.

W8NOH — Working on filter for six and two. Suggest dropping Lou a card for pertinent details.

K9MWQ — Conditions very poor during v.h.f. contest. Building new modulator to modulate two-meter final one hundred per cent.

W8BFF — Looking for someone in the Detroit area who can run some schedules for propagation research purposes on 50 Mc.

W8FZ — Monitoring six meters for KL7FLC, no luck.

K9RRS — Incorporating tape recorder for use with transmitter and receiver.

K3HDW — Completed 250-watt two-meter final using 826s grounded grid.

K3BYD — Working on transistorized six-meter transmitter using 2N697s and push-pull.

K1CIG — Working on 432-Mc. equipment.

W4FNR — Quite disturbed about EPT leaving "The World above 50 Mc." (As who isn't?) Working on 100-watt, s.s.b., 50-Mc. rig.

WA2INB — Installed RCA 6922 in place of 6BQ7A in two-meter converter. Observed a worthwhile improvement. (Drop a card for details.)

K9QPA — Finally worked his KL7 on 50 Mc.

W4NVV — Raised power on six meters to 40 watts. Results were gratifying. Working on new two-meter rig.

K1JML — Notes that he did not work VO1DW, although he did hear him.

K1CHY — Completed band switching two meter, ¼ meter exciter. Working on 432-Mc. parametric amplifier. You live next door to me, why not come over and talk over your preamp — *Sam.*)

W9PNE — Discovered that coaxial vertical antenna is no good for six-meter aurora.

W6IEY — Working on 1296-Mc. antenna feed for 2 foot parabola.

K4KYL — Working on six-meter Echo I reflections. A fuller report will be forthcoming.

KØBWQ — Running schedules with K3KPF every evening. Hoping for Echo I reflections.

K7GZB — Modifying communication receiver for use as 2 N 6 meter i.f. strip.

W7ZVY — Working on surplus two-meter converter. More details later.

K7BBO — Experimenting with new six-meter antennas.

KN7LQA — Starting work on 416B converter. Made two meter solar noise recordings as per ARRL bulletin, No. 764.

W5QDO — Took part in solar radiation measurements on six meters as per ARRL bulletin, No. 764.

K2LMG — Maintain nightly propagation schedules with K2GQI, W2WZR and W4LTU. (Drop him a card for frequency and time.)

K3CNN — Completed a cascade 6AM4 r.f. amplifier for two-meter receiver.

K3BFA — Worked nine contacts in two sections on 220 Mc. in last contest. Running only 10 watts to an 8-element beam. Heard 15 stations in four sections but modulator trouble prevented more contacts.

K3KUD — Completed six-meter field-strength meter. Drop card for more detail.

K3JHE — Completed 144-Mc. *Handbook* converter. Also would like information on converting SCR-22 for two meters.

W3FEY — Keeping 432-Mc. sked with W8JLU, Toledo, Ohio, at 2245 EDST. Working on 1296-Mc. gear, looking for contacts. Drop him a card.

W6PIV — Keeping two meter c.w. schedule on Tuesdays and Thursdays, 9:00 P.M., PST, with K6HMS, Balboa, Island.

W4KVH — Has completed code wheel to call CQ on c.w. Drop Joe a card for operating schedules.

K4EUS — Working on 432-Mc. converter. Has GL6299, would like information from anyone who can supply.

W1ZPV — Completed 432-Mc. crystal converter and 16-element colinear, looking for skeds.

K6HCP — Starting experimental tests on six-meter halo. Active on 432 Mc.

W4MEU — Working on s.s.b. exciter for 144 and 220 Mc.

W3RTV — Completed transistorized meter. Have extra transistor available. Will donate it to anyone interested in building such a gadget. Drop him a line. Still working on v.h.f. s.s.b.

K2AZT — Completed a 6360 tripler from Gonset to 432 Mc.

WA6BFC — Preparing equipment for 420 Mc. onslaught this winter.

K6TVC — Experimenting with a simple coaxial verticle for two meters.

W4CIN — Maintaining schedule with K4VTA, Marietta, Georgia, on week ends. Drop him a card for details.

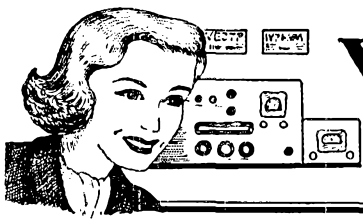
K6GTG — Operating 500-watt two-meter s.s.b. into 20-element Spiralray, getting good reports. Putting finishing touches on new kw. two-meter final.

K6SIX — Working on six- and two-meter transmitter.

K8SUJ — Heard aeronautical W1AEO on September 17 on 50 Mc.

W8PT — Calls CQ at 2200 EST on 220.052, c.w. for three minutes, every Monday, Wednesday and Friday, beam heading east looking for W1s, 2s and 3s.

K1INL — Working on BC454 tuneable i.f. for v.h.f. receiver. QST



YL NEWS AND VIEWS

CONDUCTED BY ELEANOR WILSON,* W1QON

YL Certificates and How to Obtain Them

As of October 15, 1960, 23 YL clubs throughout the United States issue a total of 27 different certificates that are available to amateurs — some are issued to YLs only, some to both YLs and OMs, and a few to OMs only. The South African Woman's Radio Club also issued two certificates. The four most popular and best known YL awards are issued by the Young Ladies Radio League, an international organization.

Following is a list of the various awards and general rules for obtaining them. Unless it is specifically stated that the awards are for YLs only, or for OMs only, the awards are usually available to both YLs and OMs. In general, contacts made during club net meetings do not apply towards awards, and certificate seekers are requested to make contacts other than during net time. In most cases, the award custodians appreciate (and sometimes require) a stamped, self-addressed envelope with sufficient postage to cover cost of returning QSLs, lists, and logs, usually by first class mail. More detailed information may be obtained from the club that issues the awards or from the award custodians. OM K6BX's new *Directory of Certificates and Awards* has a section devoted to all YL awards and certificates, in addition to information on some 350 awards from over 50 countries. (Write Clif Evans, K6BX, Box 385, Bonita, California.)

Issued by the YLRL

Worked All States YL — This award parallels the ARRL's WAS. Contact a YL operator in each state. Send QSLs and alphabetical by state list showing call, date, and band to Grace Ryden, W9GME, 2054 N. Lincoln Ave., Chicago 14, Ill. Include postage for return of QSLs by 1st class mail.

Worked All Continents YL — Proof of contact with a duly licensed YL in each of the six continents should be sent to Barbara Houston, K5YIB, Rte. 2, Box 178, Garland, Texas.

YL Century Certificate — Contact 100 different YLs anywhere in the world. All contacts must be made from within 25-mile radius of original location. Submit list in alphabetical order by operators' full names, calls, and dates along with QSLs to Katherine Johnson, W4SGD, Box 666, Fuquay Springs, North Carolina. Include postage for return of QSLs by 1st class mail. Endorsements are issued for contacts with each additional 50 YLs. (This award is for working 100 different YLs, not contacts.)

DX-YL — This award is issued to any YL (only) who works 25 other licensed YLs outside of her own country on or after April 1, 1958. A log extract of the 25 contacts should be sent to Maxine Willis, W6UHA, 6502 Wynkoop St., Los Angeles 45, California. Note that this award is for working 25 different DX YLs, not necessarily for working YLs in 25 different countries.

Issued by Other Clubs

East

WRONE Certificate issued by the Women Radio Operators of New England. Work 6 members in at least three different N. E. states after May 1, 1959. An endorsement is issued for contact with one member in each N. E. state in addition to the original application. Stations worked for original certificate do not apply toward endorsement. Send QSLs and stamped, addressed return envelope to Blanche Randles, K1IZT, 62 Linda Ave., Framingham, Mass.

Rhode Island YL Club Certificate — Contact any 10 YLs in Rhode Island. Send QSLs and list with return postage to Ruth Sherman, W1WED, 128 Massasoit Drive, Norwood 7, R. I.

Penn-Jersey Club Certificate issued by the Penn-Jersey YL ARC. U. S. stations contact 10 members, foreign stations contact 5 after June 1, 1956. Send list (no QSLs) to Carolyn Currens, P. O. Box 523, Norristown, Pa.

WAYLARC Certificate issued by the Washington Area Young Ladies ARC. Contact 5 members on or after Jan. 1, 1960. DX stations need only 3 contacts. Send QSLs, 10 cents, and stamped return envelope to Camille Hedges, W3TSC, 2202 Culver St., Washington 21, D. C.

Georgia Peach Award issued by the Georgia Peaches for contacts with 10 paid-up members after Oct. 1, 1957. Send QSLs and return postage to Olivia Coogler, K4DNL, 286 Howard St., Atlanta 17, Ga. Endorsements available for each 5 additional contacts.

Floridora Certificate issued by the Floridora YL Club for contacts with 10 members for U. S. operators, 5 for others. Contacts must date after April 21, 1957. Send QSLs and 15 cents to Shirley Hill, 710 E. South Lambright, Tampa, Fla.

Mid-West

Dark-Eyed Queen's Certificate issued by the Chicago YLRL, Inc. Contact 5 club members on or after Jan. 1, 1960. Send QSLs and 10 cents to Lillian Rochelle, 3638 Ruby St., Franklin Park, Ill.

LARK Certificate issued by the Ladies Amateur Radio Club of the Chicago area. Contact 10 members after Jan. 1, 1952. Send list of contacts to Gladys Jones, W9MYC, 4232 Hampton, Western Springs, Ill.

HAWK Certificate issued by the Hoosier Amateur Women's Klub. Contact 10 HAWKs after Jan. 1, 1958. Send list, QSLs and return postage to Adah Elliott, W9RTH, 721 Centennial St., Semour, Ind.

Grandmother's Certificate issued by the Grandmother's Club. Contact 10 members after March 17, 1958. Send list to Mary Meyer, W9RUJ 16520, Patricia Lane, Brookfield, Wisc. If you are a grandmother and would like to join the club, send a card to W9RUJ telling her how many grandchildren you have.

GAYLARK Certificate issued by the Gulf Area YL ARKlub. Contact 6 GAYLARKs after Jan. 28, 1958. DX stations required to contact only 5. Send log extract and 10 cents to Audrey Beyer, K5PFF, 7339 Guadalcanal St., Houston, Tex.

Texas

TYLRUN Certificate issued by the Texas YL Round Up Net. Confirm contact with 25 YLs who are full paid-up members of TYLRUN. Send QSLs with alphabetical by call list showing name, member number *, member date *, date of contact, time and frequency, (* — information on

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

members' QSL) and 10 cents to Ethel Chastain, K5OPS, 338 Seabrook, San Antonio 2, Texas.

YL-OM 10 CC issued by the Texas YL Round Up Net to YLs only. Confirmed contacts with 1000 different OMs required. YL may use only one call. List alphabetically by country, area, call letters, showing date, time, station, band and report. Three licensed operators must verify the list and sign the application, or the list and QSLs may be examined and notarized by a Notary Public. Send 15 cents (no QSLs) to Lyn Ohlson, W5RYX, 7614 Maxwell Ave., Dallas, Texas.

WHOOT Certificate issued by the Women Ham Operators of Texas for contact with 7 members after July 1, 1958. Send log extract to Ruth Jones, K5GMI, 1908-B Argentina Drive, Dallas 24, Texas.

WHO Certificate issued by the Women Ham Operators of Tarrant County, Inc. Contact 3 members or 2 members and club station K5LZW after May 1, 1958. Send log extract to Margie Klar, K5PIO, 3525 Bellaire Drive, North Fort Worth, Texas. Endorsement for 3 on one band, all c.w., or all mobile.

ALAMO Certificate issued by the Alamo Ladies Amateur Microphone Organization. U. S. and DX stations contact 3 members, Texas stations contact 4. Send list and 10 cents to Inez Cole, W5WXT, 320 Meadowbrook Dr., San Antonio, Texas.

West

Portland Roses Award issued by the Portland Roses of Portland, Oregon. Contact and send your QSL to 8 members after Jan. 1, 1956. Club member must receive your QSL. Send list to Helen M. Wise, W7RVM, 4311 S.E. Salmon St., Portland 15, Oregon.

Missions to Missiles Certificate issued by the San Diego YLRC. Contact 7 members on or after June 1, 1959. Send log extract to Pat Muelheim, W6GGX, 4275 Del Mar Ave., San Diego 7, Calif.

Lad 'N Lassie Certificate issued by the Los Angeles YLRC. The requirement is confirmed contact with 10 members after Jan. 1, 1952. After July 1, 1959 contacts made during any YL net do not count. Endorsement for 10 additional contacts with 10 additional members. Send log extract with return postage to Irma W. Weber, 762 Juanita Ave., Santa Barbara, Calif.

Chirp-Tificate issued by the Camellia Capital Chirps of Sacramento. Contact 6 members after July 26, 1957. Send QSLs and 12 cents to Jane H. Willis, Route 1, Box 524J, Chico, Calif.

The new President of the YLRL for 1961 is Doris Anderson, K5BNQ, of Broken Arrow, Oklahoma. Consistently a very active YL since getting her license in 1955, Doris has some 50 ham certificates framed and "the rest in a big brown envelope" to show for her efforts. The XYL of W5IWL, Doris especially likes contests, emergency work, chasing YLs, and, of course, earning certificates. Believe it or not, she has three teen-age children too! (photo by W5IWL)

With regrets, but with deep appreciation for her outstanding service, the YLRL announced the resignation of Wanda Gluck, K6ENK, as editor of *YLRL Harmonics*. For the past two years under Wanda's capable direction the club's bi-monthly paper has grown and flourished (circulation now about 900). With Connie Hauck, K6EXQ, taking over her editorial duties, K6ENK anticipates a happy return to 40- and 80-meter ragchewing.

Mermaid Certificate issued by the Bay Area YLRC of San Francisco. Work 6 members or associate members. Send copy of log to BAYLARCs, 2183 44th Ave., San Francisco 16, Calif.

KH6 YL Certificate issued by the KH6 YL ARC. Hawaiian stations must work 7 members. U. S. and possessions and Oceania must work 5 members — all others 3 members. Contacts must date after June 1, 1958. Send QSLs with stamped return envelope to Elsie Wright, 733 Murray Drive, Honolulu 18, Hawaii.

The Parka Award issued by the Polar Amateur Radio Club of Alaska for contact with 7 paid-up members after Feb. 1, 1955. Send QSLs and stamped return envelope to Geraldine Nichols, KL7ALZ, c/0 Alaskan Railway, Anchorage, Alaska.

Union of South Africa

Worked All YL Award issued by the South African Women's RC. Contact after June 30, 1952 10 YLs located in the following areas: ZSI-9, ZE, VQ2, OQ5, or CR7. Contact may be with any or all areas. Send QSLs and 7 IRCs to Margaret Snyman, ZS1RM, P. O. Box 80, Strand, Cape Province, Union of South Africa.

K.K.K. Award (Key Keen Klub) issued by the SAWRC. Issued in three parts: 1 — for 100 two-way c.w. contacts; 2 — for 500 two-way c.w. contacts; 3 — for 1000 two-way c.w. contacts. All contacts must date after Dec. 31, 1956. Minimum reports R4 and T8. Have form for application completed by "Scrutineer" who checks applicant's log and forwards form to Custodian. Members SAWRC, no charge. All others, $1.00 or 5/s to custodian Margaret Snyman, ZS1RM, P. O. Box 80, Strand, Cape Province, Union of South Africa.

Miscellaneous Certificates

Seldom Heard OM Certificate awarded by the *Western Radio Amateur* magazine. Contact 25 licensed OMs who have XYLs who are licensed hams at the time of the contact. Contact must be with the OM using his own call *not* with the XYL using her OM's call. Contacts must date on or after Jan. 1, 1960. Five states must be represented in these 25 contacts. Send list showing OM's and his XYL's calls; date, and time to Jean M. Kincheloe, K6OQD, 6625 N. Brightview Drive, Glendora, Calif. Stickers for each additional 25 contacts.

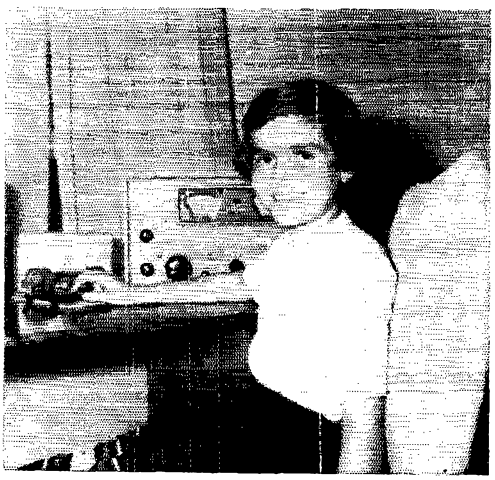
SWOOP (Suffering Wives of Operators' Protectorate) The San Francisco YLRC sponsors SWOOP designed to

make XYLs feel welcome at hamfests and conventions. Certificates for distribution to XYLs may be obtained from Esther Given, W6BDE, P. O. Box 84, Montara, Calif.

Loaded Clothes Line Net Certificate is issued to any amateur who contacts 10 members of the Loaded Clothes Line YL Net on or after Jan. 1, 1959. Send list to Lucille Miller, K5GYZ, 215 E. Frazier St., Roswell, N. M.

Petticoat Operators of Six YL Certificate is issued by YLs in the Pittsburgh, Pa. area who get together each Tuesday at 9:00 P.M. EST on 50.4 Mc. to any amateur who contacts and QSLs at least seven members of the net. Send list to Frances Berkey, K3AZZ, 1412 Sloan Ave., Wilkinsburg, Pa.

Worked Kansas YL Certificate issued by the Kansas Radio Club (to our knowledge this is not a YL club). Contact YL stations in Kansas after Jan. 1, 1947 as follows: Novice applicants 2; DX-2; Kansas applicants 10; other U.S.-6. Send QSLs and 50 cents (or 4 IRC) to Kansas Radio Club, 5019 Gramar, Wichita, Kansas.



Note: The Texas YL Round Up Net, though a net, is usually considered a YL club as well as a net; hence, information about its two certificates appear above under "Clubs" rather than under "Miscellaneous".

FD Addition

Our 1960 YL Field Day story appeared in last month's column. To complete the record, and with thanks to Ellen White, W1YYM, of headquarters for supplying the information, here is the final summary of 1960 Class A FD YL Club Scores: (For explanation of figures and letters following each call, see complete summary of FD results beginning on page 54 of this issue.)

One transmitter —
KH6 YL ARC operating KH6AFL/KH6
378-AB-5-2484

Two transmitters —
Bay Area YL ARC operating WA6MAO/6
307-AB-9-2463
San Diego YLRC operating W6VSL/6
323-B-7-2088

Three transmitters —
Gulf Area YL ARKlub operating K5SKF/5
252-B-8-1512

Four transmitters —
Chicago YLRL operating W9DEQ/9
95-AB-7-855

KN1OJK, Miss Karen Kelly, left, of New Canaan, Connecticut. She and your column conductor wish everyone a very Merry Christmas and a Happy New Year too.

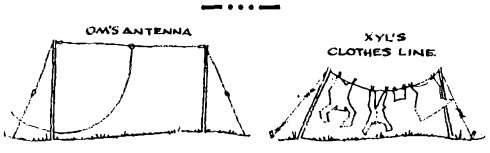
Strays

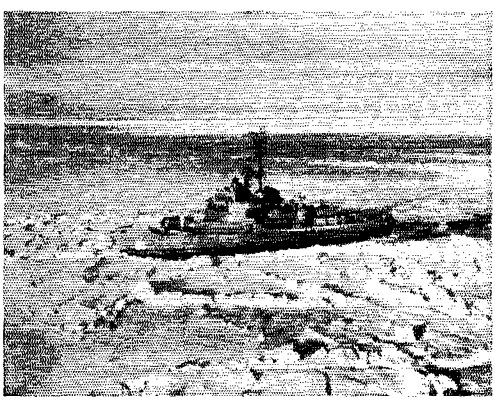
W1LIG is co-author of a book entitled *Laundered Limericks*. Try it for laughs.

—•••—

W7QZH calls our attention to a source of danger in some surplus gear. Some classified equipments were equipped with detonators to prevent capture by the enemy, and W7QZH has run across one piece of aircraft gear with the detonator still in it. This was a transmitter from an AN/DMZ-2. The explosive capsule was one inch long and 5/8 of an inch in diameter, and when detonated on hard ground, it blew a hole 3 inches deep and 6 inches in diameter. Obviously, this could seriously injure a person. So, the moral of this little tale is that you had best double-check if you are dismantling any gear that was classified secret or the like.

—•••—





If it's a noise-free location you're looking for, this should be it. The Navy ice-breaker *USS Staten Island* is operating from the Antarctic again this winter, and on board will be four operators, using the call K7ISB maritime mobile. Using an HT-32 with a 500-watt linear, and an SX-101, they should get through to the States FB. The *Staten Island* will attempt to penetrate the Amundsen Sea during February—this area being heretofore unexplored.

Correspondence From Members-

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

UNCLAIMED QSL CARDS

¶ I attended the Central Division Convention in Indianapolis September 11 and 12. Through the cooperation of Pat Husk, K9EUG, I was able to use part of the ARRL booth for the QSL Bureau. I had with me about 7000 unclaimed DX cards and in addition, 25 packages of new cards recently received from the foreign bureaus.

I spent almost 11 hours at the booth — Saturday from 10 to 5 and Sunday from 9:30 until about 2 when most of the exhibits were dismantled.

Frankly, the number of cards distributed was relatively small, probably not 10% of my file, but I did have the opportunity to discuss the Bureau with a lot of people, many of whom didn't know such an arrangement existed much less that it is another service of ARRL. Sure, most of them read *QST* but I'll gamble a de-based 210 that few are looking at anything but the ads by the time they reach pages 158, 166 or 172.

The real DX man doesn't have to be told about the QSL Service. He knows the score. The fellow we want to reach is what I call the casual DX-er. He normally works state-side stuff but on occasion will hook a VK, ZL, G, PY or maybe a CO. He sends the foreigner a card, then later cusses him for not replying. The chances are the card is gathering dust, taking up space and adding to the headaches of some W/K QSL Bureau.

As time has permitted, I have sent well over 700 notices to stations having 4 or more (often 15 or 20) cards but my unclaimed file continues to grow. Something has to be done to apprise Mr. Casual DX-er of the facts of life for I'm sure the other ARRL Bureaus are experiencing the same problem. No matter how good a product one has it must have publicity to bring people in to the store and Mr. Casual DX-er just isn't coming in to the store, even though we'll *give* him the merchandise. — *Julian F. Oberg, W9DSO, W9-K9 QSL Manager, 2601 Gordon Drive, Flossmoor, Illinois.*

A C.W. MAN'S RECEIVER

¶ I knew there was something wrong with ham-band receivers as a class, but couldn't quite put my finger on it until I read the footnote on page 164 in October *QST*: ". . . the deliberately poor low-frequency response of most communications receivers."

I'm a c.w. man with much more time as a commercial marine op than as a ham, the latter being confined to Field Day work with a club. I rack up an average score on 40-meter c.w. despite my inexperience, and one reason may be that I copy the *lowest pitch signal* as I did on shipboard. Those marine receivers I used were simple — 4- or 5-tube regens for l.f. & m.f. and 7- to 9-tube supers for h.f. with no fancy gadgets like xtal filters or, sometimes, b.f.o. knobs even. I preferred a large (9-inch) speaker to the small outboard or built-in speakers or cans, and in view of the wide i.f.-audio bandwidth of maybe 10 kc., I set the b.f.o. dead center in the pass band on boarding the ship and never touched it again.

Now I don't feel I've got much more to work with when I've got a single-signal selectable-sideband receiver than I had with the old Federal and RCA clunkers. True, as I tune the band I can set up so I hear the signals squeal down to zero beat and never come back up again, but no adjustment of the constellation of knobs makes the 50-60 cycle signal the loudest one, as it should be for c.w. work, as all my c.w. cohorts agree. It must be true, what you say. But the gentlemen hawking receivers at the HARC convention were not willing to admit that the l.f. audio response was made deliberately poor. I hope the manufacturers are not going to leave us with phone-only receivers, because I can't tune in an intelligible phone signal in QRM, and from what I read in *QST*, I wouldn't want to decode it anyway. — *Phil Ellis, K2QKI, Westbury, N. Y.*

THE GENTLEMEN'S AGREEMENT

¶ I want to take this opportunity to express my appreciation for the fortitude shown by you in the lead editorial, "20 Meter Cooperation," published in October *QST*.

All amateurs are aware of the fact that s.s.b. and a.m. are not compatible. You are to be congratulated on the directive laid down in the editorial. It reflects sound judgment and indicates that a thorough investigation of the existing confusion was made before your solution to the problem was promulgated. Your analysis of the situation and the solution offered will certainly contribute to general welfare of all amateurs.

I am ratifying the editorial by confining my personal operations to the limitations set out. Let us hope that the great majority of the other members of our fraternity join me in ratifying the operating procedures recommended by your editorial. Universal ratification by all amateurs will give optimum results in the use of our 20-meter band regardless of whether the individual prefers to use c.w., a.m. or s.s.b.

QST and the amateurs on their own have worked on the so-called Gentlemen's Agreement in the 15-meter band for several years. This "agreement" has never been consolidated into a single document, however. Will you please give us a similar editorial on 15 meters? — *Edward Preston, W5JNO, Dallas, Texas.*

¶ Your editorial will undoubtedly evoke considerable comment, some of it unprintable. However, I hope you will find these few thoughts worthy of publication.

Most amateurs should agree with you on two points: (1) that a.m. and s.s.b. do not mix well and separation is desirable (not only on 20 meters!), and (2) that it is far better that we do this by gentlemen's agreement than by FCC regulations. I would add that the ARRL, representing organized U. S. amateur operators, could most fairly set forth the suggested divisions of the amateur bands for this purpose.

Having used both modes of operation, I must say that s.s.b. has many advantages, particularly through the generosity of the present wording of the power input regulations. And it seems that a major shift to s.s.b. operation is a virtual necessity if we are to utilize the allotted spectrum most effectively. However, let's not eliminate a.m. completely. Aside from the fact that it is so much more pleasant on the ear, this mode requires less exacting technical ability from the standpoint of design, construction and repair. Therefore, it can and should serve as a stepping stone in the evolution of the skilled amateur.

Your editorial missed one important point. You inferred that the half division of the 20-meter phone band is an equitable arrangement. I submit that it is not. In the same issue of *QST* (page 86), it is reported that a survey of 3196 amateurs revealed slightly over 10% using s.s.b. Assuming that this sampling is accurate, how can one justify the arbitrary allocation of 50% of the phone spectrum to a 10% segment of amateurs: Wouldn't 10% of the phone spectrum be logical? In fact, it might even be argued that 5% of the spectrum should accommodate an equitable number of s.s.b. signals.

I would like to suggest that the ARRL periodically take a sampling and, based on the relative utilization of s.s.b. and a.m. publish suggested phone spectrum allocations which give fair opportunity to the users of each mode. — *James H. Stewart, K5STJ, New Orleans, Louisiana.*

(*Editor's Note:* K5STJ is arithmetically correct, but the 3196 amateurs include a substantial number of inactives, so the 342 who indicated current use of s.s.b. is considerably higher than 10% of the active group. Unfortunately, there is no specific figure on the active-inactive ratio. However, please see the insert questionnaire in this issue, page 112A.)

Operating News

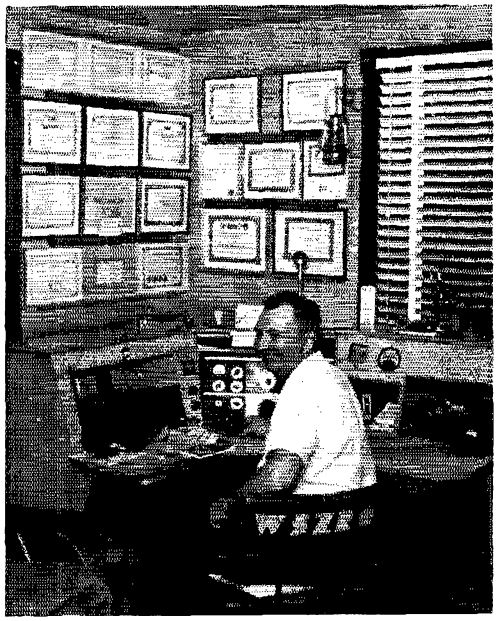
F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
JOHN F. LINDHOLM, W1DGL, Ass't. Comm. Mgr., C.W.
ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Ass't. Comm. Mgr., Phone

Holiday Traffic and ARL-Texts. It's a natural to use the message handling side of our amateur radio to exchange Christmas and New Year's greetings and other messages at this season. Many amateurs newer in the game, as well as the old-timers, can demonstrate that their own radio stations are capable of handling messages for themselves and families! Receiving a radiogram can be a pleasant surprise, and sets the missive apart from the ordinary greeting card exchanges.

Each ARRL Log Book has a complete list of the *ARRL Numbered-text Messages* to select suitable texts for different occasions, where there is no expressed preference for individual wording. This provision is designed to help your station and amateur radio cope with the higher volume of traffic that comes with handling seasonal greetings, as well as emergency messages in times of natural disaster. To shorten a text to a number is not to conceal its meaning, but only for abbreviation to permit handling more traffic in a given time. Our list of numbered messages in the log (or CD Form 3, free on request) includes an explanation of how to use the messages effectively. The operating signal ARL? is an inquiry as to whether you have this list of numbered radiograms and are ready to take such a message. ARL (one R) appears in such traffic both in the check of the message and in the text just ahead of the number which identifies a particular text. Such numerals should be spelled out so the possibility of error will not rest on a single character. On receiving a numbered-text message for delivery, the receiving operator must always expand the number into the proper message text indicated, since the numbers merely serve as a transmission abbreviation, to limit the amount of time for transmission. To the addressee a number would be meaningless.

Traffic Routings. In starting any message include a complete and correct address. Unless this is done, you have lessened the chances of delivery. Excepting when you have a direct schedule with a given point, we suggest always starting and routing your traffic through your local traffic-capable net or nets. Otherwise there's a gamble involved in finding a chap with traffic know-how at the point of delivery. This can be attempted, of course, by using a directional CQ or (better) by studious reference to your call book as you carefully use your receiver to hunt a station at the point where your message is going. This may be fun and a challenge, but it becomes less practical if you have several messages on the hook.

To locate your section net frequency and time of daily operation for ARRL-recommended routing purposes, see the net directory listings given in this part of *QST* last month. Also consult the Station Activities in any *QST;* the best traffic handlers can be located in these reports for each



Note all the fine wall paper in the shack of W3ZRQ, SCM for Eastern Pennsylvania. Al is one of our more active SCMs, participating in all sorts of contests, CD Parties etc.

area, and lots of net data is included. To brush up on procedures, if necessary, we suggest you see *Operating an Amateur Radio Station* for any needed information on the correct order of sending your message. It is important for every amateur to use standard form. This minimizes the chance of error. Standard form is expected of you by the operator who takes your message. Your ARRL section net is normally the best one in which to report. Most such nets, phone or c.w., have organized tie-ins with NTS schedules for fast systematic relay in connecting stations and the National Traffic System to all other regions and ARRL sections throughout the country.

To start your message, you merely have to get on net frequency and report in, when the net is called to order. You call the NCS (net control station) and, when recognized, report your traffic. You stand-by until told to pass your traffic. Once your message is acknowledged, which conveys acceptance of responsibility for further handling, your traffic is successfully on the way.

We suggest that all concerned start their holiday traffic at any time during December. Using section nets and NTS, you can take advantage of organized amateur radio to send domestic traffic (as long as no compensation to your station direct or indirect is involved) throughout the year. You can enjoy participation in these local groups that handle traffic *all year*, by occasionally taking part in the net.

More Ideas Re Holiday Ham Work. Inviting persons besides licensed amateurs to talk to their friends and convey greetings back and forth across the USA is a possibility; this can be arranged where the operator behind the mike can fix up the distant schedules. One has to remember here that "third parties" names must be logged per FCC's section 12.136 (b). Also that internationally, station operation in behalf of third parties is prohibited, excepting for a handful of countries having special agreements with the USA, as explained in *Happenings of the Month* in view of Paraguay's liberalizing agreement. To give a pleasant service within W/VE land to larger numbers of people, radiograms meet the spirit of the season very nicely. Amateurs get warm thanks too, from those for whom such service can be devised. We should add here that if a message is to be started, and your station is off temporarily, the nearest ORS, OPS, or OES appointee will ordinarily be delighted to handle or originate radiograms.

Make Your QSL Count. In connection with WAS and DXCC it's not exactly news that ARRL has to turn back some of the written evidence as inadequate — and we're not referring to DXCC's rule 11 either. How then to write a letter or card that will have the elements essential to be accepted by ARRL or others for bona fide awards? There has to be a statement that backs up the fact of the two-way exchange. In this day of s.w.l. and citizen band work a tabulation of call, date and time looks like any "heard" card, doesn't it?

You can hardly go wrong if your QSL provides expressions such as "your sigs worked . . . thanks for the .. Mc. contact" or "confirming QSO as follows: .." Just this week we had to return cards for *not* so certifying *two-way* amateur operations. To be useful for state or countries credits the date, time, band, the mode, the location (state for WAS) from which the contact was made should be given. Include the report for phone or c.w., and give your operator signature as the final proper identification or certification that belongs on any document. The report given should conform to the mode used. Some awards (not ARRLs) set minimum report requirements.

Quite aside from the awards value of a card, the recipient appreciates all fraternalism and information that can be shown. We can't all picture our station on a card, but a description which gives antenna, power and equipment details, operator awards held, nickname, station elevation etc., adding something to whatever you exchanged in QSO, will go far in making you better acquainted — and getting that QSL you expect in return!

100% QSL! We expect the record of many Novices and new General Class licensees may come closer to the ultimate of 100% QSL exchanging than the current record of operators who have been in the game many years. However, all true amateurs, irrespective of seniority or bent in amateur radio, generally do acknowledge that *the QSL is the final courtesy of a QSO.* We hope that everybody will live up to this. Back sometime ago in *QST* a U. S. amateur referred to his poor returns on QSLs sent to overseas amateurs. A letter just received would show that the shoe is sometimes on the other foot. In furtherance of QSLing and as a true appeal to all amteurs we quote the following from PAØJAL: "I have sent a QSL to all my W and K stations but I received QSL returns only from about 40% of them. I worked in the last years about 250 U. S. stations and much need their confirmations to present for WAS. May you help me get more QSLs returning?" *Now 40% isn't good.* Can we help him and others by each making it QSL for QSL, and aim at 100%?

Official Observers Wanted. In July *QST* we discussed the number of qualified OOs SCMs aim to appoint. A prime service to operating members, we're proud of the heavy file of thank you letters to reach our hard working Observers. The continuing policy of self help to amateurs through the OO card-notices makes band operating conditions better. These cooperative forms also save many an amateur from receiving an FCC rebuke or official black mark on his record. Most SCMs have recently completed an annual review of the

NATIONAL RTTY CALLING AND WORKING FREQUENCIES

3620 kc. 7140 kc.

required activity status of appointees in which they dropped inactive OOs. In many sections SCMs are now looking for new candidates from those who are qualified to assist in this program. A quota of at least seven active OOs is desired for each one of the 73 ARRL sections.

The post of Observer requires action in card sending; ARRL provides postpaid forms. To be accepted as an OO, one must, in addition to other qualifications have had at least 3-years licensed experience as an amateur. Know-how relating to images, receiver overload and other technique is required. Accuracy, tact and neatness in making out observer-cards and reports to ARRL are all necessary to become an OO. A General Class, Conditional Class or higher grade of FCC operator license is required. There are four appointment classifications. If you can devote time observing in phone or c.w. bands, or specialize in the cases of radiated harmonics of amateur stations or other out-of-band signals and like to try to help others, then you may be needed if you can qualify. It is indeed a useful field of service. Standing Information (CD-100) is made available to OOs on receiving appointment from one's Section Manager. Those in a position to apply will find the full address of the SCM indicated on page 6, of this issue of *QST*.

Exam Fraud Suspension; Novice Suspended for Liberties with Call. April *QST* reported details on FCC license revocation where exam fraud was a factor in obtaining an amateur license. Here is another case. The second example stresses the FCC requirement that one's assigned call must be adhered to.

FCC ordered (May 31, 1960) that the Technician Class Amateur Radio Operator license of Loren B. Chan (WA6ENC), Menlo Park, Calif., BE SUSPENDED for a period of six months, under authority contained in Sec. 303 (m) (1) (A) of the Communications Act and Section 0.292 (f) of FCC rules; his amateur license to be mailed to the FCC at Washington, D. C.; *it appearing that the licensee*, Loren B. Chan, on Oct. 19, 1959, willfully and knowingly, obtained his Conditional Class Operator License in violation of Sec. 12.21 (d) and 12.162 of FCC rules and in violation of 303 (m) (1) (F) of the Communications Act, in that he falsely represented before a volunteer examiner that he resided at Pacific Grove, Calif., more than 75 miles from a location where examinations for General Class are regularly held; whereas his actual residence is Menlo Park, within 75 miles of such location, and in taking the examination, he used a different first name (Yen Fai) from that under which his Novice and Technician Class amateur operator licenses had been obtained. FCC ORDERED in this instance a six-month license suspension. This action was effective from June 26, 1960, the Conditional Class license having already been voluntarily submitted and cancelled.

FCC took under consideration the suspension of the Novice Class Amateur Radio Operator license of Robert R. Housel (WV6HMS), Pico Rivera, Calif., *it appearing* that said licensee on Feb. 20, 1960, while operating WV6HMS transmitted call letters not assigned by proper authority to his said radio station, violating Sec. 12.158 of FCC rules. The Federal Communications Commission ORDERED (Apr. 20, 1960) that this Novice Class License BE SUSPENDED for the remainder of the license term. This action was effective as of May 10, 1960.

Responsibility in Giving Examinations. The SCM of Kansas, WØFNS, at recent meetings has stressed the important part clubs play in assisting newcomers. In addition to his discussion of the need for better operating procedures, he stressed another point concerning "by mail" license examinations. Persons unable to appear for General Class examination because of physical disability or residence more than 75 miles airline from a city where FCC conducts examinations, may apply for Conditional Class exam papers. Novice and Technician exams, of course, *must* be taken by mail. WØFNS writes that several Conditional licensees have told him recently of being called in to check their code speed. His thought in mentioning this FCC activity is to stress to all individuals and clubs the responsibility in giving *proper* examinations. He states: "If amateur examiners will take pride in this job and be as strict as FCC, if not a little more, then there will be operators coming into Amateur Radio who take real pride in their tickets and for whom there need be no apologies to the FCC or the persons thus licensed!"

Can do? —*F. E. H.*

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.

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. 19 at 2130 Eastern Standard Time (0230 GMT, Dec. 20). Identical texts will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Dec. 7 at 2100 PST (0500 GMT, Dec. 8) on 3590 and 7129 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST (0230 GMT). Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date Subject of Practice Text from October *QST*

Dec. 6: *Meter Reading by Sound*, p. 14
Dec. 12: *A Limited-Space Antenna*, p. 23
Dec. 15: *Compression Tuning . . .* , p. 16
Dec. 26: *Two-Band Mobile Station*, p. 26
Dec. 27: *Screen Protection and More*, p. 22

Not so long ago we received a clipping from a newspaper in which a local amateur was featured as a hero in a natural disaster emergency. It was a masterful piece of publicity, occupying a whole page of the paper and replete with pictures and quotations from the amateur in question. To the public, it was good publicity for amateur radio, forcefully bringing to their attention the fact that amateurs are good for something.

There was just one thing wrong. The amateur who sent us this clipping (not the amateur featured) scribbled all over it words to the effect that this was all the worst kind of hogwash, that the amateur mentioned was not only a nuisance but a menace to the established emergency nets, that he broke in, caused QRM, used poor operating procedure and was generally offensive and inimical to the whole cause of emergency communications.

Jealousy? Perhaps; *we* don't know. But it *could* happen. We have seen it happen, and probably you have too, that the amateur with the biggest mouth gets most of the attention, not necessarily the one who does the best job. The press, it seems, is very happy to have someone call in with such information, and if the subject has enough human interest or "hot news" value, they'll sometimes go all out to give it a big spread. After all, newspapers depend on circulation and circulation depends on attracting readers, and readers want to read about specific things that are done and said. They don't want a lot of generalized information and statistics. Thus, the "character" on the net is more interesting than the "plugger" who keeps at it without thought of anything but the job to be done.

There is only one way we can see to it that the newspapers, magazines and broadcast stations get the proper material to publicize our activities, and that is to give it to them ourselves. Your headquarters can and does submit frequent releases to the news agencies and local papers as appropriate, but the local angle is far more important, and only you can supply this. If you don't do this, then the press is going to seek out the amateur who makes the most noise and print *his* version of what goes on. Sometimes this version is correct, sometimes it is not. Sometimes the noisemaker is the real leader, sometimes he is just a noisemaker, and while his publicity may *seem* to be beneficial, it can often redound to our everlasting discredit.

Our first consideration in any emergency is to get the job done. This takes precedence over all else. The getting of publicity, the giving of credit where credit is due, are secondary. Headquarters has a very fine booklet which goes into the greatest detail in ways and means of getting publicity; it's designed primarily for use by clubs, but the methods can apply just as well to an AREC group. It is free for the asking, and we urge you to use it. But let's keep publicity in its proper place in our emergency work — as a means to an end, not an end in itself. — *W1NJM*

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Maybe this will interest you. The Washington SCM and SEC have organized a monthly on-the-air forum consisting of themselves and the ECs in the section to discuss AREC activities and problems. All AREC members in the section are invited to listen in and submit comments or problems to their ECs. This is not only a good means of getting the section AREC officials together, but it can assist in keeping up interest in the AREC in the section and give the SCM and SEC an idea of which ECs are active and which could stand replacement or jacking up. If your section is in the AREC doldrums (or even if it isn't), this may be a device worth trying.

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Audubon, Iowa, was hit by a wind and rain storm at 2230 CST, Aug. 6, which put all lights and phones out of business. The sheriff requested five mobiles to help out. *WØs* VAU UIO ISV TOO and PGA responded, and also fixed stations *KØs* AJN PTO EXN DRV/Ø SNZ WBY. *WØs* LSF VAU UIZ and K5KUC/Ø assisted in contacting Audubon or acted as relays. The mobiles assisted the cleanup crews, after having handled plenty of emergency traffic, until 1600 CST Aug. 7. — *WØVAU, EC Audubon Co., Iowa.*

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Sometime in mid-August, W5LAJ answered a call directed to Houston, Texas, by OA4GJ of Lima, Peru, who reported an emergency situation. What ultimately transpired was that these two amateurs and several others made arrangements that resulted in saving the life of a man in Peru with a heart condition that required immediate surgery. The stricken man was flown from Lima to Houston; a specialist was flown from near Allentown, Pa., to Houston to perform the operation, which was successful. After making all these arrangements, the amateurs made it possible for the patient to talk with his family in Peru. These communications were not available by commercial means. Our report comes from a newspaper clipping sent in by W5IQL.

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The Lafayette (La.) Civil Air Patrol asked the amateurs to provide communications for a practice search and rescue mission on June 2. The local net was activated from Easterwood Strip to Lafayette Airport with stations at Rayne and Crowley taking part, relaying for mobiles and keeping the channel clear. Mobile units were paired with planes and messages dropped from the planes were relayed to the bases at the airports. Administrative traffic between the airports by C.A.P. officials was also carried on the amateur frequency of 3860 kc. The Civil Air Patrol says this was the best communications setup they have ever had. Four mobiles and a total of 13 amateurs participated in the exercise. — *K5DPH, EC Lafayette Area, La.*

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The Straits Area Radio Club provided communications for the annual Top O'Michigan marathon race on July 17. A network of mobile stations was set up at Cheboygan, Indian River, Devils Elbow and Conway with W8GQN, club call, as the NCS. A boat at the turn-around in Conway carried a v.h.f. unit to relay information to the shore. Nine amateurs participated.

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Despite inclement weather, eight amateurs provided communications for the sports car race in Deer Park, Spokane, Wash., on Sept. 4. Operating on two meters with all stations on emergency power, there was no time during the day when immediate contact with all critical locations wasn't available. Six stations were located at turns, one was mobile and a net control station was set up at the start-finish line to give all concerned a convincing demonstration of portable communications. The race chairman said "the one bright spot in today's activities is the wonderful job done by the hams." — *K7BEO, EC Spokane Co., Wash.*

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Working as a division of AREC in conjunction with RACES, some 20 radio-equipped mobile units were operated in the gigantic VFW parade in Detroit in early September. The cars provided communications along the parade route and assisted in maintaining orderly movement of the many segments of this seven-hour parade. Sixteen of the mobiles were stationed along the line of march while the remainder roved the area. All operation was on ten meters.

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The Maritime provinces of Canada were plagued with forest fires in August and September which had the AREC of that section in action much of the time. SCM VE1WB sends in three reports and promises more later.

The Forest Glade fire, near Prince Albert, N. S., seemed to be under control by Aug. 28 but was fanned back into life by a stiff breeze, and the chief forest ranger called on amateurs to supplement the already-overworked forestry communications facilities. Annapolis Valley amateurs responded with eight mobiles, five fixed stations and three additional operators, all of whom stayed on the job for three days until the fire was out. Mobiles were stationed at strategic points, some in hot spot areas where their personal danger was great; this latter group consisted of *VE1s* MA ZH and MO. Other mobiles were *VE1s* GA ABJ XY AEH and WW. VE1TG acted as NCS, assisted by *VE1s* LG ID and BT. Other amateurs taking part were *VE1s* IM AEM ZL and AGL. — *VE1MO.*

In the Hammonds Plains (N. S.) fire of Sept. 8, EC VE1ADH was called by VE1PC, who lived in the fire area and wanted some communications equipment. VE1GC was dispatched from Halifax with equipment for an 80-

meter link, but they discovered what was needed was a six-meter link, so base station equipment for that band was set up and operated through the night by VE1PC and VE1GC. The next morning *VE1s* ADH AEW and AFK arrived at the control center to assist with the operating. The two latter operators stayed until midnight and VE1SP and VE1HC took over the following day (Sept. 11). On Sunday the c.d. truck was put into service as a control station, necessitating more operators, so four operators of VE1AFD were placed into service, with VE1FQ assisting. VE1SP assumed responsibility for the control station and remained until Monday, when the fire was brought under control.

On Sept. 8, provincial c.d. headquarters in Halifax, N. S., received a request to establish a communications net for emergency use during one of the worst forest fires in Nova Scotia's history. This request was forwarded to Queens c.d. and immediate work was begun to gather equipment and personnel. By 1600 EST Friday a station was established at Camp I on the northwestern shore of Lake Rossignol, using emergency power, thus giving Camp I a link with c.d. headquarters in Liverpool. At 1900 AST a station at Indian Field went on the air, and a three-station net was in operation. The following day a fourth station was located at Camp 21. The frequency of 3760 kc. was declared an emergency frequency by the Department of Transport. The net operated for seven days and was assisted by a number of other amateurs. Amateurs serving as operators during the period, all members of the Liverpool C.D. Radio Club, were *VE1s* LB FV QP LR ABB ABP RL US. Assisting stations included *VE1s* NA FQ ADH IM ABJ and VX. — *VE1US, EC Liverpool, N. S.*

A.R.R.L. ACTIVITIES CALENDAR

Dec. 7: CP Qualifying Run — W6OWP
Dec. 19: CP Qualifying Run — W1AW
Jan. 5: CP Qualifying Run — W6OWP
Jan. 7–8: V.H.F. Sweepstakes
Jan. 14–15: CD Party (c.w.)
Jan. 20: CP Qualifying Run — W1AW
Jan. 21–22: CD Party (phone)
Jan. 28–Feb. 12: Novice Roundup
Feb. 1: CP Qualifying Run — W6OWP
Feb. 3–5: DX Competition (phone)
Feb. 11: CP Qualifying Run — W1AW
Feb. 15: Frequency Measuring Test
Feb. 17–19: DX Competition (c.w.)
Mar. 2: CP Qualifying Run — W6OWP
Mar. 3–5: DX Competition (phone)
Mar. 17–19: DX Competition (c.w.)
Mar. 20: CP Qualifying Run — W1AW
June 10–11: V.H.F. QSO Party
June 24–25: Field Day

OTHER ACTIVITIES

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

Dec. 3–4: 21/28 Mc. Telephony Contest. RSGB (p. 75, last month).

Dec. 10–11: New England QSO Party, Connecticut Wireless Assn. (p. 160, this issue).

Dec. 11: Wisconsin QSO Party, Milwaukee Radio Amateurs' Club (p. 142, this issue).

Dec. 10–11: Pennsylvania QSO Party, (p. 120, this issue).

Jan. 14–15: New Mexico QSO Party, Sandia Base Radio Club.

Jan. 28–29: Massachusetts QSO Party, Merrimack Valley Amateur Radio Club. (page 164, this issue).

Jan. 28–29: Kansas Centennial QSO Party.

When Hurricane Ethel was headed for Mobile, Ala., on Sept. 14, EC W4WHW alerted nets on six and ten meters and within minutes a good number of stations were active. Evacuation of low areas became an urgent problem. K4TRR was sent to Dauphin Island to assist in evacuation communications, and later moved to Bayou La Batra. K4THT was set up at the Weather Bureau and K4SFH and K4HJB set up a station at the Red Cross Building on six meters. By 1800 K4HJB had logged in the following on the six meter net: *K4s* ZNE TRR/mobile THT VDC, *W4s* PIA PWO LYT and W7JCU/4. By 1900, K4YNA had logged the following in the ten meter net: *K4s* DDB PWE ZQS MDE KKG SLU ANX ZXG ZEX DSG TVL UQE QFO MLF KJP SKX, *W4s* RKA EXE CSA NU LPU SBJ AYM/mobile IIF/mobile YA1/mobile CLC/mobile, W2NAF/4-mobile. At 1930 a monitoring and liaison station for 40 and 80 meters with a relay link on ten meters was set up at the Trade School, manned by *W4s* EXE/4, IAX and K4ZQS. Mobile County C.D. was put into operation on six and ten meter teletype by *K4s* KVF EEH BOF UQF GVW THT MLQ MLF, *W4s* INU (radio officer) WPC and HHJ. W7JCY/4 set up all-band operation through six meters in the club house and stood by. A traffic link was set up on six meters to Pensacola. Liaison was also maintained with Army MARS. Other amateurs participating, not mentioned above, included *K4s* FQD GGV HJS PWD URJ YWD ZOL. — *W4WHW, EC Mobile Co., Ala.*

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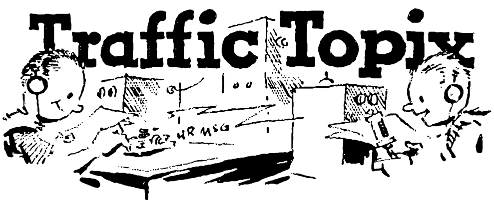
The month of August produced 29 SEC reports, the same as this month last year, representing 11,477 AREC members, a thousand or so more than last year. If you will look at the jubilation expressed in this column in last December's *QST*, you will get some idea how we feel about it now. Twenty-nine reports in a single month is no longer a record, but it's still a good showing; and we have a feeling it's going to be better. Last August was exceptional. That exception is fast becoming the rule.

Sections reported: N. Mex., Iowa, Ga., E. Mass., S. Texas, Md.-Del.-D. C., NYC-LI, Mich., Ohio, Wash., Ind., Colo., San Joaquin Valley, Ala., Utah, Ore., Maine, Minn., E. Fla., E. Bay, S. Dak., Ill., Okla., Santa Clara Valley, E. Pa., Ont., Wis., Va., N. Texas.

RACES News

At the Hudson Division ARRL Convention held in New York in October, the AREC-RACES meeting was attended by approximately 75 people. Master of Ceremonies was Bob Link, W2VKF, RO for the city, and on the program were W1NJM for AREC and W2BGO, N. Y. State RO, for RACES. It was an interesting meeting. W1NJM (pardon the third person form, but it seems better that way) urged greater participation under the AREC, bemoaned the fact that many amateurs seemed to go in for emergency work more for what they can get out of it than for what they can put into it and therefore preferred RACES to the AREC because of the better possibility of getting equipment (whereas the AREC can't spend taxes), described the proposed AREC emblem and decal, and wished aloud that RACES people would urge their amateurs to participate in AREC just as it is a policy of the AREC to urge implementation of RACES. W2VKF brought a laugh when he asserted that anyone who has taken part in NYC RACES certainly did not do so for the equipment he gets out of it. W2BGO then proceeded to outline in fine detail the policies and procedures of New York State RACES, including the facts that he and other ROs in the state, most of whom are also ECs, work hand in hand, that in New York the RACES people *do* urge the amateurs to sign up in the AREC and that the AREC is a highly regarded and highly useful organization in a state in which RACES does not go into operation on a "for real" basis except in an enemy-caused emergency. Statewide attempts are being made to bring about identity between ECs and ROs, and AREC officials in the three sections involved are assisting in this effort.

A question period followed, but the time allowed for the meeting was hardly sufficient to enable us to thrash out any problems. We do feel, however, that some progress was made in getting across the idea that AREC is an important part of RACES just as RACES is an important part of AREC and that there is a need and place for both.



The half way point in the annual BPL race found K2UTV well established in second place with 293 BPL points as against 143 for W0LGG in third place. The rest of the top ten include W0SCA (114), W0LCX (112), K1CIF/MMQ (111), W0BDR (108), W7BA (104), W8UPH (95), and W4PL (94). We're glad to see our old friend, Ben, W4PL, back in the saddle and right up there with the leaders again. Call area leaders not among the top ten are W5ZHN (47), W6GYH (81), W9DYG (82). Canadian leader is VE2WT (32). Note that all but three of the ten call areas are included in the top ten, and two of the others are hanging fairly close on the heels of W4PL, indicating that traffic is not quite so regional as it was.

In the Post-War (since 1946) listing, second place is occupied by W4PL with 2040 points, followed by W7BA (1941), W2KEB (1873), W0BDR (1829), W0SCA (1805), W9NZZ (1255), W3WIQ (1184), W0CPI (1099) and W6GYH (1062). Call area leaders not among the top ten are K1CIF/MMQ (287), W5RCF (371), W8UPH (619). Canadian post-war leader is VE2WT (76). It takes a lot of BPL points to hit the top ten in the post-war category (now over a thousand, and brother, that takes years!), so here's the rest of the top 25: W9JUJ (982), W7PGY (906), W7CZY (885), W6CE (815), W0TQD (809), W0LGG (804), K2UTV (695), W0PZO (639), W0LCX (635), W8UPH (619), W2RUF (591), W9TT (571), W4PJU (522), W2KFV (511), W0QXO (479).

You get BPL points at the rate of four points for each time you make BPL plus one point for each full hundred points in your BPL total. Only individuals working from their own stations are eligible. If you have less than 25 points and fail to add to them in five years, you lose them. If you go over ten years without adding to your BPL points, you lose all under 50 points. Otherwise, you are on the BPL list for life.

What? Who is in *first* place? What a question! Anyone who handles traffic knows that W3CUL is *always* in first place. She has 314 points in mid-1960, and a total of 5016 (no, that's not a misprint!) in the post-war list. — *W1NJM.*

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September Net Reports.

Net	*Sessions*	*Check-ins*	*Traffic*
N. E. States Traffic.........	29	251	156
20 Meter Side Band........	21	617	2189
7290 Traffic.............	42	1263	556
Mike Farad Emerg & Tfc....	51	571	1119

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National Traffic System. With the annual Christmas rush fast creeping up on us, it is going to be necessary to shorten all our procedure as much as possible if we are to get all the traffic handled in decent season. We have noticed that not many NCS are using the new QN signals (see July 1960 *QST*, p. 84), even in situations when they might well be used. You still hear NCS say "call W0XXX & if OK up 10 Iowa," or "go dwn 10 and wait until W0XXX finishes with W0YYY, then send him tfc for Iowa." This kind of procedure is a waste of valuable time when traffic is piled high on hooks. Let's use QNV and QNQ respectively in the above situations. They are correctly listed in the new Operating Aid No. 9 and in the operating booklet.

In connection with the upcoming Christmas rush, we would also like to point out that because traffic is heavy is no real reason to allow the NTS time schedule to go haywire. Quite the contrary, that's when the time schedule is important; it's what makes NTS a *system* instead of a bunch of individual schedules. A net starts at a certain time. Its participants are usually anxious to get their traffic, or get rid of their traffic, and be on their way. In NTS, it is policy, for this reason, to hold net stations for *fifteen minutes only* after the intial call-up, and at that time excuse any stations who are clear. So, if policy is followed, you may find yourself without any outlets for traffic if you show up late.

But that isn't the only reason. Another good reason for reporting into nets on time, *especially* if you have a hookful of traffic, is to give yourself time to clear it, and also to give the *net* time to clear it. Don't forget, you may be the only one with a hookful, and when you report in late, even if not a full 15 minutes late, you may very well have held up the net that long.

So, keep your NTS commitments on time. If it occasionally means you have to cut someone off before he is clear, all *right!* If it's necessary, it's necessary. NTS is not an unlimited load system, and sometimes we have more than we can handle. Traffic that cannot be handled in the allotted time should (1) be handled by special schedules, (2) take alternate routings or (3) be held over. But keep those NTS net and schedule commitments on time. September reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation (%)*
EAN.......	27	1259	.844	46.6	98.1
CAN......	30	1383	.942	46.1	100.0
PAN.......	29	1330	.822	45.9	100.0
1RN.......	28	438	.352	15.6	83.1[1]
2RN.......	60	694	.584	15.6	96.7
3RN.......	60	461	.314	7.7	90.6
4RN.......	57	856	.386	15.0	93.4
RN5.......	53	610	.390	11.4	89.2
RN6.......	60	1236	.441	20.6	89.7
RN7.......	60	660	.340	11.0	34.4
8RN.......	60	314	.208	5.2	90.0
9RN.......	59	971	.566	16.4	69.9
TEN.......	88	1187	.631	13.4	59.8
ECN.......	22	55	.129	2.5	63.6[1]
TWN......	29	236	.333	8.1	53.4[1]
Sections[2]....	930	7470		8.0	
TCC Eastern	99[3]	793			
TCC Central	91[3]	1281			
Summary...	1651	21234	CAN	11.6	CAN/PAN
Record.....	1567	20071	.882	15.4	100.0

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

[2] Section nets reporting: QMN (Mich.); NJN (N. J.); SCN (S. C.); BUN (Utah); WSSN, WIN & BEN (Wis.); MDDS (Md.-Del.-D. C.); Iowa 75; SCN (Calif.); NEB (Nebr.); FPTN, Gator, TPTN, FMTN (Fla.); MSPN Eve, MSPN Noon, MSN, MJN (Minn.); SDN (S. Dak.); S. Dak. 75; NJQ (S. Dak.); Tenn. CW; WVN (W. Va.); AENP, AENP Morn, AENO, AENB (Ala.); EMN (Mass.); TLCN (Iowa); WSN (Wash.); HNN, CCW, CWXN (Colo.); GSPN (N. H.); CPN (Conn.).

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

It's getting so that when there is a report missing at region, area or TCC level we search frantically for it, unable to believe that it didn't arrive and thinking it was somehow misplaced. Very few reports at those levels are omitted, and this is very good going. Some day we're going to log a 100% reporting record for a whole year! What's more, each month's summary brings down some new records. As we've pointed out before, the record-breaking totals are not phenomenally higher than previous totals, but always seem to exceed them. This points to steady, healthy progress.

It was pleasant visiting with 2RN Manager W2PHX at the Hudson Division Convention in October. Dick was m.c. at the traffic meeting, although W1NJM did most of the talking. TCC Director W1SMU was there, too, and we had quite a good traffic meeting and informal confab before and afterward. W9DYG reports a very good traffic attendance at the Central Division Convention in Indianapolis in September, and a successful informal meeting. Attendance of conventions is an important fraternal side to our traffic work, and we hope everybody arranges for it.

W3UE always includes some chit-chat with his 3RN report; this month he comments on the fact that both conditions and interest in 3RN seem to be "in the high brackets." K4AVU takes over as manager of 4RN, replacing W4SHJ; Hoppy goes on extended leave for a while. Region net certificates were awarded, during September, to K6KCB K6LKD WA6HKD and W4DNU/6 for their fine work on RN6; W6RSY says that Nevada is delinquent in attendance. Out of the eight sections which are a part of RN7, only three show any attendance; must we give up on Alaska, Alberta, Sask., Mont., and Idaho? W8DAE says 8RN is doing fine but doesn't like "book" messages. W9ZYK has awarded a 9RN certificate to W2MTA/9. VE3BZB looks for increased attendance by the VE1s in ECN during October. K0EDH says that Wyoming is back in business in TWN, but Arizona is still missing.

Transcontinental Corps. W1SMU is a regular bird dog when it comes to sniffing out new prospects for TCC, and he has uncovered some beauts. The turnover remains rather high. WØBDR's Central Area crew is showing signs of some healthy expansion. September reports:

Area	*Functions*	*% Successful*	*Traffic*	*Out-of-Net Traffic*
Eastern.....	99	96.0	1387	793
Central.....	92	93.4	2574	1281
Summary....	191	94.8	3961	2074

The TCC Roster: Eastern Area (W1SMU, Dir.): *W1s* AW EMG NJM OBR SMU WEF, *W2s* FEB OPB, *WA2s* COO APY, *K2s* SSX UFT, W3WG, K4KNP, W8ELW, VE2AZ1/W1. Central Area (WØBDR, Dir.): K4AKP, W4ZDB, *WØs* CXY DO DYG ZYK, *WØs* BDR LCX SCA.

NEW AFFILIATED CLUB TRAINING AIDS

ARRL Training Aids (except quizzes) can be loan-booked *only* to League affiliated radio clubs, since we have a limited number of listings and nearly 1150 active affiliated groups that can book items for club meetings. Available items are listed in bulletin TA-21. We are pleased to announce some additions to the availabilities this season. Besides new listings, extra copies of certain already listed most-in-demand items have been obtained. Concerning the new: We have spliced and combined two new titles covering how transistors work. Additional films cover theory and practical applications for testing with meters and multimeters, the principles and applications of the diode tube, and practical safety precautions. Two new audio tapes can be booked as club training aids, one in the field of precise frequency measurement and the other covering the Geneva conference. The listings are all covered in our revised list of training aids, TA-21. Affiliated clubs requesting any of the new aids listed below, will please use the reference number listed before each title. As usual we suggest you refer to our main list and indicate some alternate choices. By indicating an acceptable substitute or specifying more than one possible showing date on high demand bookings, you improve the possibility of obtaining one booking if the other is not available. Here are our new items:

Films 16mm sound:

F-38, *Hams Wide World*, shows what amateurs do and expresses the true story and meaning of amateur radio.

F-39, *Safety Precautions for Electronic Personnel*, shows how to avoid electric shock and stresses methods and precautions. We think this film is as basic and valuable as our F-23, which covers artificial respiration.

F-40, *The Diode: Principles and Applications*, illustrates the principles of electron flow, basic features of the diode tube and how it controls electron flow; principles of photoelectric cells, x-ray tubes and the use of the diode as a rectifier are explained.

F-41, *Transistors: P-N Junction and Triode Fundamentals*, explains the theory and mechanisms of semi-conductor diodes and transistor action showing that junction transistors (triodes) have three sections with two P-N junctions separating them.

F-42, *Circuit Testing: With Meters and Multimeters. Part 1: Theory*, explains the theory and construction of meters.

F-43, *Circuit Testing: With Meters and Multimeters. Part 2: Practical Applications*, demonstrates the actual use of instruments.

Magnetic Tapes:

T-4, *Let's Talk About Frequency Measurement*, is the title of a discussion by Allan Gunston, W8GQ, on setting up for frequency measuring in ham work. The tape mentions ARRL's frequency measuring tests and runs for about 29 minutes at 3¾ ips.

T-5, *The Geneva Conference*, a tape talk by John Huntoon, W1LVQ, covers the Geneva conference and frequency allocations proceedings. This is a more personalized account than the complete summarized report (page 55, Mar. 1960, *QST*); it runs approximately 1½ hours at 3¾ ips.

We sincerely hope that affiliated clubs use these aids when and where possible. If your club is affiliated and has not made bookings, let us send the new TA-21 and booking suggestions. Our desire is to help *your* club increase participation and build up interest, and to help instructors in your club courses explain radio and electrical theory, and demonstrate the use of different types of radio apparatus.

We have a new 4RN Manager. At the Rock Hill, S. C., hamfest in early October retiring manager W4SHJ, right, turned the 4RN records over to his successor, K4AVU.

BRASS POUNDERS LEAGUE

Winners of BPL Certificate for September Traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	269	2216	1864	340	4689
WØLCX	12	990	960	84	2046
W7BA	13	949	903	45	1910
WØSCA	22	845	836	5	1708
W9IDA	14	759	754	0	1527
WØLGG	539	437	379	36	1391
K6BPL	38	674	596	78	1386
WØBDR	112	656	498	33	1299
K4SJH	102	607	537	47	1293
K2UTV	70	520	509	10	1109
K4AKP	205	451	424	26	1106
W6WPF	120	489	456	33	1098
W4PL	15	541	503	19	1078
W6RSY	38	580	338	105	1061
WØPZO	8	521	492	41	1052
W6GYH	233	412	348	14	1007
W7DZX	7	468	439	20	934
W9DYG	30	392	335	23	780
K2UAT	319	222	159	64	764
KØONK	115	320	306	8	749
WA2CIG	6	350	337	13	706
W2MTA/9	32	298	267	31	628
W9CXY	11	303	291	10	615
W4DNU/6	57	290	225	42	614
KØORK	31	301	230	49	611
W6EOT	6	317	255	24	602
W8DAE	48	291	201	49	589
W2EZB	12	291	276	7	586
W3VR	43	271	262	4	580
KØCLS/6	64	288	210	14	576
W3IVS	10	279	261	18	568
W1SMU	21	278	262	6	567
W9TT	36	270	111	135	552
W9TUS	16	250	230	37	533
W8ELW	7	257	241	14	519
WØDUA	10	252	251	4	517
K6EPT	8	254	156	98	516
K4UBR	43	249	203	12	507
K2UFT	31	287	124	61	503
Late Reports:					
W1NJL (Aug.)	63	517	466	51	1097
W6ZJB (Aug.)	239	303	291	12	845

More-Than-One-Operator Stations

W6YDK	2199	315	251	56	2821
K6MCA	77	625	600	16	1318

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

K7BKH	212	K5IBZ/5	115	K4FSS	105
K2DEI	150	WA2CCF	113	K6ZCR	104
W7QMW/VE8	143	W2EW	112	Late Reports:	
W5ODM	130	K2RBW	112	K4CNY (Aug.)	140
W4CNZ	128	W9DGA	110	K2YMU (Aug.)	106
W4FJE	118	W4BAZ	109		

More-Than-One-Operator Stations

KØCRG/Ø	191	Late Report:	
K4NCN	123	K9VRU (May)	164

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W1JXD, K4EHY, K5WIC.

The BPL is open to all amateurs in the United States, Canada, Cuba and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

BRIEFS

Page 86 of October *QST* in referring to the increase in sideband use, should indicate 67.86 *per cent* of the amateurs covered by the report operated phone (a.m., s.s.b., n.b.f.m., etc.).

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Page 57 of October *QST* should report W6KG as the c.w. winner for the Northern California DX Club in the 1960 DX Contest. W6KEV was so reported in error.

—•••—

Page 55 of October *QST* (1960 DX Contest) should report K2GXI as the top phone scorer in the second call area. W2ZX was so reported in error.

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*
Yukon*	Dec. 9, 1960	W. R. Williamson	Mar. 17, 1949
West Indies	Dec. 9, 1960	William Werner	Aug. 10, 1958
Kentucky	Dec. 9, 1960	Robert A. Thomason	Aug. 16, 1960
Idaho	Dec. 9, 1960	Mrs. Helen M. Maillet	Feb. 10, 1961
Colorado	Dec. 9, 1960	Carl L. Smith	Feb. 11, 1961
Minnesota	Dec. 9, 1960	Mrs Lydia S. Johnson	Feb. 17, 1961
Sacramento Valley	Dec. 9, 1960	Jon J. O'Brien	Feb. 25, 1961
Eastern Florida	Dec. 9, 1960	John F. Porter	Feb. 27, 1961
Missouri	Dec. 19, 1960	C. O. Gosch	Mar. 1, 1961
Connecticut	Dec. 9, 1960	Victor L. Crawford	Resigned
Oregon	Feb. 10, 1961	Hubert R. McNally	Resigned
Michigan	Feb. 10, 1961	Ralph P. Thetreau	Apr. 10, 1961
British Columbia*	Feb. 10, 1961	Peter M. McIntyre	Apr. 10, 1961
Los Angeles	Feb. 10, 1961	Albert F. Hill, jr.	Apr. 18, 1961
Wisconsin	Mar. 10, 1961	George Woida	May 12, 1961

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Noel B. Eaton, VE3CJ, R.R. 3, Burlington, Ontario. To be valid, petitions must be filed with him on or before closing dates named.

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.

Santa Barbara	Robert A. Hemke, K6CVR	Aug. 10, 1960
Nevada	Charles A. Rhines, W7VIU	Oct. 10, 1960
Santa Clara Valley	W. Conley Smith, K6DYX	Oct. 15, 1960
Southern Texas	Roy K. Eggleston, W5QEM	Dec. 10, 1960

In the New Hampshire Section of the New England Division, Mr. Ellis F. Miller, W1IIQ, and Mr. Albert F. Haworth, W1YHI, were nominated. Mr. Miller received 116 votes and Mr. Haworth received 77 votes. Mr. Miller's term of office began Oct. 26, 1960.

In the Kansas Section of the Midwest Division, Mr. Raymond E. Baker, WØFNS, and Mr. Clarence R. Hillman, KØAWO, were nominated. Mr. Baker received 304 votes and Mr. Hillman received 125 votes. Mr. Baker's term of office began Oct. 29, 1960.

A.R.R.L. AFFILIATED CLUB HONOR ROLL

This month we present with pleasure, 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 83 of June '60 *QST* for the earlier listing of those affiliates with 100 per cent ARRL membership this year. Our honor list is prepared each time based on analysis of data received in connection with each club's return of a survey or Annual Report form. In early 1961, probably in February, a new survey form will be sent every active ARRL-affiliated radio club for the annual filings on which continued affiliation and our *QST* listings are based. All the following-listed Honor Roll clubs now will receive our "100% ARRL club" certificates shortly after the distribution of this issue of *QST:*

Amateur Radio Technical Society of St. Louis, Mo.
Amateur Transmitters' Association of Western Pennsylvania, Venetia, Pa.
Beacon Radio Amateur Club, Cheltenham, Pa.
Blue Ridge Radio Society, Greenville, S. C.
Coffee Dunkers of Detroit, Mich.
Davenport Radio Amateur Club, Inc., Davenport, Iowa
Daytona Beach Amateur Radio Association, Inc., Daytona Beach, Fla.
Garden City Amateur Radio Club, Finnup Park, Kans.
Hi Plains Amateur Radio Club, Plains, Kans.
Jefferson Barracks Amateur Radio Club, St. Louis, Mo.
The Mahanoy Valley Brass Pounders Club, Mahanoy City, Pa.
Maui Amateur Radio Club, Kahului, Maui, Hawaii
Northeast Nebraska Radio Club, Fremont, Nebr.
Pampa Amateur Radio Club, Pampa, Tex.
Pocatello Amateur Radio Club, Inc., Pocatello, Idaho
Porterville Amateur Radio Club, Porterville, Calif.
Prairie Dog Amateur Radio Club, Yankton, So. Dak.
Rappahannock Valley Radio Club, Fredericksburg, Va.
St. Louis Amateur Radio Club, Inc., Webster Groves, Mo.
Shelby Radio Club, Shelby, N. C.
Skagit Amateur Radio Club, Arlington, Wash.
Smoky Valley Radio Club, Abilene, Kans.
Sweetwater Amateur Radio Club, Sweetwater, Tex.
The Thirteen Amateur Radio Club, Vancouver, B. C., Canada
Valley Radio Club, Eugene, Ore.
West Essex Amateur Radio Society, W. Caldwell, N. J.
Westside Amateur Radio Club, New Orleans, La.

CLUB COUNCILS AND FEDERATIONS

Cleveland Area Council of Amateur Radio Clubs, Gertrude E. Maxim, W8OIS, Secy., 23644 Woodhill Drive, Berea, Ohio

Federation of Eastern Massachusetts Amateur Radio Association, Eugene Hastings, W1VRK, Secy., 28 Forest Ave., Swampscott, Mass.

Indiana Radio Club Council, Inc., Adah Elliott, W9RTH, Secy., 721 Centennial St., Seymour, Ind.

Los Angeles Area Council of Amateur Radio Clubs, Inc., Bob Dailey, W6UKC, Secy., P.O. Box 25, Whittier, Calif.

Michigan Council of Clubs, Roland R. Beineman, W8QBA, Secy., 136 Guild St., N.E., Grand Rapids, Mich.

The Ohio Council of Amateur Radio Clubs, Karl H. Kanalz, W8THX, Secy., 225 Tibet Rd., Columbus 2, Ohio

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 during the period from October 1, 1958 thru September 30, 1960. *QST* space considerations make it necessary to limit the size of the list this year. The total number of DXCC certificates issued as of September 30, 1960 was 7162. Since the necessary space to run the complete DXCC roster is no longer 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.

• 300
W1FH
ZL2GX

• 299
W3GHD
W6AM
W8HGW
W9NDA

• 297
W2AGW
W2HUQ
W4BPD
W6SYG
W8BRA
W8JIN
KV4AA
PY2CK

• 296
W1ME
W3JNN
W4DQH
W6CUQ

• 295
W6EBG
W6ENV
W9YFV

• 294
W3KT
W5ASG
W7GBW
W7GUV
W8BKP
W8DMD
W9RRI
ZL1HY

• 293
W1GKK
W2BXA
W7AMX
G2PL
G3AAM

• 292
W3BES
W5ADZ
W6ADP
W6DZZ
W8UAS
CE3AG
ZS6BW

• 291
W4TM
W6NNV
W6TT
G4CP
LU6DJX

• 290
W8KIA

• 289
W1BIH
W1CLX
W2HMJ
W6TS
W9KOK
W9LNM
WØELA
4X4DK

• 288
W2LPE
W6VE
W6YY
W8DAW

• 287
W1JYH
W2QHH
W6GPB
W7FZA
W8KML

• 286
W6MX
W7GXA
W7PHO

• 285
K2GFQ
W3GAU
W9FID
W9HUZ
WØQVZ
VE7ZM
G6ZO

• 284
W2JT
W2TQC
W3LMA
W6LDD
WØDU
HB9J

• 283
W4QCW
W6NTR
W7AC
WØAIW

• 282
W4TO

• 281
W2WZ
W5KC
W8TMA

• 280
W2KUW
W2LV
W3EVW
W6CYV
K6ENX
W6TI
W8EWS
W8JBI
W8MPW
VK2ACX
VK2DI

• 279
W5ABY
W7ENW
W8LKH
WØDAE

• 278
W3KDP
W5AFX
W6MUR
W9YSX
GM3EST
SM5LL

• 277
W2GUM
W6QNA
W9AMU
HB9EU

• 276
W1AXA
W2DEC
W2DS
W3IYE
W4LYV
W4MR
W9FJB
WØQDF
VE2WW
DJ1BZ

• 275
W1ADM
W3ECR
W5BGP
OE1ER

• 274
W1TW
W6BZE
W6KSM
W6NGA
W8PUD
W9FKC

• 273
W5CKY
W6SN
W6YMD
W9ABA
W9WHM
WØNTA

• 272
W5MMK
W6ZEN
W8SYC
CN8MM

• 271
W1TYQ
W2JVU
W3CGS
W4EPA
W4KFC
W5KBU
DL7AA
G3YF

• 270
K2DCA
W2ZX
W3EPV
W4AAU
W4CFD
W4GXB
W4HA
W4LVV
W5EGK
W5JUF
W6BVM
W6EFR
K6EVR
W6UHA
W7KTN
W8WZ
WØNLY
VE7GI

• 269
K2BU
W2HQL
W9FDX

• 268
W8KPL
W9GIL

• 267
W2OKM
W2ZGB
W7HIA
WØGKL

• 266
W7ADS
DL7BA

• 265
W2CNT
W2IWC
W6NJU
G5VT

• 264
W1FZ
W2GT
W2SAW
W2SUC
W3DRD
W5FFW
W6KZL
W6TXL

• 263
K2BZT
W2LAX
W3OP
W4FVR
W4IMI
W4ML
W5BZT
W6CHV
W6FOZ
W8CLR
W9IU
VK3KB

• 262
W2BOK
W2BRV
W2TVR
W5MMD
W6TZD
G3AAE

• 261
W1ZZK
W2AYJ
W2CTO
W4FIJ
W5OLG
W9UXO
KH6CD
W7FB
DL3LL
G3DO
G6RH

• 260
W1HX
W1MV
W2BYP
K2GMO
K2OEA
W3NKM
W3PGB
W4AZK
W4BYU
K4LNM
W5OGS
W5UX
W6CAE
W6CTL
W6GMF
W6KEV
W6OME
W7HKT
W8EV
W8IRN
W8UPN
W9GRV
W9QLH
VE3DIF
CO2SW
G3HLS
HIAMU
LA7Y
OK1FF
VK4FJ

• 259
W2ESO
W3RUT
W6LRU
K6UYC
KH6IJ
W8QJR

• 258
W4OM
W5NW
W8UDR
W9SFR
WØVBQ
F8BS
HIAOF

• 257
W6ALQ
ON4AU

• 256
W1IAS
W2CYS
W4LZF
K4RID
W5CE
W5PZL
WØPGI
VE6NX

• 255
W2CR
KP4CC
KP4KD

• 254
W2FXN
K6CQM
W6ID
W6UJ
4X4RE

• 253
W1UCP
W2AEB
W6IBD
W8GLK
WØMLY
WØNUC

• 252
W2NUT
W3ADZ
W4KWC
W5HJA
W6WO
VE1PQ
G3FKM
ZL2HP

• 251
W1HA
W2CTN
W2UVE
W3ALB
W5HDS
W5URU
W6BSY
DL1BO
HB9MQ

• 250
W1BIL
W2BBS
W2GVZ
W2HSZ
W2RWE
W2SSC
W2TXB
W2YTH
W3DKT
W4GRP
K4PDV
K5LIA
W6PH
W6RLP
W6ULS
W6WWQ
W6YK
W7AH
W8BSH
WØBFB
VE7SB
G3FNN
G8KS
ON4DM
PY4ZS
SM5ARP

• 249
W5PQA
W8SDR
W9JUV

• 248
W3RNQ
K4AIM
K6EWL
W8YIN
HB9X
ON4NC

• 247
W1QNC
W3FGB
W8NGO

• 246
W1RB
W2FBS
W8CED
WØQGI
CN8JX
DJ2BW

• 245
W2DOD
W6SIA
W9KXK

• 244
W1HZ
W1VG
K4GSU
W5TIZ

• 243
W2EQS
W3WGH
W4OPM
HISM

• 242
W1NLM
K2CPR
W2TWC
W6DBP
W6ZVQ
W9QNO
JA1AG

• 241
W2IRV
W3VKD
W4DHZ
W5AWT
W6BUQ
W7HXG
W9QIY
VE1EP
CE3DZ
DL7AB
PY4AO

• 240
W1BGA
W1EOB
W1WDD
W2CWK
W2DSB
W2LSX
K2LWR
W2MUM
W2QJM
W3MFW
W4CYY
W4TFB
W4VYP
W5ALA
W5LGG
K6ENL
W6SQP
W6UOV
W7AUS
W7EJD
W7GHR
K9BVR
W9FVU
W9HCR
W9RKP
W9YNB
WØBCI
VE3RE
VE7MD
CR6BX
LA3DB
ON4PA
PAØFX
SM3BIZ
SM7MS

• 239
W1CBZ
W5FXN
W6LTX
W6OBH
W9VIN
WØYCR
EA2CA
PY1GJ

• 238
W8VDJ
WØSYK

• 237
W1LZE
W6GMC
WØBPA
PY1HQ

• 236
W3GEN
W9ABB
VE3ES
G3BKF

• 235
W1BLO
W1OJR
W1TX
W1ZL
W2DGW
W3LMM
W6KUT
W9GDI
VO1DX
G6XL
GI3IVJ
KV4BB

• 234
W2HO
WA2IZS
K2PIC
W3KZQ
W6ANN
W7BGH
K9EAB
YSIO

• 233
W5VU
W6LN
DL7AH

• 232
W1AEW
W3EYF
K4BVQ
W4PLL
W5QVZ
WØANF

• 231
W1BOD
W1OOS
W1TS
W2ICO
W3AYD
W5NMA
W6UQQ
KH6PM
W8CQ
W9UIG
W9WFS
KL7PI
SM7QY
ZL1AH

• 230
W1AZY
W1ELR
W1EQ
W1KXU
W1PFA
W2EMW
W2TE
W3IMV
W3WU
W4THZ
K5BGB
W5PM
W6BIL
K6EC
K6KII
K6LGF
W6NHA
W8WFB
K9AGB

K9ECO
W9EU
WØBSK
VE2NV
VE3JZ
OZ7BG
PAØGN
PAØTAU
SM5AHK

• 229
W2AZS
K5ADQ
WØIEV
CE3HL
DL7AP
F3YR
IT1TAI
KP4YT
SM5WJ
TG9AD

• 228
K6AYA
K6CJQ
W6LDJ
W9GFF
TI2PZ

• 227
W7YGN
W9TQL

• 226
W5DA
W7MGT
VE3DKY
DL3RK
ZL1PV

• 225
W2PCJ
W3LMO
W6ATO
W9WKU
DL1GU
HB9ET

• 224
W1HGT
K4CTU
W5EFC
K6RWD
W8ONA
W9KA
W9PQA
EA3CY
OK1HI
PAØRLF
PAØVB
ZS1BK

• 223
W1BFT
W1BGW
W2KJZ
W4GJW
OY7ML
SM5CCE

• 222
W1FFO
WA2OJD
W3BQA
W3CA
W3FYS
W3JKO
W3SOH
W4BQY

K4HRG
W6PLK
CO2RL
ON4FQ

• 221
W1LHZ
K2QXG
K2SHZ
W3AYS
W3HIX
K4LPN
W5BUK
W6JHV
WØAJU
G5RV
G6UT
KV4BQ
KZ5WZ
PY1DH

• 220
W1QJR
W2BUI
K2IRO

• 219
W3BCY
W3KFQ
K4EHA
W8SZS

• 218
W2ROM
W3VRJ
W5VIR

• 217
W1JNV
W1LOP
W1WY
W3AXT
W5RDL
W6MEL
VE2YU

• 216
W2ORX
SM5KX
ZP5CF

• 215
W4IEH
W4JAT
W5GNG

K6EDE
W6KYT
W9PIO
KØHGB
VE6JR
OZ8SS

• 214
KH6AYG
DJ2AE
HIUA
JA1DM
OH3RA

• 213
W1GYE
W2CKY
W2JB
WØIJW
EA1BC
OK1CX
PY4OD
5A5TO

• 212
W1ACB
W1IJB
W1NHJ
W2CGJ
W2DEW
W2GFW
W2GNQ
K2JYH
W2REF
W6OSU
W9JIP
W6GUS
F3FA
HB9KB
HB9MX
PAØLOU

• 211
W1LQ
W1QM
W2DSU
W2FAR
K2JGG
K2UVU
W2UWD
W3ELZ
W3NOH
W4BBR
W4JII
W6KEK
W6KG
W6TOT
W7DAA
W7PQE
W7QGF
W9ROU
DL3BK
G3AIZ
OZ3Y
ZL3AB
ZL3GU

• 210
W1RAN
W1WK
K2FC
W2FXA
W2PZI
W3DBX
W4DKP
W4IFN
W4YWX
W5DML
W5LGS

W6BIF
W6CG
W9RJY
W9VP
VE3PK
EI9Y
HB9UL
PY2OE
VS6AE
ZL1AJU

• 209
W4HVQ
W4UKA
W5KLB
W7AHX
WØBTD
YV5AE

• 208
W7DJY
WØUQV
CT3AN

• 207
W3EBG
W3FMC
W3GRS
W9OTS
DL1QT

• 206
K5AHZ
W9HKL
CP5EK
LA6U
OE1RZ

• 205
W1BAV
W3MWC
W4GD
W4NBV
W5LW
W7AQB
W8EYE
K9CLO
WØMKF
WØAIH/VE3
DL1DX
HB9GJ
HB9MO
JA8AQ
PAØBW
ZP5ET

• 204
W1KQF
W2QKJ
W5MCO
W6FUF
W6SRU
W9BPW
W9EHW
W9ERU
WØAGO
WØZYB
DL3DU
ST2AR
VQ2GW
ZS2AT

• 203
W2BTA
W3AOH
W3LEZ
WA6EYP
W8ILG
W9DWQ
W9INN
W9IRH
OE1FF

• 202
W2RA
W3DWY
K6CYO
W6PZ
W6RAN
W9LTR
W9TKV
W9UZS
HB9NU
JA1AB
JA8AA
KP4AIO

• 201
W2NOY
W3KA
W3KVQ
K4DRO
K4GEZ
K4HNA
W4JBQ
W4JFE
K5KBH
W6FZL
W6VDG
W8HMI
W9HQF
W9SWR
WØCPM
WØVBK
CR6AI
DL6MK
DL6YK
F8EJ
G3BHW
KP4WD
PY4ZG
PY7VG
ZL2AFZ
ZS1RM

• 200
W1MDO
W1OOA
W1QMM
W1WLW
W2FZY
W2MZB
W2TP
W2VYX
W3LPF
W3MLW
W3RPG
W4COC
W4ECI
K4HFS
W4HYW
W5ERY
W5WZQ
W6EAY
W6NXP
W6SUQ
W6ZMX
W7ZAS
W8LAV
W8ZCQ
W9GRF
W9UX
WØCDP
WØDMA
WØRBA
VE5JV
VE6MN
VE7VC
DJ3JZ
DL7EN
EA2CB
EA4CR
G6VQ
JA1CR
JA6AO
KR6AC
OH2LA
OK1KTI
SM3AKW
SM5BCE
YV5BZ
ZL4GA
ZS1OU

• 199
W1AUR
W2AYU
W4FID
W4WDI
K9CJK
DL6EN
VQ4KRL
ZE1JV

• 198
W3JZY
W6AGO
W6IPH
W8IBX
W8VLK
VE2YA
GM3CIX
JA7AD

• 197
W4VZQ
DL3FM

• 196
W1ICW
W1OHA
W1YPK
W2PID
K9CAN
JA1AA
ON4KT

• 195
W1AJG
W1FPH
W1FTX
K4EJO
VE4XO
DJ3KR
I1FO

• 194
K4LTA
W8LY
WØDEI

• 193
W1OGU
W2SHC
W3DPS
W4NT
K4SXO
K9ATZ
KØDQI
WØLBB
VO6EP
VE7YR
F8CW
F9IL

• 192
W1VAN
W6OUN
G6RC
DL8AX

• 191
W4AAW
W4HZZ
W5CFG
W6HYG
W8AE
W9LI
WØFNN
WØGUV
WØLPA
VE3IR
G2BVN

• 190
W1AW
W1JMI
W2PDB
W3AS
W3MJF
W3QQL
W3SWV
W4EO
W4NWW
W4RNP
W5PSB
W6ETJ
W6OF
W7ACD
W7FBD
W7IAA
W8NJC
W8TUO
W9ALI
W9NN
DL1YA
G3DOG
OE3WB
PAØNU

• 189
W1CKU
W1NS
W4EEO
K8IKB
W8ZJM
DL1BS
VK2BA
VS1FJ

• 188
K2QHL
W2RGV
K6SXA
W8PHZ
KØGXR

• 187
W1CUX
W1HRI
W1ZDP
W4EFX
WØMCX
OK1JX
ON4FL

• 186
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W8DLZ
EI3R
SM7ANB

• 185
W1EIO
W1JSS
W1JTD
K4JVE1
K4KOY
K5DGI
W5VGR
VE5RU

• 184
W1FQA
W2LJR
W4CYR
K6KJR
K7GIE
W8MCC
DL1JW
JA2JW
JA6AK
SM7ID

• 183
W1NI
W6CIS
W7MCT
W9IHN
W9LQF
W9ZTD
WØEWH
VE7CE
I1KDB
ZS6IF

• 182
K1JDN
W2GDX
W2GTL
W3KHU
W5QN
W6MUF
W6OJW
G3HCL
OH3TH
SP7HX

• 181
W1KGH
W1IUU
W1ORP
W1OTX
W1ZDZ
W2AXR
W2KIR
W2OTC
W3EEB
W4QT
K5BGT
W5RX
W6MVL
W7BA
W7CSW
W7OCL
KL7PIV
W8KZT
DL1IN
DL3SZ
HB1BR
XE2FL

• 180
W1BGY
W1HWH
W1WAI
W2BMK
K2DGT
W2FXE
K2VUI
W2ZY
W3AFU
W3ARK
W3IPO
W3JNM
W3MDO
W3TXQ
W3WPG
W4AIS
K4CLT
W4TP
K5JKY
W6GSL
W6MUM
K6SHJ
W7ATV
W7CMO
W7NRB
W7WDM
W8JXY
W8MWL
W8RVU
W8TTN
K9IYW
W9QGR
W9WHY
WØOAQ
WØYPQ
VE2WL
VE3HB
CR7LU
DL3TJ
DL7CW
DU7SV
G2FYT
G2IO
OH2QQ
PY1ANR
SM5KV
SP8CK
VK5RX
ZK1BS

• 179
W1MIJ
W2BAC
W2BHU
W2RWN
W4BEY
K4ICK
W4TAJ
W5BQJ
W6JU
W9GHK
WØSMV
VE2II

• 178
W3RZL
WØDGH

• 177
W1JEL
DL9PF
G3HJJ
LA5Q
ON4MS

• 176
W4BWP
W4WSJ
W8GCN
FQ8AP
G2AKQ
G4TM
LA2B

• 175
W2BXY
W6TKX
K9COS
W9PVA
OH3NY
SM5DW

• 174
W2CDP
K2OPJ
W8GB
W9RH
SM7TQ
VP7NM

• 173
K2UKQ
W3ZQ
W5ACL
W6FLT
W9MZP
WØDSP
KØLFY
VE3ADV
DL9RK
HB9NL
I1RC
PY4AJD

• 172
W3EOB
W3HDZ
W3WSF
W8YPT
KØDMY
VE2AYY
DL1DC
G2YS
G3JZK
OH1QE
PY5UG

• 171
K1CCA
K2BSM
K2ZKU
W3RSR
W4HKJ
W4KPK
K4SXR
W6PHN
W6WTH
KH6WW
K8LSG
W9WJH
WØGBJ
DL8CM
G2HAP
G3BNC
HB9KC
SM6VY

• 170
W1UCA
W2BUY
W2FJH
K2HXL
W2JVZ
W2QQ
W3MSR
W4BFR
W4CKB
W4GHP
K4HXF
K4IEX
W4IF
W4JJL
W4SHX
W4ZMC
W5LV
W6BAG
W6FHR
K6GLC
W6PHF
W7ABO
W7QON
W8AYS
W8PCS
W8SCU
W9NZZ
VE1HG
VE1WL
EA7CP
G2AJB
G6GH
IS1FIC
KP4RK
OH2TM
ZL4CK

• 169
W2GBX
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K4TWK
K9CUY
DJ2KU
F3AT
JA3DY

• 168
W4YGZ
K6IYJ
WØQBA
G3AJP
PAØVO

• 167
W3KJJ
W5TJ
PAØHJK
4X4CJ

• 166
W1LQQ
W4AWS
KH6RR
DL1IA
DL1LZ
G4JZ

• 165
W3BYI
W6UNP
KL7MF
K9BHD
W9MBF
G3CEG
KT1EXO
LA5S

• 164
W2GTP
W4DXI
W4SIB
W6CLS
W7CWE
W8ELL
KØPIE
VE3DCI
G2AFQ
G4FN
OH2LX
PAØNIC
VP9BM

• 163
W1KXP
W1YNP
W3MQC
W4FZO
K4GSS
W4IUO
W5RHW
W5WW
KH6BLX
W9EXY
W9UXS
WØDIB
WØFLK
DL6GP
DL9TJ
EA2CR
G3BYM

• 162
W3CPB
W4VCB/3
W4IKL
K6OYE
W7BTH
W9HLY
W9KQD
W9VZP
VE5KG
G8PL
X22TH
YV5ABD

• 161
W1UMC
K2LGN
K2MIO
W3MVQ
W4KYI
W5BLA
W8AZD
K8DYX
W9LJU
DJ1VS
G3IEW
SM5BPJ
VK5QR

• 160
W1ALK
W1CTW
W1GDY
K1IVT
W1YZG
W2GUR
K2HIY
K2KCE
W2ZKQ
W3KVB
W3LUD
W3RBW
W3ZAL
W5AUJ
W5CK
W5OVE
K6CWS
W6NZ
K6OXU
W6VX
KH6DKA
W7WH
W8AJH
W8DWP
K8KAE

K9ALP
W9BYN
K9KDI
W9QVF
W9QFC
KØESH
WØSLB
VE2BK
VE2BV
VE3CIO
VE3EU
VE7EH
DL1HA
DL1YQ
DL9KP
G5VU
HB9TT
ZS1FD

• 159
W1GVZ
W4ZD
W6APH
WØCU
EA9AP
G3JLB
OH1TM
OH2YV
4S7NX

• 158
W3QMG
KH6BXU
VE1EK
GM3EOJ
VQ8AD
ZL3IS

• 157
W4YK
K6OYD
W8KBT
WØOBW
G3FUR
GM3BCL

• 156
W1EFQ
W6AFI
W7LEV
K9DNR
WØJSN
HB9QQ
JA2DN
KZ5LC

• 155
W2EHN
K2UPD
W4LDL
W6JH
W8ESR
W8YCP
K9BCK
W9CMQ
W9PNE
EA3GF
G3JKF
I1BLF
I1VS

• 154
K1MLI
K2DSV
W5FJE
K5JKH
W8FPR
W8ZCK
VE5TK
F8GB
G3VA
SM5AJU
SM5BRO

• 153
W1DGT
K2JFV
K4BCN
K4OMR
K8CTV
W8JRG
W9UNG
VE5VL
JA6MW

• 152
K1CJV
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W1RWS
W1UOP
K2QQQ
W3DJZ
W3PN
W4ARR
K6GCF
W6HJ
K6LAE
W7YEY
W9AKK
W9DSO
W9UKG
WØIUB
VE5GF
DL7CS
DL9SN
OA4FM

• 151
W1YRO
K2IAD
W2LNB
W3BVL
W3EIS
K4DKE
W4IPR
W4JZQ
W6WQT
W8BWS
W8QS
W8VOW
W8YGR
W9GGO
W9SD
W9WNB
WØYZB
VE3BHS
VE3BMB
F8TM
G3CXM
G3DQC
G3HIW
G3LP
LA5HE
OK1AEH
SM5AQB
ZE6JY
ZL3IA

• 150
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W1EKO
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W2FLD
K2PFC
W2QDY
W2RQH
W3CLP
W3DYU
W3HFF
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W4JUJ
K4RJN
K4YCW
W4YMG
W5CPW
W5MY
W5TTB
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K6OWQ
K6QXF
W8MQR
W8OKB
K9BGL
K9CAZ
W9FYM
W9LSV
W9OAN
K9PPX
W9ROK
W9TKD
WØVIP
VE7KJ
CN8DJ
DJ3BB
DL3ZI
F3ZU
F8SC
G3FKH
G3GIQ
GW3BNQ
HB9IM
HZ1AB
I1IZ

• 142
W2PUX
OZ7GC
PAØFAB
PY2AJK
SM5AJR
SP6FZ
SP9RF
ZS6IW

• 149
W1AZW
W6HAL
KH6CQS
W9PCF
WØMAF
WØRSZ
F8SK
G3JNX
VP7NS
ZE3JO

• 148
W2RUJ
K5ALA
K8BOD
DL1ME
DL3AR
F3CB
OZ5KQ
SM3AZI

• 147
K2PKT
W4RVW
K5JCC
W6CHL
W6UYW
W6WLY
WØVFE
DJ2YL
G3CCN
G5JU
PY2AK
SP9DT
ZL1NG

• 146
K2GUN
W4IBB
W8BMX
W8LQA
G3BDS
OQ5IG
SM7VX

• 145
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K9PJN
VE1EX
F8PM
G2KI
ON4LX

• 144
W1YXD
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W3VXE
W3SW
W3ZBF
K6TXA
W7GPP
W8QQH
W8TQV
WØBMM
VE3EHR
EI9Q
JA6FB
ZS6LW

• 143
K1BEB
W1WKW
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W3QJJ
W3YPI
W4CQI
K5BEU
K5LMJ
W6LER
W8AAI
W9AZP
K9ENB
CX9AJ
G5OO
I1BAF
I1ZN

• 142
W2PUX
K4QIJ
W4SXE
W6CBE
W7PJK
W7QNI
K8HFO
W9BVM
WØJMB
WØWAN
VE4DB
DL6GL
DL7CX
G3KHE
OZ7KV
TG9AL

• 141
W1CJU
W1CSC
W2WMG
W2YLS
W3JW
W4IKM
W4MS
W5GAI
W5II
W5LEF
W6AUT
W6YC
W9GVZ
W9TQD
CE3ZO
EA8BC
LA3SG
OE3FS
PAØZV
SM6AMR
ZS6APQ
ZS6ASW

• 140
W2AQN
W2NIY
W2STJ
K2TQC
W3CDG
W4FNS
W4HSJ
W4MCM
W4PDP
W4REZ
W4SNR
W4TK
W4WHN
W4YHF
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WA6AMZ
W6RZS
W6VVR
W7TMF
W7YOA
W8BIE
W8BQV
W8HEV
K8IQQ
W8VVD
W8ZNO
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W9IWX
W9PWM
W9TPA
WØAUB
WØUYC
VE2DR
CT1NT
G3KZI
HB9EO
I1UB
I1ZQ
KZ5KA
OH2VZ
SM5LN
SM5WZ
SP3PL
ZS2U

• 139
W1UQP
W2GND
K5MZD
K9GTK
VE7QL
DL1FZ
DL1SO
F9TX
HB9DK
HH2LD
ZD2DCP
ZE7JY

• 138
W1ORV
W3DDV
W4LHT
WØDRG
G3GSZ
LA8RB
LA7XE
OZ3GW

• 137
W2GZZ
K5ESW
W7LIO
EA3KI
HB9DB
KP4AOO
OE6A1
PAØCE
ZS3S

• 136
W8CJ
JA1BF
SM5BVF
ZL1AMO

• 135
K1DMG
WA2CCC
W2IP
K4ELK
W4FUI
W4KKG
W4OMW
W4UHC
W6KXG
W6SIJ
W7BAJ
W9ONB
DL1ES
EA5AF
G5DJ
PAØOI
YU3OV
ZP5LS

• 134
W1GET
K6COP
W6JFV
W7MCK
K9HOL
DJ3WA
DJ4OP
EA4GA
I1DV
SM7CNA
VQ2RB
ZS5LU
4X4BR
5A5TE

• 133
W1EXY
W1JLN
K2CQP
K2HVN
W4DIA
K8CVQ
K9CTX
W9DO
KØRAL
KV4BK
ZE8JJ

• 132
W1AIN
W1AJO
W2AAU
W2REH
W7AEA
W7VIU
W8VZ
W9LNQ
W9YZG
DL1EV
DJ4TZ
DL7BC
DL9OH
EI4AB
F3TP
G8CD
G8TS
LA1MB
OA7I
SM7BEM
UO5AA

• 131
K1IJG
W1WTF
W2AWH
W2NIN
K2YOR
W4KET
K4RXQ
K5ABV
K5IIX
W5OJL
W5QK
K6AKS
W6KNM
W6PYE
W7HDL
K8EZU
W8PCQ
W9GWO
WØCDV
WØQPL
WØTGQ
VE8PB
CR6AU
G2FFO
SM5DX
SM5RC
UB5DW
ZE3JJ

• 130
W1BDI
K1IFJ
W1MLG
W1PPN
W1UWB
W2BTG
WA2DIG
K2IXP
K2DJD
K2DNA
W2HDW
W2MOF
K2USA
W2VUF
K2ZAU
W3QLW
W3ZHQ
W4GUV
W4HTV
W4JCH
W4KL
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K5KES
K6ANP
W6GEB
K6HOR
K6IEC
W6NUQ
W6SQX
W6WLO
KH6EQ
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W7TPE
W7YAQ
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W9TMU
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WØGTU
WØRZU
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VE3AGC
VE3BOR
VE6TP
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DL3LB
DL6BP
HB9RS
HI8BE
I1RMO
LA1K
PAØXE
SM5KG
SM5VN
SP5HS
PAØNLC
UC2CB

• 129
W1AJZ
K6IXS
W6OAZ
W7OEV
W8UUS
W9CMC
W9YYG
CN8IF
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FS7RT
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SP1JV
UR2BU

• 128
W2PEV
W3LE
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W8MTQ
W8QW1
DL9RH
PAØPFR
PY7SA
VP2LU
9G1BQ

• 127
W1ICV
W1QQV
W2RXC
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W3TLN
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W8QHW
VE2IL
VE8TO
OE8KI
OQ9DZ
OZ4FF

• 126
W2BWC
W4AMC
K4QIE
W6CQW
W6OHX
KØITF
DJ1KR
SP9EU
ZS2H1

• 125
W1KNU
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W6TMX
K9EUZ
WØNGM
VE3PN
F9TV
G3ASG
G3BFP
KA2DE
UQ2AN
VP9BO
XE1AX
4X4KK

• 124
W2IVS
K4TEA
W6HHI
DL3OC
JA5AF
OH2RL
OZ7CF
SM5BFE
SM5CFC
ZE7JV

• 123
W1CKA
W3HTF
W3MYL
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W8QZA
W8YAH
W9FBI
W9YZA
DL6OS
DL8CH
DL9PT
EA9AC
JA3FT
OH3SE
SM6APH
SM6RS
VS1JF
ZBIFA
ZS4UP

• 122
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K4BUJ
K4ZKZ
K5EJQ
W5GSE
K6GJS
W7LVR
K9BLY
VE3XK
DL1GN
DJ2IV
I1ZCN
JA1GC
OE6FD
SM3ADP
SM3AZV
OZ8U
ZS1ACD

• 121
K1EFI
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W3LSG
W3MQY
W3WUH
W3YZI
W5CYE
K6EIE
K6HZP
KH6BTX
W7YAM
W8ZPX
W9GIH
K9OTB
W9RUB
WØVXD
DJ1WT
DJ2MN
G2DCG
G3JFB
IT1AGA
KP4ADS
PAØXM
SM5BO

• 120
W1RST
W1PEG
W1PWK
W2ABL
W2BOT
K2EUH
K2QIL
W2QZI
W2VCZ
W3GGT
W3KQD
K4CIA
K4EME
K4IGS
W4ORT
K4TFI
W4WGB
K5EJC
W5NXF
W6BLZ
K6CQF
W6MDK
KH6DLF
W7IAM
W7JWE
W8DUA
K8KTZ
W9AZI
K9GOQ
W9IGK
W9VFZ
W9WNV
W9WWJ
WØBBS
WØDVZ
KØHWB
VE1OM
VE2AFC
VE2BR
VE3IG
VE7KX
DL4EAC
DL6CL
DL6EQ
F3GL
F3II
G3JHZ
JA5AA
OE8SH
OH2NQ
OH9RD
OZ2KD
SP8AG
ZS1NQ
4X4GY

• 119
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K2MDL

• 112
W1CPJ
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W4YSY
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W6WII
W6WLI
W7KOF
W7LBN
K8BSZ
W8SDF
W9CBE
KØEUV
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EL4A
G3JHI
G3KBH
G3LPA
HB9TU
OH3TT
OZ1JW
UB5AQ
VP5BL

• 111
W1LVQ
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W2KOY
K2LBB
K4EHO
K4ZCP
W5QIX
K6HFA
W6TWI
K7FAE
W7WFJ
K9DJN
DJ1QT
DJ2XP
G8DI
GM3EFS
JA3AA
JZØHA
LZ1KSZ
OH3RU
OX3DL
SM5ATK
SM5NG
UA9CL
UB5ND
UQ2AS
VK7LZ
ZP9AY
ZS4IO

• 110
W1ECH
W1FJJ
W1IJO
W1KYK
W1TKC
K2FG
W2JTJ
K2OUS
K2RNN
W2UNS
W3AHX
K3ALD
K3AXH
W3GID
W3INH
W3TEC
K4JKR
W4UG
W4WSF
W4ZQK
K5CSA
K5GOE
W6ISQ
K6OCX
K6VFF
W7RYS
W8CRI
K8DTZ
K8JXK
W9MPN
W9NLJ
WØCVZ
W7DIS
W7LNG
W8CDV
W8JAQ
W9JO
DL9YX
EA1FD
EA5BA
F9BB
G3GMY
G6YL
GC3AAE
KP4VUH
LA6CF
PAØCF
SV1AA
ZB21

• 109
W1VKZ
W2PVV
K3BQB
W3GKY
W6BRE
W6EYB
W6FYM
K7AWH
K8BPX
KØLEQ
VE1KM
VE3BMO
DM2AIG
DM2AMG
EA3IH
G3HHT
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OE5HE
ON4IX
SP2LV
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K6OES
K6RTK
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K9HMY
W9MLE
W9YAE
KØBIT
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DL3TW
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GI3CDF
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CN8FD
CN8FL
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G3FIU
G3SD
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KA2HB
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W6MKH
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W7MWF
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UA3AF
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FM7WP
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OH3TI
OH5OV
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SM7CAB
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W1CPV
K1DXW
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W1ZJJ
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W2LFL
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K2ZYR
W3AQZ
W3CBP
W3DAO
W3FOX
W3GYP
W3HWE
W3PL
W3SFC
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W4CXQ
W4DBJ
W4HBK
K4HPR
K4IQV
K4JEY
KØKWY/4
W4LAV
W4LXX
W4PM
K4RPK
W4RRK
K5CAV
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W7DH
W7ESN
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W9ETN
W9HDV
W9LGH
KØPEF
WØSYA
WØWRO
VE7YE
DJ2CP
DJ3FW
DJ3HW
DL1PA
DL6KC
DL6YQ
F8SH
G2AMV
G2VV
G3AHE
G3ANW
G3GNL
G3KYF
G3LVC
SM6APB
HB9EK
KA2NY
KM6BL
LA5QC
OE1FR
OE5GR
OH8NC
OK1AJB
OK1KLV
OK1MP
OK3HF
OK3LA
OK1IZ
ON4RN
ON4SH
PJ2ME
SL5AB

(Continued on page 124)

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—Eighty-meter long-haul has been given an assist by the early evening skip and VR and CUL have added another final amplifier for the winter work load. Another trafficker, EML, looks forward to CD Parties. HNK is now in the U. S. Postal Department. Our RM, AXA, states that the EPA C.W. Net again made 100 per cent QNI with 3RN. K3s CAH, BHU, CDL, GSU and JSX and W3s DUI, DGX, GEU and AMC, led by our PAM IVS, were Tamaqua visitors for a 14-hour eye-ball QSO. UIU is now back in the swing of traffic handling and tried his skill in the W-VE Test. K3LKR is a new OES and K3HTZ has been added to the list of ORS. K3JLW has become an active member of the PFN. Ed is NF Fri. nights and ZVW Sat. and Sun. The rest of the week he is NF/3 from Levittown. KKW has two extra operators now, K3HBU and KN3KUN. K3CNN has been filling in as NCS on the PACD Net. ELI is having trouble with his wire cutters; they always cut his antennas too short for 3850 kc. JNQ lost his 80-meter antenna and beam. K3ALD received the Keystone Award. The Oxford Circle RC received the call K3NIA. ZLP has enlisted in the Army and K3KNQ in the Navy. New officers of the West Philadelphia RC are UQV, pres.; DJW, vice-pres.; K3HWX, secy.; K3KLJ, treas. New Generals are K3ITD and K3EGG. A new home-brew 6N2 converter was added to YLL's shack. K3ACD is adding 6 meters to his shack. NOH is modifying and adding a new rig, keyer and all. BUR assisted K3BUZ in the V.H.F. Contest. DUI and K3KNO have new Viking Valiant transmitters. The North Penn ARC held a home-built equipment show. A quote from the Hilltop Transmitting Assn. bulletin: "At the last Board Meeting it was decided to dig a well. So the boys made a motion to dig. So dig we will a well." The well will be located at the club-room building. The Mahanoy Valley Brass Pounders set up for parade control of the Schuylkill County Firemen's Convention in Mahanoy City. The SEC, DUI, invites reports from all ECs on their Simulated Emergency Test exercises. When trying out his new mobile, K3LVA was quickly contacted by JZF when LVA's XYL had to report a family mishap and request his return home. 4UWA forwards a news story on this (*Centre Daily Times*). Traffic: W3CUL 4689, VR 580, IVS 568, EML 160, HNK 115, K3BHU 95, W3AXA 89, K3IPK 88, W3NNL 79, K3HEX 70, W3KMD 47, UIU 47, K3HTZ 40, IPA 40, JLW 37, ANU 26, MVO 23, W3NF 23, K3CAH 20, AHT 19, W3ZRQ 19, BFF 17, AMC 11, K3HXC 11, JSX 10, W3DUI 9, ITI 9, ADK 8, BUR 8, ADE 7, K3BCV 7, W3OY 6, K3CNN 5, W3TEJ 5, PDJ 4.

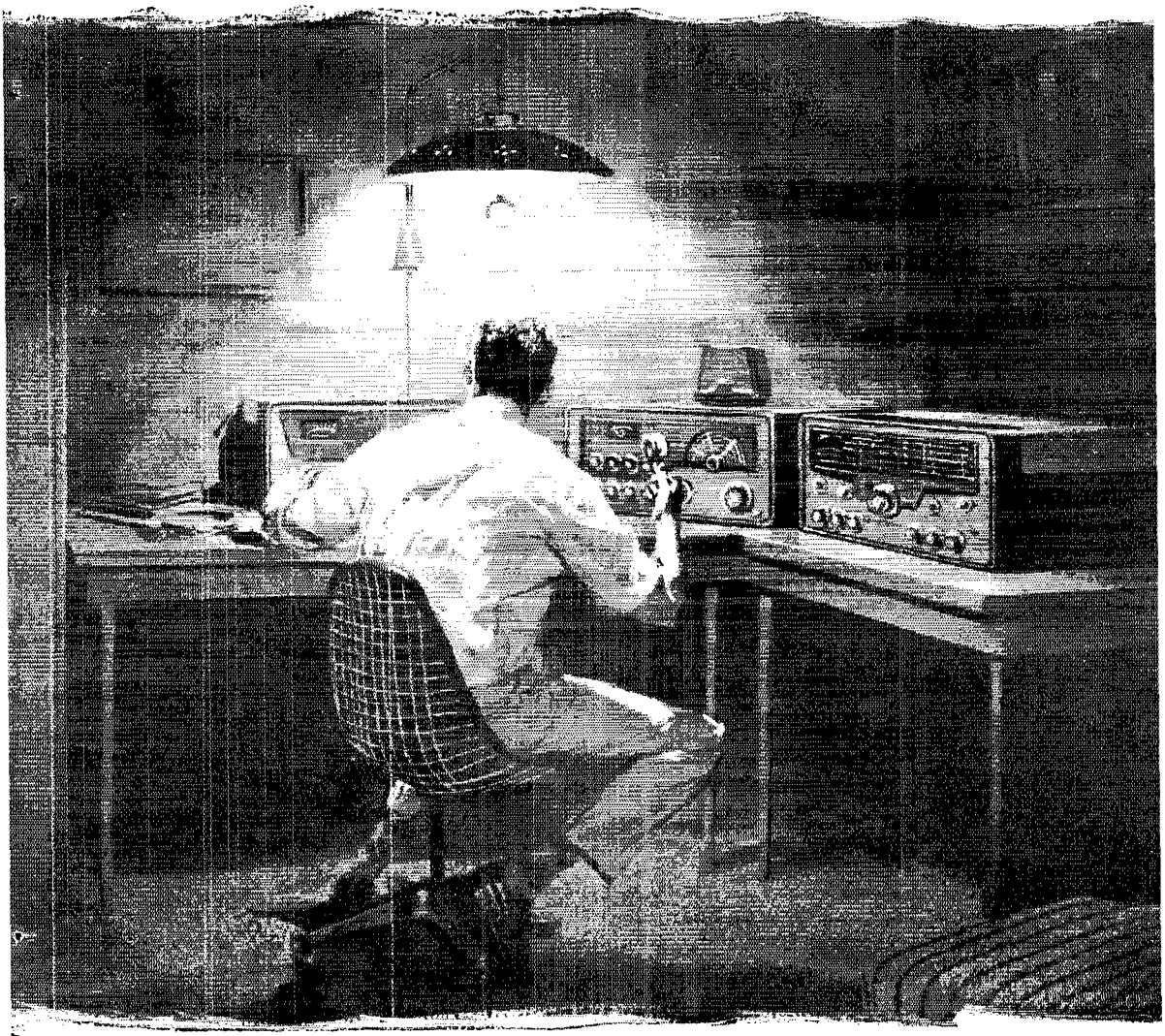
MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—SEC: CVE. MDD Traffic Net, 3650 kc. Mon.-Sat. 1915 EST. MEPN (phone) 3820 kc. Mon., Wed., Fri. 1800 and Sat. and Sun. 1300 EST. New appointments: K3JYZ, KQS and YVQ as ORSs; K3KHN and K3MDL as OESs; CVE as SEC. The Free State ARC provided call-in service at the Foundation Hamfest Oct. 2 with their 2½-ton emergency communications van. The Washington RC had 20 new members turn out at the beginning of its new code class at Guy Mason Rec. Center in N. W. Washington. Visitors are welcome. The PVRC is reactivating its 2-meter net. K3ADS is enthusiastic with his new 5-over-5 6-meter beam. AHQ continues to lead the section in OO activity. K3ANA is back on the air at his new QTH. BUD is organizing AREC drills in St. Marys County. K3BYD has a new five-element beam. CDQ is back on the air after her latest European trip. CPM reports he is resuming OO work. Old-timer CQS reports a new 10-meter beam. K3CRF handled Delaware traffic during the hurricane emergency. Atlantic Division Vice-Director ECP operated 48 continuous hours during "Donna." K3EJF reports in from Laurel. EOV finally is trying mobile c.w. EDQ has the new 500-watt rig going and has been appointed EC for MEPN. EXM/3 reports that his XYL is now KN3NKE. FMR is back after a long absence. K3GBV is firing up on 220 Mc. We should have more section activity there! K3GKF is busy working for awards. K3GMD has resumed 6-meter code practice transmissions. K3HDW has 250 watts and a twenty-element beam on 145 Mc. K3IZM plans to attempt satellite scatter work on 50 Mc. K3JET continues OO activity. K3JIQ is active on the phone nets. K3JTE received a scholarship at the U. of Pa. as a result of satellite bounce success. K3JYZ has a new antenna and is ready for the season's traffic activity. KA put the finishing touches on the new rig for the SS. Congrats to KHA on passing the Extra Class exam. K3KHN is rebuilding on 6 meters. K3KPZ reports that the Chesapeake ARC is planning a DXpedition to Delaware. New ORS KQS is back at college. KN3LLR is now on 40 meters. K3LNH operated from Wisconsin during the summer. KN3MCG passed the General Class exam. MCG has a KWS-1 and a 70-ft. tower. K3MDL took part in emergency work on "Donna." K3MLY likes OES reporting. MSR is receovering after an accident from a falling tower. KN3NFJ is on 80 meters with a grid-dip meter as a transmitter! OSF reports in from Baltimore. KØPIV/3 reports in the MDD Net when not on active Navy duty. Thanks to PKC for a fine job as SEC during his term of office. TMZ likes FMT measuring. TN keeps up his outstanding traffic work. TSG is now operating at marine coastal station WMH. UE is lining up 3RN for fall activities. K3WBJ handled considerable hurricane traffic. New ORS YTW is providing an Eastern Shore outlet for MDD. ZAQ reports his new QTH is excellent ham location. ZNW is planning a station for Calvert County Fair. Traffic: (Sept.) W3UE 210, K3WBJ 193, W3TN 113, MCG 92, K3JIQ 73, KØPIV/3 56, W3ECP 54, ZNW 44, BKE 26, AHQ 22, EOV 17, BUD 11, K3EJF 11, JYZ 11, W3KQS 9, K3MDL 5, W4EXM/3 5, W3CQS 3, YTW 3, KA 2. (Aug.) W3TSG 208, MCG 140, KØPIV/3 107, K3KPZ 15, W3KHA 10, KQS 10, KA 8. (July) W3MCG 118. (June) W3MCG 107.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: W2YRW. RMs: W2BZJ, W2HDW and W2ZI. September totals of the N. J. Phone and Traffic Net are: Sessions 30, QNI 565 and traffic 202. K2DEI, Maple Shade, again made BPL. K2JJC, Pitman, renewed his OPS appointment. K2JGU, Glassboro, has applied for ORS appointment. He now is OPS. W2BEI, Audubon, increased his traffic-handling because of 2RN skeds. W2RG, Merchantville, vacationed in Vermont. Ed has built a basement shelter equipped with transistor receiver and transmitter. W2BZJ, Pennington, is NCS Mon. on NJN and also takes 2RN Tue. and Wed. WA2ECR has been elected director of the Gloucester County Amateur Radio Club. The SJRA's annual "Hamfest" was a big success. About 1100 attended. The SJRA's 10 on 10 Net continues to grow in members and interest. K2BZK is NCS. K2RXB, Margate, reports that Atlantic County RACES was activated during Hurricane Donna. Mobiles served very well during the time of power failure. W2IU, Absecon, reports no traffic activity because of bad band conditions. W2ZI, Trenton, supplied a complete report of Mercer Co. activities during "Donna." RACES Hq. was manned by W2ZI and K2GHJ. The following stations were active during the emergency: W2AAI, W2SXV, W2LZZ, W2VNL, K2PHR, K2ETJ, K2QAU, W2LQN, W2LY, K2LXL, K2DMV, W2SHL, W2GTE and K2SJI/2. ZI personally handled over 50 messages. The Burlington Co. Radio Club supplies communications for many county activities. W2UAP, Camden, was the speaker at the September meeting of the Levittown (N. J.) meeting. UAP is quite active in MARS and is an A-1 Operator. No reports were received from Salem, Cumberland or Atlantic Counties. Monthly reports are solicited. Traffic: K2DEI 257, W2BEI 88, W2RG 87, K2JGU 64, W2BZJ 60, W2ZI 50, K2RXB 30, K2SOX 30, K2SNK 20, K2JJC 2.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK— SEC: W2LXE. RMs: W2RUF and W2ZRC. 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. at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, 1PN or 3980 kc. at 1600. W2CIG made BPL for the eleventh consecutive month: W2EZB also is in there this time. Congratulations. New appointments: W2CRH and W2TPV as ORSs, WA2BFI as OPS and WA2DAC as OES. En-

(*Continued on page 120*)

Man's desire to communicate still offers our greatest opportunity to achieve peace on earth and good will toward all mankind



Merry Christmas and
Happy New Year

hallicrafters company

. . . and 73 from

W. J. Hallygan W9AG Bud Hallygan Jr.

● Edison Award trophy and $500 check are presented to the 1959 recipient—Walter Ermer, Sr., W8AEU—by L. Berkley Davis, General Electric vice-president. Ermer (at left) took the initiative in organizing Cleveland's big, well-equipped Amateur Radio Emergency Corps. The ceremony highlighted a banquet at Washington, D.C., which was attended by members of the Government and Armed Forces, the electronic communications industry, and the press.

JAN. 2 DEADLINE FOR EDISON AWARD NOMINATIONS

Nominating letters for the 1960 Edison Radio Amateur Award must be postmarked not later than January 2, 1961.

Please remember that the judges will consider only candidates whose names are submitted in writing by you and others. There is no other source for Edison Award nominations.

Therefore, between now and January 2, canvass in your mind the activities of amateurs you know, in order to make sure no deserving OM or YL fails to be represented. If you uncover such a candidate, by all means send in his name promptly.

For help with your nominating letter, and for rules of the Award, see the October issue of this magazine, or write to *Edison Award Committee, General Electric Co., Electronic Components Division, Owensboro, Ky.*

HERE ARE TYPICAL ACTIVITIES THAT CAN QUALIFY FOR THE AWARD:

- Emergency communications work in a disaster, such as a flood, hurricane, tornado, or explosion.
- Helping amateurs and others with their specialized problems, through professional knowledge and experience.
- Community service in organizing mobile and fixed communications to promote the success of fund drives and other public events.
- Helping disabled or physically handicapped persons.
- Relaying messages from remote points for the benefit of isolated servicemen and civilians.
- Designing and constructing radio equipment for use by persons in remote parts of the world, who do not have access to regular commercial communication channels.
- Civil-defense organization work; weather reporting; radio assistance to state or local traffic and police authorities; cooperation in forest-fire prevention and control.
- Teaching basic electronics to young people.

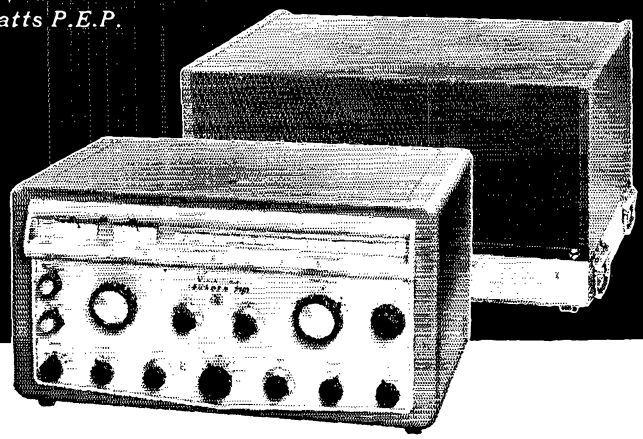
GENERAL ELECTRIC

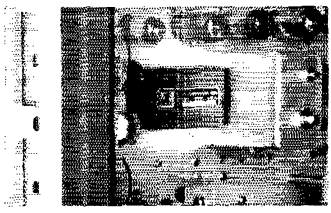
624-402

the very finest **SSB** equipment you can buy!

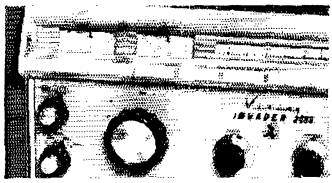
INVADER AND INVADER–2000

A superbly engineered SSB Transmitter/Exciter . . . add hi-power conversion for 2000 watts P.E.P. (twice average DC) input SSB!

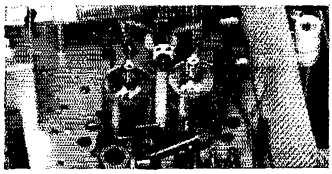




CRYSTAL FILTER-TYPE SIDEBAND—Exclusive high frequency bandpass crystal filter gives you more than 60 db of unwanted sideband and carrier suppression! Select upper or lower sideband instantly.



SIMPLIFIED OPERATION—Extremely easy to tune and operate! Tune for maximum on the meter and you're ready to go—just a few front panel controls give complete flexibility!



FREQUENCY CONTROL—Instant band-switching coverage 80, 40, 20, 15 and 10 meter bands. Built-in VFO is differentially compensated and factory adjusted for maximum stability—"keep warm" heater element keeps VFO at operating temperature even with equipment turned off . . . NO WARM-UP DRIFT!

Free 8-page "Invader" brochure with detailed specifications and photographs!

INVADER

The transmitter you've been waiting for—with more exclusive features than any other Transmitter/Exciter on the market today! Instant band-switching 80 through 10 meters—no extra crystals to buy—no retuning necessary. Rated 200 watts CW and SSB input; 90 watts input on AM. Unwanted sideband and carrier suppression is 60 db or better! Wide range pi-network output circuit. Fully TVI suppressed. Self-contained heavy-duty power supply. Wired and tested with tubes and crystals.

Cat. No.	Amateur Net
240-302-2	$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.	Amateur Net
240-304-2	$1229.00

HI-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"—a solid 2000 watts P.E.P. (twice average DC) input SSB, 1000 watts CW and 800 watts input AM. Completely wired and tested—includes *everything* you need—no soldering necessary—complete the entire conversion in one evening!

Cat. No. 240-303-2 . . Hi-Power Conversion, complete . . . . . **Amateur Net $619.50**

FIRST CHOICE AMONG THE NATION'S AMATEURS

Viking

E. F. JOHNSON COMPANY • WASECA, MINNESOTA

choose your features... pick your power... from the nation's most popular transmitter line!

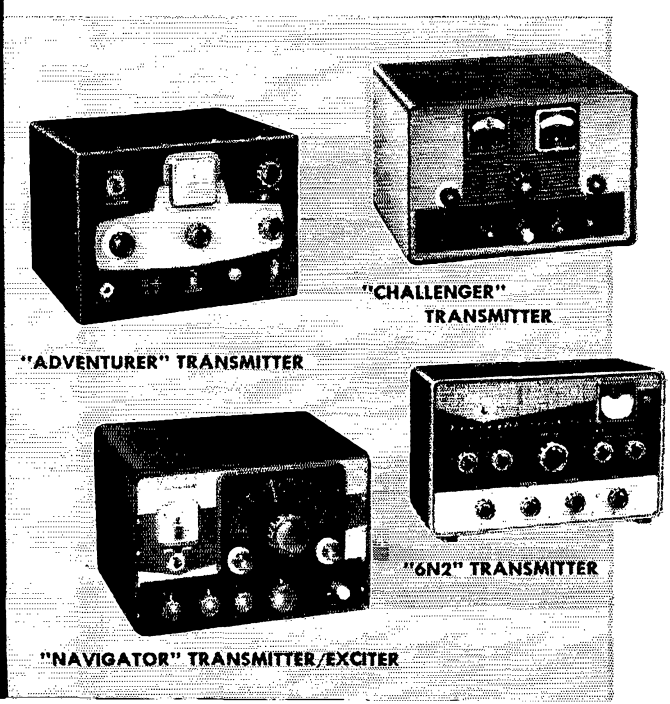
VIKING "KILOWATT" AMPLIFIER (Above)

The only transmitter that provides maximum legal power in all modes—SSB, CW, and plate modulated AM. Class C final amplifier operation provides plate circuit efficiencies in excess of 70% with unequalled broadcast-type high level amplitude modulation. Two 4-400A tubes in Class AB_2 easily deliver 2000 watts P.E.P. (twice average DC) in SSB mode—provides 1000 watts input AM with two push-pull 810 tubes in Class B modulator service. 1000 watts input Class C CW. High efficiency pi-network output circuit will match 50 to 500 ohm antenna loads.

Pedestal contains complete unit. Excitation requirements: 30 watts RF and 10 watts audio for AM; 10 watts peak for SSB. With tubes. **Cat. No. 240-1000**..Wired and tested.....**Amateur Net $1595.00**

Matching accessory desk top, black and three-drawer pedestal. **Cat. No. 251-101-1**.. **FOB Corry, Pa. $132.00**

★★★★ *popular transmitters...*



"ADVENTURER" TRANSMITTER

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**

"CHALLENGER" TRANSMITTER

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.....**Amateur Net $154.75**

"NAVIGATOR" TRANSMITTER/EXCITER

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.

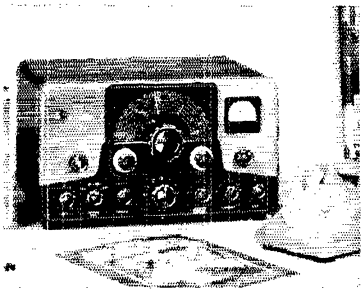
Cat. No. 240-126-1..Kit.....**Amateur Net $149.50**
Cat. No. 240-126-2..Wired.....**Amateur Net $199.50**

"6N2" TRANSMITTER

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 the Viking I, II, "Ranger", "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.....**Amateur Net $169.50**

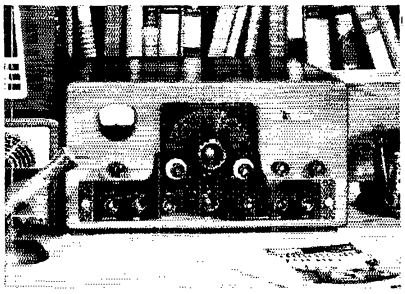
★★★ *feature-packed transmitters...*



"RANGER" TRANSMITTER/EXCITER

This popular 75 watt CW or 65 watt phone transmitter will also serve as an RF/audio exciter for high power equipment. Completely self-contained—instant bandswitching 160 through 10 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.

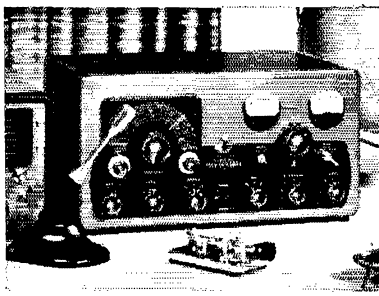
Cat. No.	Amateur Net
240-161-1..Kit	$229.50
240-161-2..Wired and tested	$329.50



"VALIANT" TRANSMITTER

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.	Amateur Net
240-104-1..Kit	$349.50
240-104-2..Wired and tested	$439.50

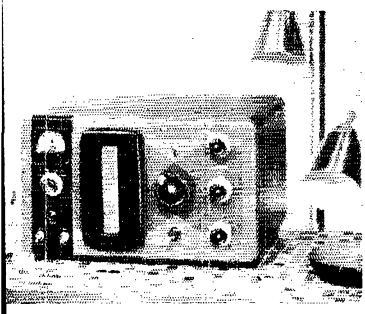


"FIVE HUNDRED" TRANSMITTER

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.	Amateur Net
240-500-1..Kit	$749.50
240-500-2..Wired and tested	$949.50

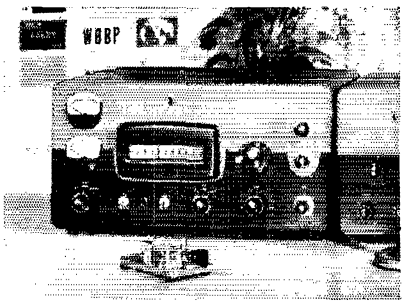
★★★ *exciting desk-top linears...*



"COURIER" AMPLIFIER

Rated a solid 500 watts P.E.P. input with auxiliary SSB exciter as a Class B linear amplifier; 500 watts CW or 200 watts AM linear. Self-contained desk-top package—continuous coverage 3.5 to 30 mcs. Drive requirements: 5 to 35 watts depending on mode and frequency desired. TVI suppressed. With tubes and built-in power supply.

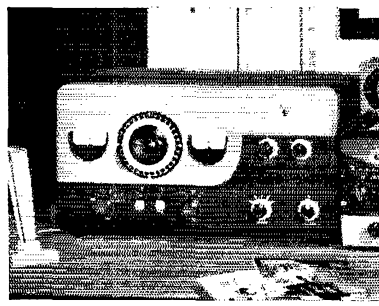
Cat. No.	Amateur Net
240-352-2..Wired and tested	$289.50



"THUNDERBOLT" AMPLIFIER

The hottest linear amplifier on the market—2000 watts P.E.P. (twice average DC) input SSB; 1000 watts CW; 800 watts AM linear. Continuous coverage 3.5 to 30 mcs.—instant bandswitching. Drive requirements; approx. 10 watts Class AB_2 linear, 20 watts Class C continuous wave. With tubes and built-in power supply.

Cat. No.	Amateur Net
240-353-1..Kit	$524.50
240-353-2..Wired and tested	$589.50



"6N2 THUNDERBOLT" AMPLIFIER

1200 watts (twice average DC) input SSB and DSB, Class AB_1; 1000 watts CW, Class C; and 700 watts input AM linear. Continuous band-switched coverage on 6 and 2 meters. TVI suppressed. Drive requirements: approx. 5 watts Class AB_1 linear, 6 watts Class C CW. With tubes and built-in power supply.

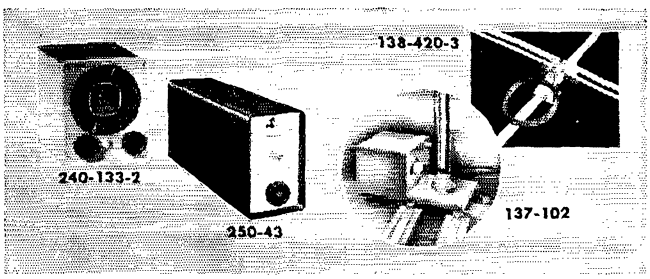
Cat. No.	Amateur Net
240-362-1..Kit	$524.50
240-362-2..Wired and tested	$589.50

FIRST CHOICE AMONG THE NATION'S AMATEURS

Viking

E. F. JOHNSON COMPANY • WASECA, MINNESOTA

Boost performance... add convenience... with these popular Viking station accessories!



"6N2" VFO—Replaces 8 to 9 mc. crystals in frequency multiplying 6 and 2 meter transmitters. Output range: 7.995 to 9.010 mc. With tubes and power cable.

Cat. No. 240-133-1..Kit.....**Amateur Net $34.95**
Cat. No. 240-133-2..Wired and tested.....**Amateur Net $54.95**

"6N2" CONVERTER—Instant front panel switching from normal receiver operation to 6 or 2 meters. Available in following ranges: 26 to 30 mcs., 28 to 30 mcs., 14 to 18 mcs., or 30.5 to 24.5 mcs. With tubes.

Cat. No. 250-43..Kits.....**Amateur Net $59.95**
Cat. No. 250-43..Wired.....**Amateur Net $89.95**

PRE-TUNED BEAMS—Rugged, semi-wide spaced with balun matching sections. 3 elements, boom and balun.

Cat. No. 138-420-3..20 Meters.....**Amateur Net $139.50**
Cat. No. 138-415-3..15 Meters.....**Amateur Net $110.00**
Cat. No. 138-410-3..10 Meters.....**Amateur Net $ 79.50**

"MATCHSTICK"—Fully automatic, pre-tuned vertical antenna system. Bandswitching 80—10 meters. Remotely motor driven. With 35′ mast.

Cat. No. 137-102..Pre-tuned.....**Amateur Net $129.50**

VIKING AUDIO AMPLIFIER—Self-contained 10 watt speech amplifier, with power supply and tubes.

Cat. No. 250-33-1..Kit.....**Amateur Net $73.50**
Cat. No. 250-33-2..Wired and tested.....**Amateur Net $99.50**

LOW PASS FILTER—Wired and pre-tuned.

Cat. No. 250-20..52 Ohms Impedance.....**Amateur Net $14.95**
Cat. No. 250-35..72 Ohms Impedance.....**Amateur Net $14.95**

CRYSTAL CALIBRATOR—Provide asccurate 100 kc check points to 55 mc. With tube and crystal.

Cat. No. 250-28..Wired and tested.....**Amateur Net $17.95**

"SIGNAL SENTRY"—Monitors CW or phone signals up to 50 mc. With tubes.

Cat. No. 250-25..Wired and tested.....**Amateur Net $22.00**

T-R SWITCH—Instantaneous break-in on SSB, DSB, CW or AM. With tube, power supply and provision for RF probe.

Cat. No. 250-39..Wired.....**Amateur Net $27.75**

"MATCHBOXES"—Completely integrated antenna matching and switching systems for kilowatt or 275-watt transmitters. Bandswitching 80 through 10 meters.

Cat. No.	Amateur Net
250-23-3..275 Watts, with directional coupler and indicator	$86.50
250-23..275 Watts, less directional coupler and indicator	$54.95
250-30-3..Kilowatt, with directional coupler and indicator	$149.50
250-30..Kilowatt, less directional coupler and indicator	$124.50

DIRECTIONAL COUPLER AND INDICATOR—Provides continuous reading of SWR and relative power in transmission line.

Cat. No. 250-37..Coupler.....**Amateur Net $11.75**
Cat. No. 250-38..Indicator.....**Amateur Net $25.00**

ATTENUATORS—Provide 6 db attenuation with required power dissipation to enable various units to serve as exciters for Viking "Thunderbolt".

Cat. No.	Amateur Net
250-42-1..For Viking "Ranger" or similar	$21.50
250-42-3..For use with HT-32 or similar unit	$21.50

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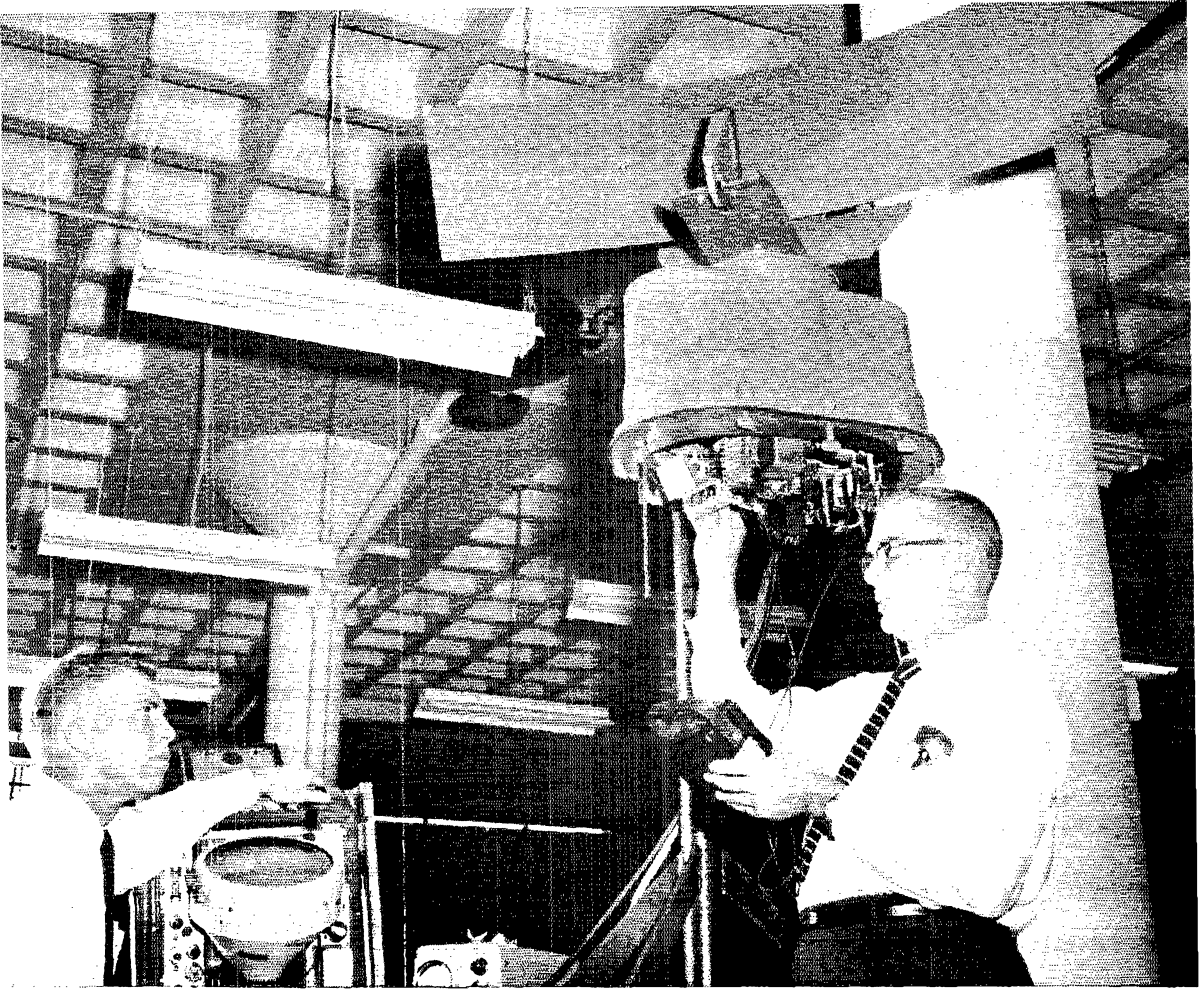
Your complete guide to amateur radio's most exciting equipment. Write today for your free copy.

FIRST CHOICE AMONG THE NATION'S AMATEURS

Viking

E. F. JOHNSON COMPANY • WASECA, MINNESOTA



STEPHEN HERZOG (left), K5RMA, and George Mayo, K1LYE, check out marine radar equipment at a Raytheon Electronic Services Division service center in Boston, Mass.

FIELD ENGINEERING WITH A FUTURE

From Boston to Seattle

Raytheon field engineers Steve Herzog, K5RMA, and George Mayo, K1LYE, are shown here on a special technical evaluation assignment at one of the Raytheon Electronic Services Division's 17 service centers, situated in major marine and industrial communities from Boston to Seattle, Duluth to New Orleans.

This time they're testing commercial marine radar. Tomorrow it might be an installation project or overhaul and repair. For Raytheon field engineers tackle a broad range of tasks all over the country and overseas. And, with continuing expansion of services, there is plenty of room for advancement to executive positions.

Perhaps you can qualify for a Raytheon field engineering future. Requirements: previous experience plus an E.E. degree or the equivalent in practical experience with guided missiles, fire control, ground and bombing radar or sonar.

Benefits: attractive salary, insurance, educational programs and relocation assistance. *For details, please write Ronald Guittarr, Electronic Services Division, 2nd & South Ave., Northwest Industrial Park, Burlington, Mass.*

RAYTHEON

RAYTHEON COMPANY

ELECTRONIC SERVICES DIVISION

Station Activities

(Continued from page 112)

dorsements: K2QDT as OPS. K2KIR went back to M.I.T. K2TDG and OM K2TDH have a new TA-33 beam. K2GUG attributes the fire in the roof of his house, which caused extensive damage, to arcing in the gutter pipe when the rig was on the air. W2EMW received the WLA Award (Liverpool, England). K2LGJ now is on 2 meters. WA2FBM operates mobile. WA2HTW has a five-element TACO beam. WA2IYB has a new Valiant. W2OE now lives in Northville. The SEC is in the process of making new appointments. Is your county represented with an active EC and AREC program? Clubs are invited to write W2LXE with suggestions. K2JFV spoke at the RARA meeting regarding his stay in Russia on a scientific mission. W2BLP got an ARRL citation for his excellent record as the country's top OO. K2CEH now has 28 states on 2 meters. K2LMG has 21 states. Every station is invited to make monthly reports regarding station activity. Form 1 cards are available for the asking from ARRL. Anyone interested in appointments should contact your SCM. Remind yourself to let your SCM know your club or personal views on a more representative name for the Western New York Section. Merry Christmas to all and best regards. Traffic: (Sept.) WA2CIG 706, W2EZB 586, K2QDT 361, K2SSX 299, W2RUF 183, W2OE 133, W2FEB 125, K2IYP 125, K2RTQ 96, K2OFU 77, K2TDG 66, W2CRH 40, K2KIR 39, W2TTV 33, K2GKK 30, K2DWR 27, W2RQF 20, WA2IYB 17, WA2HEC 14, K2LGJ 14, K2UZJ 14, WA2FTM 11, W2PGA 11, W2PVI 11, WA2DSC 10, K2EE 8, K2MTE 7, K2RTE 4, W2ZRC 3. (Aug.) K2OFV 51, K2LGK 13, W2ZRC 11.

FOURTH ANNUAL PENNSYLVANIA QSO PARTY

December 10-11, 1960

All amateurs the world over are invited to take part in the Fourth Pennsylvania QSO Party. This Party enables amateurs to further standings for the WAPC (Worked ALL Pennsylvania Counties) Award.

Rules: 1. The time of the contest is Saturday Dec. 10 at 1800 EST (2300 GMT) until 1800 EST Sunday, Dec. 11. 2. The general call is "CQ PENNA." Pennsylvania stations are requested to identify themselves by signing "DE PA" on c.w. and "Pennsylvania calling" on phone. 3. Exchanges consist of QSO number, RS(T), and Penna. county for Penna. stations. Outside stations send QSO number, RS(T), and QTH (state, VE province, or country). 4. A station may be worked once *per band* and only c.w. to c.w. and phone to phone contacts count. 5. *Scoring:* Each completed contact counts two (2) points, one for receiving and one for transmitting exchange. Outside stations multiply number of contact points by the number of Penna. counties worked. Penna. stations multiply QSO points by total number of states, VE provinces, and countries worked. 6. *Awards:* New call book to highest scoring station in Penna., outside Penna.; for the purpose of this event, all VEs are regarded stateside and KL7, KH6, KP4, KZ5, as overseas. Certificates to 2nd and 3rd place winners; certificates to first place Novices. 7. Logs must show time, band, emission, date, and complete log information and must be mailed by December 31, 1960, to John F. Wojtkiewicz, W3GJY, 434 Glenwood Drive, Ambridge, Pa. The decision of the contest committee will be final.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA. RMs: KUN, GEG and NUG. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. The Penna. Fone Net meets Mon. through Fri. at 1800 EST on 3850 kc. New appointment: LIV as OO. The Coke Center RC reports: NCE is building a Valiant; JW still is working DX; new Novices are KN3NGY and KN3NFS; BZR has gone back to college. The Pittsburgh Chapter of the QCWA has AVY as pres. and UGV as secy. The Etna RC (EXW) reports via "Oscillator": DZP received his Keystone Award; a new Novice is KN3MZS; TVW has a homebrew mobile on 10 meters, K3GHH *is working* DX on 10 and 20 meters. The ATA had at its October meeting Mr. Bossart from Carnegie Museum, whose topic was "Paleonotology and Spelunking," accompanied by

(Continued on page 140)

Just in time for Christmas . . .

HEATHGIFTS

for the Radio Amateur

new through Heath research

$199.95

SAVE UP TO 50%
WITH HEATHKIT
QUALITY ELECTRONICS

NOTE: 6 METER VERSION MODEL HW-10 COMING IN JANUARY 1961

EXPECTED SHIPPING DATE
DECEMBER 4, 1960

NEW COMPLETE MOBILE OR FIXED 2-METER TRANSMITTER, RECEIVER COMBINATION . . . ALL IN ONE COMPACT UNIT

- Tracked VFO and Exciter Stages for single knob tuning
- Up to 10 watts RF output to antenna
- Built-in Low Pass Filter
- Built-in 3-way Power Supply for 117 V. AC, 6 V. DC or 12 V. DC operation
- Push-to-talk Ceramic Element Microphone

"PAWNEE" 2-METER TRANSCEIVER KIT (HW-20)

More features, quality, performance and versatility are designed into the new "Pawnee" to bring you the finest in *complete AM and CW facilities* on the 2-meter amateur band. The transmitter section features a built-in VFO with all frequency determining components mounted on a "heat sink" plate for temperature stability . . . plus, *four switch-selected crystal positions* for novice, CAP and Mars operation. VFO and all exciter stages are tracked for convenient *single knob tuning* over any 500 KC band segment (greater excursions require simple re-peaking of final). A *VFO "spot" switch* is provided for zeroing-in signals with transmitter off.

A *6360 dual tetrode final* RF amplifier provides up to *10 watts of power output* to the antenna and a *built-in low pass filter* is incorporated to suppress harmonics and other spurious radiation which might reach the antenna. The *dual purpose modulator* provides a full 10 watts of audio for *high level plate modulation* of the final RF amplifier or 15 watts of audio for *public address operation*, selectable with a push-pull switch.

The receiver is a *superheterodyne* using *double conversion* with the first oscillator *crystal controlled* for high stability. All oscillators are *voltage regulated*. The large, slide-rule type dial with *vernier tuning* provides ample bandspread for both receiver and VFO tuning. Also featured is an RF gain control, BFO, ANL, squelch, AVC on/off switch and *front panel tuning meter*. Meter is automatically switched to read received signal strength or relative power output. Meter and tuning dial are *edge illuminated* for high visibility.

A unique *built-in 3-way power supply* allows 117 VAC fixed station operation or 6 or 12 VDC mobile operation simply by using either AC or DC power cables furnished. The power supply uses heavy-duty vibrator system with silicon type rectifiers in bridge circuit configuration. All sections of the unit are *completely shielded* for maximum stability and noise-free operation.

The "Pawnee" comes complete with *built-in speaker*, two power plugs (AC & DC), heavy duty power cables, primary fused relay for mobile installation, mounting bracket and *push-to-talk* ceramic element microphone with coil cord and mounting clip. Cabinet measures 6" H x 12" W x 10" D.

Model HW-20...34 lbs....
..... $20.00 dn., $17.00 mo. **$199.95**

more exciting
HEATHGIFTS
to choose from

NEW PHONE AND CW TRANSMITTER KIT (DX-60)

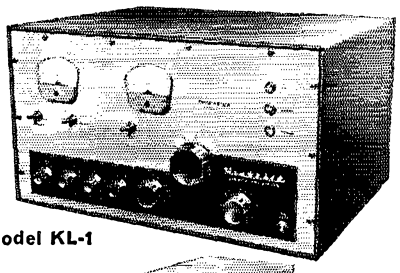
Model DX-60

This successor to the famous DX-40 offers far more than any other unit in its price and power class. Its smart modern appearance, clean, rugged construction and conservatively rated components all add up to ease of assembly and trouble-free operation. New features include a built-in low pass filter for harmonic suppression, neutralized final for high stability, grid block keying for excellent keying characteristics and easy access to crystal sockets on rear chassis apron. A front panel switch selects any of four crystal positions or external VFO. Modulator and power supply are built-in. Single knob bandswitching and the pi-network output provide operating convenience. A tune-operate switch provides protection during tune-up and a separate drive control allows adjustment of drive level without detuning driver. May be run at reduced power for novice operation. A fine kit for the beginner as well as general class amateur.

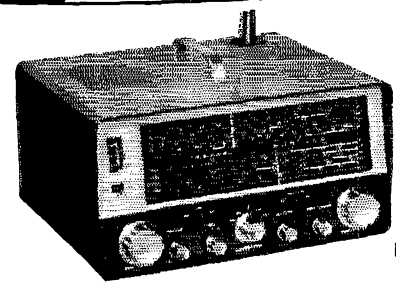
SPECIFICATIONS—Power input: 90 watts peak carrier controlled phone or CW. **Output impedance:** 50-72 ohm (coaxial). **Output coupling:** Pi-network. **Operation:** CW or AM phone—crystal or VFO control. **Band coverage:** 80 through 10 meters. **Power requirements:** 117 V 60 cycle AC, 225 watts. **Dimensions:** 13¾" W x 11½" D x 6¼" H.

Model DX-60...27 lbs....$8.30 dn., $8.00 mo..**$82.95**

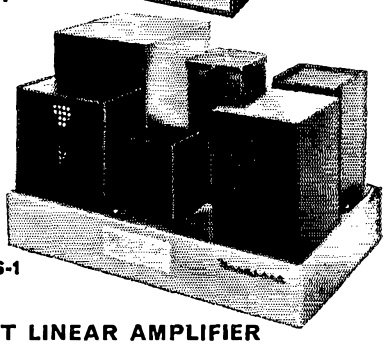
Look to HEATHKIT® by DAYSTROM *for the*



Model KL-1



Model GC-1A



Model KS-1

KILOWATT LINEAR AMPLIFIER & POWER SUPPLY KITS

The "Chippewa" and KS-1 power supply combination team up to bring you performance unsurpassed in amateur rig equipment at the lowest cost anywhere! Compare price, features and specifications with any other unit on the market today, and you'll see why any ham would be proud to call this pair his very own! It is the only kilowatt rig with oil-filled, hermetically sealed plate transformer and filter choke and features full kilowatt power in ALL modes of operation (1500 watt Class C capability on dummy load tests). Any of the popular AM, CW and SSB exciters can be used as a driver; provides maximum legal amateur power inputs on 80 through 10 meters, Class AB1 or Class C operation. Power input in Class AB1 attains 2,000 volts P.E.P. with much better linearity than can be obtained with lower plate voltages or other modes of operation.

Model KL-1 "CHIPPEWA" KILOWATT LINEAR AMPLIFIER..70 lbs...$40.00 dn., write for details..**$399.95**

Model KS-1 POWER SUPPLY...105 lbs. $17.00 dn., $15.00 mo. **$169.95**

ten transistor battery powered circuit!

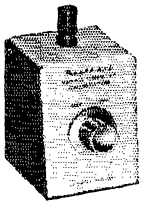
"MOHICAN" GENERAL COVERAGE RECEIVER KIT (GC-1A)

Many firsts in receiver design bring you complete portability, high sensitivity, selectivity and stability in this outstanding communications receiver. Features ten-transistor circuit, flashlight battery power supply, ceramic IF "transfilters," Zener diode voltage regulation front end, telescoping 54" whip antenna, S-meter, flywheel tuning and large slide-rule dial. Covers 550 kc, to 32 mc in five bands with calibrated bandspread scales (oscillator tuning) on amateur bands 80 through 10 meters, including 11 meter citizens band. Sensitivity is better than 2 uv for 10 db signal-to-noise ratio on amateur bands. GC-1A quickly converts from battery power to 117 VAC operation with plug-in power supply XP-2 for fixed station operation. 20 lbs.

Model GC-1A (kit)...$11.00 dn., $10.00 mo...**$109.95**

Model GCW-1A (wired)...$19.35 dn., $17 mo.**$193.50**

Model XP-2: 117 VAC power supply for GC-1..... 2 lbs.....**$9.95**

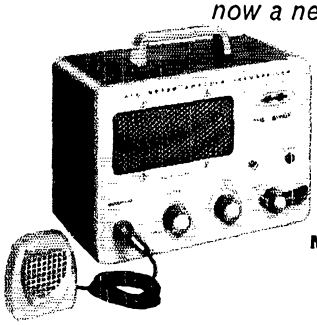


100 KC CRYSTAL CALIBRATOR KIT (HD-20)

Perfect for amateur or service shop use in dial calibration checks of communications receivers. Provides marker frequencies every 100 kc between 100 kc and 54 mc. Transistorized and battery powered for complete portability. Accuracy assured by .005% crystal furnished.

Model HD-20...1 lb.....**$14.95**

now a new improved 6 meter model joins this famous transceiver series



Model HW-29A

new through Heath research

2, 6 & 10 METER TRANSCEIVER KITS
(HW-30, 29A, 19)

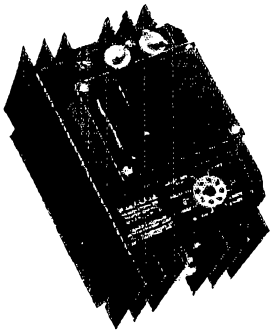
The new 6 meter HW-29A joins "Tener" and "Twoer" to bring you top transceiver performance at the lowest prices anywhere. Like the "Twoer," the new HW-29A multiplies to its output frequency from an oscillator using an 8 mc fundamental crystal for rock steady stability. All models have crystal controlled transmitters and tunable, super-regenerative receivers with RF preamplifiers. Receivers pull in signals as low as 1 uv and the 5 watt transmitter input is FB for emergency work or "local" nets. Features include transmit-receive switch, metering jack, ceramic element microphone, and two power cables. Less crystal. 10 lbs. each.

Model HW-19...(10 meter)..... **$39.95**
Model HW-29A...(New improved 6 meter version) **$44.95**
Model HW-30...(2 meter)..... **$44.95**

Attn. HW-29 owners: Convert your "Sixer" to the new improved "A" model by ordering this easy to install conversion kit. Allows use of 8 mc crystal for maximum stability.

Model HWM-29-1...1 lb..... **$4.95**

best values in Amateur Radio



Model HP-10

UTILITY AC POWER SUPPLY KIT (HP-20)

Furnishes filament, plate and bias voltages for converting Heathkit and other mobile amateur gear to fixed station operation. Delivers 120 watt ICAS DC plate power of 600 VDC @ 200 ma or 600 VDC @ 150 ma & 300 VDC @ 100 ma plus bias of —130 VDC @ 30 ma. Less than 1% AC ripple. 6.3 VAC @ 8 amps or 12.6 VAC @ 4 amps for filaments.

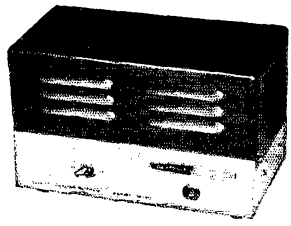
MODEL HP-20...10 lbs..... **$29.95**

MOBILE POWER SUPPLY (HP-10)

Heavy-duty, all semi-conductor circuit furnishes all power required to operate Heathkit mobile gear. With 12.6 v input supplies 600 VDC @ 200 ma or 600 VDC @ 150 ma & 300 VDC @ 100 ma, and —125 VDC @ 30 ma. 120 watt ICAS output rating. Extruded aluminum heat sinks provide efficient cooling of power transistors.

Model HP-10...10 lbs..... **$44.95**

new through Heath research



Model HP-20

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ITEM	MODEL NO.	PRICE

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☐ SEND MY FREE COPY OF YOUR COMPLETE CATALOG

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City_____ Zone____ State_____

Dealer and export prices slightly higher.

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UA3KNB W1TSZ K2MPU K4BYN K5HTG K6VKX W8NAN KØEMK DJ4JJ JA2AB SM5BFR
UA4IF W1WF K2PHC K4CEF K5IZM K6VVA W8NDC KØGPF DL7DE KR6JF SM7BPO
UA6LF W1YIS K2QAR K4CRF K5KET K6WSV W8OHV KØHUD DL9XY KX6CO SM7TV
UA9CM W1YU K2RDA W4GSM W5RVI K6ZMB W8OTI KØJAU DM2AHM KX6ZB SP5AA
VP5RR W2ASY K2TCD W4IEN W5VZU K7ABV W8TFU WØLJW EI3BD OA4KF UA1CK
ZL1APM K2AYC K2YGN K4IGD K6AUC W7AIB K9AVQ WØQDP F2EC OE1HZ UA9VB
ZL1ARY W2BLP K2YMO W4KJL K6BTU W7LYO W9BDQ WØSIJ F8DF OE2KF UAØOM
W2BXS W3AEM K4KJN K6BWX W7NNF W9DCN KØSLD FB8BD OE2UR UF6FR
•100 WA2CBB K3ERC K5LEU/4 WA6DTA W7OEB K9ELT WØWMH FF8BF OH6AA VP3MC
W1ALW W2ECU W3FTW W4NWJ W6EOT W7POC W9FPZ WØZSL FQ8AG OK2UD YU1DF
W1AOL W2EPZ W3GOQ K4PDT W6ERS W7SNA W9GJY VO2NA G3AEZ ON4FK ZC4BC
W1BB K2EVP W3HIB K4PHY W6EUV W7VOL K9KFS VE3AML G3GGF OZ2NU ZK2AD
W1BGH K2EYZ W3HQO K4SQX K6IAP KL7FAK K9LSN VE6HG G3JZV OZ4RT ZS1RK
K1GUD K2GWL W3JEJ K4TJL W6IMC KL7TI W9MIK VE7ANR G3KAD PAØMRN ZS5KU
W1LKG K2IZA W3KKO K4ZYU K6JGN W8AYV W9NGB VE8MX G3KRC PY1BDU ZS6RR
W1PCO W2KIN W3NQB W5ANE W6MFZ W8FDN W9UTV CN8FQ HA5BW PY3XE ZS6FR
W1PEA K2LIP W3QYG W5ARV W6OJW W8FIT W9WEN DJ2HH HA8WS SM4AEQ ZS6ZF

RADIOTELEPHONE

•297 PY2CK

•292 W8GZ VQ4ERR ZS6BW

•290 W3JNN W8BF

•289 W1FH W3RIS

•288 W6YY W8HGW W9RBI

•287 W6AM' W8PQQ ZL1HY

•286 W8KML 4X4DK

•285 W7PHO

•284 CX2CO

•283 W9NDA

•279 W4DQH

•278 ZL2GX

•274 W2BXA

•273 PY4TK

•271 W9WHM

•270 WØAIW

•268 W8BKP W9YSX

•267 W6GVM VE7ZM TI2RC

•266 EA2CQ G2PL

•265 W2ZX CN8MM

•264 LU4DMG

•262 W7HIA W9YSQ TI2HP

•261 W8DMD W8UAS

•260 W5BGP

•258 G5VT

•257 W8QJR HC1FG HIAMU

•256 W5KBU

•255 W3GHD

•254 W2JT KH6OR

•252 ZP5CF

•251 W3DHM W9RNX

•250 W4ANE W4HA CE2CC HIAUF

•249 HI8M

•248 W2OKM HB9J ON4DM

•246 W9BVX

•245 SM5ARP ZL1KG

•244 G3DO

•243 W6SYG WØGKL CO2BL

•242 W3ECR W3KT G3FNN G3HLS

•241 VE3QA PY4CB ZS6Q

•240 K4AIM

•239 W2HTI CO2BK DL7BA

•238 W1JCX W8VDJ DL3IR

•237 PY4ZS SM5LL

•236 W6OBH EA2CA OZ7FG

•235 W8JIN WØJYW

•234 PY2AHS

•232 W4QCW K6LAS

•230 W1ADM W1PST W2GLF W2PUN W5JUF W8ZET CT1PK PY4KL

•229 TG7AD

•228 W5ASG W7HTB W9QLH

•227 W4EEE W5HJA W9FDX

•226 W5TIZ SM3BIZ

•225 W2PTE W7ADS ON4RC

•224 VE3KF

•223 W4JGO W6ZEN CE3HL ZP5ET

•222 W2WZ W5VU

TI2LA VK5AB

•221 W6MBD W8JBI W9JJF W9LNM

•220 W1DCE VE2WW CX2AX

•218 W8NWO

•217 W4DCR W5PQA W5YLL

•216 W2JY W2LV W4ESP W4TFB W5EFC KV4BB 9K2AZ

•215 W1CLX

•214 W1LLF W8PUD

•213 W1OOS W3NKM W4TO W8WT DL3LL LA7Y

212 W5GXP VE3AIU CX3AA PY1AQT YV5AB

•211 K2CJN W6CHV W8EAP W9JLH HICTE PY1NC VK4FJ

•210 W1FZ W1GOU W2CKY W3MAC W4AZD W4NYN W5NMA WØQVZ CR6BX HIUA ZS1DO

•209 W3HIX

W4MKB W8TMA WØVSK

•207 W3FGB PAØHRO

•206 W4ADY W4OM

•205 W3AEV W4CFD W9RRX

•204 W3BES W8BGU W8CLR ON4SZ

•203 W4BWP W7MGT WØIEV

•202 MP4BBW

•201 W1GKK W5JJA W6NJU W6RCD F3DJ HB9NU PY7YS 5A5TO

•200 W2BQM W5ALA W5KC W8ZOK WØHX F9HF GI3IVJ ON4DH

•199 HB9ET

•198 W4GRP WØCPM

•197 W1JYH W5AFX W5ERY

•196 EA2CB G3AAE

•194 W3GEN W5MMK W0SYK

•193 W1BAN W3CGS W9HP

•192 K4BVQ WØFUH

•191 W1FPH W1WDD W6QOG W8SDR OZ3Y PY2JU ZL1PA

•190 W1YPK W4AAW W6TXL W6YMD W7EMP W7MBX KL7AFR W8IUA W8NGO W9PQA DL6VM F8CW SM5WJ

•189 LU8CW OE3ME

•188 W2LWC G3BID DL2UZ

•187 W1MMV K2JGG W9BEK ZL1PV

•186 K6EVR W8PWH CE3DY PY7VG

•185 W3FWD W9MKJ PAØNU

•184 W4EFX WØMLY WØZSZ PY4RJ

•183 W1FFO W5JRF DL7AA HIKDB

•182 W1EKU W2DEC W5GNG WØKOK EA4CX 9M2DQ

•181 W1HJB W2AEB

W2BYP W3VKD W4CWV W4SKO HK7LX

•180 W1JSS W5JCY W8NXF DL1LH DL1WP DL7CE G3AIZ HIZCT ON4PJ

•179 W6AED W8END W8MXS W6GEK G6RH

•178 W2KUW W3DPS WØAGO VE5RU DL7AB XE2FL

•177 W6FHR

•176 W4WSJ K5JEA K6LGF W7AUS DL3TJ ZL4BO

•175 W3EVW W3RUT W6BSY K6TXR YS1O

•174 W1HX W4PDL W0QGI ON4BX

•173 W1BEQ K4CTU W8JXM W9JAV CX3BH F8XP

•172 W1AUF W2UTH K4SXO W4VYP W8WZ W8GCN WØBFB VE6TF

•171 K2BZT W3DRD

W4VZU W5URU W9JUV CP5EK CT1MB DJ2YI G5RV PAØZD PY1AGP TI2EV

•170 W1KRS W1LSZ W2QKJ W3ICQ W4BOC W6CHY W7HXG DL7EX G2HAP ON4YI VK2JZ

•169 W1LIB W5RNG HB9FE HIRC

•168 W1VAN W8SZS W9LTR

•167 OE2YL 4X4RE

•166 W2HQL W3KVB GI3KVQ G2MI

•165 W9QNO VE7SB DL3EA G4JW HIRIF

•164 W7WDM W8MWL

•163 W2FXN W2LKW W2RGV W3HCO EA7GF G3KHE VQ4KRL

•162 W1BIH W2SNI W2TP W4DWN W5RHW K9EAB VE3MR G2AFQ G3BNC PAØFX YV5ARD

•161 W1PMZ W1UMC W2FXE W3AYD W3BIW W4DOU W4RVL W5IYU W8CQL W9HPS W9UZC HCQD PY1FR VR2BC

•160 W2HMJ W2WCY W2YYL W3AOH W6CLS W8HBI W8MRC K9ATZ KØCTL DL1IN DL6PC F9IL GC2RS PAØWWP ZK1BS

•159 W4BYU KICYF W8LAV W9SFR EA7EM

•158 W1YZG W3JZY W8AJH W9ICL OE1FF ZS6UR

•157 W4EEO EI3R G8QX

•156 W2BRV W6TZD W8EKW W9ZNY ON4MS

•155 K4EHA HIVS VP8SD

•154 HIZFF

•153 W1LHZ W2SUC W3QMG W7AHX K9KYF VE2YU SM5RY

•152 W1FAB W1OHJ W1UOP K2MGE W2RTX W5KFT W6YMV W6JWL W8CQL VE6NX CX1AK EI6X HB9EU HIBRN

•151 W1ARV W1GR K2RKN W5MZP W5RDA K8CFU W8RVU W8UMR KØACC VE1PQ HITBU

•150 K2FW W2GBC K2QQQ W3BUX W3BVL W3DJZ W6TOT W8OUH W8QNF EA1GH EA8AX GM3BCL OZ7OP ZS5PG 4X4GB

•149 W7SFK W8GNY WØVVV WØAIH/VE3 SP7HX

•148 W5HWX K9COS EA3CY GM3CIX TI2OE

•147 W2TVR W5BQJ W6MEL W6TT W8TJM WØGUV WØOBW VE1DR

•146 HB9JW

•145 WA2IZS W3RPG W4EBO

•143 W2YBO W4YQB W8GUZ CO8JK HIBAF HIZFT

•142 W1YXD K4HRG W4NBV W5SFT F8SK G3MCN HITHZ OQØPD OY7ML SM3AZI

•141 W2KR W3ALB W3DYT W3VSU W4TDW K5BEU W6BCQ W8GLK W9BVM VE3ES CX6BM F8MY TG9AL

•140 K1DRN W1ZSU K2JFV W3ROA W3SW W4VCB/3 W5WJQ W6HYG W6LHI W7DAA W8HOY W9FVU WØAMR WØDIB WØMCX CX1BY CX2CN F8VU TI2PI

•139 W9BZB CT1HF DL3VZ

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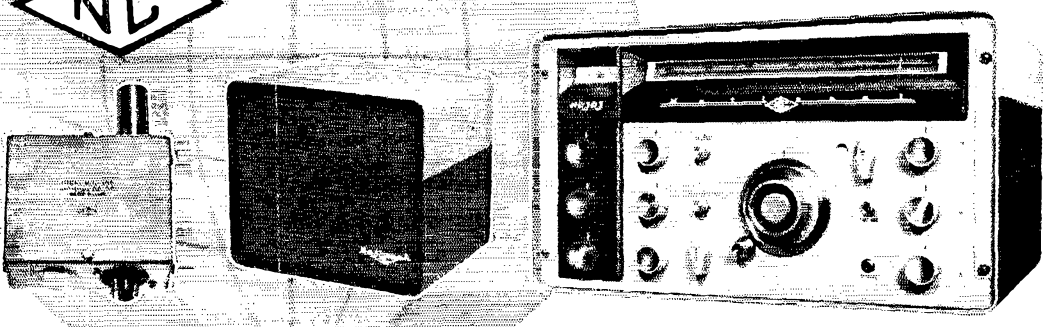


NATIONAL NC-303 SUPER RECEIVER plus FREE SPEAKER and CALIBRATOR

NC66 & RDF66

All Purpose Portable & Directional Finder

$139.90

3-way portable, ham, marine, SWL receiver 5 bands. Has built-in whip for shortwave. With RDF 66 can be used as a direction finder for small marine craft.

No. 45DX366 Portable alone $99.95
No. 45DX369 Finder alone $39.95

Regular Net **$494.90**
only $22 Monthly

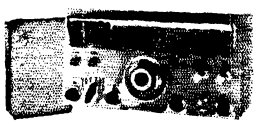
$449.00

★ *Front Panel SSB Selector!* ★ *Exclusive IF Shift Eliminates Detuning during Sideband Selection!*

Outstanding Radio Shack value! Imagine, the NTS-2 speaker and the NC-300 calibrator usually sells for $45.90 . . . but you get them both free with the purchase of this nationally famous National NC-303 Super Receiver. Many exciting features are included along with the new Q multiplier that eliminates any interfering signals. 19½" W x 11¼" H x 15" D. Sh. wt. 70 lbs.

No. 50DX521 Receiver, Speaker, Calibrator $449.50

NC 270 DOUBLE CONVERSION RECEIVER



$249.00

Matching NTS-3 Speaker
No. 44DX571 .....$19.95

Instant sideband selection, with patented "Ferrite Filter", provides for upper and lower sideband tuning with special linear heterodyne detector. Wt. 35 lbs.

No. 44DX750 Double Conversion Receiver $249.00

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HQ-100 VERSATILE LOW PRICE RECEIVER

Direct Dial Calibration, Built-in Q-Multiplier

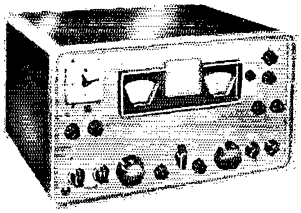
ONLY $10 DOWN

$189.95

$9.50 Monthly

Outstanding Special! Continuously tunable from 450 kcs to 30 mcs; Q-Multiplier permits continuously variable selectivity! Noise limiter; electrical bandspread tuning with dial markings every 10 kcs on 80, 40 and 20 meter bands; every 20 kcs on 15 meter band; every 50 kcs on 10 meter band. Voltage regulated and temperature compensated. 10 tube Superhet. 16¼" x 9 7/16" x 9⅛". D. Sh. wt. 33 lbs.

No. 45DX285 HQ-100 .....$189.95
No. 45DX286 HQ-100C w/clock $199.00



HQ-170 SSB Receiver

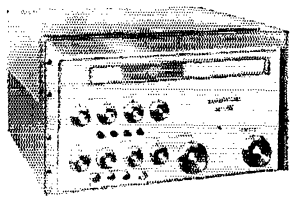
$359

Popular Model HQ-170 features SSB/CW and AM/MCW reception. Dial coverage of 6, 10, 15, 20, 40, 80 and 160 meter amateur bands. 17 tubes, triple conversion with IF freq. 3035, 455 and 60 kcs. for excellent image rejection. Automatic noise limiter. Sh. wt. 45 lbs.

No. 45DX292 HQ-170 .....$17 Monthly....$359.00
No. 45DX298 HQ-170C w/clock ....$17 Monthly....$369.00

HX-500 SSB Transmitter

$695



HX-500 features 100 watts of undistorted performance! Superb for amateur and commercial users! Bands covered: 80, 40, 20, 15 and 10 meters. TVI proofed. Complete, no extras to buy! Sh. wt. 100 lbs.

No. 45DX279 HX-500 .....$33.50 Monthly.....$695.00

Hammarlund Versatile Receivers

No. 45DX287, Sh. wt. 37 lbs. 12 tube Receiver HQ-110. $11.50 Monthly **$249.00**

No. 45DX273, Sh. wt. 53 lbs. Best SSB Receiver HQ-180. $20 Monthly **$429.00**

No. 45DX294, Sh. wt. 49 lbs. General Receiver HQ-145. $12.50 Monthly **$269.00**

ALL MODELS $10.00 EXTRA WITH CLOCK.

MATCHING SPEAKERS

No. 45DX291, S-100, For HQ-100, HQ-110, HQ-145. **$14.95**

No. 45DX296, S-200, For HQ-170, HQ-180. .....**$19.95**

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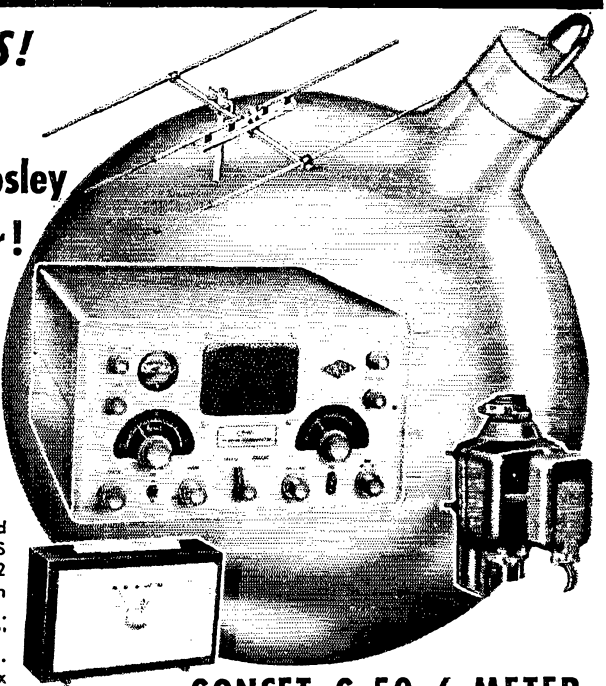
GONSET G-28 10 METER COMMUNICATOR – PLUS Mosley A-310 Antenna Alliance Rotor!



Mfrs. Net $371.95

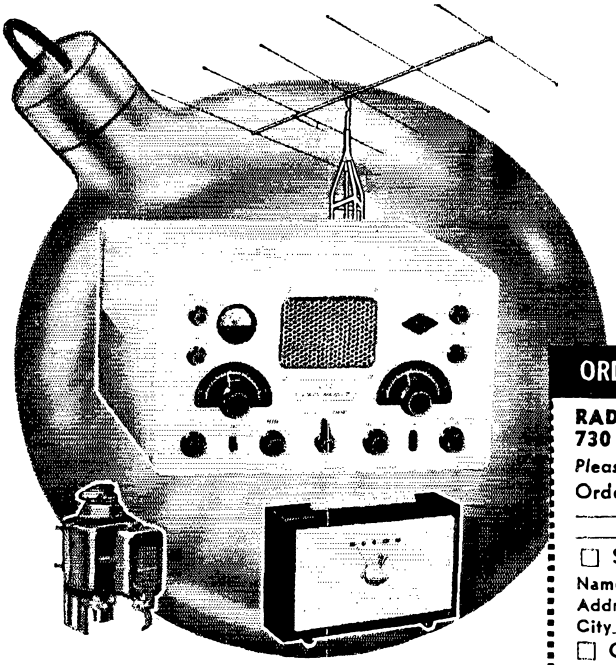
$319.00

Only $14 Monthly

SAVE $53

Complete 10 meter station: transmitter, receiver and 115V AC power supply in one compact unit! PLUS superb Mosley A-310 10 Beam with Alliance T-12 "Tenna-Rotor!" 50W transmitter uses #6146 tube with pi network output. Highly stable VFO to aid tuning. Double-conversion receiver has adjustable "squelch," noise limiter and "S" meter. Coverage is 28-29.7 mcs. Good looking, compact housing: 13" W x 7½" H x 12½" D.

No. 50DX531 G-28 Ship. wt. 35 lbs. $319.00



GONSET G-50 6-METER STATION PLUS Hi-Gain 65B Antenna and Alliance Rotor!

$339.50 *Mfrs. Net $393.30*

$15 Monthly

Virtually identical to G-28 in size, appearance and general technical characteristics. 48W transmitter uses 6146 tube, pi network output, cal. VFO (or optional crystal), 115V AC power supply. Package is complete with Hi-Gain 65B Beam and highly efficient Alliance T-12 "Tenna-Rotor."

No. 50DX532 G-50 Ship. wt. 35 lbs. $339.50

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HIGHLY SENSITIVE MODEL SX-111 RECEIVER

Ham Bands Only!

Only $11.50 Monthly **$249.95**

Exceptionally fine receiver with sensitivity of 1 μV on all bands; 5 steps of selectivity from 500 to 5000 cps. Dual conversion, selectable sideband. Covers 80, 40, 20, 15 and 10 meters; a 6th band tunable to 10 mc. for crystal calibration with WWV. Term. for 3.2 and 500 ohm speakers; "S" meter electrical adjustment. 10 tubes plus v-regulator and rectifier.

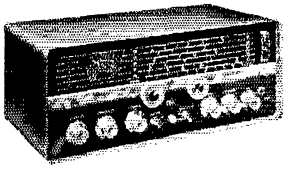
No. 45DX325 SX-111 Sh. wt. 40 lbs. $249.95

MODEL HT-37 TRANSMITTER
Low Priced SSB Transmitter

Only $21 Monthly **$450.00**

Amateur band transmitter with SSB, AM or CW output on 80, 40, 20, 15 and 10 meters. Instant CW calibration from any mode, precision V.F.O., 52 ohm pi network output for harmonic suppression. 12 tubes, 2 rectifiers and v-regulator.

Ord. No. 45DX349 HT-37 Sh. wt. 80 lbs. $450.00

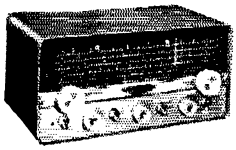


MODEL SX-110 RECEIVER

$7.50 Monthly **$159.95**

Crystal-filtered for precision tuning. 1 RF, 2 IF stages; sep. bandspread tuning condenser; broadcast plus 3 shortwave bands. 7 tubes; rectifier. 105-125 VAC; 50/60 cy.

No. 45DX324 SX-110 Sh. wt. 32 lbs. $159.95



MODEL S-107 RECEIVER

$5 Monthly **$94.95**

Model S-107 combines quality workmanship with impressive specs at a low price! Features broadcast bands from 540 to 1630 kc plus 4 SW bands; sep. electrical bandspread; AM/CW switch; PM speaker. 7 tubes plus rectifier.

No. 45DX322 S-107 Sh. wt. 18½ lbs. $94.95

MATCHING SPEAKER for Hallicrafters Receivers. Fidelity switch permits selection of music or voice response.

No. 45DX385 R-48 .....$19.95

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DELUXE

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STANDARD $99.95

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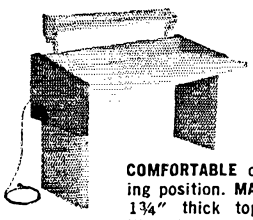
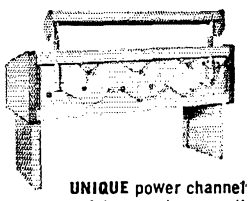
NEW!

PRE-ENGINEERED HAM EQUIPMENT CENTER With 8 AC and 3 RF Outlets!

Bring the ham center up out of the cellar — let the whole family share in the fascinating world opened up by global communications. The handsome styling of this functional unit fits well in any decor. It will surely appeal to the XYL and neatly organize equipment and cables. Deluxe model: two tone grey, gleaming white formica top, vinyl trimmed ends. Long lasting baked enamel finish.



COMFORTABLE operating position. **MASSIVE** 1¾" thick top 26" W. x 60" L. provides room for everything!



UNIQUE power channel safely encloses all wiring, relays, etc. Room for power supply, etc.

CONVENIENT "big switch" with indicating fuse holder and neon pilot light.
THREE wire detachable line cord brings in all power — insures proper grounding.
POWER channel has eight 110-volt outlets, 4 above top and 4 below; grounding contact . . . eliminates makeshift outlets.
DELUXE model equipped with 3 SO-239 RF antenna lead connectors.

DELUXE STATION FACILITY . . . complete with formica top, trimmed ends, shelf and all electrical and mechanical features listed above.
No. 44DX629 Ship. wt. 190 lbs. $139.95

STANDARD STATION FACILITY OR WORK BENCH . . . masonite top, standard steel ends and all applicable features as described above.
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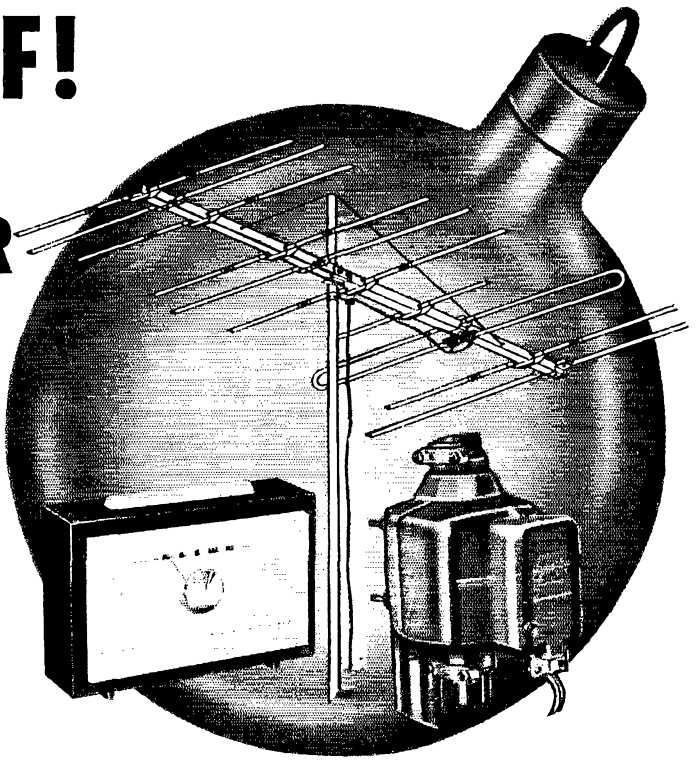
Finco, Alliance BEAM-ROTOR ANTENNA with control!



Reg. Price $76.55

$56.55

Only $5.00 Down

Shipping weight 27 lbs.

Superb new package provides easy, dependable antenna operation at lowest cost! New Finco A-62 6 and 2 meter combination antenna consists of: 6 Meter; 1 folded dipole, 1 reflector, 2 directors (4 elements) . . . 2 Meter; 1 folded dipole plus special phasing stub, 1 3-element Collinear reflector, 4 3-element Collinear directors (18 elements). Front-to-back ratio at 6 and 2 meters is exceptional, as is the forward gain. Features heavy duty square 10 ft. aluminum boom, Famous Alliance T-12 "TennaRotor" included to assure dependable positive-direction rotation. Features direction dial, "touch-bar" operation. EXTRA . . . 100 ft. of 300 ohm twin lead . . . 75 ft. of rotator cable!

No. 50DX526 .....$56.55

- ★ Assembly in Seconds
- ★ Sleeve Re-enforced Elements
- ★ Touch Control Operation
- ★ All Lead Wire Included

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Please send me, Order No. 50DX526, which includes Finco Model A-62 Antenna, Alliance T-12 TennaRotor, 100 ft. 300 ohm twin lead and 75 ft. rotor cable. ☐ Send FREE 192 Page 1961 Catalog

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2 Complete 10-15-20 Meter Systems!

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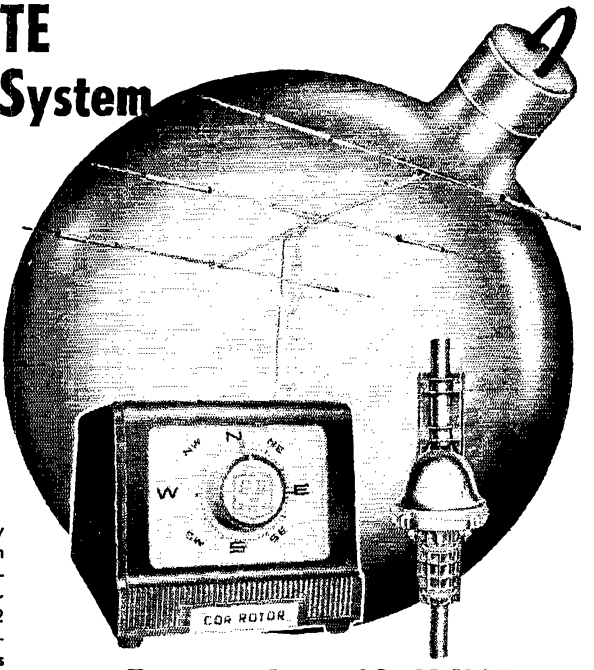
- ★ Coax Connector Type PL-259



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$6 Mo.

$111.95

Reg. Value $147.03

MOSLEY TA-33 Multi Band Antenna. Is exceptionally broad banded for excellent results over full Ham bandwidth. Good forward gain, excel. front-to-back ratio, 3 element beam, SWR1.1/1, max. element length 28', boom length 14'. Fabulous AR-22 is the ultimate in heavy-duty rotors. Handsome cabinet with control dial, 4 wire cable; easily handles 150 lbs.

No. 50DX506, TA-33, Ship. wt. 76 lbs. $111.95

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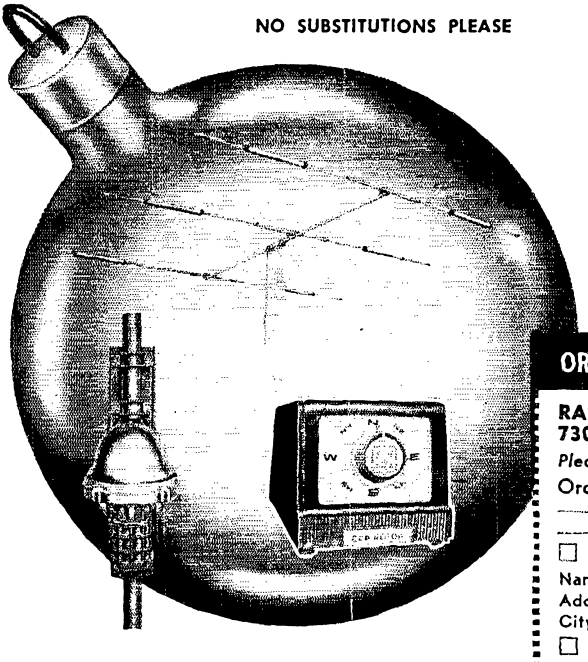

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PAØDOK
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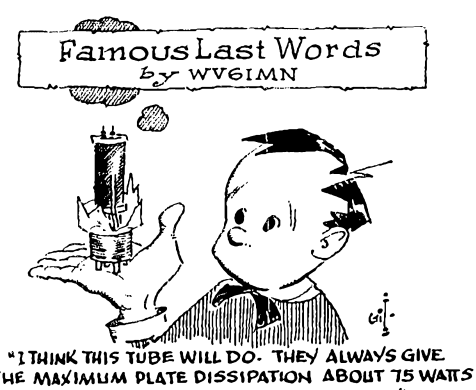
VQ2RB
XE1AE
ZL4HE
ZP5KQ
ZS1KO
ZS8I

Strays



ZS2OB ain't — she's a YF!

—·—·—

Radio amateurs living within a radius of 50 miles of Kansas City, Mo., have Ben Walker, KØAEU, to thank for their free copies of the third edition of the Kansas City Area Call Book. It lists calls alphabetically, giving name, QTH and phone number; also lists hams by last name; and includes a list of all nets operating in the area, all known clubs and their meeting times, and all mobile stations. Ben sparks the project which is sponsored by HARC.

—·—·—

Two members of the River Park ARC in Chicago are W9TPQ and K9TPQ.

—·—·—

K5QNZ served as youth governor of Oklahoma, being elected in April of this year.

AN APPEAL TO INTELLIGENCE

A product that is consistently advertised in *QST* month after month, year after year, has to be good. Over 10,000 GOTHAM antennas have been purchased by *QST* readers. Even the "price-is-no-object" customers choose GOTHAM antennas on the basis of performance and value. Select your needs from this list of 50 antennas:

Airmail Order Today—We Ship Tomorrow

GOTHAM Dept. QST
1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

TWO BANDER BEAMS

A full half-wave element is used on each band. No coils, traps, baluns, or stubs are used. No calculations or machining required. Everything comes ready for easy assembly and use. *Proven Gotham Value!*

6-10 TWO BANDER.....	☐	$29.95
10-15 TWO BANDER.....	☐	34.95
10-20 TWO BANDER.....	☐	36.95
15-20 TWO BANDER.....	☐	38.95

TRIBANDER

Do not confuse these *full-size* Tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is broad banded. It does not have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

☐ 6-10-15 $39.95 ☐ 10-15-20 $49.95

2 METER BEAMS

Gotham makes only two different two meter beams, a six-element job and a twelve-element job. They are both Yagi beams, with all the elements in line on a twelve foot boom.

☐ Deluxe 6-Element 9.95 ☐ 12-El 16.95

6 METER BEAMS

New records are being made every day with Gotham six-meter beams. Give your rig a chance to show what it can do, with a Gotham six-meter beam.

☐ Std. 3-El Gamma match	12.95	☐ T match	14.95
☐ Deluxe 3-El Gamma match	21.95	☐ T match	24.95
☐ Std. 4-El Gamma match	16.95	☐ T match	19.95
☐ Deluxe 4-El Gamma match	25.95	☐ T match	28.95

10 METER BEAMS

Ten meter addicts claim that ten meters can't be beaten for all-around performance. Plenty of DX and skip contacts when the band is open, and 30-50 miles consistent ground wave when the band is shut down. Thousands of Gotham ten meter beams have been perking for years, working wonders for their owners, and attesting to the superior design and value of a Gotham beam.

☐ Std. 2-El Gamma match	11.95	☐ T match	14.95
☐ Deluxe 2-El Gamma match	18.95	☐ T match	21.95
☐ Std. 3-El Gamma match	16.95	☐ T match	18.95
☐ Deluxe 3-El Gamma match	22.95	☐ T match	25.95
☐ Std. 4-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 4-El Gamma match	27.95	☐ T match	30.95

CITIZENS BAND ANTENNAS • Any of our ten meter beams or the V40 vertical is perfect for the CB operator.

FREE GIANT 1960 CATALOG

Name.....
Address.....
City.....Zone.....State.....

New! Ruggedized 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

☐ Beam #R6 (6 Meters, 4-El)....$38.95
☐ Beam #R10 (10 Meters, 4-El).. 40.95
☐ Beam #R15 (15 Meters, 3-El).. 49.95

15 METER BEAMS

Fifteen meters is the "sleeper" band. Don't be surprised if you put out a quick, quiet CQ and get a contact half-way around the world. Working the world with low power is a common occurrence on fifteen meters when you have a Gotham beam.

☐ Std. 2-El Gamma match	19.95	☐ T match	22.95
☐ Deluxe 2-El Gamma match	29.95	☐ T match	32.95
☐ Std. 3-El Gamma match	26.95	☐ T match	29.95
☐ Deluxe 3-El Gamma match	36.95	☐ T match	39.95

20 METER BEAMS

A beam is a necessity on twenty meters, to battle the QRM and to give your signal the added punch it needs to over-ride the high power boys. Hundreds and hundreds of twenty meter beams, working year after year, prove that there is no better value than a Gotham twenty meter beam.

☐ Std. 2-El Gamma match	21.95	☐ T match	24.95
☐ Deluxe 2-El Gamma match	31.95	☐ T match	34.95
☐ Std. 3-El Gamma match	34.95	☐ T match	37.95
☐ Deluxe 3-El Gamma match	46.95	☐ T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax. T-match beams use 300 ohm line.)

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 talking about.

Wishing you the best for 1959, I am

Sincerely yours,
Thomas G. Gabbert, K6INI (Ex-TI2TG)

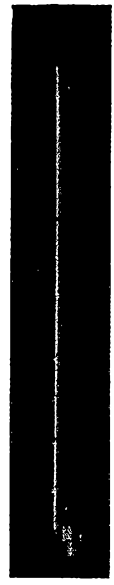
FACTS

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



YOU COULD WORK WONDERS WITH A GOTHAM VERTICAL ANTENNA!

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.

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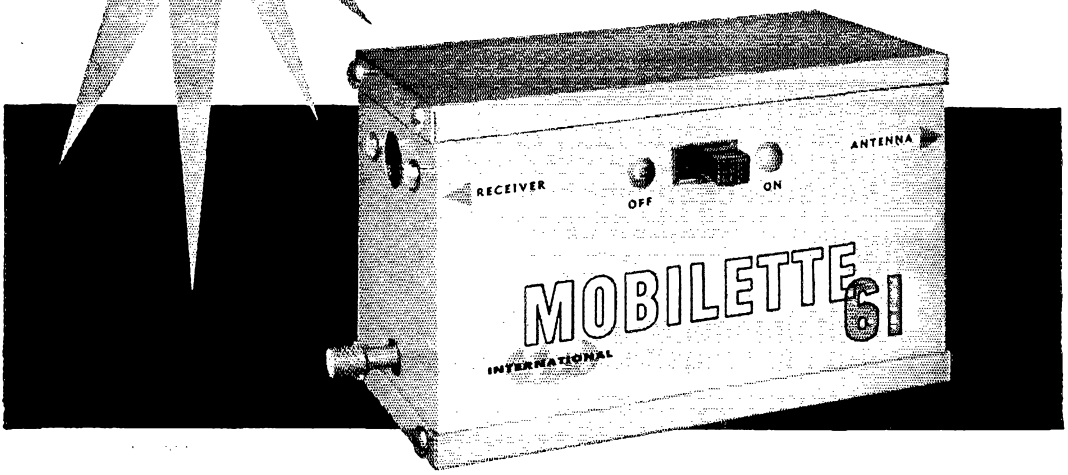
Address.....

City.....Zone.....State.....

AMATEURS

CITIZEN LICENCEES

MOBILETTE 61



MOBILETTE 61, International's *new improved* all transistor, crystal controlled converter provides a "quick and easy" way to convert your car radio for short wave reception. **MOBILETTE 61,** units cover a specific band of frequencies providing a broad tuning range. Mobilette units are miniature size and quickly interchangeable.

Check these all New features . . . New and improved circuit for increased gain . . . New internal jumper for positive and negative grounds . . . New RF amplifier, mixer/oscillator . . . New separate input for broadcast and short wave antennas . . . Mounting bracket for under dash installation.

MOBILETTE 61, is available in a wide choice of frequencies covering the Amateur bands 75 through 6 meters, Citizens band. Civil Air Patrol

CIVIL AIR PATROL AMATEURS CITIZEN LICENCEES

...with improved circuit

for mobile short wave reception

Write for International's complete catalog of precision radio crystals, and quality electronic equipment—yours for the asking.

18 NORTH LEE • OKLAHOMA CITY, OKLA.

low band frequencies, WWV time and frequency standards. Any frequency in the range 2 MC to 50 MC available on special order.*

Designed for 12 VDC, MOBILETTE 61 will operate on 6 VDC at reduced output. Power connector plugs into cigarette lighter socket.

See the MOBILETTE 61 at Your Dealer Today.

Mobilette 61 units cover these short wave frequencies.

Catalog No.	Frequency
630 - 110	6 meters (Amateur) 50 - 51 MC
630 - 111	10 meters (Amateur) 28.5 - 29.5 MC
630 - 112	11 meters (Citizens) 26.9 - 27.3 MC
630 - 113	15 meters (Amateur) 21 - 21.6 MC
630 - 114	20 meters (Amateur) 14 - 14.4 MC
	15 MC (WWV)
630 - 115	40 meters (Amateur) 7 - 7.4 MC
630 - 116	75 meters (Amateur) 3.8 - 4.0 MC
630 - 117	10 MC (WWV)
630 - 118	CAP (Low Band)
630 - 119	Special Frequencies 2 MC - 50 MC

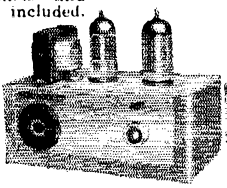
Complete, ready to plug in and operate . . . . only $22.95

**Special frequencies 2 MC -50 MC.....only $25.95*

Join Our 25th Anniversary

GIVE GLOBE GIFTS

The Globe SM-90 Screen Modulator is the perfect gift for the owner of Globe's Chief Deluxe. Permits radio-telephone operation at minimum cost. Self-contained. Printed circuit board, all parts and complete instructions are included. Kit only, $11.95.

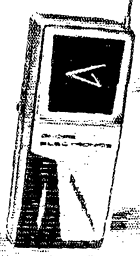


ONLY 10% DOWN

HOLIDAY TRADE-INS

AROUND THE YEAR

The new Globe Pocketphone 2-way Citizens Band Radio will fit as easily in the stocking as it does in your pocket. Transistorized. No license required. Pocketphone to Pocketphone. Range — ½-1 mile. Rechargeable battery. Weighs only 13 ounces. $125 each.



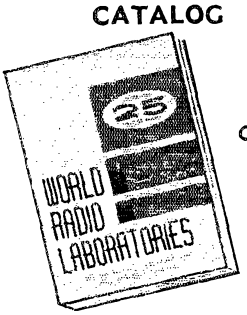
New Time Payment Plan!

Ideal Christmas companion to the Scout Deluxe is the Globe VFO-755A, for 10-160M, complete with power supply with voltage regulation. Output on 40 & 160M. Vernier drive. 14:1 tuning ratio. Approx. 50 RF volts output. Temperature compensated. Wired at $59.95. In kit form, $49.95

Globe's 90w bandswitching Chief Deluxe now has new circuitry. A powerful, compact, handsome transmitter with power supply built-in. *Numerous features* include choice of cathode or grid block keying, easy plug-in receptacles for addition of modulators and VFO. Wide range Pi-Net. *Multi-colored* kit *diagrams*. Put it under the tree for $79.95, unless price increased, in wired form. $59.95 as a kit.

The Latest Yule Surprise is the 90w CW-5w Fone Globe Scout Deluxe, a smartly styled, versatile transmitter with built-in power supply. Outstanding features include straight through operation of final amplifier, high level plate modulation, wide range pi-net on 10-80 meters, link coupled on 6 meters with front panel adjustment. Completely wired, only $159.95.

SILVER ANNIVERSARY CATALOG



Over 200 Pages of excellent bargains for the novice, the technician and the advanced amateur. Fully illustrated. Includes the complete service story on World Radio.

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SAVINGS UP TO on Reconditioned

WRL'S huge Reconditioned Equipment Department carries more than 1000 items continually in stock, with turnover of nearly 500 pieces each month. Whenever you buy from WRL's reconditioned department, you are assured that your gear has been thoroughly checked, re-

Christmas Celebration

WRL

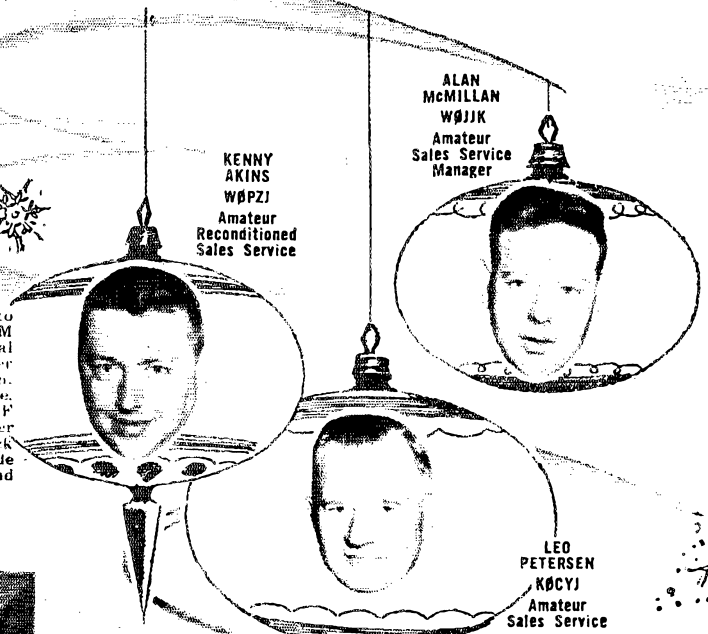
Make this Christmas the finest ever — shop the World Radio way during our Silver Anniversary. What could be more fun on Christmas morning than discovering one of these fine Globe Products under your tree? Better yet, they're yours for only 10% down with budget terms under WRL's new Easy Payment Plan.

With 23 hams to serve you, WRL offers maximum trade-in prices, prompt shipment and close personalized attention to your needs. Take a look at our Reconditioned Equipment Story below, too. Then send for our latest lists of the best used gear with guaranteed factory-new operation.

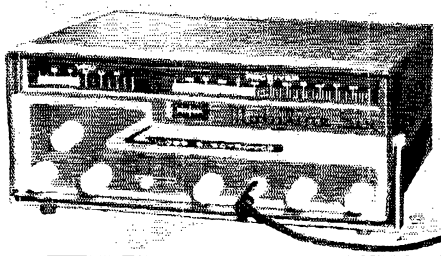
And of course . . . a very Merry Christmas from

"Hams to serve your Ham needs"

Globe's Universal Modulator UM-1 is a Class A or AB-2 modulator matching output impedances of 500-20,000 ohms. Supplies up to 40w audio with proper tubes. May also be used for driver for higher power modulator. Give the UM-1 and the Chief Deluxe together. In kit form (less tubes), $34.95. Completely wired, with tubes, $49.95.



The new Mobiline Six is Santa's answer to those wishing a complete transceiver for 6M mobile or fixed station use. Offers crystal or VFO control with 20w input. Power supply included for 6-12-115 V operation. Weighs approximately 20 lbs. with 5x12" face. Receiver portion includes 7 tubes and RF stage, with squelch control. Transmitter portion has voltage regulated VFO, shock mounted. "S" Meter, tuning meter, slide rule dials. Only $229.95 with 10% down and easy payment plan.



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paired, aligned and tested by the five-man technician team at WRL. In short, this equipment will operate as if it came directly from the factory line. With the great demand and subsequent turnover, new lists must be prepared each month. Send for your free lists today.

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LEO: PLEASE SEND: ☐ FREE CATALOG ☐ LATEST RECONDITIONED EQUIPMENT LISTS, AND ☐ COMPLETE INFO ON THE GLOBE LINE.

NAME: _____

ADDRESS: _____

CITY & STATE: _____ CALL: _____

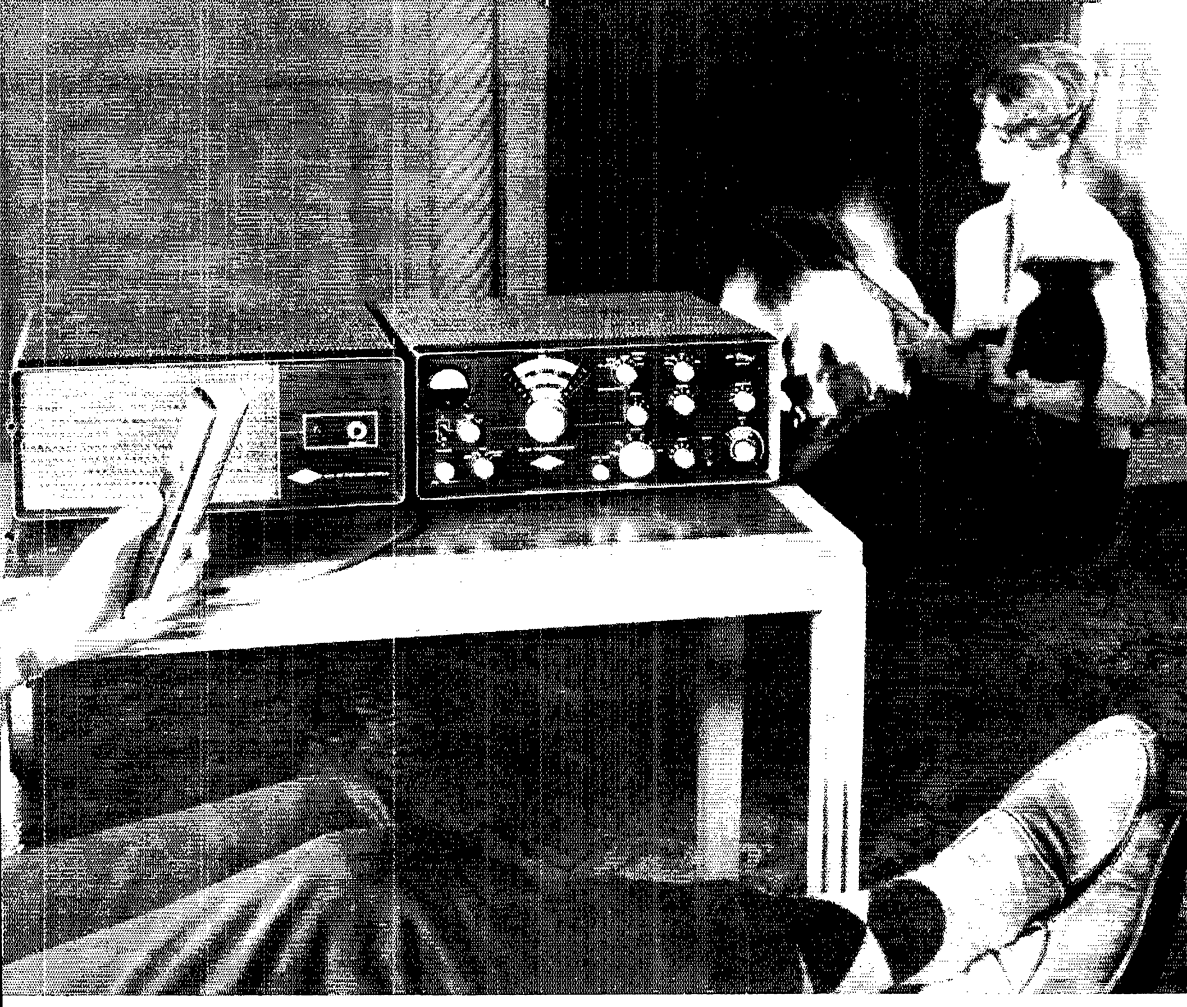
color slides in 3D. The Steel City ARC (KWH) reports via "Kilowatt Harmonies": K3JVM received his General Class license; SDV is a music instructor; the club station participated in the Sept. V.H.F. Party. RTV, WHA and NER conducted a mobile test on 10 meters for the Verona Boro Auxiliary Police with good success. The Washington County ARC Net meets every Sun. at 1330 EST on 3850 kc. The Cumberland Valley ARC reports via "Valley QRM": Club members operated in the Sept. V.H.F. Contest using the call ZQU/3 with good success; club officers are RIH, pres.; FMK, vice-pres.; ACH, secy.-treas.; ZUX, act mgr.; regular club meetings are held every 4th Sat. The Nittany ARC reports via "QST de K3HKK": The club has a new club house; the ELT/3 expedition to Forest County was a success with ELT, K3CLX, K3JZT, K3LUX and K3AKR participating; MGP is working DX; the Centre County Six-Meter C.D. Net meets on 50.380 Mc. each Sat. at 2100 local time; the club station participated in the Sept. V.H.F. Party with SYY, WFZ, JTS, K3AKR, K3MMB and K3LVA. The Allegheny-Kiski Amateur Radio Assn. (AKARA) meets at the Greenwald School in New Kensington on the 3rd Fri. of each month. The Foothills Radio Club's new location is at the Old Pleasant Valley School House. PHH recently became a father. K3GQW is a Capuchin Friar located at Herman, Pa. He operates the rig at St. Mary Monastery in six foreign languages. Traffic: W3WRE 124, KUN 77, MFB 54, NUG 29, K3GHH 8, W3YA 6, K3COT 4.

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. The Central Division Convention Committee announced that the 1961 Central Division Convention will be held in *Springfield, Ill.* Aug. 26 and 27 at the St. Nicholas Hotel. Many an eyeball QSO was encountered at the recent Central Division Convention held in Indianapolis, which was very well attended and at which an FB program was presented. GSB, MVQ, PVD, EDJ, NFO, WGT, K9ADU, ABI, TNG, LUG, TQJ, TRM, GII, KKN, K9BYO and K9GXT have been moved from the Chicago Area to Springfield because of the relocation of the Illinois Bell Telephone Company personnel. PRN, K9LVB, K9SBB, K9KKL and PPM were elected as the new officers of the Sangamon Valley Radio Club, Inc. MCE and KMD have replaced their "plumber's delight" beam with a new Mosley TA33 and are now bringing in the hard-to-find DX. DL4PI/K9EPU is waiting for his return to civilian life and will be back with the Chicago gang very soon. K9BJM, K9AIU and HAE are working the bands with Heathkit Sixers. The recently-elected officers of the Quigley Seminary Radio Club (Chicago) are K9KPT, K9QMJ, K9VCU and KN9VCZ. New appointees this month included K9QPJ, ZTK and K9TVA as OBS and K9KXP as OO. LGH has received his DXCC certificate and K9OZM finally snagged his WAS. New Novices heard are KN9VVX, KN9ARV, KN9ZKN, KN9ZBF and KN9ZUA. K9OCU's new beam is now mounted on a 36-ft. pole. K9BQW is sporting a new GSB-100 and K9AMC is using the new W9TO keyer on c.w. DX. A new club has been formed called the Chain of Lakes Radio Club, Inc., with K9JJD, K9QNV, KN9YXC and K9MZB as officers. The club station is ADZ. NSA, BBR, DQX and MRJ have new HT-37s. CN now is s.s.b. The ARRL Executive Committee has approved affiliation of the South Shore High School Radio Club. K9WEH received his General Class license and a Heath Apache the same day. Ken Audley, ex-APY/ARC, of Rockford, passed away on Sept. 17, and this column offers sympathy to members of his family. The North Central Phone Net handled 176 pieces of traffic during September, a cording to Net Manager K9QYW. IDA is the only one to make the BPL this month. Traffic: (Sept.) W9IDA 1527, K9UGY 365, BTE 351, W9DO 226, K9OZM 214, W9MAK 121, JXV 73, K9IVG 71, W9SXL 60, K9QAE 41, QYW 40, OAD 37, UOV 34, W9AEZ 20, K9RAS 20, W9VAR 16, K9JJD 12, W9PRN 12, QQG 11, JJN 6, K9RHU 6, BIV 5, W9ICF 5, SKR 4, K9LLA 3, QNJ 3, IYV 2, OCU 2, QPJ 2. (Aug.) W9FAW 41, K9OCU 4.

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC. SEC: SNQ. PAMs: K9AOM, W9BKJ, RVM and UKX. RMs: DGA, FJR, TT and VAY. Net skeds: 1FN 0900 daily and 1830 M-F on 39.10 kc.; ISN (s.s.b.) 1930 daily on 3820 kc.; QIN (training) 1800 M-W-F on 3756 kc.; CAEN (160 meters) daily at 1900 on 1805 kc. New appointments: KØYGN/9 as EC for Howard County. K9HZY is OO Class III and IV, and K9LQX is OES. A new publication serving Northern Indiana is *The Radio Amateur's News Carrier.*

(Continued on page 142)



WHEN WINTER COMES... G-76

When there's a chill in the air... when thoughts of sunny summer's mobile operations are crowded out by less pleasant, but highly pertinent considerations of anti-freeze—and windshield wipers that haven't yet been fixed. This is exactly the time to consider the addition of a new Gonset G-76 100 watt, 6 band transceiver to your worldly goods! A most pleasant traveling companion when your activities trend toward mobile, G-76 is also right at home... when winter comes.

There's real pleasure in store for you in home operation of equipment with the versatility of G-76. Just connect this powerful little gem to your available antennas—load up—operate! Have you tried 75 lately? Or 40? It may also come as a pleasant surprise to find that your G-76 will give the same lively performance on 6 meters as on the other five widely used 10, 15, 20, 40 and 80 meter bands. Like to keep your hand in with a little CW? G-76 has good clean keying characteristics, a stable BFO in its receiver.

Handsome too. Functional, industrial-designer styling, blending, subdued-tone finishes. These are some of the many features that make G-76 as welcome in your fine living room as it is in your new car.

G-76.....Model #3338.....376.25
less power supplies

117V AC power supply in combination with speaker in matching cabinet.....Model #3349.....145.00

Compact 12V DC transistorized power supply for mobile operation. (Negative ground only)....Model #3350.....145.00

Dual conversion receiver • BFO for SSB and CW reception • Automatic Noise Limiter • Excellent sensitivity: 1 uv for 6 db S+ N/N ratio • Excellent selectivity: 3 to 3.5 kc bandwidth at 6 db down; 14 kc or less at 60 db down • Transmitter and receiver oscillators temperature controlled, have VR tubes... have low drift even with wide variation in both plate and filament voltages • Transmitter has highly stable VFO for all bands except 50 mc*... crystal control may also be used • Transmitter power input 100 watts AM phone; 120 watts CW • 6DQ5 Final Amplifier operates into pi-network matching system • Push-to-talk control, or by T-R switch on panel • Tuning meter on panel • Compact... only 12⅝"W, 5⅛"H, 11½"D.

* crystal control

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Editors are K9GSV and K9ORZ. EDO has been awarded a CWA certificate for 50 w.p.m. copied in long hand. A new call in Kokomo is K9ARW, the son of HUF. Among the fine representation from the League at the Central Division ARRL Convention was President Dosland, who presented Indiana's Outstanding Amateur Award to AYW. This annual award is sponsored by the Indiana Radio Club Council and the amateur is selected by an out-of-state club based on letters submitted to the chairman of the council. Name and call letters are deleted before the judging. Kent was chosen for services rendered, station maintenance and improvement and his faithful and untiring contribution to amateur radio in general. Field Day plaques were awarded to the Michiana Amateur Radio Club for the highest score on any one transmitter, 3699; to the Michiana V.H.F. Club as 6-meter winner; and to the Duneland Amateur Radio Association as 2-meter winner. Through error K9VRU was not listed in May traffic as receiving BPL on having a traffic count of 204. This station is the Notre Dame Amateur Radio Communications Club, which operates 80 through 10 meters with an HT-37 and an SX-101. K9UZF is on 6 meters with an H-B rig. K9AYI is attending Columbia U. but will be active in the nets during the Christmas vacation. *Amateur radio exists as a hobby because of the service it renders.* September net reports: IFN total was 416, reports RVM; K9AOM reports 363 for ISN; QIN total was 410, reports VAY; FJR reports a total of 68 for QIN Training; RFN totaled 79, reports TT; and no report was received for CAEN. Making BPL: DGA and TT. Traffic: (Sept.) W9TT 552, ZYK 372, VAY 282, FJR 235, K9UBK 224, W9DGA 131, K9AOM 110, W9GJS 104, SVL 96, SWD 83, K9RMI 70, PDE 65, W9RTH 62, RVM 55, K9GBB 54, W9QYQ 54, K4LFB/9 48, W9BDG 47, K9CRS 43, W9SNQ 42, UQP 42, VRU 36, BKJ 34, K9DSY 32, W9BDP 23, K9IXD 29, W9CC 28, K9UOF 28, LZN 22, W9IMU 21, K9TCG 21, W9YYX 21, K9ILK 19, W9FWH 17, HUF 16, DOK 15, BVR 14, EJW 7, KN9WET 7, K9GEL 5, MAN 5, VHF 5, HMC 4, VMG 4, W9NZZ 3, K9VHE 3. (Aug.) K9TCG 38, RMI 13, VMG 2. (May) K9VRU 204.

WISCONSIN QSO PARTY

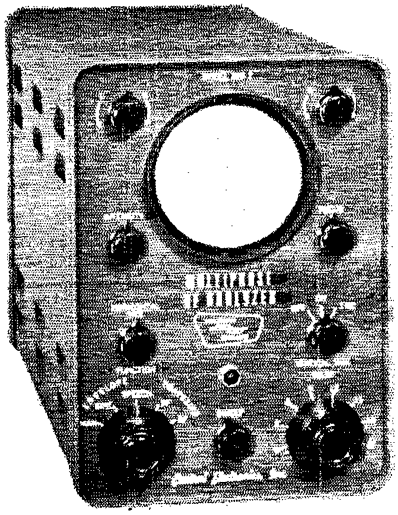
December 11, 1960

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 10:00 A.M. CST and end at 5:00 P.M. CST Sunday, December 11. 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) Information to be exchanged during contact will consist 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 sent and 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. These awards, donated by local radio suppliers, will be presented at the Wausau Hamfest. 8) A self-addressed stamped envelope to W9ULA will bring contest forms. Send logs, postmarked not later than January 8, 1961, to John Hughes, W9ULA, 3344 E. Van Norman Ave., Cudahy, Wis.

See how many Badgers you can work during the seven-hour contest period. Get on the air December 11 and meet the gang!

(*Continued on page 144*)

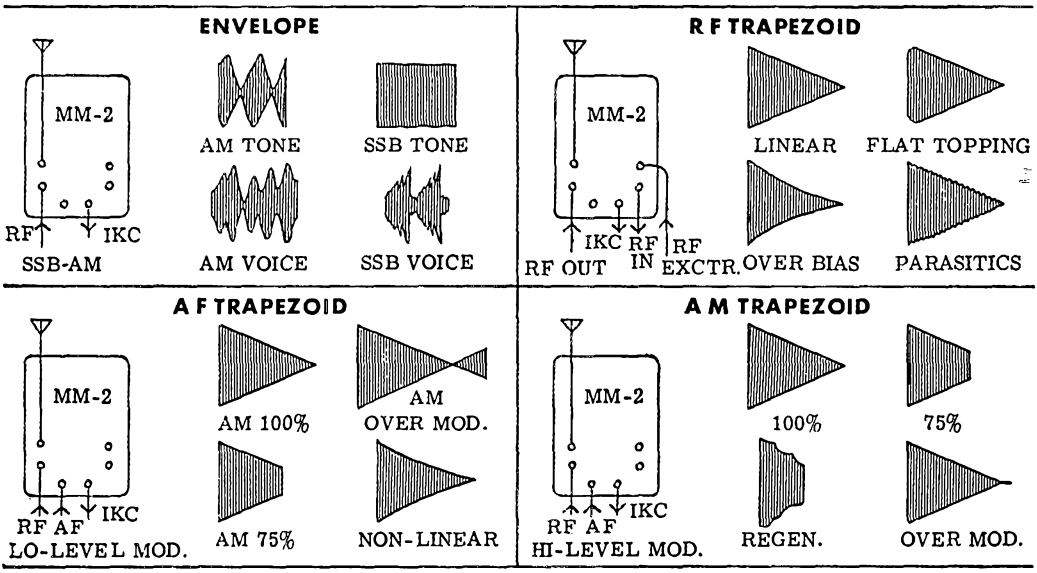


THE MULTIPHASE MODEL MM-2
RF ANALYZER

- Monitors the RECEIVED and TRANSMITTED signals. Shows flat-topping, overmodulation, parasitics, keyed wave shape etc. Silent electronic switching keyed by transmitted RF.
- No tuning required. Broadband response flat 1 MC to 55 MC at power levels of 5 watts to 5 KW.
- New variable sweep control for transmit and receive.
- RF attenuator controls height of pattern. Calibrated in 3 DB steps.
- Function selector for ENVELOPE, TRAPEZOID and BOW-TIE patterns on transmit. For SSB, DSB, AM and CW.
- Built-in 1 KC audio oscillator, less than 0.5% distortion. With 3" scope, is ideal for complete alignment of SSB exciters.
- For use in series with 52-72 ohm coax lines. A short pickup antenna may be used with other systems.
- Plug-in adaptors available to match 50 KC, 60 KC, 80 KC or 455 KC receiver IF systems. Only one simple connection to receiver.

MM-2 Kit ... (less IF adaptor). $119.50
Wired ... (less IF adaptor). $149.50
Plug-in IF adaptors (wired only) .....
RM-50 (50 KC), RM-80 (60-80 KC),
RM-455 (450-500 KC)... ea. .. $12.50

THERE IS NO SUBSTITUTE FOR A SCOPE IF YOU WANT THE CLEANEST, MOST PERFECTLY MODULATED SIGNAL YOUR TRANSMITTER CAN PROVIDE. THE MM-2 IS BY FAR THE MOST DEPENDABLE and EASIEST TO USE, SINCE IT WAS DESIGNED STRICTLY FOR THIS PURPOSE.



OTHER FINE C.E. PRODUCTS

Model 100V	New 100 Watt Broad-Band Exciter-Transmitter ..	$795.00
Model 600L	Broad-Band Linear Amplifier	$495.00
* Model 20A	Bandswitching SSB Exciter	$299.50
* Model 10B	Multiband SSB Exciter	$193.50
* Model GC-1	Gated-Compression Amplifier	$ 66.50
* Model B	Sideband Slicer with Q Multiplier	$104.50

* Also available in kit form
AND MANY OTHERS ... WRITE FOR LITERATURE

THE SSB PIONEER

MULTIPHASE EQUIPMENT

Central Electronics, Inc.

1247 W. Belmont Ave. Chicago 13, Illinois
A subsidiary of Zenith Radio Corp.

WISCONSIN—SCM, George Woida, W9KQB—SEC: YQH. PAMs: NRP and NGT. RMs: VHP and VIK. New appointees: VCM and K9KJT as EC. YQH will remain as our SEC for another year. The Dunn County Club elected K9KSR, pres.; K9HJT, vice-pres.; K9SIZ, secy.-treas. MG is back in Wisconsin after 37 years and is active with a KWM-1, an NC-300 and a vertical. K9GSC passed the Amateur Extra Class, commercial radiotelephone 1st and radiotelegraph 2nd-class exams. NK9YDY received his RCC and AREC certificates. BEN certificates went out to NLE, HEA, KKM, MAI, K9s POL, VNN, HJS, PGF, KBE, K8CQW and 4VRD/9. 2MTA/9 is active on 8 nets and assists with TCC relays. K9DOL now is operating RTTY. A new beam has K9UTN active on 10 and 20 meters. From the new DX bulletin, edited by QYW for the Milwaukee Club: DYG called VE1VR during the W/VE Contest and it turned out to be VQ1VR. K9AEQ is active on all bands while attending school in Florida. YQH was guest speaker at the RACES-AREC meeting, scheduled by EC ONI at Superior. KN9AEP is new in Whitewater. A 10-w.p.m. CP Award went to KN9VER. WIN elected KZZ and WSSN elected CBE as delegates to the Wisconsin Net Association. OO notices sent during September: RKP-88, K9GDF-53, K9EZG-6, CCO-1. Are you operating in the "PICON?" Join one of the section's NTS nets: The BEN, 3950 kc., 1800 daily; the WIN, 3535 kc. daily at 1915; the WSSN, 3535 kc. Mon. through Fri. at 1830. Happy Holidays to you all from your SEC, PAMs, RMs, Director and SCM. Traffic: (Sept.) W9DYG 780, W2MTA/9 628, W9CXY 615, K9GDF 146, W9KQB 81, VHP 61, SAA 53, APB 40, K9GSC 38, W9OTL 32, K9DTK 32, W9NRP 31, VIK 31, K9DOL 23, W9KKM 22, LFK 21, K9JQA 14, ELT 10, W9ZB 8, K9EQQ 8, W9CBE 6, MWQ 6, CCO 3, K9TUD 2. (Aug.) K9JQA 104.

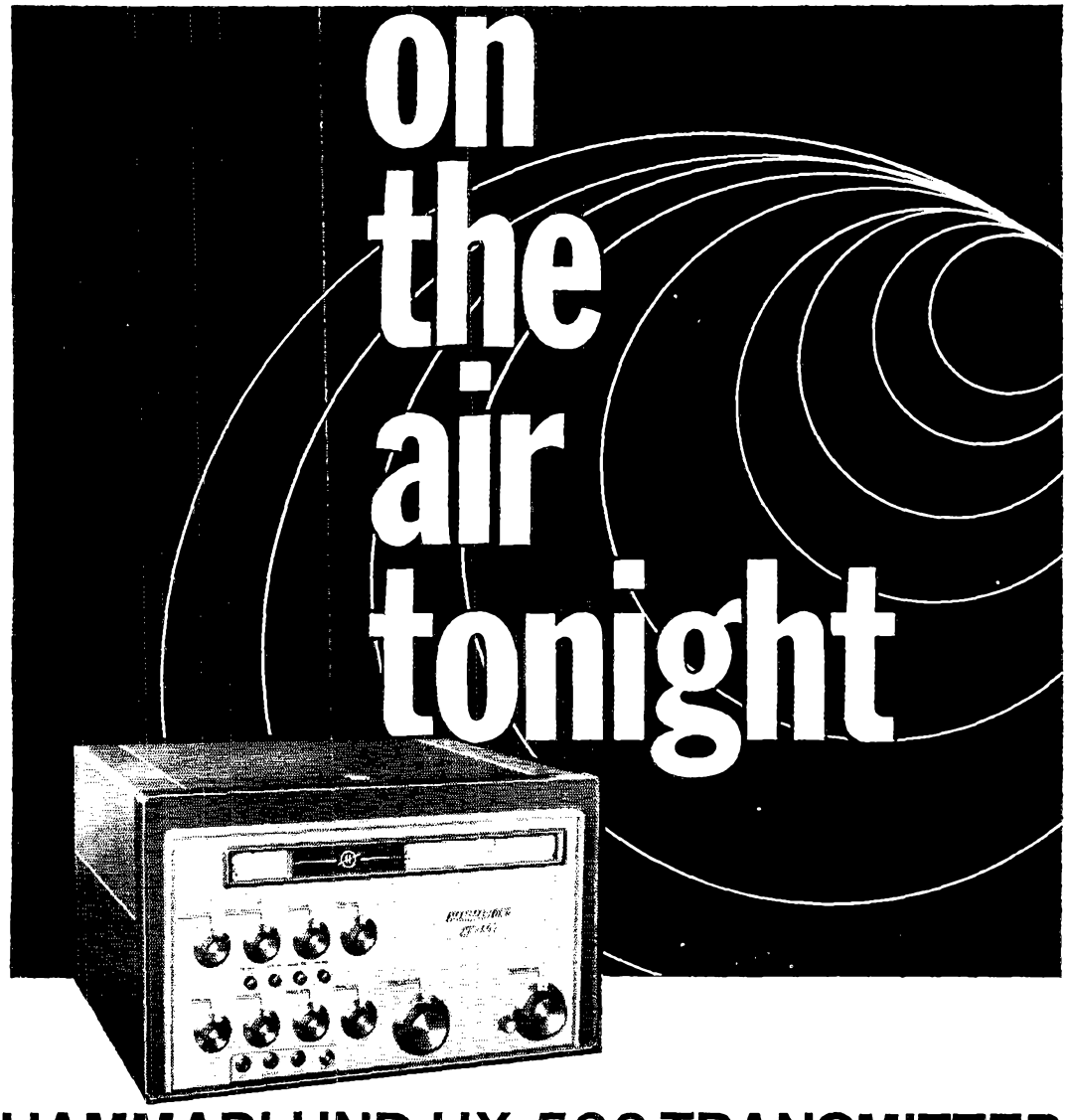
DAKOTA DIVISION

NORTH DAKOTA—SCM, Harold A. Wengel, WØHVA—SEC: KØKBV. PAM: KØKJR. RM: KTZ. As this is being written your SCM is in the process of moving from Bismarck to Williston, so the news is pretty scanty. Net reports for September will be reported next month. The Laramie State High School Radio Club has become an ARRL affiliated club. Congratulations. We hope to have news from you soon as well as news from other clubs. We welcome AQR, at Tioga, to the 75-Meter Net. Notice the net now has two ARRL Official Bulletin Stations, PHC and KØGRM. Traffic: KØITP 121, YST 9, TVY 8, WØPHC 6, KØRRZ 6, WØBHT 5, YCL 4, BHF 3, OMA 2, KØTVI 2, VTP 2.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: SCT. Newly-elected officers of the Sioux Falls ARC are RWE, pres.; KØWEM, vice-pres.; KØYNR, secy.; and KØDYR, treas. The Hi-Lo RC is building a 160-meter rig for club use. KØWJT is experimenting with a Windom antenna. VHC has a new daughter, making VQC a granddad the second time. VQC celebrated by purchasing a TA-36 beam. DTB, formerly of Centerville, now is located at RFD 2, West Branch, Iowa. VTP has received his Conditional Class ticket. KNØALU, Sioux Falls, passed the General Class exam. A new call in Sioux Falls is KNØEEZ. KØUXC is attending college at Orange City, Iowa. KØVIZ is a Class IV OO. KNØDDZ, St. Onge, is attending Huron College. OJH has moved back to Minnesota and is attending Mankato College. KNØBSW, Madison, passed the Technician Class exam. OOL is working for Western Electric in Sioux Falls. Traffic: WØSCT 379, BMQ 265, DVB 256, KØHSW 214, WØVQC 41, ZWL 28, PHR 23, KØDUR 12, WØCTZ 10, OFP 5, KØVIZ 5, WØXVF 5, KØRQY 3, KOY 2, WØNNX 2, KØSEJ 2, SZJ 2, WØTNM 2, KØKLR 1, VYY 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Rollie O. Hall, ØLST. SEC: TUS. Asst. SEC: KØEWC. PAMs: OPX and KØEPT. RMs: RIQ and KØIZD. The Dakota Division ARRL Convention was well attended with 590 registrations. Byron Goodman's (1DX) talk on "Amateur Receivers" was a big hit. All meetings were well attended. The pre-registration prize, an SX-111, went to OGP's XYL, the mink stole to TQQ, the Collins KWM-2 with power supply to PAM and the DX-100 to SZJ. KØSBB had a wonderful visit at 1AW and met W1WPR, one of the operators. EC FGP is back on 3820 kc. after a series of rig troubles and eye surgery. RTH's new call is F7BM in the French Riviera. KØMIZ now lives in Windom. KØOIW is attending St. Thomas College in St. Paul. KØGYO, Northwestern Bible student, has a Globe Scout 680A and a four-element Telex beam on 6 meters. The following appointees renewed their appointments: ECs HEN,

(*Continued on page 146*)



HAMMARLUND HX-500 TRANSMITTER

Tonight, and every night to come, more and more Hammarlund HX-500 SSB transmitters will be operating and serving as the topic of conversation. This new transmitter is rapidly setting the standards by which all other transmitters will be judged.

Loaded with new features, designed to provide the finest performance, and built to the fine traditions of Hammarlund craftsmanship, the HX-500 is your best buy in the fine transmitter field...

Write today for complete details... **$695.00** amateur net.

Established 1910

HAMMARLUND AN AFFILIATE OF TELECHROME

HAMMARLUND MANUFACTURING COMPANY, INC., 460 W. 34th ST., N. Y. 1, N. Y.

Export: Rocke International, 13 E. 40th St., N. Y. 16, N. Y. Canada: White Radio, Ltd., 41 West Ave. N., Hamilton, Can.

See Hammarlund at the 1961 Tropical Hamboree

ZMK, VTZ, MZR, VPO, KØs IKU, GIW and JYJ and OBS KØQLM. These appointments were cancelled because of request, change in QTH, inactivity or lapse of ARRL membership: ECs EYW, FYT, YNY, PRJ, KØs QLM, OIW, KEJ, BDD and MPG. Congrats and happiness to the new babies and parents as follows: MDA and his XYL and son; VYL and WVO and son; KØIYK and his XYL and daughter. KØUKU earned a Section Net certificate and ORS appointment. KNØWWY received his Gen. Cl. license and KØWNV his Conditional within 21 days. EC KØIKU stated that a kw. was mounted in the civil defense trailer and operates on 40 meters. The KMG Net has been reactivated and meets daily on 3835 kc. at 0030 GMT. NNG reports. TUS and KØORK made BPL. OO WMA reported two violations. Traffic: (Sept.) KØORK 611, WØTUS 533, WØKJZ 215, KØUKU 164, SNC 151, WØRIQ 128, KYG 107, KØQBI 106, PAIL 70, WØPET 61, HEN 54, OPX 50, KØSNG 49, IZD 41, WØVPO 41, LST 39, KØQLM 39, EPT 29, WØISJ 29, WMA 29, NYM 27, KLG 25, UMX 24, KØRHN 22, JYJ 20, SBB 19, WØBUO 18, KØICG 16, WØKFN 15, KØMGT 15, WØDQL 14, KØVPP 12, VXW 11, WØTHY 10, KØOQT 9, WØWVT 8, KØIKU 7, OBP 7, WØDYC 6, KØWYV 5, TWM 3, KYK 2, MAH 2. (Aug.) WØNYM 19, KØKYK 5. (July) KØKYK 1.

DELTA DIVISION

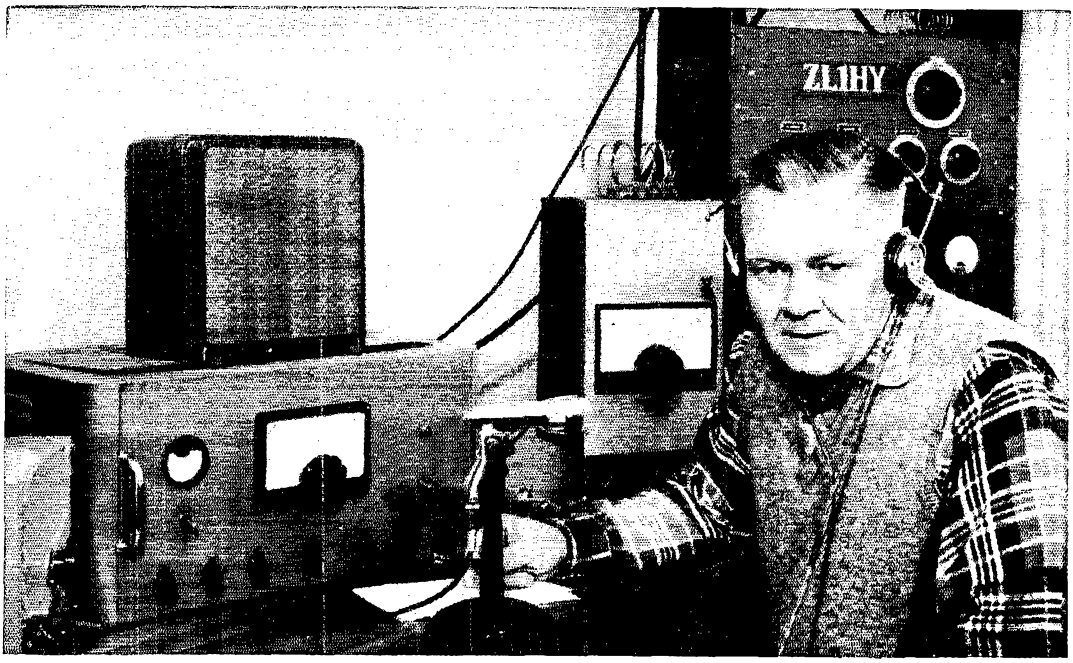
ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR. PAM: DYL. RM: K5TYW. K5YTR is sporting a new HT-37 and now is active on s.s.b. SZJ now has a DX-100 and we expect to hear his melodious voice on phone soon. K5GXR is in college again at Fayetteville. K5INJ now has a complete station on at the club house of the Miss. Co. Amateur Radio Club. The club also has a new Hornet beam. Perhaps this is my last article for *QST* as SCM. May I take the space to thank you Arkansas amateurs for letting me serve you for the past two terms. My only regret is that time did not permit me to do many things that I would have liked to have done. At the time of this writing we do not know who will take my place but whoever it is, let us all give him our best support and make this one of the strongest ARRL sections in the League by supporting the traffic nets, the AREC and reporting to your new SCM. Traffic: K5GXR 50, W5SZJ 50, RYM 44, K5INJ/5 25, IPS 20, YTR 14, W5ZZY 6.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—The Hamfest that the Greater New Orleans held Oct. 8-9 at Jackson Barracks was a success all the way with an attendance of about 600. K5MSN won the beam, rotator and tower; Owen H. Wilson (a non-ham) the TO-keyer; K4USR and RRV won the 4-400As; QQK, the 4-250; JTL and APH the 4-125s. Activities included code sending with the left foot. Everybody had such a nice time that plans are being formulated to have a bigger and better one sponsored by all the ham clubs in the New Orleans Area. The hamfest was opened by Director DeHart, 4RRV, and attended by the SCM, SEC, RM and numerous OPSs, ORSs, OOs, OESs and AREC members. Car licenses showed that Texas, Louisiana, Mississippi, Arkansas, Alabama, Florida and Tennessee (4RRV) were represented. DPJ, newly-appointed OBS, is now transmitting ARRL Bulletins four days per week on 75, 40, 20 and 10 meters. CEZ, ORS and Route Manager, came into New Orleans for the hamfest. EA writes that he is building a whole new station. UQR, OES, completed 29 consecutive propagation tests with stations in the Mobile, Ala., and Pensacola, Fla. Areas. Nightly tests indicated 50-Mc. ground wave nearly 100 per cent reliability for distances up to 150-160 miles. 4LDM/5 complains that while traffic has picked up, it still is not up to Florida level. Traffic: W5CEZ 302, W4LDM/5 63, K5AGJ 42. W5NUH 31. K5UYL 26, W5EA 12.

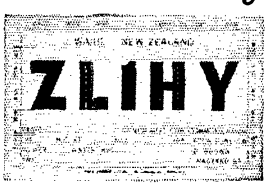
MISSISSIPPI—SCM, Floyd C. Teetson, W5MUG—Hurricane Ethel provided the gang with a chance to show what they could do. The Gulf Coast S.S.B. Net, the Magnolia Net and the Gulf Coast Hurricane Net were very active. About 250 messages were handled. I recently met with the Meridian Club. The fellows have a very active club with weekly drills. Their mobile activity is really going strong. Congratulations, fellows, you have a fine club. Also, the Meridian Club will have an s.s.b. rig and an a.m. rig on the air at the Miss.-Ala. Fair this year. Look for them on 3818 kc. Several of the gang attended the New Orleans Hamfest recently. I understand a fine time was had by all. Both DLA and SPX have returned from the hospital. It's good to have you home, Doc and Jay. Yours truly is sporting a KWM-2. Hope to have it on mobile in the not-too-distant future. Let me hear from you, gang. Net Traffic: The Magnolia Net—599 checked in with 160 items of traffic handled. Traffic: W5JHS 70, RIM 22.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K4EJN. RM: FX. PAMs: PAH and UOT. From

(Continued on page 150)



"everyone preferred the 951"



. . . writes Dave Brown, ZL1HY, of his Electro-Voice Model 951 Cardioid Microphone

ZL1HY, among the top worldwide DX men, phone and C.W., is a ham that has to be convinced. He first compared his new Electro-Voice 951 with his two other mikes on the monitor and, in his words, ". . . *it certainly sounded better* . . .". Next, ZL1HY tried "*. . . swapping mikes during the QSO's . . .*". and discovered, "*. . . everyone preferred the 951 . . . they claimed I sounded far more natural and not as deep as with my other mikes.*"

There are solid design reasons why ZL1HY's contacts claimed he sounded "*far more natural.*" First, the highly directional cardioid pattern of the 951 improves audio quality by effectively reducing random back-ground noise by as much as 67% . . . insures smooth VOX operation. Also, the 951's Variable-D® principle* virtually eliminates changes in bass response with working distances.

*Patent Pending

See and try the Model 951 at your distributor—today. It's the lowest priced cardioid on the market employing E-V's Variable-D principle . . . worth a substantial increase in power. You'll be convinced, too.

TECHNICALLY SPEAKING: Model 951 utilizes a Bimorph type Rochelle-Salt element completely sealed against moisture to extend crystal life. Uniform cardioid pattern permits nearly twice the pick-up working range. Variable-D principle insures a uniform frequency response. Proximity effect virtually non-existent. Pop-proof grille minimizes breath blasts. High-pressure die cast zinc case finished in Metalustre gray. Convenient ON-OFF switch.

Model 951 (without stand)	Net Price: $29.70
Model 951 (with Model 418 desk stand)	Net Price: $35.70

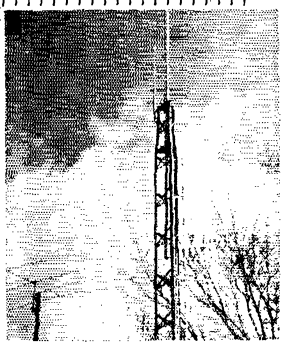
Electro-Voice®

Commercial Products Division

ELECTRO-VOICE, INC.

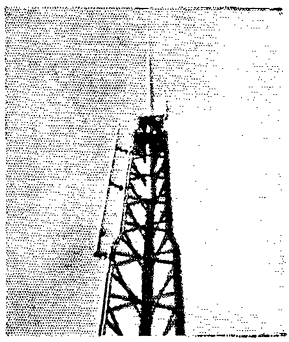
Dept. 120Q, Buchanan, Michigan

ENGINEERING REPORT on the new Hy-gain Hy-Tower

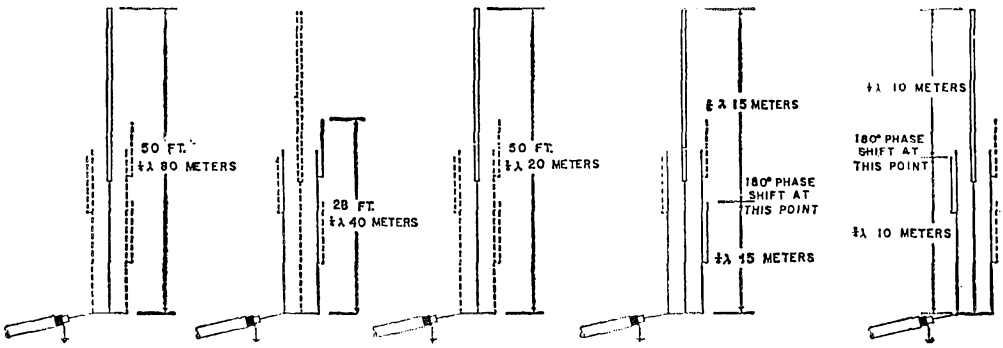


GENERAL DESCRIPTION

The 18-HT "Hy-Tower" is a multi-band vertical antenna system designed to work against ground or a grounding system . . . Through the use of the unique stub decoupling system, automatic band selection is accomplished for the 10, 15, 20, 40 and 80 meter bands. The stubs (or linear traps) effectively isolate various sections of the vertical so that an electrical quarter-wave length (or odd multiple of a quarter-wave length) exists on all bands. The Hy-Tower will withstand very large amounts of RF power. The overall height is 50 feet and it is completely self-supporting in wind velocities up to approximately 80 miles per hour.



The Hy-Tower utilizes the method of stub decoupling. In principle, a quarter-wave shortened stub is used to effectively insulate or decouple various sections of the tower, maintaining low-impedance current feed on all bands. The following illustrations show how the antenna looks electrically on all bands. The dotted sections are the inactive parts on each band.



On both 40 and 80 meters, the Hy-Tower operates as a quarter-wave vertical. As shown above, the entire antenna is in use on 80 meters. On 40 meters the tower proper (which is insulated from the aluminum mast) acts as a quarter-wave stub or sleeve, decoupling the top mast and a quarter-wave 40 meter antenna results. On 20 meters the entire antenna is operative as a three-quarter-wave vertical. On 15 and 10 meters, the decoupling stubs are positioned at the proper points to act as phase reversal stubs and a colinear action results in a gain of 2 db over a quarter-wave vertical at the same height. It is interesting to note that the antenna makes no compromise in efficiency on any band. The stub multibanding in no way limits the operational efficiency. The Hy-Tower is slightly shorter than natural length, mostly because of the slight shortening effect due to the large cross sectional area of the tower.

ASSEMBLY AND INSTALLATION:

The 18-HT Hy-Tower vertical antenna is easily assembled on the ground. Coded and predrilled parts allow for rapid assembly. The antenna utilizes a three-section, hot-dip galvanized tower for the lower half. The upper section is telescoped high-strength 6061ST6, aluminum tubing. Due to the light (yet rugged) construction of this antenna, two men can easily walk it up into position.

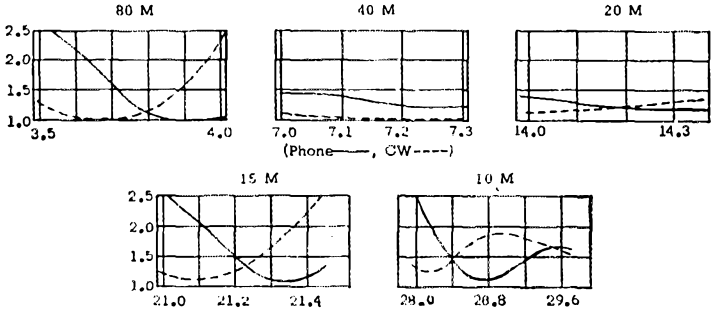
Several types of base mountings are available. For permanent mounting, the poured concrete base is recommended. This base requires ⅜ cubic yards of concrete and results in a neat, permanent installation. Also recommended for permanent installation is the Spaulding Products Model X36CBO which is a cylindrical base to be buried in the earth and tamped in place, with no concrete required. This base is available for $19.06 Ham Net. For semi-permanent or temporary installations, the antenna can be mounted on three stakes and a set of heavy, non-metallic guy cables installed at the top of the tower section. For wind velocities in excess of 80 miles per hour, it is recommended that guy cables be installed for any type of base mounting.

GROUNDING:

The Hy-Tower performs very well with a simple ground system consisting of six television ground rods installed directly at the base of the antenna. The use of this grounding system eliminates the necessity of an extensive radial system. For somewhat improved performance, especially in dry or sandy soil, a system of ground radial wires may be employed.

FEEDLINES AND VSWR:

The recommended feedline for the Hy-Tower is RG-8/U coaxial cable of any length. However, for long runs at high power levels (in excess of 500') RG-17/U coaxial cable is preferable. The VSWR of the antenna is low on all bands with exceptionally broad bandwidth. Settings are provided to favor either CW or PHONE operation. Due to the broadband characteristics, the antenna will perform well over the entirety of each band no matter which setting is chosen.



OPERATIONAL RESULTS:

Extensive field testing has shown the Hy-Tower to be an excellent performer on all bands, 80 through 10 meters. It is outstanding on long distance DX contacts due to its low angle radiation characteristics. On short skip contacts, it compares favorably with a horizontal doublet at the same average height.

For the ultimate antenna system on 80 and 40 meters, it is possible to mount two Hy-Tower antennas 65 feet apart and switch the phase in order to obtain gains of the order of 3 db on 80 meters and 3 db on 40 meters.

The Hy-Gain Model HTP phasing kit will supply the necessary phasing networks. The Hy-Gain Model HII indicator and control unit, which matches the RBX-1 Rotobrake indicator unit, completes the installation for the ultimate shack. Write for details.

MECHANICAL

Height: 50' 0"
Weight: 100#
Construction: Tower Base Section: Hot-dip galvanized. Height, 24'
Top mast: 6061ST6 Aluminum. Height, 26'
Wind Area: 16.7 square feet
Wind Load: 503 lbs. at 100 mph
Insulators: High-impact cycolac, injection molded
Hardware: Iridite-treated steel to mil. spec. MIL-14072

ELECTRICAL

Pattern: Low-angle omni-directional on all bands
Gain: 2 db on 15 and 20 meters; unity on 80, 40, 20
Impedance: VSWR less than 2:1 on all bands relative to 50 ohms
Power: In excess of 5 KW
Feedline: RG-8/U, RG-58/U, or RG-17/U

Memphis: K4AKP, OGG and EET originated Mid-South Fair traffic; SCF is now director of MARS RTTY. K4GFL is MARS director and K4DSI is asst. director. From Chattanooga: WAZ awards went to QT and K4CLT. WAS to K4HVA and TPA. Canal Zone award to K4IOP; TZD needs an early morning sked with Kentucky on 6 meters; K4BWS has a 75A-3. The Roane County Net has moved from 50.7 to 50.3 Mc. UVU has moved to Knoxville. New appointments: K4AKP as OBS, WBK as Memphis EC. Appointments renewed: TZJ as EC. Thanks to BAQ, who has resigned as EC for Memphis, for his service. Net reports were received from FX, PAH and UOT; an OES report from K4KYL; an OO report from K4RIN. Traffic: K4AKP 1106, W4PL 1078, FX 143, K4BWS 138, W4VJ 94, PQP 84, EIN 73, K4FNR 34, W4NHT 33, K4AMC 29, W4TZG 23, UIO 17, PAH 9, JVM 8, SGI 7, TYV 4, UVL 4, VNU 4.

GREAT LAKES DIVISION

KENTUCKY—SCM, Robert A. Thomason, W4SUD—Asst. SCM: W. C. Alcock, 4CDA. SEC: BAZ. RM: K4CSH. PAMs: SZB and K4HCK. V.H.F. PAM: K4LOA. RHZ has been active on 50 Mc. and above. He has new 65-ft. tower and beams. K4SUU and HZO are working Louisville and Cleveland ground wave. ADH is working on 50-Mc. s.s.b. K4LOA is heading up the MARS Net on 49.94 Mc. JUI regularly works his son K4HTO at M.I.T. K4VDO is back after repairing storm-damaged antennas. BAZ originated 106 in September to make BPL. CDA and the Danville Scout troop have a complete emergency mobile unit. The City of Owensboro has agreed to help build an amateur station for c.d. KKG is back in gear for the winter. K4ZQR reports that the Cincinnati and Lexington hamfests were very successful. OO reports were received from K4ZRA and K4ZQR. A new OO is NUQ. Ex-Tennessean K4OEK now is at Georgetown. Traffic: K4CSH 168, KWQ 116, W4BAZ 115, K4PGH 104, W4SUD 83, RNF 40, K4VDO 40, W4ADH 35, CDA 29, SZB 28, KJP 17, K4SFD 15, W4HTD 12, K4KIS 12, ZQR 10, LOA 7, QHZ 6, W4KKG 4, SZL 4, WVU 4, VJV 2.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: YAN. RMs: SCW, OCC, QQO and FWQ. PAMs: AQA, K8CKD, K8JUG and ATB. V.H.F. PAMs: NOH and PT. EC appointments went to JYJ, QGQ, and K8EXV; ORS to FWQ, K8GWZ, IBB and RTN; OPS to AHV; OBS to AHV, K8GUE and K8PSV; OES to K8NEY and K8PBA. New officers of the Brass Pounders (Pt. Huron) Club are FWQ, pres.; K8KJL, vice-pres.; K8PCG, secy.-treas.; K8BDI, prog. The Saginaw Valley ARA "Sixer" project is going well with 47 units working which were in use at the County Fair. K8HAB has a new jr. operator, opened the window and now has WAS! What Flint Area XYL ham "lost her gear" while water skiing at Burt Lake? The Kazoo ARC bulletin has a good thumbnail sketch of CVQ. K8BGZ now has 18 states on 2 meters. K8PBA also turns in a good OES report. K8NHC has a cubical quad up 40 feet and an electronic keyer. JTQ is moving. NOH made a hetro exciter. Communications for the Powder Puff Derby was conducted by K8KPS, K8DVL, K8EFY, EKU, EGI, ELW, HJS and TBP at Muskegon. EMD finds the transistor frequency meter has drift. K8KCO has a new 75S-1. New officers of the Calhoun Area RC are K8IVG, pres.; OCC, vice-pres.; BAY, secy.; CZG, treas. The Chain O' Lakes Area RC has 29 members. KN8TQT wired his DX-40 with acid core, then had to do it over. RAE says he is "coming to life" again. ELW makes BPL. OCC is active in QMN, 8RN and EAN, as is FWQ. SWF handled traffic for the Colorado parents of a boy here who later died. Officers of the Pictured Rocks RC are K8KIT; pres.; K8QHB, vice-pres.; K8QOM, secy.-treas. NUL is helping Novices. K8LOS had no luck in getting UA for Wayne State Univ. RC. Traffic: (Sept.) W8ELW 519, OCC 267, FWQ 222, FX 107, JTQ 96, RTN 96, K8QIL 65, W8NOH 53, K8EXE 48, DJQ 46, W8AUD 41, K8KMQ 40, GWZ 27, LZF 27, GJD 23, W8EU 22, QQO 20, SCW 20, EGI 18, HKT 18, QPO 15, SWF 13, DSE 12, JKX 12, AHV 11, K8LPV 10, W8YAN 10, QBA 8, CQU 7, ZHB 4, K8KIT 3, EFY 2, W8NUL 1. (Aug.) K8CWI 224, OTJ 175, W8FWQ 170, K8LZF 69, W8ILP 42, QBA 14, UFS 11, K8AEM 10, W8NUL 8.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: HNP. RMs: DAE and VTP. PAM: HZJ. Wish all of you a Very Merry Christmas and a Happy New Year, with the best of health throughout 1961. Sure do appreciate receiving Toledo's *Ham Shack Gossip*, Columbus ARA's *Carascope*, Springfield ARC's *Q-5*, Massillon ARC's *MARC News*, Canton ARC's *Feedline*, Lancaster-Fairfield County ARC's bulletin, Seneca RC's bulletin cards and letters from K8BXT. From these I received the bulk of my news for this year. One of the Dayton ARA's *R-F Carrier* was received recently, the first in two years. Also dur-

(*Continued on page 152*)

from EICO® . . a completely new

CITIZENS BAND TRANSCEIVER

that meets FCC regulations*

*EICO premounts, prewires, pretunes, and seals the ENTIRE transmitter oscillator circuit to conform with FCC regulations (Section 19.71 subdivision d). EICO thus gives you the transceiver in kit form that you can build and put on the air without the supervision of a Commercial Radio-Telephone Licensee!

designed by Hams . . . for Hams . . .

to the highest Ham standards

#760: 117 VAC Kit $59.95 Wired $89.95

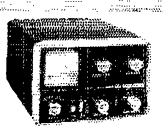
Highly sensitive, selective SUPERHET (not regenerative) receiver with 5½ dual function tubes and RF stage. Continuous tuning over all 23 bands. Exclusive Super-Hush® noise limiter. AVC. 3"x5" PM speaker. Detachable ceramic mike. 5 Watt xtal-controlled transmitter. Variable "pi" network matches most popular antennas. 12-position Posi-Lock® mounting bracket. 7 tubes and 1 xtal (extra xtals available). Covers up to 20 miles. License available to any citizen over 18 — no exams or special skills required; application form supplied free. Antennas optional.

Additional crystals $3.95 each.

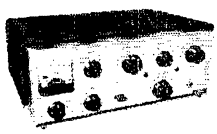
#761: 117 VAC & 6 VDC
#762: 117 VAC & 12 VDC
incl. mtg. bracket (Pat. Pend.)

Kit $69.95
Wired $99.95

Most EICO distributors offer budget terms.



NEW! 60-WATT CW TRANSMITTER #723
Kit $49.95 Wired $79.95
Ideal for novice or advanced ham needing low-power, stand-by rig. 60W CW, 50W external plate modulation. 80 through 10 meters.



90-WATT CW TRANSMITTER*
#720 Kit $79.95 Wired $119.95
*U. S. Pat. No. D-184,776
"Top quality" — ELECTRONIC KITS GUIDE. Ideal for veteran or novice. 90W CW, 65W external plate modulation. 80 through 10 meters.

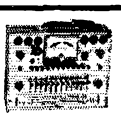
HIGH-LEVEL UNIVERSAL MODULATOR-DRIVER #730
Kit $49.95 Wired $79.95
Delivers 50W undistorted audio. Modulates transmitters having RF inputs up to 100W. Unique over-modulation indicator. Cover E-5 $4.50.

GRID DIP METER #710
Kit $29.95 Wired $49.95
Includes complete set of coils for full band coverage. Continuous coverage 400 kc to 250 mc. 500 ua meter.

COLOR & MONO DC-5MC LAB & TV 5" OSCILLOSCOPE #460
Kit $79.95 Wired $129.50
5" PUSH-PULL OSCILLOSCOPE #425 Kit $44.95 Wired $79.95

PEAK-TO-PEAK VTVM #232 & *UNI-PROBE®
Kit $29.95 Wired $49.95
*U. S. Pat. No. 2,790,051
VACUUM TUBE VOLTMETER #221
Kit $25.95 Wired $39.95

RF SIGNAL GENERATOR #324 (150kc-435mc)
Kit $26.95 Wired $39.95
TV-FM SWEEP GENERATOR & MARKER #368
Kit $69.95 Wired $119.95



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ing those lean years none was received from the Greater Cincinnati ARA, so if any of you boys in Dayton, Cincinnati or Cleveland complain because of no news about happenings in your cities, don't blame me for I can't smell it. K8LYR received his General Class license. K8EKG received his WAC and WAS certificates. OSV has a new 100V. K8s RMW, TOK and USJ are new Technicians. K8PYD received his WAC. K8IPD joined Silent Keys. Dayton ARA's *R-F Carrier* tells us that KØSGY, of Collins Co., spoke at a club meeting on "S.S.B. Simplified" and KN8VFG is a new ham in Waynesville. K8VWW received her General Class ticket, making another OM and wife team. Her OM is K8SND. NAL has gone mobile. K8JZN also is mobile. K8EML has a new TA33 Jr. beam. Columbus ARA's *Caraxcope* informs us that NPF received DXCC membership and notices the Columbus club has eight others who hold membership. DMR gave a talk on Anolog Computers, RRJ and TYY put on an amateur TV demonstration. Springfield ARC's *Q-5* states that the club held an auction, K8PMF received his General Class license, K8s RIP and UYU are on 6 meters. DAE made BPL in September. A new appointment in September is K8MLN as OES. AQ has a new HQ-170 and spent a week in W7-Land. Toledo's *Ham Shack Gossip* inform us KDK was named as its "Ham of the Month," the Toledo amateurs displayed to the public what we amateurs are doing and can do by having a station in operation in the local library; the mobile club held a picnic; K8's CJS, LFG, NQK, NZA, QAY and QPG have their General Class licenses, BBO is home from the hospital and the stork brought a baby boy to K8s BHC and EJX. Your SCM attended two large hamfests. The first, along with your SEC, was the Findlay Hamfest where more than 900 attended with 381 amateurs registering. The second, along with our Great Lakes Director, was the Cincinnati Stag Hamfest with over 1200 amateurs registering. The HX-500 transmitter was won by K8RTE and the SX-111 by DCB. This is all the news I have, so you can see many clubs do not report. Traffic: (Sept.) W8DAE 589, UPH 431, K8ONQ 100, W8BZX 93, CXM 50, OKN 33, YGR 23, OUU 22, AL 21, K8BNL 16, VWH 12, W8LZE 10, WYS 7, IBX 6, EEQ 4, LT 4, HZJ 2. (Aug.) K8MFY 54, RMW 12, KHH 9, W8PBX 8, K8JSQ 2, NXN 2.

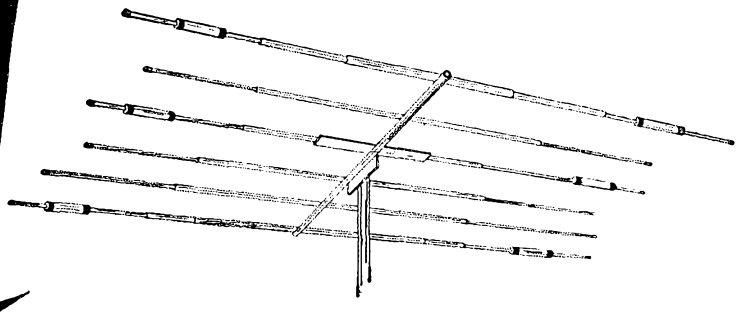
HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC. RM: W2PHX. PAMs: W2IJG and W2NOC. Section nets: NYS on 3615 kc. at 1900; NYSPTEN on 3925 kc. at 1800; ESS on 3590 kc. at 1800; ENY (emerg.) on 29.490 (Thurs.) and 145.35 Mc. (Fri.) at 2100; MHT (Novice) on 3716 kc. Sat. at 1300. K2JYN has been appointed as EC. Endorsements: W2AWF and K2HNW as ECs, K2YJL as OBS and WA2AKK as OES. Welcome to the Putnam Co. Amateur Radio Assn. and the Colonie Central High School RC as newly-affiliated clubs. The Dutchess Co. V.H.F. Society participated in the Sept. V.H.F. Contest with K2GCH, K2OZT, K2UKE, K2VNV, W2EAX, W2HZZ, W2YPM, WA2EBP, and W2LWI as operators. New officers of the Athens ARC, WA2LOK, include K2YJL, pres.; WA2GWZ, vice-pres. A new Technician is WA2MYU. New 6-meter beams are in evidence at K2CKJ and WA2MYU. K2EJJ has a new Challenger. W2NYU has a Globe Chief. K2CVG worked 10 states in 20 days on 2 meters with W8 as best DX. New officers of the RPI Club, W2SZ, are K2YQH, pres.; K2LCF, vice-pres.; K3DZF, secy.; and K2YRZ, equipment supervisor. The rigs include a kw. on 80, 40 and 20 meters; 350 watts on 6 meters and 500 watts on 2 meters. Twenty students are in the code and theory classes of the Communications Club of New Rochelle. K2RRZ is the new editor of the club's *Communicator*. A new XYL General Class licensee is WA2JZI; ditto OMs K2SJN and K2RRZ. Under the direction of K2OGS, mobiles in Yonkers, including K2IOM and K2HGN with K2BIG, operated nearly 24 hours during Hurricane Donna. Congrats. They have a fine RACES group. K2BIG is both president of the Yonkers Club and editor of its *Yare-Mitter*. K2BFU and W2QAI are the proud possessors of new beams. Congrats to K2UTV on making the BPL. Traffic: K2UTV 1109, W2EFU 271, K2MBU 137, W2PHX 103, K2RKY 66, K2DEM 51, K2OZT 48, WA2AUC 27, K2YZI 14, K2HNW 2.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: W2ADO. RM: W2GXC. PAM: W2UGF. V.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. nightly at 1930 EST (regular session) and 1815 EST (early session) and Sat. and Sun. at 1915 EST. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST. NYC-LI AREC, 3908 kc. Sun. at 1730 EST. V.H.F. Traffic Net, 145.8 Mc. Tue., Wed., Thurs. at 2000 EST. BPL cards were earned by K2UAT, K2UFT, K2RBW and W2EW, the latter recording his sixth BPL

(Continued on page 154)

NEW!



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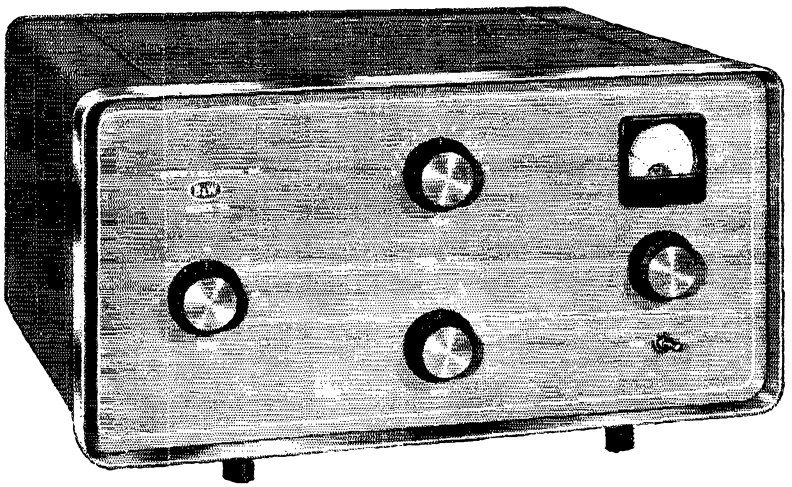
earned exclusively on the v.h.f. net. The V.H.F. Traffic Net led all section nets with a total attendance of 180 and a total of 355 messages handled in 13 sessions. K2UAT entered the BPL ranks for the first time with a section-leading traffic total. WA2GPT is trying to make WAS and YLCC plus trying for some DX; however, Bea's traffic total continues high. Many of our AREC/RACES nets were alerted during Hurricane Donna and did a fine job. W2OKU will be mobile with a Heath Tenner. WA2FBC is using an HQ-110 on the traffic nets. It is with deep regret that I report W2AZY as a Silent Key. W2MES received his DXCC certificate. W2BQM added a few more countries on s.s.b. to bring his phone-only total to 211 countries worked. K2CMV removed the "bugs" from his rig and returned to the air. An SX-101 and a Globe 90-A are on the air at K2DZA with a Heath Tenner in his mobile. K2TPU is using a Heath Twoer. K2VDR reports from Cornell, where he has returned to college. Bruce took along a 3A5 50-Mc. rig for those "free" moments. WV2OUY is a new call in Dix Hills. W2LDC, the new 2-meter EC for Kings County, and his XYL, K2UAG, are active on 2 meters. Two 432-Mc. band openings enabled the section's leading 432 station, W2OTA, to raise his states total to 9 confirmed. WV2OOK is on the air with an HQ-170, a Globe Chief and a vertical antenna. K2MYW installed a Mosley Tri-bander and installed an all-Gonset mobile. W2UMF and his son, K2RYE, operate a Lettine 242 and an NC-300 with a converter on 6 meters using a six-element beam on top of a 40-ft. tower. Many antennas fell before "Donna's" blasts. Among those who are repairing are K2QBW, K2QEY/WA2HTI, K2RBW and K2VBJ/WA2BEI. K2AZT, using a 2-meter Communicator driving a 6360 tripler, made his first 432-Mc. contact with W2OTA. K2ZGZ, editor of the new Suffolk County RC newspaper, did a fine job on issue No. 1. Your SCM would appreciate receiving your club bulletins or newspapers for information. W2EW is the new president of the V.H.F. Institute, completing the unexpired term of K2ZLE, who has moved to Ohio. W2HQD and K2AIU welcomed their new harmonic—it's a boy! K2EFB and K2OEI operated K2EFB/1 from Hogback Mt., Vt., on 2 and 6 meters working more than 300 stations. K2RHG is now active on 2 meters. A letter from ex-W2KFV announces that his Arizona call is K7NIY while XYL Georgie, W2KEB, now signs K7NOA. A new call in Brooklyn is WV2OND, active with an EICO 720 and an HQ-145. New members of the New York RC are WA2CGG, WA2JID and WV2NLK. WA2KKA passed the General Class exam and is waiting for his new S/Line. K2MVP's jr. operator, Steve, is awaiting his call. It is my pleasure to report that our Hudson Division Director, W2KR, has been reelected for a second term. Your SCM will assist Mort in the new capacity of Vice-Director. Mort and I sincerely hope to continue the fine progress of the Hudson Division. Traffic: (Sept.) K2UAT 764, K2UFT 503, K2RBW 440, W2EW 281, WA2GPT 264, K2THY 129, W2GXC 83, WA2CZG 77, W2GKZ 75, W2OKU 75, W2LDC 64, WV2KWZ 56, K2DNY 34, WA2FBC 34, K2CMJ 33, WA2BVH 28, K2OEI 22, W2OME 22, W2LGK 14, W2PF 11, K2YQK 10, W2EC 9, K2RHG 8, W2AEE 7, W2TUK 2. (Aug.) K2YMU 409, W2UGF 37, WV2KWZ 29, W2LDC 18, WA2BQK 12, W2EC 12.

NORTHERN NEW JERSEY—SCM, J. Sparks Remeczky, K2MFF—SEC: WA2APY. RM: W2RXL. PAMs: K2SLG and K2KVR. Section nets: NJN, 3695 kc. nightly at 1900 EST; NJFN 3900 kc. nightly at 1800 EST. The NJN reports 30 sessions were held, 633 stations checked in and 432 messages were handled. New appointees are WA2BDP as OES, W2DMM as OO and K2TWL as OES. K2PTI is now a member of the RCC. K2JTU was awarded a W-CONN certificate. Your SCM received his WFRC certificate. Both K2GIF and WA2HAY had antenna problems after Hurricane Donna passed through our area. K2LXL has entered Stevens Institute of Technology. W2GKE, K2LSU and K2OQA are busy recounting the story of their DXpedition to St. Pierre Island in August. W2BVE has reurtned from his job as communications officer at the National Boy Scout Ranch in New Mexico and says that the OO business is booming. WA2JHQ is building equipment for 220 Mc. WA2GQZ was host at the fall meeting of the Shore Emergency Net. WA2COO is now manager of the ESN. K2OIY built a "2AZL" converter. W2KR, Hudson Division Director, was the guest speaker at the Garden State Amateur Radio Association meeting Sept. 28. K2VZJ, QSL manager for FP8BM, is doing fine on 40 meters with a barefoot v.f.o. since his DX-20 died. WA2CCF earned a BPL card for originations and deliveries. W2CFB has a new tower and a new 20-meter beam. W2QNL says, "Having the time of my life." Handling traffic, that is. I have never seen anyone so completely fill the front of a four-by-nine envelope with the address and return address as K2UCY does. The NJ6 net reports 10 sessions were held, 122 stations checked in and 35 messages were handled. The annual

(Continued on page 156)



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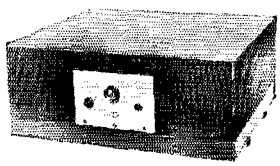

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banquet of the Irvington RAC on Sept. 24 was deemed a success. A good time was had by all, including your SCM, at the Garden State ARA picnic Oct. 2. Happy holidays to all from your SCM, and remember, this column *is for* news. Not *just* the news about the traffic men, but the word on any NNJ amateur. Please send reports about *your* activities. Traffic: K2VNL 267, WA2COO 260, WA2GQZ 220, WA2APY 215, WA2CCF 153, WA2GQI 151, K2UCY 128, W2QNL 124, W2RXL 115, W2EBG 105, K2VVL 98, WA2FGP 86, WA2JHQ 58, K2MFF 58, WA2EDG 53, K2CBG 25, K2GIF 20, K2MFX 15, W2BVE 14, K2SLG 13, K2QGD 11, W2CFB 8, W2CVW 8, WA2CNV 7, WA2GZR 7, WA2EJZ 6, K2PQR 2, K2PTI 1. (Aug.) K2SLG 13.

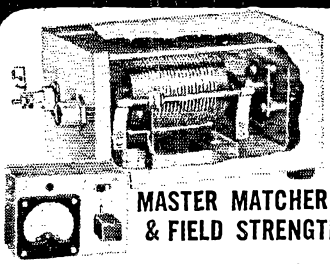
MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—Asst. SCM: Walter G. Porter, ØUJC. SEC: KØEXN. PAM: KØBSZ. RM: PZO. The 160-Meter Phone Net reports holding 15 sessions with 230 QNS and 6 messages handled. The 75-Meter Phone Net held 26 sessions with 1050 QNS and 144 messages. The TLCN held 26 sessions with 235 QNS and 752 messages. GYE, the YXL of FKB, has joined Silent Keys. The following have received EC appointments: TBR, FSO, GKN, IAE, KØAJN, QKF, DSC, OTV, QDC, TBL, CBC, PDJ and RTF. Following are renewals: BRE as EC, LCX as ORS and GKN as OBS. KØCRG operated portable at the Old Threshers Reunion at Mount Pleasant and made BPL with 191 originations. KØGBD is going to Iowa University at Ames. JNK is going to the State University at Iowa City. The Bedford Club reports a good attendance at its picnic Sept. 11. The Sioux City Amateur Assn. elected KØKGS, pres.; EQN, 1st vice-pres.; and KØSLU, 2nd vice-pres. KØVDY reports working IAEO, aeronautical mobile in a jet tanker over Sioux Falls, So. Dak., during the Sept. V.H.F. QSO Party. Traffic: (Sept.) WØLCX 2046, SCA 1708, LCG 1391, BDR 1299, PZO 1052, DUA 517, KØCRG/Ø 191, HEA/Ø 93, HBD 91, WØLJW 45, KØKAQ 32, WØVWF 31, KØBSZ 26, WVK 25, WØJPJ 20, PTL 20, KØRTL 16, SEW 16, EAA 14, YLN 14, IHC 13, WØHWU 13, BLH 12, BTX 12, KØEXP 12, WØYDV 12, KØEXN 10, MFX 10, GOT 9, WØQVA 9, KØBRE 8, JNK 8, WØQVZ 8, REM 8, KØVKT 8, WØVQX 8, GQ 7, KØPOI 5, VSV 4, WØEEG 3, KØMYU 3, WØNGS 2, KØRTF 2. (Aug.) WØJPJ 46.

KANSAS—SCM, Raymond E. Baker, WØFNS—SEC: VZM. Asst. SEC: LOW. RM: QGG. PAM: ONF. V.H.F. PAM: HAJ. Section nets: KPN, 3920 kc. Mon. through Fri. at 0645. Sun. at 0800. Mgr. ONF. NCSs KØQKS, EFL, IZM and AMJ. QKS, 3610 kc. daily at 1830. Mgr. QGG. NCSs SAF, FNS, TOL and KØBXF. HBN, 7280 kc. Mon. through Fri. at 1200. Mgr. KØHGI. Our thanks to UTO for her splendid work as Phone Activities Manager and it is with regret we lose her to Colorado; also our great appreciation to her OM, SYZ, for his great help as NCS on QKS and as representative to TEN for Kansas. Had the pleasure of attending the Kansas Federation Club meeting put on by the McPherson Radio Club and it was a great success with a Novice session by KØGIA, a MARS session by KØEMF as well as the traffic and AREC session held by our SEC, VZM, and myself. There is nothing new on Centennial except that KØIZM or IUB may be contacted for all information. The Wichita Club ACARA will start code classes about Feb. 1, 1961. The Wichita ARC already has one going. New appointments are OFN as PAM, IFR as OBS, ORB as OBS, KØIZM as OBS and BYV as ORS. UHL advises that the Parsons Picnic was held at Forest Park with IHH, ZYM, QPS, VLB, ABY, UHL, KØJWX, JVQ, TCT, ZFZ, GZP and K5LUM present. Jon is coming on the air with a new Globe Scout and an SX-11. FHT has taken over as EC of Kingman County. Traffic: (Sept.) WØFNS 385, KØHGI 318, WØTOL 130, SAF 129, IFR 103, ABJ 88, ORB 51, KØHVG 31, UAX 21, WØAMJ 26, VZM 20, KØQKS 19, WØFDJ 14, WFD 13, KØSMQ 12, WØSKW 9, KØIZM 8, WØBBO 7, KØQOB 7, TNW 6, WØBYV 5, KØEFL 5, JID 4, WØFHU 3, LOW 2. (Aug.) WØSAF 129, KØBXF 31, SMQ 11, ZSG 3, WØFDJ 2.

MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØLTP. RMs: OUD, QXO and KØONK. PAMs: WØBVL and OMM. Net reports: (Sept.) MEN (3885 kc. 1800 CST MWF) 13 sessions; QNI 383; QTC 95; NCSs OMM 5, OVV 4, OHC 2, KØKBD 2, MON (3580 kc. 1900 CST M-S) 25 sessions; QNI 182; QTC 181; NCSs OUD 14, KØQCQ 5, KØONK 3, KØPFF 2, KIK, SMN (3580 kc. Sun. 1600 CST) 4 sessions; QNI 10; QTC 3; NCS OUD. MSN (7115 kc. 1615 CST M-F) 15 sessions; QNI 31; QTC 21; NCSs KØONK 14, BHM. KØLGZ is now active on the 50-Mc. band. He reports that KØJPH is attending the Missouri School of Mines at Rolla. KØVXU, VBU, QCQ and UTX report QRL school activities. DE built a "dog house" for his and OUD's emergency power generator—it vibrated the entire house when mounted in the basement. RIP reports a "zero-beating" parakeet as a result of his construction of sev-

(*Continued on page 158*)



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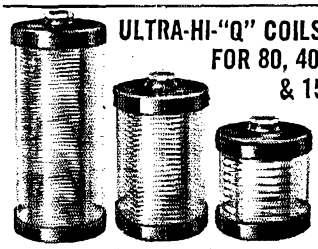

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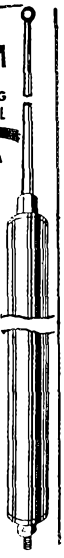

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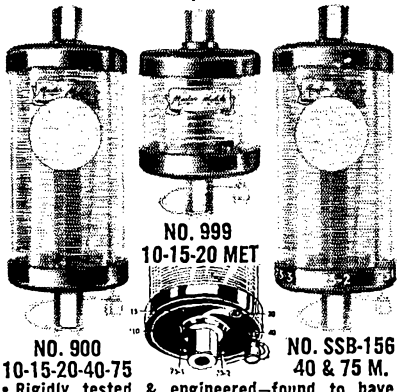

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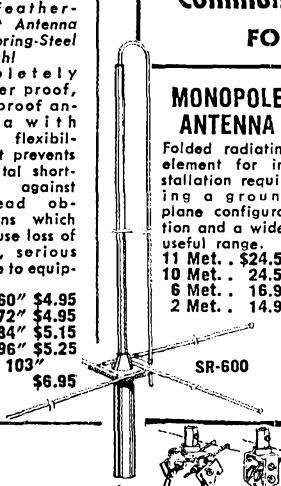

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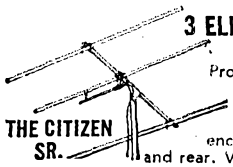

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MASTER-MAGIC WAND

New easy-to-install, single band, top-loaded plastic covered fiber glass antenna provides maximum performance at the most useful radiation frequencies.

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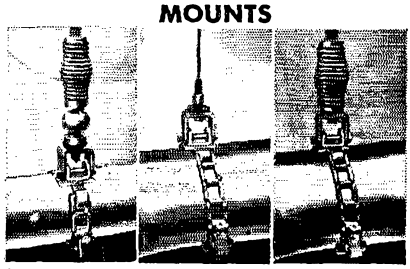
MOUNTS



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Adjustable to any bumper. No holes to drill.

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Gets your signal through where others fail. Concentrates signals at the lowest angle, provides omni-directional pattern for best coverage. Matches RG 59/U Cable. SM-700

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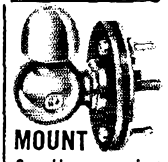

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11M. CITIZEN BAND ANTENNA

40" base loaded S.S. whip antenna. Fitted with a ¼" dia. brass slug for all-purpose mounts. Low standing-wave ratio on most of band when fed with a 52 ohm coax.

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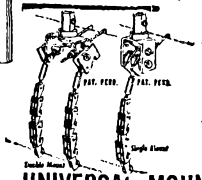

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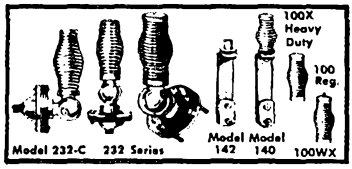

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AT LEADING RADIO JOBBERS EVERYWHERE

eral different exciter units. There is increased activity on 144 Mc. throughout the entire State in preparation for the new RACES frequency allocations. New officers of the Jefferson Barracks ARC are ODI, pres.; KØSZX, vice-pres.; KØKWJ, secy.; KØDCQ, treas. NXX has devoted considerable time to radio classes at the Missouri School for the Blind. As a result of his efforts there are two Technician and 2 Novice Class licensees on the air. AIW showed slides and a film of his last DXpedition to the Indian Ocean at the last meeting of the HARC (K.C.). MAE has retired from the Santa Fe and now has all the time in the world to work the ham bands. Appointments: KØRPH as OPS and OO, KØLCB as OES. Endorsements: TOD as OBS; KLQ as OES; IJS and RTW as ORSs; CWT, DFK, KØOLW, YHT and YOI as ECs; KØKBD, KØLTK, KØOJC and WYJ as OOs. Traffic: KØONK 749, LTJ 331, MMR 184. WØKIK 122, KØPFF 119, WØOUD 93, KØQCQ 92, WØMKJ 62, KØWBD 58, MAU 54, WØANT 53, OMM 39, BUL 35, BVL 30, GBJ 29, WAP 25, KØRPH 20, WØOVV 14, KØLGZ 13, WØRTW 10, KØVPH 9, WØZLN 9, ARO 6, KØVNB 6, PCK 3, IHY 2, VBU 2, WØPXE 1.

NEBRASKA—SCM, Charles E. McNeel, WØEXP—The Nebraska 75-Meter Morning Phone Net, daily on 3980 kc., reported by NC KØDGW, had QNI 756, QTC 160. The Western Nebraska Net on 3850 kc., reported by NC NIK, had QNI 550, QTC 130. The following reported 100 per cent for Sept.: KØBMO, DVB, ZWL, NIK and KØTUH. The Nebraska Section Net (c.w.), reported by NYU, had 27 sessions with QNI 196, QTC 98. KØRRL reports a new net, the Western Nebraska Emergency Net, operating on 3850 kc. at 1815 MST daily and reports 10 sessions with QNI 163, QTC 78. KØROP has left Alliance for Thule, Greenland, and will be looking for Nebraska contacts. ZJF reports two new Novice tickets in Falls City, KNØDIN and KNØDIT. KØKKJ reports Operation Medolert started recently. Traffic: (Sept.) WØIJW 148. KØRRL 109, TUH 108, WØNYU 99, KØBRS 98, DGW 92, QFK 92, WØFTQ 68, DDT 51, KØDVW 51, KTZ 48, ZJF 45, KJP 44, OKO 41, WØNIK 38, RDN 18, KØCDG 17, WØKDW 17, KØUWK 17, WØPZH 16, VEA 15, KØMSS 14, DFO 12, WØGGP 12, KØELU 11, MZV 10, WØEGQ 9, KØSPB 9, WØLJO 8, KØSLB 8, WØVZJ 8, KØJLG 6, WØLFJ 6, HTA 5, KØVIA 5, YDS 5, WØWKP 4, HOP 3, OOX 2, URC 2, YFR 2, KØVAZ 1. (Aug.) WØRDN 4.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, W1TYQ—SEC: EOR, RM: KYQ, H.F. PAM: YBH, V.H.F. PAM: FHP. Traffic nets: CPN, Mon.-Sat. at 1800, Sun. at 1000 on 3880 kc.; CN, daily at 1845 and 2200 on 3640 kc.; CVN, Mon., Wed. and Fri. at 2030 on 145.98 Mc.; CTN, Sun. at 0900 on 3640 kc. WHR reports BQQ, VXJ, WHR and K1MJM were active for the Cheshire RACES and AREC during the Sept. 12 hurricane alert. ZAD operated from DEX/1 in Middletown on 29.58 Mc. during the alert. KN1PTW and KN1PFK are new Novices in Columbia. K1IVT ran his DX score to 191/187 before leaving for school. FHP enjoyed meeting many of the hams he QSOed from his mobile rig on 2 and 75 meters while on vacation down South. K1MJC and K1NVY, of Waterbury, are now General Class. FYF has received the W-CONN award on phone. WAZ vacationed in California. YBH reports that CPN handled 274 messages during 30 sessions. Average attendance was 25 stations. High QNI were K1AQE, DAV, YBH, 30; VQH, 28; K1BSB, 27; IHG, 26. New stations active on CPN are K1ACQ, Norwalk; K1EAT, Orange; K1HEJ, Ashford; K1OIK, Norwalk; FTE, Windsor; ULZ, Ellington. APA has a Vee antenna up at the new QTH and is using p.p. 810s at 500 watts. K1GDW has a new HQ-180. LCG has a new Mosley TA-33 beam. WHL advises that the Conn. 6 Meter Net handled 42 messages with an average attendance of 15 stations per session. ROX hopes to be back on CN soon. KFB, the Greenwich High School station, is on with Heath equipment. K1LST and K1CJV are using the Heath Twoer. K1EFI is attending the U-Conn. branch in Stamford. VKZ received WAC and DXCC certificates. K1PST is CO and director of USNUSL at New London. FVY is back on Ice Island. IUN is active on 6 meters. OBR lowered his beam for "Donna." K5SPD gave an interesting talk to the TCARC on the history of YLs in amateur radio. Her OM, K5OEA is active on CN. The Southington ARC assisted c.d. and the Auxiliary Police with communications during Hurricane Donna. FVV and XYL celebrated their 34th wedding anniversary. ZPV reports that from Sept. 25th to the 27th there were three days of steady signals from Nova Scotia to South Carolina on 2 meters. Because of a transfer to Arabia I must resign as SCM. Serving as your SCM for the past four years has been the most interesting and rewarding period of my 25 years in amateur radio. My thanks to all of you for your help and support. Appointments renewed: HHR and NQO as EC: K1EFI as OO: VKZ as ORS. Reports received: OES from FVV; OO from K1EFI, K1GUD, K1IVR.

(*Continued on page 160*)

K1IVT, K1JBN, K1LFX, EQV and ZKQ. Traffic: (Sept.) W1OBR 288, AW 195, EKJ 140, YBH 137, K1HOP 127, GGG 86, AQE 46, W1QV 33, K1LAH 28, CBV 25, W1BDI 22, K1MBA 16, DGK 15, W1CHR 12, K1IVR 10, JAD 10, W1VIY 10, CUH 6, K1BSB 5, W1BNB 3. (Aug.) W1OBR 235, K1HOP 124, GGG 69, JAD 35.

NEW ENGLAND QSO PARTY

December 10 and 11, 1960

sponsored by
The Connecticut Wireless Association

Eligibility: All licensed amateurs in New England are eligible and invited to participate. Only single-operator entries will be considered for awards. CWA members will not be eligible for awards. *Times:* Three operating periods during the week end of Dec. 10-11 will be utilized: 7 P.M. to 11 P.M. EST Saturday, Dec. 10; 7 A.M. to 11 A.M. EST and 7 P.M. to 11 P.M., Sunday, Dec. 11. *Frequencies:* All amateur bands may be used. Each band with its sub-bands counts as one band for scoring purposes. For example, 80-meter c.w., 80-meter Novice, and 75-meter phone all count as 80 meters. It is suggested that the 25 kc. on the low edge of each band and sub-band be used. *Exchanges:* Call "CQ New England" on phone and "CQ NE" on c.w. The exchange will consist of QSO number, RS(T) report, name (or abbreviation) of county and state. For example W1XXX might send: "NR 7 589 ESSEX, Mass." *Scoring:* Count one (1) point for each contact. Multiply total contact points by number of different counties worked. Multiply again by number of states worked. For example, W1XXX works 50 stations, 35 different counties and 6 states. His score would be $50 \times 35 \times 6 = 10{,}500$. Maximum possible county multiplier is 67. Maximum possible state multiplier is 6. A station may be worked once *per band* regardless of mode. *Awards:* A certificate will be awarded to the 1st, 2nd, and 3rd high scorers in each state; to the 1st, 2nd, and 3rd high scoring Novice in New England; and to the 1st, 2nd, and 3rd high scoring Technician in New England. *Logs:* Logs must show date and time of each contact, complete exchange information, call and address of operator and final score calculations. Mark each new county and state as worked. Mail copy or carbon of logs to: Roger E. Cory, W1JYH, 67 W. Allen Ridge Road, Springfield 8, Mass., no later than January 15, 1961.

MAINE—SCM, Jeffrey I. Weinstein, W1JMN—The State of Maine AREC met its first real challenge during "Operation Donna" on Sept. 5, 1960. The exercise involved well over 100 State of Maine amateurs and many representatives from the areas, ranging from New York to New Brunswick, Canada. My sincere thanks to all the stations who cooperated so fully with central control station JMN. This situation only further enlightened us to the fact that emergency preparedness and the AREC is one of the most important phases of our hobby. Your local area EC not only needs AREC members but Asst. ECs and group leaders. The time required to be an active State of Maine AREC member is very minute indeed for the important service that the AREC offers the public. Contact your EC immediately for more information, or write me directly: Jeffrey I. Weinstein, JMN, 79 Caleb Street, Portland 4, Maine. All ARRL members are urged to apply for a station appointment and participate actively in the State of Maine programs. The Maine Slo-Speed Net, which meets Sun., Tues., Thurs. and Sat. at 1730 on 3726 kc., cordially invites all New England Division amateurs to participate in its operation of handling c.w. traffic. The Pine Tree Net, a higher-speed c.w. net, also extends a hand to newcomers. The PTN meets daily at 1900 on 3596. Phone traffic can be handled on the Sea Gull Net daily at 1700 on 3940 kc. We're planning fun for '61'. Be on the watch! Season's Greetings to all. Traffic: (Sept.) K1DUG 41, MPM 30, GVQ 29, W1UDD 28, K1KSG 22, W1JMN 12, K1OAZ 11, DYG 6, W1FV 4, K1MBM 4, IAA 3, W1SWX 3. (Aug.) K1DUG 63.

NEW HAMPSHIRE—SCM, Robert H. Wright, W1RMH—SEC: K1GQK. RM: K1IIK. PAM: IIQ. The GSPN meets at 1900 Mon. through Fri. and at 0930 Sun. on 3842 kc. The NHN (c.w.) meets Mon. through Sat. at 1830 on 3685 kc. The RACES and AREC nets in New Hampshire were ready and operating during the Hurricane Donna alert. The Contoocook Valley Radio Club is now an ARRL affiliated club. K1BCS, long inactive, in-

(Continued on page 162)

Make This

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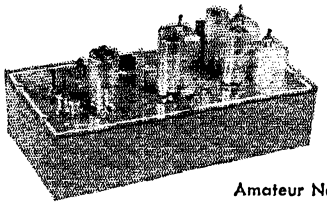

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CC-120	For Aircraft Frequencies	CC-220	220-225 mc - 1¼ meters

Specify I.F. Frequency

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Choose IF output between 2 and 6 mc. to suit your receiver.

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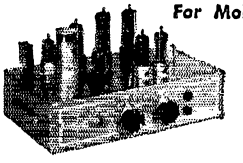

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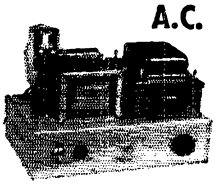

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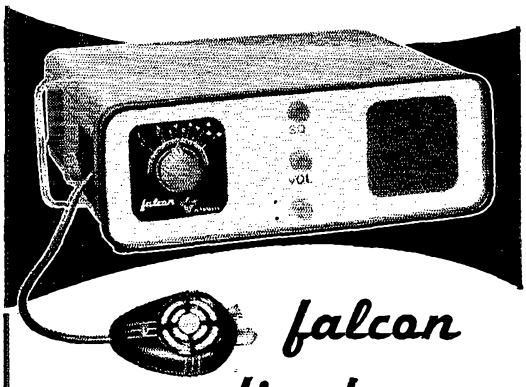

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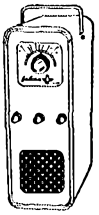

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tends to be back on the air soon. A RACES plan for the City of Concord has been submitted to OCDM for approval. GDE has been renewed as EC for Hillsboro County. Other renewals: K1MID and W1EVN as OPSs. As this is my last report to you as SCM, I would like to take this opportunity to thank you for the fine cooperation I received for the past two years. Your station activity and traffic reports were sincerely appreciated. My congratulations and best wishes to HQ, of Wolfeboro, my successor. I am certain he will receive your continued cooperation. Traffic: (Sept.) K1IIK 185, W1CUE 98, QGU 67, TA 63, YHI 38, UGV 27, K1ITS 25, W1IIQ 21, ZUS 21, ZUR 20, PFU 14, JLN 12, KVG 11, JNC 6, K1MID 4, IEH 3, W1BYS 2. (Aug.) K1CIG 2.

RHODE ISLAND—SCM, John E. Johnson, K1AAV—SEC: PAZ. RM: SMU. PAM: TXL. K1ABR is the new EC for Cranston. A report was received on Hurricane Donna from the SEC. KN1PWC received his Novice Class ticket. K1JNJ is back from his assignment in the Army. NCRC members of Newport taking part in the hurricane emergency were JFF, ETM, JHF, MMX, TXL, WLG, LUO, K1ELI, K1MCT, K1DPY and K1EGE. They maintained communications with the Red Cross, C.D. and Hurricane Nets. The Newport group was cited by the Governor for its part during the storm. The only damage was that JFF and MMX lost their antennas. The R.I. Mobileers assisted auxiliary police in evacuating the shore line and maintaining communications between shelters and the Red Cross. Members taking part were K1GRC, NTU, K1HSY, K1LCX, YVW, K1DZX, K1PNI, K1EBX and KCS. The W1AQ Club of East Providence operated its transmitters under emergency power during the storm. The V.H.F. Society of Providence operated the Red Cross Net during the emergency and HKN acted as net control for the Hurricane Net. All R. I. radio amateurs can be proud of the job they did during the emergency. RISPN report: QNI 243, traffic 126. Traffic (Sept.) W1SMU 567, TXL 196, K1GRC 48, BBK 15, W1WED 3. (Aug.) K1GRC 62, W1WED 5.

VERMONT—SCM, Mrs. Harriet Proctor, W1EIB—SEC: K1DQB. PAM: HRG. A group that met to assist the SCM with state activities included K1BSN, K1DKN, K1DQB, K1HGY, KJG, LMI, NDL, TJ, UCL and VSA. Suggestions are invited from any amateur in the section. The CVARC had a transmitter hunt near the Woodbury Lake Camp of K1AUE and K1BSN. VSA, with a new beam, made first contact with Cook Island on 20-meter RTTY. New officers of the BARC are LMI, pres.; K1CEG, vice-pres.; DAP, clerk; K1KSS, OJO and VSA, trustees. HYK, of Danville, is a new station on 6 meters, K1BQB is very active on the SDL program. Vermont nets need more traffic originated in the section and more NCS volunteers. Traffic: W1KJG 21, K1KCT 18, W1EIB 10.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—SEC: AOG. New appointments: K1JAW as RM for 40-meter c.w. ACB as EC and RO for Quincy, K1MHM as ORS. Heard on 75 meters: EHT, QLT, DKS, PX, ZTO, K1s AFF, OCG and JGX. WK has an Apache. MVI is building for 6 meters. JIT moved to Somerset. GOU has 213 countries confirmed on 10 meters. Our sympathy to DDO on the death of his boy. Heard on 2 meters: FCJ, TJW, JJS, AJA, EZV, K1s NTU, PFT, CCF, KHP and KN1PFI. During Hurricane Donna almost every RACES and AREC group was alerted. ORV was in the hospital. AUQ has a Heath Q multiplier. K1CMS and his XYL went to Europe. EMG wants some of the traffic boys on 2 and 6 meters to check in on our c.w. net on 3660 kc. K1MHM has a new 100-watt rig and is going on 6 meters. The 2200 Club Net meets on 50.85 Mc. at 2200 daily. K1BUF is back on the air. K1MEM's Tri-bander staved up but all other antennas came down in the storm. K1MMH is now General Class. The Chelmsford ARA elected UJA, pres.; KHQ, vice-pres., K1BNA, secy.-treas. K1BNA has a quad for 20 meters on an H&B tower. APW has a new harmonic. The No. Eastern States Net had 29 sessions, with 251 stations and handled 156 pieces of traffic. K1ODL is building a new v.f.o. rig. VIN has a new beam to go up. MD has a phone pole for the new 3-band beam and a Windom antenna. K1OFB has the c.w. award from W-CONN. HSM is on 20 meters. KN1PUQ is K1HYF's mother. MPP will be on soon. NF worked VQ1SC. AKN is RO for Sandwich, also Asst. MARS Director for Mass. and State Training Officer. The T-9 Radio Club met at MNK's QTH. The Eastern Mass. 2 Net had 30 sessions, 462 stations, traffic handled 246. K1MJS has a Globe Scout and a Ranger. K1GNR LLX, IBY, PEX and UEQ meet on 10 meters. K1KZU is on 2 and 6 meters. The 2-meter band opened up several times. AQE worked South Carolina, VO1DW worked stations in L. I., N. Y., N. J. and Maine. K1AQF worked N. Y. and Penn. K1MHC worked L. I. and W2RQC in So. N. J. K1CHY and IPJ were up on Mt. Ascutney, Vt., for the Sept. V.H.F. QSO Party. Heathkit "Sixers" are being used by K1s JME, OUY, EKQ, CQH, NPC, W1s GPN

(*Continued on page 164*)

10 db GAIN

BASE STATION TO VEHICLE

-in both directions

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Base Station Antenna

The STATIONMASTER consists of a number of collinear radiating elements fed inphase and encapsuled in a continuous weatherproof Fiberglass housing and withstands winds in excess of 125 m.p.h.

Nominal input impedance	50 ohms
VSWR	1.5:1
Bandwidth	±0.5%
Max. power input	150 watts
Omnidirectional gain	5.8 db
Internal feedline	RG-8A/U
Frequency range	450-470 mc

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Feedline	10′ of RG-58/U
Frequency range	450-470 mc

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MARLBORO NEW JERSEY

Percentages listed are measured values

and HUG. K1HEX has the 2-meter version. The Reading High School ARC now is affiliated with ARRL. K1CFT is going to college. TWG worked two VEs on 2 meters. K1MKX worked all New England, N. Y., N. J. and Penn. K1GVR now is in Cambridge. K1DTJ is back in Brighton. OFK, our Somerville EC, reports a net on Sun. at 2100 on 146.25 Mc. K1JKR has a new Heath 10-meter transceiver. EAE worked with the Boston Red Cross during the hurricane. ADM is moving to Mansfield. LHZ moved to Hanover. K1OIS spoke at the QRA. The Malden Radio Club held an auction with HKG at it again. K1JAW, K1BUF, JIU, MHM and FJJ are active on the 40 meter net. K1CHC is RO for Whitman. K1KTK is building rigs for 2, 1¼ and ¾. The Brookline Club, VBC, was on 2, 6 and 10 meters during the hurricane and the following helped out with mobile rigs: WIs PST, ZFQ, DPE, ALV, KCU, IEF, ETB, ZTL, LXW, MSW, IQS, NSH, IRQ, TWH, IRH, HGT, K1s DJG, KKQ, BAF, BCJ, HSB, MIA, IDZ, LKP, LUT, LPQ, JIY, JUM, OGB, IWB, ADH, AJV, KBN, LQP, GVD, DZG, KAN, ADA, CZX and K2CAM/1. Appointments endorsed: VYS Weston, JSM Arlington, KZW Westwood, MD Hingham, CZW New Bedford, DVS Falmouth as ECs; AUQ and CFT as OOs; JSM and EUJ as OESs, WU and K1BUF as ORSs; K1BUF and JAW as OBSs; TWG as OPS. OOP spoke at the El Ray Club on "Moon Bounce." GOU is a new OO. K1LJK is on 160 meters. NUP is active again. DEI, is on a Naval Reserve cruise. JSM worked VEs on 2 meters during the opening. K1MOD is General Class and has an SX-100 and an Adventurer. ZGI and ETW have Tri-banders. Traffic: (Sept.) K1GNR 361, LLX 214, W1EMG 193, PEX 166, ZSS 140, TZ 127, EAE 125, K1JAW 84, W1FJJ 76, K1MHM 71, W1DOM 65, OFK 60, K1DTJ 44, JIU 41, BBH 40, W1SIV 31, AUQ 28, K1BYL 28, W1VYS 20, K1MHC 19, KZP 18, LLU 17, W1RQL 13, TWG 13, K1CMS 12, JUR 11, LCQ 10, BUF 8, W1AAR 6, K1GYM 6, W1NUP 6, GTX 5, K1LJK 2, W1NJL 2, K1IWP 1, MEM 1. (Aug.) W1NJL 1097, AUQ 44, K1CMS 14, AII 7, DSA/W1SWX 2.

THIRD ANNUAL MASSACHUSETTS QSO PARTY

January 28 and 29, 1961

The Merrimack Valley Amateur Radio Club announces a Massachusetts QSO party in which all amateurs are invited to participate. Details follow.

1) The contest begins at 6 P.M. EST January 28 and ends at 11:59 P.M. EST January 29. 2) Suggested congregating frequencies are 3660, 3870, 7080, 7260, 14,100 kc., 21100, 28100, and 50 and 144 Mcs. 3) The same station may be worked for additional credit on more than one band. Phone and c.w. are considered separate contests. Stations may enter both but must submit separate entries. 4) General calls: "CQ MASS." Massachusetts c.w. stations identify themselves by signing "de MASS (call) K." Phones say "Massachusetts calling." 5) Contact information: Mass. stations send QSO number, RS or RST and county. Others send number of QSO, RS or RST and state, province or country. 6) Scoring: Each completed contact counts five points. Non-Mass. amateurs will multiply by the number of Mass. counties worked; Mass. stations will multiply by total number of states, provinces and countries worked. Multiply this total by 1.5 if input power remains under 150 watts at all times. 7) Certificates will be issued to the highest-scoring station in each state, province, country and county in Massachusetts. 8) Logs must show the date, time, emission, and power input as well as the required contact information. 9) Contest logs should be submitted to Robert M. Knowles, K1DIR, Act. Mgr. MVARC, 9 Brown St., No. Billerica, Mass. postmarked not later than February 18, 1961.

The Worked All Massachusetts Counties certificate will be issued to those who succeed in working all 14 counties during the contest, regardless of the type of emission used.

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, W1BVR—SEC: BYH. RM: K1IJV. PAM: DX8. WMN meets on 3560 kc. at 7 P.M. Mon. through Sat. WMPN meets on 3870 kc. at 6 P.M. daily. WMNN meets on or near 3744 kc. at 6:30 P.M. Mon., Wed. and Fri. As of Nov. 1 K1LBB has been in charge of a West. Mass. Slow Speed Net. This operates on 3560 kc. at 6:30 P.M. Tue. and Thurs. Any West. Mass. amateur will be

(*Continued on page 166*)

NOW! TWO ANTENNAS IN ONE*

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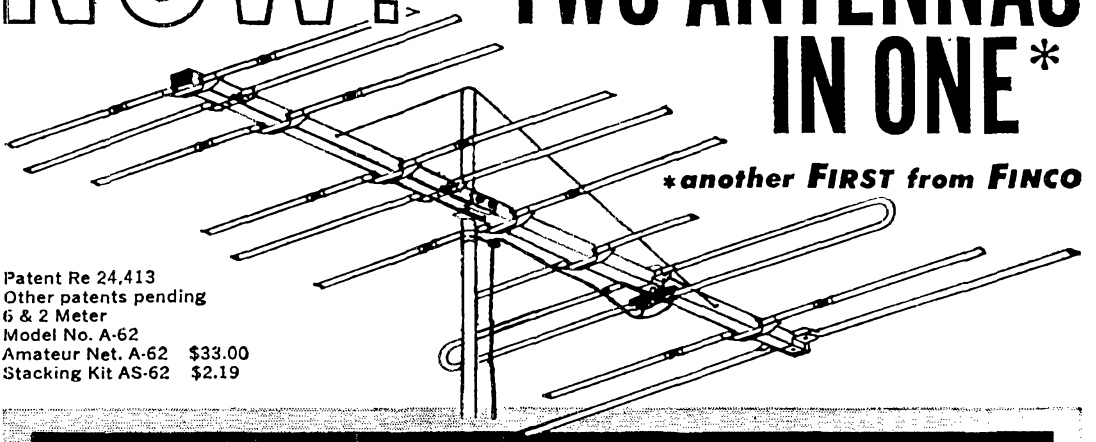

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Model No. A-62
Amateur Net. A-62 $33.00
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6 & 2 METER COMBINATION ANTENNA

from **FINCO®**

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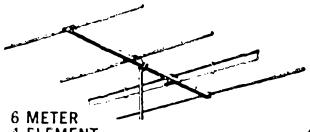
- All Elements Are Sleeve Reinforced And Completely Pre-assembled With "Snap-out" Lock-Tite Brackets
- Boom Suspension Rods Are Supplied Completely Pre-assembled, Ready To Be Snapped Into Upper End Of Mast

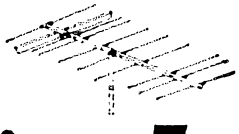
ON 2 METERS
18 Elements
1 — Folded Dipole Plus Special Phasing Stub
1 — 3 Element Collinear Reflector
4 — 3 Element Collinear Directors

ON 6 METERS
Full 4 Elements
1 — Folded Dipole
1 — Reflector
2 — Directors

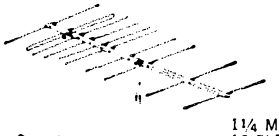
OTHER ANTENNAS for the DISCERNING AMATEUR



6 METER
4 ELEMENT
AMATEUR NET
A6-4 $17.16
STACKING KIT
AS-6 $2.19



2 METER
10 ELEMENT
AMATEUR NET
A2-10 $11.88
STACKING KIT
AS-2 $1.83



1¼ METER
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AMATEUR NET
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AS-1¼ $1.26

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welcome, and this net should prove a stepping stone to the regular WMN. OY, EC for Westover AFB, reports 25 Full AREC members! K1IJV has been awarded the "Worked All Conn." award by the Willimantic Jaycees. YK again is active in the traffic nets with K1AII as chief operator. The new 1RN session on 3830 kc. is working very smoothly with all New England sections regularly represented, with the exception of East, Mass. Congratulations to DXS on a job well done in organizing that net so quickly and efficiently! With the aid of self-addressed return postcards, RM K1IJV has lined up NCS and 1RN representatives for the fall and winter season on WMN. DZV is at Tufts College with pal KGJ. BYH will be using his second call, K1APR, this season. The October meeting of the Hampden County Radio Association was held at television station WWLP. QWJ and STR were active on 1200 Mc. during the September V.H.F. Contest. K1JGW worked KC4USN at the South Pole on s.s.b. W1MJM is a new ham in Pittsfield. K1MRP has his new Tri-bander on a 40-ft. tower. K1DJN is starting a 6-meter RACES-C.D. net in N. Adams, where he is Radio Officer. BYH has a new 50-ft. tower and a Hammarlund HC-10. K1DPP has a new Rohn tower and 20-meter beam. K1JPP has a new Heath Sixer. We have lots of other news here, but this time we ran out of space, which is as it should be. Hi. Traffic: K1IJV 105, W1BVR 97, K1LBB 95, W1YK 33, ZPB 11, DVW 2, K1GCV 2.

NORTHWESTERN DIVISION

IDAHO—SCM, Mrs. Helen M. Maillet, W7GGV—Operation Yellowjacket forced Idaho hams to use 40 meters; for a few of the boys it was the first time on 40 in over a year! The FARM Net (3935 kc., 1700, Mon.-Fri.) held an election. DWE is net manager; JFA, net control; with ISY, WBK and GGV, alternates. The Lewiston-Clarkston Radio Club will offer a contact-certificate during the '63 Tercentennial Celebration. K7NPT is the new call of the Teton High School at Driggs. Bannock County EC GCO and K7IMB gave instructions in message-writing and handling to AREC members. Pocatello 2-meter stations are experimenting with beer-can coaxial vertical antennas. K7KBU now has his 1st-class commercial ticket. K7KBX moved to Salt Lake City. GGV was elected YLRL 7th District Chairman for '61. GHT is back on the air and checking in to RN7. GMC has a new Sunbeam Alpine sports car. FARM Net traffic: 24. **FLASH!** H. A. Keller, pres. of the Lewiston-Clarkston Radio Amateur Club (P.O. Box 383, Lewiston, Idaho) announces a certificate award. It commemorates the 100th anniversary of founding Lewiston, then the territorial capital. Contact any two area-amateurs living in the Lewiston, Idaho, Clarkston, Washington Valley, any band, QSOs between Nov. 1, '60 and Sept. 1, '61 and apply by sending QSLs to LCARC, address above. Traffic: W7GMC 69, GGV 26, VQC 20, LIQ 10, K7BWV 7, W7DWE 6, JFA 2.

MONTANA—SCM, Ray Woods, W7SFK—SEC: BOZ, PAM: YHS, RM: K7AEZ. MPN meets Mon., Wed. and Fri. on 3910 kc. TSN meets Mon. through Fri. at 1200 on 7230 kc. MSN meets Tue., Thurs. and Sat. at 1830 on 3530 kc. DXM is back at college in Havre. QYA is with the school superintendent's office in Lewistown. DXK has a new son. K7BFJ is at her school teaching. K7ECF is back from the Vet's Hospital. JFR is moving to a new QTH. Montana will miss NZJ, who joined Silent Keys. The Old Faithful Radio Club is ready for any emergency, with 1 kw. and 10 kw. on trailers. K7BKH batted out another BPL for September. The passing of PYZ is deeply regretted in this area. The Harlo Radio Club elected K7CHA, pres.; CTM, vice-pres.; TGM, secy.-treas.; TGL, act. mgr. The Assistant EC at Harlo is K7IUJ. New appointments are BOZ as SEC, W7RZY and K7GHK as ECs, RZY as OBS (RTTY) and BOZ as OES. Traffic: K7BKH 315, DCI 268. DCH 56, W7JFR 20.

OREGON—SCM, Hubert R. McNally, W7JDX—Bessie, DIC, seems to have recovered from the mumps and is active again. AJN says he has been riding backward! GUH has a new rig on 6 meters and reports good activity, but school is getting him as well as others of our young gang. DEM was in Southern California for two weeks. KN7JRA let his license run out. Better get busy, Denny. DTT reports activity on the new Washington County 6-Meter Net. K7EZP reports good DX on 6 and 2 meters during September. OSN reports quite a pick-up in activity during the month and we hope the summer slump is over. OEN is going along nicely and the AREC Net on 3875 kc. has a nice report. Ken, K7CLL, and Diana, K7IWU, are now located in Salem and we hope they can again be active. However, law classes may slow Ken up. A fine report was received from our SEC, UQI. Hope all of you realize the swell

(Continued on page 168)

PENTA PL-175A BEAM PENTODES SELECTED FOR OUTSTANDING NEW "INVADER 2000" TRANSMITTER!

In designing the new "Invader 2000" single-sideband transmitter, the E. F. Johnson Company chose a pair of Penta Laboratories PL-175A beam pentodes for the final amplifier. The 400-watt PL-175A was a logical choice, because it employs Penta's exclusive, patented "vane" suppressor grid, which causes it to deliver more useful output than similarly-rated conventional screen-grid tubes.

If your present transmitter uses conventional 250-watt or 400-watt tetrodes, chances are that you, too, can enjoy the many advantages of Penta's newest tube. Most tank circuits have sufficient tuning range to accommodate the slightly higher input and output capacitances of the PL-175A, and slight retuning is usually all that's necessary to put you on the air with increased power output.

The PL-175A has other advantages, too—such as the lower grid-plate capacitance which reduces neutralizing problems, a complete lack of annoying negative screen-grid current, and a sturdy, solid, one-piece plate cap and seal which has no set-screws or separate parts to loosen or fall off.

Follow the lead of the E. F. Johnson Company's knowledgeable engineers, and get the best for your transmitter—the new Penta PL-175A beam pentode.

CHARACTERISTICS AND RATINGS		
Filament Voltage	5.0	volts
Filament Current	14.5	amperes
Direct Interelectrode Capacitances		
Input	15.1	μμfd
Output	9.8	μμfd
Grid-Plate	0.06	μμfd
Maximum Plate Voltage	4000	volts
Maximum Plate Current	350	ma
Maximum Screen Voltage	1000	volts
Maximum Plate Dissipation	400	watts

For complete details write for the PL-175A data sheet. Also, ask for your copy of "Transmitting Tubes for Linear Amplifier Service," a nine-page bulletin which shows in detail how and why Penta's pentodes out-perform conventional tetrodes.

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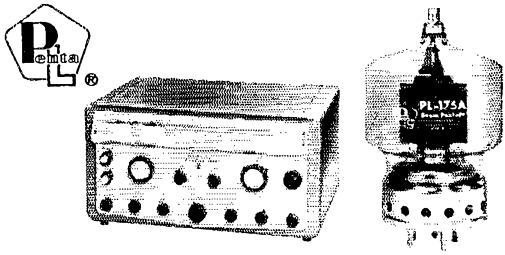

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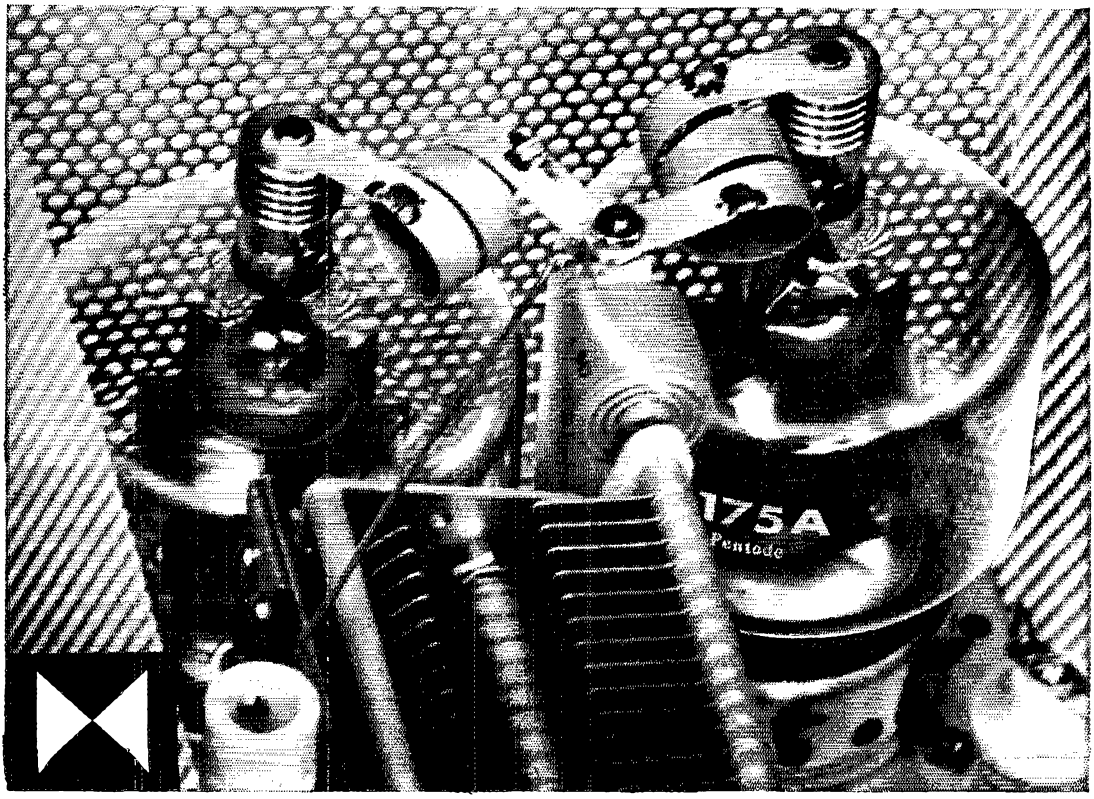

job Red is doing. The Portland Affiliated Club Council is holding meetings to plan on the National Convention which will be held in Portland in 1962. It takes lots of planning ahead and that's what is being done. The news is scarce again this month. Sure wish more of the gang would send in their newsy postal cards each month. Your SCM cannot invent news. Traffic: W7BDU 242, K7AXF 208, W7ZFH 104, DEM 47, GUH 38, LT 36, MTW 26, AJN 12, K7CBA 6, W7DIC 6, DTT 5, K7EZP 1.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—The Fourteenth Annual Walla Walla Amateur Radio Picnic and Hamtest was held at Wildwood Park in Walla Walla Sept. 11 with some 240 in attendance. CPY, Northwestern Division Director, was the main speaker, along with PGY and HMQ. IST is QRL college. AMC is awaiting the arrival of a new Globe Chief. GIP reports several new men are checking in with WSN on 3232 kc. AIB worked six new countries during Sept. IEU still is QRL shift work. ACA was active in the c.d. alert for Benton County. JEY is back on the traffic nets. The Tacoma Area C.D. Net had 31 check-ins for the first drill of the fall season. BTB is building a new 3-band quad. K7DDQ is waiting for a new tower and Tri-bander. K7CWO blew his 20-A and is off the air temporarily. The Skagit Amateur Radio Club had 100 at the Annual Barbecue. K7JIO is QRL building a new church. ZSH returned from KL7-Land. K7KNZ replaces ZDQ as EC for Clark County. K7GZB is making plans for 582 glow scan T.V. The Valley Amateur Radio Club (VARC) of Puyallup put on the exhibit and display of amateur radio gear at the State Fair with an estimated 150,000 persons viewing same. MPH was the chairman, assisted by TYI. FIX is realigning receivers with the next problem a new keying system for a TCM-2 transmitter. AXT reports a Ford spark coil keeps him inactive. PGY put up a new 20-meter Gonset bow-tie on a 50-ft. tower. K7LVI has the new Gonset mobile twins. VME is attending radar school at Keesler AFB, Miss. DZX is looking for a pair of 814s. The WARTS Net had 27 sessions with 1542 check-ins and 238 pieces of traffic for Sept. The first meeting of the new Forum for the Washington State Emergency services was held Sept. 25 on 3970 kc. at 1800 PST. Meetings will be held the last Sunday of each month on 3970 kc. at 1800 PST. All ECs and AREC members are invited to be present. REC and his XYL became new grandparents Sept. 15. EKQ has a new addition to his household, a daughter. DEP is heading back to school. CNE is heading for Arizona for the winter. BA is back in the traffic game. HRC and his XYL returned from a trip to W6-Land. A good turnout was on hand at the Roberts meeting in Tacoma on Sept. 12, sponsored by the Tacoma Amateur Radio Club. CAM is redoing his ham shack. Traffic: W7BA 1910, DZX 934, QLH 494, K7IEY 476, W7IST 247, APS 156, AMC 66, EHH 64, KZ 35, GIP 32, AIB 21, IEU 20, ACA 19, GYF 18, JEY 16, VPW 16, K7AJT 15, BBO 12, W7BTB 10, K7DDQ 10, CWO 7, W7OMO 6, LFA 4.

PACIFIC DIVISION

NEVADA—SCM, Charles A. Rhines, W7VIU—KOI is back on the air after a prolonged siege of eye trouble. UPS has his 75S1-32S1 on mobile. BYR is back from a big game hunting trip in Africa. VIU has his new shack completed and will be back on the air by the time you read this. AZF sold his tower to K7HRW. JDI is in Korea. NCO is a new ham in Elko operating mobile. We are badly in need of traffic outlets all over the section, especially in the Reno-Sparks, Las Vegas, Boulder City and Henderson areas. Surely there must be enough hams in the State who operate c.w. so we can get some representation a few nights a week in NTS. I also would like to get our section net going again if we could generate some enthusiasm. If interested in traffic work, contact me. You don't have to be a hot-shot c.w. man to work traffic. The NARA mobilized for emergency work because of the forest fire cutting off power from Reno. Its AREC group also handled communications for power boat races at Pyramid Lake.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—SEC: W6ZRJ. RM: W6RSY. PAM: W6ZLO. Your SCM has recently been informed of his reelection for a two-year term ending Oct. 1962. One of the pleasures of the job is the contact with outstanding amateurs who hold official appointments in the League. At present this section counts 26 ORSs, 11 OPSs, 13 OOs, 10 ECs, 6 OESs, and 8 OBSs. The total of 74 is considered very good. There are of course weaknesses in some fields: we have twice the optimum number of OOs. For one reason or another the interest and activity of individuals change, so in the coming months reconsider your position. If you are not participating fully in the program of your appointment perhaps a change is in order. The Fort Ord MARS Club sponsored a 2-meter hunt on Oct. 9. Practically everyone turned out for Frank Quement's

(*Continued on page 170*)

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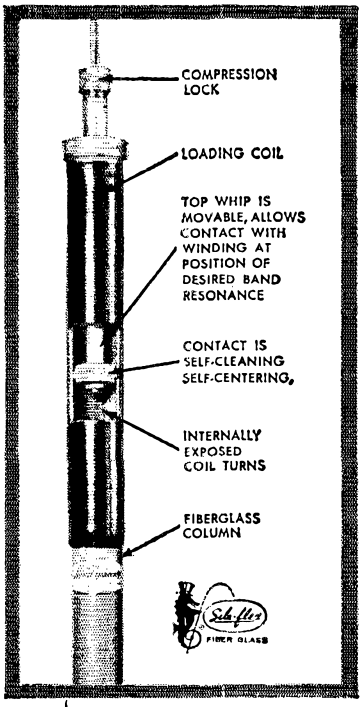
streamlined mobile antenna for effective 5-band operation



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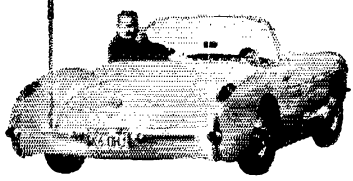

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Band Spanner is truly streamlined . . . distinctive . . . fine looking on any car. Fiberglass support column is strong, durable, lightweight . . . unaffected by moisture. Because the loading inductor is wound directly on the fiberglass column, the winding proper can easily handle substantial power. There are no flimsy plastics involved. Band Spanners give excellent performance with transceivers, such as Gonset G-76, which operate at power inputs of 100 watts or more.

Band Spanner is a well-proved performer on 5-bands . . . 80-40-20-15 and 10 meters . . . offers one of the finest antennas for use with multi-band equipment, Collins KWM-2, Gonset G-76 for example. Resonance for maximum performance can be established anywhere within the 5 bands by simple, plunger-type adjustment of the stainless steel top whip. **No multiple coil arrangements or other tuning at the base.** No exposed joints to corrode. Winding is contacted **internally,** is encapsulated in durable epoxy for lasting exterior protection.

Carefully engineered . . . mechanically excellent, built by WEBSTER, foremost manufacturer of marine and mobile antennas.

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Band Spanner (long or short type) complete with universal ball mount and heavy-duty spring.

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Band Spanner (long or short type) complete with bumper mount and heavy duty spring.

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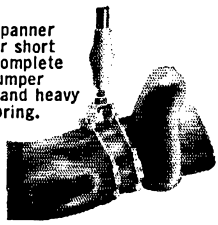

WEBSTER MANUFACTURING 317 ROEBLING ROAD, SOUTH SAN FRANCISCO, CALIFORNIA.

Third Annual Pancake Breakfast on Oct. 2. K6ZCR was reelected MCAN-7 secretary. Claire has had 220 volts extended to the basement for shack relocation. W6WX is enjoying the GSB-100 won at the Pacific Division ARRL Convention. W6OKK is converting his Viking II to differential keying. WA6HRS is building a transistorized electronic keyer. WA6AFX is now at Cal. in Berkeley. WA6BBS has moved from San Francisco to San Bruno and is attending Stanford. W6HC has returned to his professorial duties at San Jose State after sabbatical study at Stanford. Traffic: (Sept.) W6RSY 1061, K6ZCR 382, WA6OAQ 217, W6AIT 173, K6DYX 88, W6FON 84, K6GZ 67, W6DEF 66, W6HC 57, K6YKG 37, W6RFF 36, K6VQK 24, W6YHM 24, W6ZLO 21, WA6HZM 19, W6ZRJ 16, W6PLG 10, W6WX 4, W6YBV 4, WA6HRS 2. (Aug.) W6ZRJ 2.

EAST BAY—SCM, B. W. Southwell, W6OJW—SEC: K6DQM. ECs K6JNW, K6VXK, K6ESZ, K6TYX, K6VXM, W6EFI and W6LDV (acting). K6GK is working with the Boy Scouts in electronics. W6NBX is the new Route Manager for the section and is manager of NCN. K6DQM joined the NCN. The EBRC heard an FB talk on Parametric amplifiers at its Sept. meeting. The HARC is reorganizing its AREC rolls. Check with K6JNW for the Hayward/San Lorenzo Area. The MDARC provided communications on 144 Mc. for the Trail Ride, and also for the Walnut Festival Parade and Foot Race, using mobile gear. The CCRC held its Sept. meeting at the Eimac plant. W6CNW is Christmas Party chairman of the MDARC. W6EFI is QRL vacation. W6PIR (editor of MDARC's *Carrier*) and her OM spent Labor Day week end in Reno. W6HC was guest speaker at the Sept. meeting of the MDARC. The Castro Valley High School Radio Club is putting up a new tower. The XYLs of WA6HGO and WA6DJD are new members of the HARC XYL club. WA6JCS, WA6YKP, WV6MXK, WV6NFW and KICJO/6 are new members of the HARC. W6IPY is testing out a new mobile rig. Welcome WV6NPC, WV6-NFW and WV6NGH to the Novice ranks. WA6FFQ is a new Technician and WA6KCZ is a new General in the Hayward Area. Congrats. W6UGO has a new Valiant rig. WA6AHF has a new 350-watt phone rig built by K6POP. K6TIY has a new Heath Mohican receiver. W6LGE is recovering from a heart ailment. Get well soon. OM1 VR6AC won the Hallicrafters HT-37 s.s.b. rig at the Pacific Division ARRL Convention. Look for him from Pitcairn Island. Traffic: W6NBX 283, K6GK 114, K6-DQM 18.

SAN FRANCISCO—SCM, Leonard R. Geraldi, K6ANP —The NCN Northern California Net (NTS) meets on 3635 kc. at 1900 PST Mon. through Sat. The Far West Radio Club of Fortuna held its club picnic Sept. 14. About 26 members and families joined in the fun. This club also participated in the Oct. 8-9 Simulated Emergency Net. K6NCG, the club station of the U.S. Naval Schools Command on Treasure Island, is doing a very excellent job with priority traffic when it comes its way. A case in point: Recently a girl on Midway, whose father was dying in the veterans hospital in Oakland, managed to get off Midway and come Stateside. In the excitement and rush she lost some of her baggage. The boys at K6NCG finally were able to locate it and to deliver her safely to her father's bedside. The club held a camping trip to Mount Diablo Sept. 16 to 18 and operated 2 and 6 meters from the top of the mountain. The San Francisco Radio Club has changed its address and night of meetings. The new address is American Legion Hall, 2800 Taraval at 38th St., San Francisco. The new meeting night is the 1st Fri. of the month. K6ANP and W6HVN combined a vacation and DX operating trip to Ensenada, Mexico. K6ANP was issued the special call of XE6ANP. The boys made about 800 contacts, which included all continents except Europe. They tried many nights to contact Europe but were unsuccessful. Traffic: W6QMO 401, K6NCG 283, W6GQA 2.

SACRAMENTO VALLEY—SCM, Jon J. O'Brien, W6GDO—Asst. SCM: William van de Kamp, 6CKV. SEC: K6IKV. I understand that WA6DBM spent the summer writing two technical books, both of which have been published recently. I don't know the titles but congratulations to Howard. W6QHP won the RAMS annual hidden transmitter hunt. Several RAMS and other locals recently invaded 160 meters. Please be reminded that my term as SCM expires on Feb. 25, 1961 and the closing date for receipt of nominating petitions has been set at Dec. 9, 1960. If you have someone in mind, submit a petition; see page 92 of Oct. 1960 *QST*. The holiday season is upon us once more. Almost all clubs have completed plans for their annual Christmas Parties and some may have been held already. Support the club of your choice, attend meetings regularly and pay your dues. A very Merry Christmas and Happy New Year to all.

(Continued on page 172)

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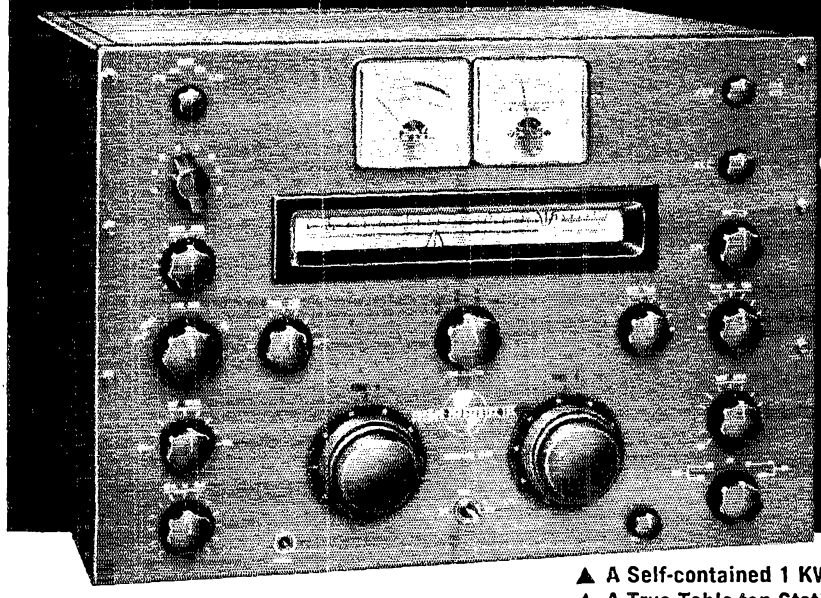

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AUDIO CHARACTERISTICS: 200-3100 cps

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VOX: Built-in
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RF OUTPUT: 52 ohms
VFO's: Dual VFO's permit transmitting on the receive or any other frequency
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SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—Once again, I would like to take this opportunity to wish everyone of you a very Merry Christmas, with a KWM-2 under every Christmas tree. K6KYU has a five-element 6-meter beam up 85 feet. K6AVA is working on a three-element beam for 6 meters. WA6JUB passed the General Class exam. W6JPS and party went deer hunting with portable rigs and got skunked. K6LKJ and W6FXV attended the S.S.B. Dinner in Santa Barbara Oct. 1, and K6LKJ won a portable antenna. W6PSQ has an 80-ft. crank-up tower. W6JXY has a 75A-4, a Gonset Tri-band beam and a new final. W6UBK is having break-in problems. K6OER is heard on 75-meter mobile. W6LOS has a 3" panadapter working. K6IZF has a 4-1000 final on 75-meter s.s.b. The SJVN Picnic, which was held in Turlock, had 162 in attendance. W6CUA was elected net manager, with W6DBT assistant in the south and W6GUU assistant in the north. K6OLN is building a 6-meter converter. W6NKZ is fighting a 2-kc. note in his mobile rig. K6GOX is attending F.S.C. with lots of homework. W6FXV has a mech. filter and is building an exciter for possible mobile s.s.b. K6BGK has a new mobile rig and a panel truck. W6EFB is building a tri-band beam. The SJVN had 468 check-ins and a traffic count of 112. The Fresno *Radio Club's* 2-meter repeater *still is having its* problems. K6OZL still is having modulator troubles. Traffic: K6KCB 294, K6ROU 206, W6ARE 180, K6OZL 60, W6EFB 11.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—PAM: DRC, V.H.F, PAM: ACY, RM: PNM. "Donna" has come and gone and again North Carolina was able to take care of communications. Barny gave me a rundown of the activity on the Tar Heel Emergency Net. The civil defense net also was operated and aided in caring for communications to c.d. headquarters. The overall picture was excellent in the communications field. Possibly more attention to 2, 6 and 10 meters for local communication is needed. K4PYV/4 sent along a good report of the activity in the Cherry Point Area, all of which was handled on 29.4 Mc. with eight stations taking part. This type activity surely would relieve the load from the state net frequency and at the same time get the local job done. 3JWN/4, of Burlington, N. C., made BPL for the past two months. Congratulations. Activity on the c.w. net continues to be tops with a growing number of stations taking part. Thanks, Ken and company, for the extra effort it takes to get a good net going and continuing to grow. Too few people are interested in hamming as a public service and it should be the first thing in the minds of every amateur. Keep your equipment in good shape, learn how to operate in a net, be ready when called in an emergency. Take some of the Christmas money and get some gear that will operate on the State Net. Incidentally, Merry Christmas and a good operating year for 1961.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—K4AVU has resigned as RM to take the managership of the 4th Regional Net. PED succeeds him as RM. The new manager of SCN chosen at the Rock Hill meeting Oct. 8 to succeed K4HDX is KNI. AKC was M.C. at the meeting and the guest speaker was MWH, Roanoke Division Director. The Rock Hill Hamfest held Oct. 9 was a big success. Prize winners were K4OVS and GXR. 4PW, president of the Rock Hill RC, was presented the plaque for the best club Field Day operation in the State by K4PJE, the SEC. K4HDX and ZHV are new ORSs. HJK has received his BPL medallion. K4ZHV is to be commended on his fine showing on UTL as liaison on Mon. night on the EAN. K4HQK, PIA, VVE, QZA and GCB are in college and are sorely missed by the SCN. ECs endorsed are K4MXK, AVU, MBN, IBX, PJE, W4GIF, ZRH, CAL, GQO, HAQ, YLT, BNN, DX, MOT and MVX. New ECs are FFH, ITV and K4ZLW. Two new 6-meter stations in Greenville are K4JQY and QOX. K4YYN is the latest of many AREC members in South Carolina. K4UOH is checking into the SCN regularly and DOV is threatening to. K4LNJ is moving to Union. K4LEI has a new beam. IQY has left for CN8-Land. *Traffic*: W4KNI 176, K4ZHV 173, W4AKC 119, K4HDX 104, AVU 56, W4CHD 35, K4LNJ 32, KIT 13.

VIRGINIA—SCM, Robert L. Follmar, W4QDY—PAM: BGP. RMs: K4QER, K4KNP, K4MXF and QDY. The VN and VSN are both sporting new managers; Ann, K4QER, for VN and K4MXF for VSN. Starting times and frequencies of our NTS section nets: VSN 1830, VN 1900 and 2200 on 3680 kc., VFN 1900 on 3835 kc. September was a hectic month, SHJ resigned as 4RN Mgr. because of a contemplated one year's visit to the

(*Continued on page 176*)

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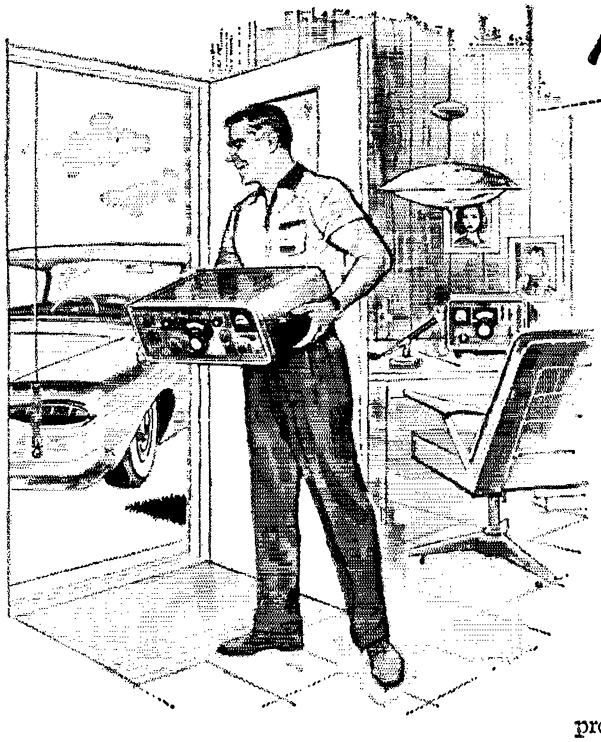

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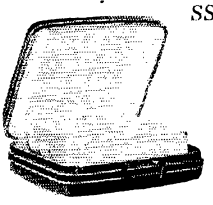

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Phillippines; we lost our SEC, K4MJZ, because of his job relocation; and Hurricane Donna messed up our Va. QSO Party, giving many stations a severe workout in emergency work. The Richmond Club was visited by the SCM and a fine meeting was held. K4TFL is back in operation again. BZE has recovered from a severe case of "fishing-pox" and is back in the nets. W4FJ reports 500 watts s.s.b. and c.w. on 144 Mc. IMP still is designing new pieces of transistorized gear. Nice going, Joe. It's back to school for AAD, K4BUI, K4DWP and K4RBQ. K4LHB is working out his Heathkit "Sixer" with good results. K4LPR got his KH6 and with it WAS and WAC! KX's rig "went west" and he's now looking for a replacement. OO PK sends his usual big list of reported violations, together with replies received. K4AJL and K4QIX still are off the air because of moving. Certain confirmed phone men threaten to work the SCM by c.w. Hi. Traffic: (Sept.) W4QDY 326, SHJ 268, DVT 185, K4MXF 163, FSS 119, W4OOL 86, BGP 75, PNK 72, K4SGQ 61 W4CWT 59, CXQ 45, K4LRL 44, TFL 41, AL 38, IIP 30, W4LK 24, RHA 20, OWV 18, AAD 17, K4FMJ 15, TUE 14, W4JUJ 9, PRO 9, K4BUI 8, LHB 8, CHA 6, CRK 6, LPR 4, DWP 2, W4KX 2, K4RBQ 2, W4BZE 1. (Aug.) K4AL 20, W4PNK 2. (July) K4SNS 21.

WEST VIRGINIA—SCM, Donald B. Morris, W8JM —New officers of the Northern Panhandle ARC of Wheeling are K8AOM, pres.; K8QPA, vice-pres.; EIT, secy.-treas. The Blennerhassett ARC of Parkersburg has applied for a club license with IBF as station trustee. WUB and NYH reported work in Hurricane Donna. The following stations have qualified for WVN (c.w.) net certificates: CCR, DFC, ELX, FNI, HZA, PBO, SNP, K8CNB, K8HVV, K8JLF, K8JPV, K8KFK K8OEQ, K8OQL, K8PJC, K8QXS, K8JYR, K8MMZ, W8JUE and K8GMG. K8CSG reports the formation of the Kanawha Valley 6-Meter Emergency Net. K8PCF has installed a new ten-element 2-meter beam. The Clarksburg ARC has an excellent 2-meter net in operation. The West Va. 40-Meter Phone Net meets Sun. at 8:30 A.M. on 7240 kc. K8BLR reports excellent v.h.f. contacts on 6 meters with 38 states confirmed. ESH is active in the Huntington Weather Net, which meets Mon. on 50.55 Mc. at 1900. TAP is active at the Veteran's Hospital Radio Club station at Beckley. The West Va. Slow-Speed C.W. Net meets Sun. on 3750 kc. at 1400. Only 20 West Va. amateurs have worked all 55 counties. Morgan County still remains hard to work, with no low-frequency activity. Traffic: W8NYH 68, K8JLF 51, HID 47, W8PBO 38, K8QXS 36, CNB 34, W8WUB 23, K8MMZ 22, CSG 19, W8ELX 8, K8PJC 5.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Carl L. Smith, WØBWJ—Asst. SCM: Howard S. Eldridge, KØDCW. SEC: NIT. RMs: WME and MYB. PAMs: CXW and IJR. OBS: KØDCC. Additional current appointments are as follows: OTR, TUT, ULZ and KØOVQ as OOs; ANA, FEO, IA, KQD, MYB, WME, KØs DTK, EDH, EDK, IIT, JTZ and RTI as ORSs; ANA, CBI, CXW, IA, IJR, NVX, KØs DCW and DXF as OPSs; KØCLJ, FKY, IUF, 7QAP/Ø and KØCLJ as OESs. In addition there are twenty-two ECs looking for all who are willing to work in AREC. My sincere thanks to KØDCW, for his work as Asst. SCM in preparing this column the last six months. Remember the deadline for SCM nominating petitions is Dec. 9. Be sure to send in a petition and vote for your favorite candidate! The new editor of *CTNN* is KØYLA. The Colorado Ham Directory is being revised by the Denver Radio Club and the second edition soon will be ready for 1961 delivery. QGO is on duty with Air Natl. Guard and originating his traffic from Texas. MYB, net mgr. of CCW, reports that FVD, now in Utah, would be sure to QNI even if he were in a submarine! New officers of the DRC are SIN, pres.; KØOVQ, vice-pres.; JGW, secy.; and KØEPD, treas. *Pueblo Certificate:* All contacts with Pueblo, Colo. stations in *December* count toward this Steel City Amateur Radio Club's certificate. Five *club-member* contacts, any band combination, reported in a list by mail to KØUMS, Rt 2, Box 395, Pueblo, will bring a certificate and honorary club membership. Any ten Pueblo contacts also rate a certificate. Merry Christmas to everyone! Traffic: (Sept.) KØEDH 412, WØWME 387, KØEDK 282, WWD 270, WØKQD 266, KØQGO 133, DCW 101, WØMYB 96, ACD 36, KØPGM 36, WØENA 24, KØEVG 12, WØCBI 8, OII/Ø 5, KØVDM 3. (Aug.) KØPGM 17.

UTAH—SCM, Thomas H. Miller, W6QWH—Asst. SCM: John H. Sampson, 7OCX. SEC: K7BLR. RQT is temporarily off the air because of a blown-up power transformer. GPN is putting the finishing touches on a kw. final using a 4-1000A. Ron Twelves has volunteered his services as SEC. Let's have some support from all of you. OCX, QWH and K7BDX received BRAT awards

(*Continued on page 178*)

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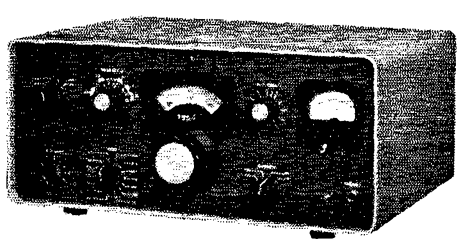

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on BUN. A group of hams and friends came up from Provo to do a little bowling. The Salt Lake gang also showed and a good time was had by all. ZBL and ATF, of Cedar City, are attending Utah U. and B.Y.U., respectively. OCX seems to be recovering satisfactorily from a stay in the hospital. Activity on 2 meters seems to be increasing rapidly. Please send your monthly reports to the SCM. Traffic: W7OCX 127, QWH 12.

NEW MEXICO—SCM, Newell F. Greene, K5IQI—Asst. SCM: Carl W. Franz, 5ZHN. PAM: ZU. 10-meter PAM: LQM. V.H.F. PAM: FPB. RM: ZHN. The Breakfast Club meets Mon. through Sat. at 0700 MST on 3838 kc. NMEPN meets Sun. at 0730 Tue. and Thurs. at 1800 on the same frequency. All ECs should try to meet the Echo Charley Net Sun. at 1900 MST. VC is NCS. Vacations cut into the traffic totals. K5IPK was in Massachusetts and K5GOJ in Colorado. The Sandia Base ARC announces that the 2nd New Mexico QSO Party will be held Jan. 14-15, 1961. It seems that generator trouble plagued most mountain-top expeditions this summer. Have you checked yours lately; or will you wait until Field Day to learn it won't run? Traffic: (Sept.) K5IPK 114, W5UBW 53, K5DAB 6, DAA 4. (Aug.) K5GOJ 41.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC: CQL. The Pony Express Net meets Sun. at 0830 MST on 3920 kc.; the Wyoming Jackalope Net meets Mon. through Fri. at 1200 MST on 7255 kc. for traffic; the YO Net is a c.w. net on Mon., Wed. and Fri. at 1830 MST on 3610 kc. HEB has gone to Salt Lake City. JLO is in Cheyenne Hospital. K7KMR, the SCM's grandson, has gone from Novice to Conditional Class. The Casper Club is giving code and theory classes once a week. During the recent SET the Casper Club, VNJ, had 20 check-ins and 19 messages in the local drill. The Pony Express Net is going fine, having about 30 check-ins every Sunday. The starting time has been changed back to 0830. K7IAY handled the net two Sundays recently. Traffic: K7IAY 19, W7HH 14, LKQ 9, AMU 7, K7GMD 3, W7YWW 3, AEC 2, EDX 2, K7GBX 2, IHO/7 2, NNX 2, LHZ 1.

SOUTHEASTERN DIVISION

ALABAMA—SCM, William D. Dotherow, K4AOZ—SEC: JDA. RMs: RLG and OCV. PAMs: PHH, BTO and JJX. New appointments: K4GOW as ORS; K4BQU and DJR as OBSs; CWO as OO III. Welcome to AENB, MAM, K4YUD, YER and K4BSJ Anniston. Welcome back to AENB, EJZ and YRO. CWO racked up 83 DX countries on phone in one month. W5RYG has added boating to his hobbies. K4MEQ now is in the new home with 6- and 10-meter beams reinstalled. K4UMD operated mobile during the storm in Sylacauga. K4OVE has added a new tri-band beam and is remodeling his shack. K4HJM promises more Anniston participants in nets. K4BSJ is back home in Anniston. K4KJD reports a new ham in Athens, KN4DGH. K4IWI, one of our excellent OOs, finds time for this other hobby, fishing. K4DJR built a 2500-watt portable power supply and installed it on a trailer. USM is busy with the s.s.b. rig on 20 and 15 meters. Congrats to K4QMH, a new General in Jasper. KN4TRJ, Jasper, is busy organizing a Novice net on 40 meters; any Novice interested should contact him. CIU moved to a new location and is sporting a new shack and antenna. K4DSM decorated the roof with a new Tri-Bander and invites Jefferson County stations to check in to AENJ at 1330 CST Sun. on 3900 kc. CWO reports that EAG and K4CIK have new crank-up 45-ft. towers complete with beams. LHG is active on 2 meters. We sincerely regret the loss of GLR and EI to Silent Keys. K4AOZ appreciates receiving monthly activity reports and news items for our column. *Six Meter News:* EFF, AENX Mgr., reports that 86 per cent of its members participated in Sept. K4AUP reports that the Muscle Shoals Area 6-Meter Net meets Sun. at 10 A.M. BMM reports weekly 6-meter drills of the Cullman group. K4IQU had a 15-minute talk with Cuba on 6 meters Aug. 8. JJX reports that K4LSK, K4HNO and CIN showed up with s.s.b. signals on 6 meters. AUP spent a few days working portable on 6 meters at Mt. Cheaha using a quarter-wave vertical hanging from a tree branch. BEI, with 2nd operator AKX, went to town again in the V.H.F. Contest from Mt. Cheaha. Kudos to FUD for maintaining interest in AENR during the summer lull. *RACES:* The new 6-meter Jefferson County C.D. Emergency Net started Oct. 12 and meets on 50.7 Mc. at 2000 CST Wed. Contact DFE, RACES Chief Jefferson County, for information concerning the RACES program for Jefferson County. Traffic: (Sept.) W4RLG 199, KIX 50, K4PHH 48, W4MI 42, PVG 40, CIU 34, OKQ 32, K4GOW 26, JDA 24, SAV 23, BTO 20, W4USM 17, K4TDJ 16, W4CEF 14, K4AAU 12, W4BMM 11, K4BQU

(*Continued on page 180*)

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11, AOZ 9, KHC 9, RIL 9, W4WHW 8, DGH 7, RTQ 7, K4JSP 5, W4CWO 4, K4HFX 4 DJR 3 HJM 3 KJD 2, ZNI 2, RIX 1. (Aug.) K4SAV 93, W4KIX 42, ZRQ 19, K4KJD 2, W5RYG/4 1.

EASTERN FLORIDA—SCM, John F. Porter, W4KGJ—SEC: IYT. RM: K4SJH. PAMs: SDR and K4LCF. V.H.F. PAM: RMU. K4LCF is our new PAM for 75 meters. He will recommend and pass on all OPS requests from those operating on 75 meters only. SDR is our PAM for 40 meters and will do the same for those operating in that band. If you are a member of one of our section nets and report in regularly, check with your net manager regarding net certificates. If a League member, by all means inquire about Official Station appointments. Applications will be mailed by your SCM to everyone requesting them. Support your section nets and if a member of the AREC, support your local net. Hurricane Donna proved that we need more and better local emergency nets. Sign up today. Thanks to K4UUO for his fine work in securing the Gamma Globulin serum for the sick in Haiti. K4ODS was awarded a four-year scholarship to the U. of Florida by the Florida *Council for the Blind*. Max ranked among the top three in a state-wide exam. Congratulations to NGR and BKC on receiving the Orange County C.D. Certificate of Merit. FJE now has a new Heath Comanche and a Cheyenne. IWM now is on s.s.b. with an SB-10 and a DX-100. The Southeastern Division AARL Convention will be held in conjunction with the Annual Orlando Club Hamfest Apr. 8 and 9 at the Cherry Plaza Hotel in Orlando. Make your plans early, guys and gals. We regret to report the passing of K4UVK, a member of the Manatee Radio Club. Hurricane Donna is the news now and for months to come. Please read your *Florida Skip* for complete details. (Sept.) K4SJH 1293, LCD 421, KDN 377, W4SDR 309, K4LCF 299, GBS 292, NCN 289, RNS 267, W4CNZ 256, FJE 245, K4BY 222, W4FPC 190, K4ILB 171, W4TRS 162, AKB 123, IYT 119, IWM 107, K4COO 91, W4SGY 82, GJI 80, LDF 78, FE 76, K4DAX 69, W4JRJ 65, BKC 60, SMK 60, K4BLM 53, W4TAS 51, K4IWT 47, AKQ 45, W4EHW 41, K4DBT 38, W4HRC 36, NGR 36, OLV 31, K4MTP 19, OSQ 14, W4LSA 12, K4YOQ 9. (Aug.) K4IWT 449, TDT 115, W4IYT 33, HRC 33, K4OSQ 32. (July) W4LDF 85, K4BLM 43, W4SVB 13.

WESTERN FLORIDA—SCM, Frank M. Butler, jr., W4RKH—SEC: HKK. PAM: K4RZF. RM: UBR. Tallahassee: KN4BSQ has replaced K4MZT as secretary of the TARC. Plans were made at the last meeting to improve the RACES/AREC set-up in Leon County. MLE made arrangement with the State Road Dept. to obtain generators for ham use during future emergencies. K4ARK, K4GXV and K4IYJ set up a portable station at Crawfordville during the storm. Quincy: K4QDN is now Gen. Class. Port St. Joe: WEB set up a portable station at the Weather Bureau radar at Apalachicola and relayed much valuable traffic. Hams all over the section were active during both "Donna" and "Ethel." JOZ did an FB job as NCS of the 75-meter net during much of this time. COD/4 is now active on 40 meters in Franklin County from East Point. KQP has gone mobile. K4UBR reports that WARN was active during both storms. Pensacola: We were sprry to learn that UC, has joined Silent Keys. PAA is recovering from an operation. ZPN has a new Hornet beam. K4YMG is using a quad. MLH completed an 8000-mile vacation trip, visiting many U.S. and Canadian hams on the way. Blountstown: K4FTJ was seriously injured in a football game. KN4DHK and KN4YSQ are new Novices in town. KN4ART, in Bristol, is the only ham in Liberty County. Traffic: (Sept.) K4UBR 507, CNY 320, W4SRK 283, K4SWQ 88, BDF 21. (Aug.) K4CNY 344, BSS/4 103.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: PMJ. PAMs: LXE and ACH. RM: DDY. The GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs.; 0800 EST on Sun.; the GSN meets Mon. through Sun. on 3595 kc. at 1900 EST; DDY as NC; the 75-Meter Mobile Net meets each Sun. on 3995 kc. at 1330 EST; K4YID as NC: the GPYL Net meets each Thurs. on 7260 kc. at 0900 EST; K4ZZS as NC; the Atl. Ten-Meter Phone Net meets Sun. on 29.6 Mc. at 2200 EST; BGE as NC: the Ga. S.S.B. Net meets each Mon. through Fri. on 3970 kc. at 2000 EST, K4AUM as net mgr. The SET week end went over fine in Georgia. Many messages were sent to IAW. In Atlanta BGE, KN4QOC, K4PKK, K4RAH and K4ZSX handled many many on 2 and 6 meters. New officers of the Barnesville Radio Club are FYC, pres.; K4CWT, vice-pres.; K4POL treas.; K4SWJ, training officer; and FYC activity mgr. Ten AREC members in Barnesville participated in the SET week end: K4SWJ, K4AEQ, K4CWN, K4UWN, K4OSC, CRN, K4VLX, K4POL,

(*Continued on page 182*)

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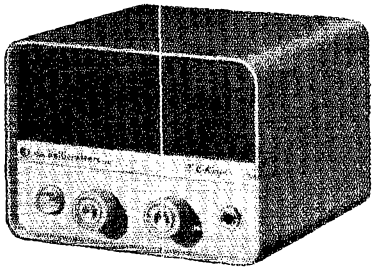

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VSW/4 and FYC/4. It was a pleasure to be visited at our QTH by K4LVE and ETD. K4UJS was third in the July CD Party. Everyone had a wonderful time in Rome on Oct. 2 at the barbecue. K4BAI is away at school. K4TEA and K4BVD have been exchanging visits on week ends. YE lost his 500-watt modulation transformer. LNG is running daily skeds with W8PT in Benton Harber, Mich., on 144 Mc. Sure glad to know MA is doing better after his illness. Don't forget to renew your ARRL apvointments. Traffic: W4DDY 180, K4BVD 66, LVE 48, UJS 47, W4JWO 29, K4BAI 22, TEA 8, W4YE 7, MKN 2.

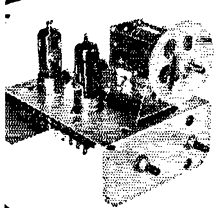
WEST INDIES—SCM, William Werner, KP4DJ—SEC: AAA. API reported his traffic activities to the Connecticut SCM while in the States on vacation and made BPL two months, operating all bands 75 to 2 meters a.m., s.s.b. and c.w., and received a 15 w.p.m. Code Proficiency certificate. He taught six youngsters enough radio to get their Novice Class licenses and has started E.E. studies at Cornell U. API's brother, WP4AVL, is on with an NC-300 and DX-20. Our Newest OPS, KP4AOD, reports a traffic total of 190 and says that AVQ at Roosevelt Roads, and W4PKS/KP4, at Vieques Island, will handle traffic to any point in the world via K4NNA, Naval Radio at Arlington, Va., on 14.330 kc. Tue. and Thurs. at 1200 GMT. AOD replaced the plate transformer in the Globe King 500 and now runs close to a half kilowatt to the 4-250A final. K9JAF, arrived in San Juan from Indianapolis Sept. 30 with a Viking I, an NC-183, etc., and will apply for a KP4 call. AOD and DJ finally finished 6-meter beams. CK found a bad 6U8 tube in the VHF-126 converter. PQ, in Ponce, is working LUs with a Heath Sixer. W2AOV/KP4 is mobile. ES added a KWM2 to the Collins collection of a KWS-1, a 75A-4 and a 51J4 and asks the San Juan 6-meter gang to turn their beams south to Ponce so his gang can work them. ES is getting a new Telrex beam for 6 meters. WA2CRU/KP4 is a new station in Rio Piedras with a DX-100 and a homemade receiver. MS popped up on 40 meters with Gonset twins. W2IQC and K2YSQ are vacationing in K4P-Land visiting ham friends they QSO daily on 14-Mc. s.s.b. ACQ ordered a Heath Sixer. AMG rebuilt the k.w. linear to use 4-400As for 2-kw P.E.P. MO is on 50,150 kc. with a new Heath Sixer. AOD went into seclusion in the mountains to assemble his Heath Sixer. AOO is on 6 meters with a Heath Sixer. DJ has resumed his 28-Mc. sked with W6NUN. Stations reporting weather to the Antilles Weather Net on 7245 kc. should file information in the following order: barometer, temperature, humidity, wind direction and force, sky condition (type of clouds and amount of sky covered), sea conditions if any, and if raining. Stations reporting at the 2130 GMT sessions are KP4AEB NCS, VP2s SL, AB, DA, GU, LS, LY, GAG, VP4MM, VP6AM, HH4VB, PJ2CH and KP4s WT, AIE, AKB, AQT and AOD. ZC operated 40-meter mobile from Carolina handling traffic to civil defense in Rio Piedras during floods caused by Hurricane Donna. CO is operating mobile using a KWM-2. AAA traded the 20-meter beam for a Hy-Gain Tri-bander. MV is manufacturing welded towers. ALY welded a 60-ft. tower for AQQ. BY is back on 40-meter phone. AZ sold his s.s.b. transmitter, BC-458-20A-200W linear and is buying a Gonset GSB-100 and a kw. linear. AWL is a new station on 6 meters from Caguas using a Scout Deluxe. AXR is another new station on 6 meters from Caguas using a Challenger. Merry Christmas to all. Traffic: KP4AOD 190, WT 96.

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD—At a meeting of the CZARA members were introduced to the new amateur coordinator, Lt. Col. E. H. Schwarze. Several points on licensing were cleared. Mobile applicants would not necessarily be required to obtain permission from local housing managers for mobile operation only. It also was pointed out that the Canal Zone licensing authorities do require U.S. Conditional licensees to take the regular examination for the C.Z. license on the basis that the licensee is well within an area to take the examination. Other items taken up were that the 28.9-Mc. Net activity was nil and that a 7-Mc. Net should be worked on for an all-Isthmus net. KQ is back from the hospital and looking very well. RV and VR are in their new quarters and back on the air with a new Tribander beam. SW will be on with a KWM-2, as will KJ. PR is in the States for 6 weeks. GK is using a new Tribander beam. KR moved to the F. A. A. housing site of Rousseau, adding to the general activities of 12 active and semi-active amateurs on one square block. Ex-Novices are MQ, ME and DT. New YLs are CS, ME and SB, formerly K2LJI. MARS Net activities are very low. A.F. MARS activities are very good with two new YLs, ME and SB, added. Stations closing are JV, ET and DT. ET will be W4NMJ and we will surely miss

(Continued on page 184)

BULLSEYE BUYS at ARROW!

AMERICAN GELOSO V.F.O.'s



Wired, tested, calibrated, ready for use. Mod. 4/104 for driving one 807 or 6146 final in AM or CW under Class "C" conditions.

Mod. 4/102 for driving two 807's or 6146's final. Has 5 bands. Supplied with Mod. 1640 dial ass'y.

Mod. 4/103 for 144-148 mc bands. Combines VFO primary freq. of 18 mc with xtal fundamental freq. of 12 mc. Supplied with Mod. 1647 dial ass'y.

Mod. 4/104, 4/102 or 4/103 less tubes and xtal, each $29.95

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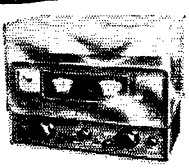

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AS-1004	Fits Hallicrafters SX-100, SX-110, SX-111 and S-108	$4.65
AS-1005	Fits Hallicrafters SX-101 and SX-101A	$4.95

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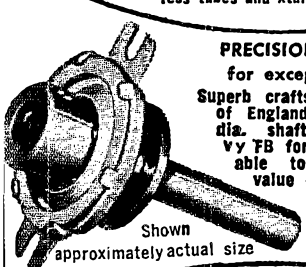

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Amateur Net $1.50 ea.
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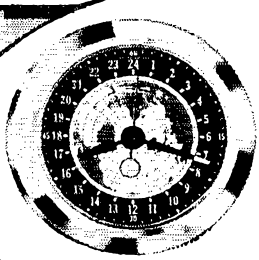
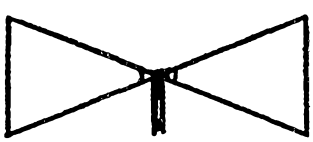


24 hr. chrome plated 8" metal wall clock. Inner dial with south polar projection map of world indicates time around world. Polar projection dial adjustable for various time zones. Shpg. wt. 2 lbs.

Amateur net $8.47 tax inc.

220V. 50 cycle model.....9.95



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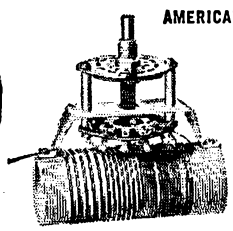

Units have 6 posit. tap switch mounted on ceramic coil form. Mod. 4/111 designed for use with two 807's or 6146's (in parallel). Freq. Range 3.5 to 29.7 mc.

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SEASON'S GREETINGS

the most active member of the Tropical Nut Net. Traffic: KZ5JW 99, OA 99, CD 81, OB 78, ET 66, AD 51, TD 33.

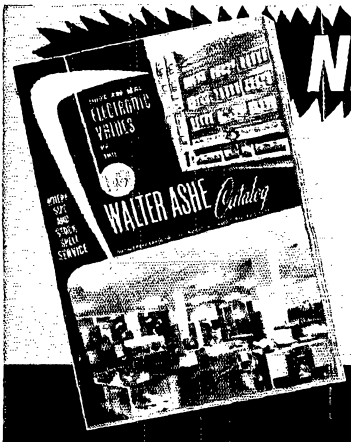
SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., W6JQB—SEC: W6LIP. RMs: W6BHG and K6HLR. PAMs: W6BUK and W6ORS. The following stations earned BPL in September: K6MCA, W6WPF, W6GYH, K6CLS/6 and K6EPT. Congrats, fellows! K6CLS/6 has been elected manager of the California Net. Congrats, Jerry! K6BEQ is back on the air with S/Line gear and his dad is now WV6NST. K6GLS is getting a pre-fab shack in the backyard for his station. K6OQD is back after some surgery and has been reelected treasurer of the YLRL. Congrats, Jean! W6VOZ holds a three-band sked with ZL-Land on week ends. WA6AWD spent the summer in North Dakota. K6LVR is back in college for the fall term. WA6CKR has been busy redecorating the house. W6SRE had a nice trip to the Northwest and a good visit with W7F1X. W6RKU has the new 400-watt s.s.b. rig going. WA6DJB reports that XE2AJ is active on 50.06 Mc. W6FB is now living in Palm Springs! W6NAA is the new EC for the Glendora Area. WA6HUQ is busy with the Calif. Assn. of Medical Lab. Technologists San Diego affair. K6MSL moved to Norwalk and is getting a new rig lined up. The following are back at the books: WA6GHW, K6COP, K6LJY, K6SLM and K6CDW. WA6HXM will be signing some fancy DX calls soon while in the service. WA6FBA is building a new 2-meter transceiver. WA6ISY found herself on TV during the Pacific Division Convention! Support your section nets: C.w., the Southern California Net meeting on 3600 kc. at 1900 PST daily; phone, the SoCal Six Net meeting on 50.4 Mc. at 1900 PST daily. Traffic: (Sept.) K6MCA 1318, W6WPF 1098, W6GYH 1007, KØCLS/6 576, K6EPT 516, K6OZJ 442, WA6DJB 320, W6BHG 167, K6WAH 159, W6SYQ 134, K6LVR 130, WA6CKR 85, W6USY 58, K6SIX 48, WA6DWP 45, WA6JOC 21, K6MSL 15, W6VOZ 13, W6CK 10, K6COP 10, WA6AWD 7, W6CIS 6, K6SLM 4, W6SRE 4, K6BEQ 1, K6OQD 1. (Aug.) W6ZJB 845, WA6CKR 128, K6TPL 126, W6KMJ 121, WA6JOC 25, W6VOZ 12.

ARIZONA—SCM, Kenneth P. Cole, W7QZH—PAM: OIF. The Copper State Net meets at 1930 MST Mon. through Fri.; the Grand Canyon Net Sun. at 0800 on 7210 kc.; the Catalina Emergency Net Wed. at 2000 on 29.627 and 145.8 Mc.; the Tucson AREC Net Wed. at 1900 on 3880 kc. The Arizona Amateur Radio Club held its annual election of directors. The following were elected: IMP, KOV, YWF, K7MEZ, AWI, WFY and QZH. The club was honored by a visit with HC6NB, and HC6ND, Ecuador. The evening was spent comparing the types of equipment in general usage in the 2 countries—and, of course, the cost. The cost of equipment, we were happy to find, is much less in the States. *QST to all Arizona amateurs!* Just received a letter from AMM, now stationed in Taif, Saudi Arabia. Listen for him on 10, 15 and 20 meters, phone, c.w. or s.s.b. The call—either HZ1BA or HZ1AEH. He is looking for a QSO in to Southern Arizona. The Verde Valley School Radio Club, a high school organization sponsored by GWX, is now an ARRL affiliated club. Congratulations! Your SCM would appreciate more news from the Tucson Area. What happened to the Catalina Club news bulletin? Traffic: W7OIF 14.

SAN DIEGO—SCM, Don Stansifer, W6LRU—Winner of the San Diego County 10-meter hidden transmitter hunt was K6AWF. Others placing from second to fifth place were K6RIF, WA6IWM, K6JPO and W6YST. Ex-WA6AEQ, now W4RNG, invites local friends to watch for him on 14.100 kc. at 6 P.M. local time. W4DNU/6 is now ORS and OBS. K6BVV, in LaJolla, is now an OO. WA6JDN, ex-member of the Newport Club, is now signing GM3FIZ. K6RCK has an 80-ft. tower for 6 and 2 meters. K6TER was the chief operator on 3991 kc. during the c.d. drill in October. He and others participating did an excellent job. W6MIT is now out of the Army and teaching electronics at Lewis Junior High. K6RWM is now mobile on all bands with an Elmac while commuting from San Diego to Oceanside each day. W6BZE is vacationing in Europe, and W6JH is expected home from Europe by mid-December. K6EC is handling the QSL chores for FQ8HO. W6EPZ and W6FAY are new members of the San Diego DX Club, being voted in at the last meeting, held in Bonita at the home of K6BX. Season's Greetings to all from your SCM, and all the best in 1961. Traffic: (Sept.) W6YDK 2821, K6BPI 1386, W4DNU/6 614, W6EOT 602, WA6CDD 286, K6LKD 276, WA6DJS 46, K6TFT 27.

(*Continued on page 186*)



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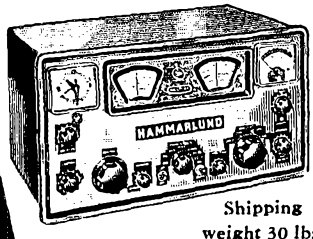

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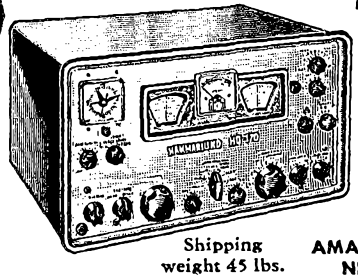

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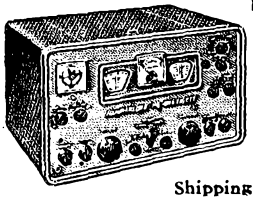

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WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—If you have been having trouble getting rid of your traffic, LR suggests you try the NTX on 3770 kc. at 1900 and 2200 daily. The net handled 335 pieces of traffic during September. K5WIC is net manager. K5PXV has built a transistorized keying monitor to listen to his new bug. After listening to some of the c.w. signals on the air more keying monitors should be in use. The amateurs of Henderson are planning to organize a club, and we hope they will make it 100 per cent ARRL. MSG has complete a transistorized harmonic amplifier for his frequency standard. LGI is net manager of the NTTN. I was able to attend the Oklahoma State ARRL Convention Sept. 10-11 and, although I was disappointed in the attendance, had an FB time. The program committee ran things concurrently so that you did not miss anything. K3GKV ex-K5ASZ, has moved back to Ft. Worth and is looking forward to getting his old call back. Welcome home, Lloyd. On Sept. 8 the Ft. Worth and Arlington amateurs had an opportunity to demonstrate their ability to render a public service. Two children, a five-year-old girl and a six-year-old boy got locked in a carport storage closet while exploring a vacant house and it took 200 searchers more than seven hours to locate them. The following hams furnished communications for the various groups taking part in the search: CQM, SJZ, WKH, YUO, K5RWR, RHV, VFA, YPI, COB, BVL, SJB, ZBM, ZPE, TKR, OPD, EGB, MQH, LCG, PAW, RWN, BLG and K3GKV/5. K5RXB acted as NC and did an FB job. Traffic: W5BKH 322, K5BKH 107, W5AYX 73, K5HTM 51, PXV 36, ZOM 9, W5GY 4.

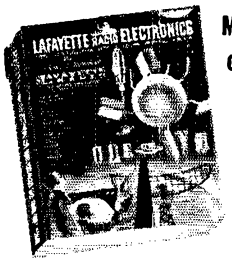
OKLAHOMA—SCM, Adrian V. Rea, W5DRZ—The highlight of September activity was the State Convention at Oklahoma City. The three affiliated clubs of that city, Aeronautical Center, Oklahoma City and Six Meter Club did a wonderful job in giving us a first-class program. K5HTF was chairman of the convention. The SCM met with the Jackson County Club on Sept. 22. VCJ, 6-meter PAM, also was present as well as several members of the Northfork Club and others of outlying sections. New officers of the Jackson County Club are K5KYM, pres.; KØOVD/5, vice-pres.; K5UND, secy.-treas. K5IZP is the new president of the Northfork Club. The Chisholm Trail Club also has new officers: K5IBZ, pres.; K5ICC, vice-pres.; UGA, secy.-treas.; K5SWL, act. mgr. The club from Okmulgee visited the Muskogee Club Sept. 19 and WAE gave a very interesting program on transistors. GZW and GIQ are operating from new locations at Heavener and Perkins, respectively. The Tulsa v.h.f. group already are at work planning the next State Convention. Traffic: (Sept.) K5IBZ 149, W5ODM 138, K5IBZ/5 117, W5DRZ 113, K5DUJ 105, W5OOF 93, K5JGZ 83, AUX 81, ELG 66, DLP 56, W5UYQ 49, K5CAY 38, OJD 35, W5WAF 33, K5ZUO 23, W5JXM 21, CCK 18, KY 18, MFX 16, K5ZEP 15, QEF 13, OTM 11, W5WDD 11, K5CBA 10, W5ESB 10, K5OOV 10, JOA 9, EZM 8, MYF 7, W5WAX 6, VAX 4. (Aug.) W5JXM 32, WAX 14.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—SEC: QKF. PAM: ZPD. RM: K5BSZ. K5JCC has been operating /1 in Connecticut all summer. QKF and QEM visited the El Paso Amateur Radio Club. While there we visited the KSTM/TV transmitter on top of Ranger Peak. I certainly would recommend that anyone passing through El Paso take this trip. You drive about one-half the way in your car and use the Aerial Tramway for the balance. You can see all of El Paso, Juarez, Mexico, and part of New Mexico, even out to White Sands. Welcome to K4BSS/5, to our traffic net for a Corpus Christi outlet. We hope you enjoy your stay in South Texas, Nick. K5MMP is sporting a new Falcon. Ask EYV for directions in installing the mobile. The 7290 Traffic Net had 42 sessions, 1263 check-ins and 556 messages. K5WIC has a new 2-meter transceiver. ETA and QKF attended the Oklahoma ARRL Convention in Oklahoma City. You certificate hunters can get a new certificate by working five of the following: K5ABS, BPG, PFG, YCZ, UFB, GDH, K5VQG and W5OHF. The QTH is Austin, Texas. Traffic: K5WIC 262, MVI 166, JFP 90, K4BSS/5 89, K5MXO 35, MWC 9, YHX 6.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCMs: A. D. Solomon, VE1OC, and H. C. Hillyard, VO1CZ. SEC: BL. Congratulations to FQ and his XYL, the proud parents of a baby boy. Newly-elected officers of the NSARA include FQ, pres.; ABU and ABJ, vice-pres.; AV, secy.-treas. VN is the winner of the Dr. L. P. Doucette Memorial Award for 1960. LT worked 5 states on 2 meters in less than 2 hours

(*Continued on page 188*)



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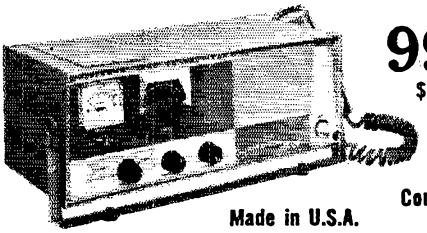

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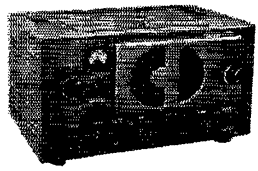

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in a recent opening. Deepest sympathy is extended to the relatives and friends of AEA, who passed away recently. QC (ex-3EII) and PJ (ex-3EIJ) now reside at Camp Gagetown. Ex-VE6AAZ is now VE1AAC. Other new calls include AGV. OM is now running 35 watts pep on s.s.b. QV has moved to a new QTH. VO2NA has been on temporary duty at Cape Harrison. VO2AW reports that the RCAF has loaned the Goose Bay Club an AT3 transmitter for use in its new club house. VO2JH has moved to a new QTH. Are we having a hamfest in 1961? It is regretted that no club found it possible to sponsor a convention this year. Should the same situation prevail next year why not an informal gathering in a central location similar to the S.S.B. Dinner held in Moncton last February? Your suggestions, *please*. Traffic: VE1OM 26, ADH 15.

ONTARIO—SCM, Richard W. Roberts, VE3NG—AJA was portable at Meaford for the fishing season. AYS was at Craigleith for the same reason. DTO, DXZ and CJJ attended the Montreal Hamfest. DTB was the guest of 2CI. LJ is on again. AEL also was heard from. The Windsor ARC will hold its Past-Pres. Banquet in November. CAB has had his nose to ye olde grindstone but is in again. New calls heard in Windsor are EWD, EBQ, EBV, EBY and DVR. CNB is back on 10 meters. CPB has a new Tri-bander. DKE is working real DX. Sudbury's officers are EAY, pres.; CJH, vice-pres.; DOY, secy.-treas. CHF is now an OBS. The North Bay gang had a relaxing summer what with no hamfest. EAW reports that conditions at the former site are not ideal anymore. They may hold an Ontario ARRL Convention instead. (Ed. note: I hope so.) COK was at the Montreal Fest. The s.s.b. gang will hold a dinner at Toronto. Where are all the A-1 operators who hold certificates? How about getting this award going. You got yours, how about the new gang? This is not meant to be a criticism but rather a reminder to get going. This is a fine award. ELO is in the Congo. BPL is on 10 meters. AUU was ill this summer but is better now. KM says the AREC is on the increase after a short lapse. The Grey Bruce Net is quite active. The Hamilton Picnic was a big success. The Nortown ARC of Toronto is planning inter-club meetings with the Hamilton Club for the fifth year. Our international Club of Sarnia is off to a good start for the coming season. The Oshawa gang had a good corn roast. Traffic: VE3CWA 293, LK 93, NG 77, BZB 60, DPO 59, RN 48, RUR 47, CFR 37, BAQ 34, DTO 24, DZA 18, AMT 17, DH 13, EHL 12, DU 11, DWN 9, VD 3.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—The Eastern Canada ARRL Convention, sponsored by the Montreal Amateur Radio Club, was an outstanding success. The VE/W Contest seems to be growing in popularity, judging from the enthusiasm displayed by VE and W hams. NI, using only 30 watts, contacted over 600 with a score of about 150,000. W2DRV, an old friend from CD Parties, visited your SCM. FQ also dropped in for a chat. From La Tuque we learn that BW, formerly of Clova, is now living there and intends to get "cracking." NW also is a new resident, having left his former Rapide Blanc QTH. Another active station is ASK, who uses a quad on 20 meters. On other fronts, TI, AOL and AUD accept traffic for Saguenay on 3750-kc. phone. AFU, HO, AUH and AIM keep 144.8 Mc. humming. All radio equipment of the late Bill Meredith, HM, was bequeathed to the MARC. JH, at Louiseville, is an expert trout fisherman. ABE, at 35-w.p.m., won the code receiving contest at the recent convention. He nosed out AZF who deserves much credit, having operated only seven months. AZG, Noranda, is experimenting with antennas on 40 meters. Our DX king, WW, promises to win next year's BERU Test. TY has half finished building the new receiver and s.s.b. transmitter. HY and XM received their Wings and are now fullfledged pilots. OQN mgr. WT reports 175 stations reported in September with 77 messages. Traffic: W7QMV/VE8 201, VE2WT 121, DR 51, EC 42, BB 21, TA 2.

(*Continued on page 190*)

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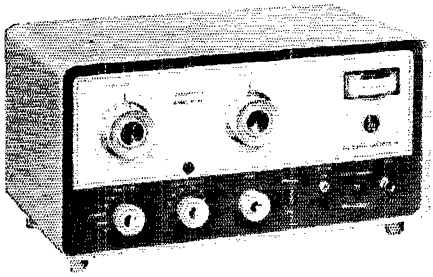

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- **REAR CHASSIS:** Microphone gain; antenna co-ax connector; remote control terminals; AC power cord.

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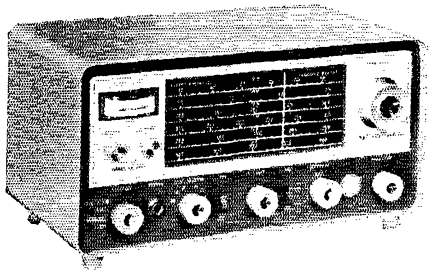

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- **TUBES AND FUNCTIONS:** 6AZ8 tuned RF amplifier and crystal calibrator; 6U8 oscillator and mixer; 6BA6 1650 kc. IF amplifier and BFO; 6T8A 2nd detector, A.V.C., ANL and 1st audio; 6AW8A audio power amplifier and S-meter amplifier; (2) silicon high voltage rectifiers.

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BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—Thanks to AOT for pinchitting for me last month while I was on vacation. Next month a former SCM will do the column for me as I catch up on the remainder of my holidays. Activity for the winter months will start picking up and net activities should increase. There are appointments available as SEC and net manager open at the time of writing. I have had no replies to communications directed to persons who I thought would fit the job and do it well. Glad to see JQ back in full swing after a bout with his appendix. This is the time of year that new executives of clubs take office so would appreciate a list from them as to their new executives. British Columbia recently lost a very active amateur, Shirley Craig, FY, who had been very active and outspoken in the cause of amateur radio and its activities. AOT is revising the *Opman* and AAF is looking after its reproduction. This manual for the BCEN is a good manual and if extra copies are available contact AAF or AOT on 3650 kc. for them. Traffic: VE7BAZ 116, AAF 66, AOT 40, ALZ 36, BDP 33, JQ 27, AMW 8.

MANITOBA—SCM, M. S. Watson, VE4JY—The Brandon ARC has a new slate of officers for the '60/'61 season: XM, pres.; DG, vice-pres.; ES, secy.-treas. The Beausejour ARC was well represented at the Brandon Hamfest by JW, our PAM, who visited EF, RB, IW, AY, OS and JK on his way home. Bill, together with DZ, will be teaching a code class this winter. EI, a pioneer in radio, gave an illustrated lecture to the ARLM at its monthly meeting covering his early days with the Marconi Co. and on board ship. Darby has gone to VE6-Land to reside in Calgary. QI is recovering nicely from a severe illness. TT has his new quad on a really big tower. FB, Ted. The Sixers cropping up all over are too numerous to mention. Many of the Redboine Boating Club boats now have 6-meter equipment and report startling results. The Sixers stole the show this past season. Traffic: VE4PE 8, AY 3, AN 2, GB 2.

A Cathode-Ray Monitor

(*Continued from page 22*)

though the display of a parasitic is often quite beautiful to look at, it certainly does not sound beautiful on the air.

Conclusion

It is not within the scope of this article to discuss the various possible transmitter difficulties, the patterns indicating them, or their cure. This subject has been covered thoroughly in the literature.[2] Suffice to say that a short period of use of the cathode-ray monitor will show that it is absolutely essential for a modern phone transmitter, be it a.m. or s.s.b., filter or phase-shift. QST

[2] For example, *The Radio Amateur's Handbook* and *Single Sideband for the Radio Amateur.*

For the Command Receiver

(*Continued from page 50*)

a.v.c. and remove the 6C4 from its socket. Disconnect the antenna from the converter. R_7, the 6000-ohm potentiometer in Fig. 3, should be adjusted to give a full-scale reading on M_1. Then replace the 6C4, and after it is warmed up adjust R_6, the 1000-ohm potentiometer, for zero reading on M_1.

(*Continued on page 192*)

We are not going to attempt to tell you what an "S9" signal should read on the meter. The RST system calls for an S9 signal to be an "extremely strong signal." With the circuit described here a 100-microvolt signal causes the meter to read approximately half scale, and a signal of a few microvolts will give a detectable indication. QST

Technical Correspondence

(Continued from page 45)

tuned the second i.f. transformer, and to my surprise the audio response was as good as that of any receiver I had ever owned. The loss of selectivity was not as great as one might expect. The complete process took less than a minute to accomplish and the results on a.m. phone reception were most gratifying.

I consider myself one of the luckier HBR-16 builders: Because of the geographical location (nice vacation spot) of my QTH I had a personal visit with Mr. Crosby and his lovely XYL; they were our guests for a few very short days. Thank you, *QST*, for printing the article, and thank you, Ted, for a very FB HBR-16 receiver!

— *B. M. (Bim) Jones, W7PIK*

(*Editor's note:* W6TC suggests stagger-tuning T_3 for about a 2-kc. spread. This can be done by first aligning the i.f. at the center frequency throughout, then detuning the signal generator or other signal source 1 kc. lower and peaking the primary of T_3, after which the signal source should be tuned 1 kc. higher than the center frequency and the secondary of T_3 peaked on this frequency. The required deviation can be obtained by first setting the signal on the center frequency, adjusting the b.f.o. for a 1000-cycle beat on the desired side, and then readjusting the signal source to zero beat with the b.f.o.).

I.A.R.U. NEWS

(Continued from page 79)

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Strays

ARRL Director Ray Meyers, W6MLZ, was asked to draw the first ticket at a hamfest, and pulled out his wife's number for a set of dishes. That's one way to keep your wife happy at a hamfest!

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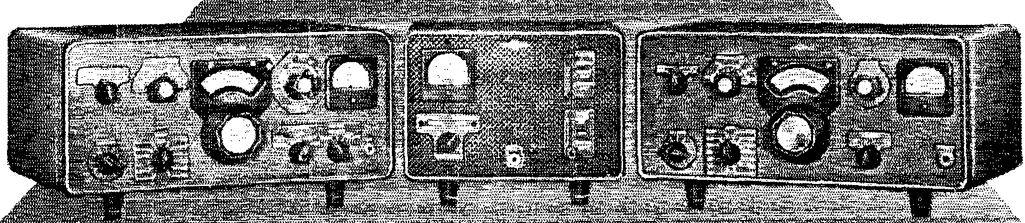

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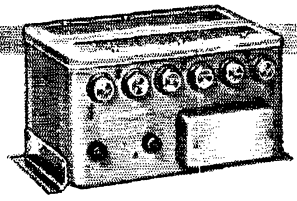

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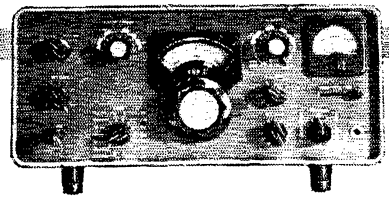

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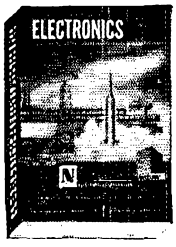

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How I Was Cured of Ham Radio

BY WALTER J. KENT, M.D.,* K2OCW

FRIENDS, it is easy to get information and advice about how to get started in this hobby. After you're hooked, however, you have to shift for yourself, slowly developing your own brand of wild-eyed desperation as you contemplate the painful return to normalcy. I think, however, I can put an end to all that. This is probably the first study ever completed on a practical technique for curing yourself of ham radio.

First of all, you must have, or develop, a sunny, generous, friendly, and sympathetic personality such as I have, and then you must have or develop some pitiable, inept, stumbling, ten-thumbed-but-nevertheless-lovable friends, also such as I have. Then just sit back and eventually you will find yourself in the following sort of situation.

With a growing family gnawing at one end of my free time, and a growing practice nibbling at the other end, it seemed that the two ends were getting closer and closer to each other. Eventually they met; spare time activities met with some careful scrutiny and some painful decisions were reached. Hamming had to be curtailed and limited to special and unfortunately infrequent occasions.

After about one year's worth of dust settled on the dust cover, I decided that some of the gear ought to be put to more use, that the shack ought to be revamped and re-evaluated, so to speak. Well, where do you logically start a program such as this? You start at the top, and at the top we find the ten-meter beam, home brew. And there, friends, is where the friend comes into the picture. This poor slob has been putting 125 watts into a folded dipole and doing pretty well. It seemed that I was doing better, though, putting my 8-watter into this beam — I had a lot more DX cards. So, in a reckless, unthinking moment I offered him the beam. You should understand that because of the traditional circumstances beyond anyone's control, offering this ham a beam doesn't mean, "Come and get it" — it means "When should I bring it over and install it?"

Getting the beam off my roof was easy; time — one hour. Getting it onto his roof, not so easy; time — 2 days. He has one of those antique peaked roofs that is difficult if not impossible to climb, and unquestionably impossible to sit on. At any rate, on the evening of the second cold,

* 243 Morse Avenue, Wyckoff, N. J.

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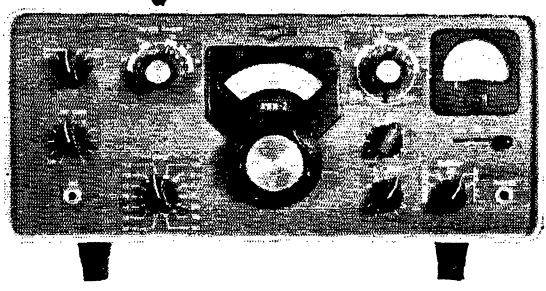

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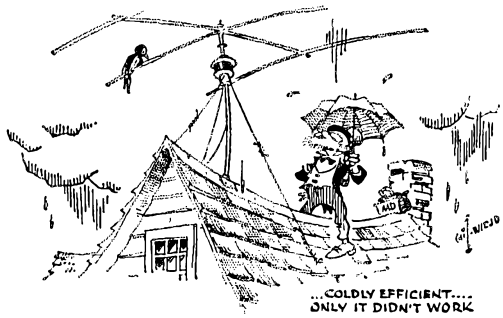
Call W4RRW

wet day it was up, well guyed, with that clear-cut, coldly efficient look, only it didn't work.



This beam was built with a gamma match using a broadcast capacitor as the tuning element. In my installation I had 8 watts going in and practically no watts coming back. Here we could get up to about 70 watts going in and very few watts coming back, but what happened to that other 55 watts? I didn't believe his s.w.r. bridge, so I put mine in the line and it only verified his. You experienced hams can well imagine the activity following such an unhappy conclusion, and I hope you inexperienced hams never have to go through it. We did *not* rebuild the transmitter, but let me assure you that it was under consideration.

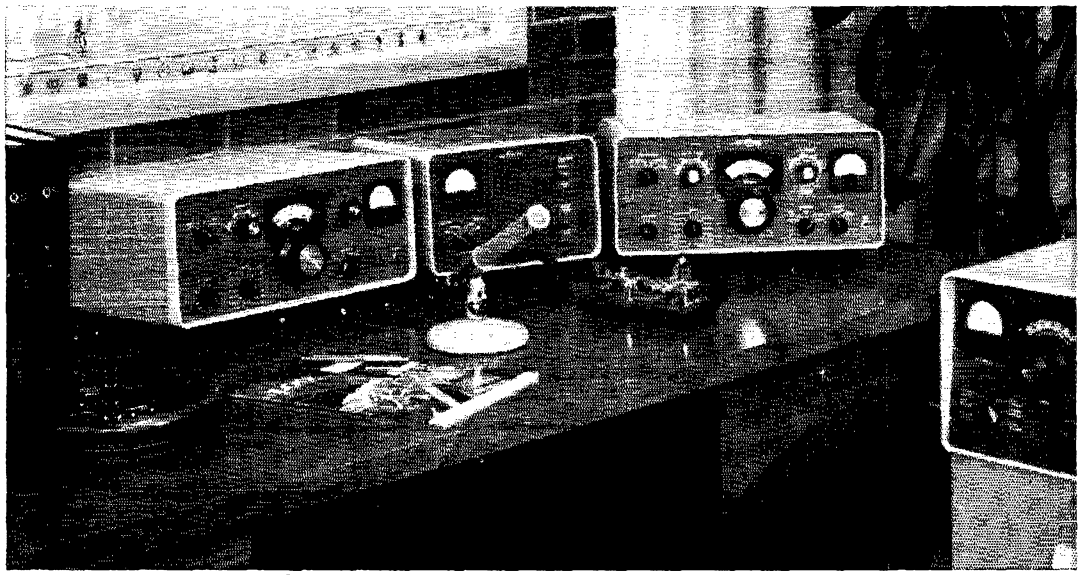
On each of the many phone calls he assured me that (1) the dipole was still outperforming the beam (2) that S-meters both far and near verified this, (3) that I had been using a malfunctioning beam for 5 years, (4) that aluminum tubing will never replace copper wires in antenna construction.

The only consequence of this could be much thumbing through the books, many valuable minutes spent in pensive reflection, and of course the conferences with professional help. One of our conferees assured us that since he had personally conceived and constructed most of the "dew-line" antennas, our search for help would end with him. As it turned out, our nation can be thankful he had more luck with the dew line than with our ten-meter beam.

Today, however, the cure was applied. We went to his home again, well prepared for another session on the roof, but we were greeted with such smiles and effusive happiness that we knew immediately the problem had been solved. The explanation started out like this (I never heard the end), "Y'know, Walter, the beam works better than the dipole and always has, in fact. I just had the two transmission lines confused. . . ."

And, friends, if that won't cure you, give up.

QST



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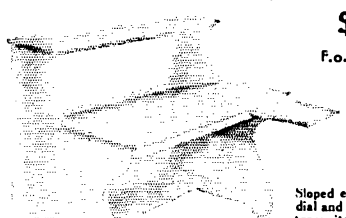

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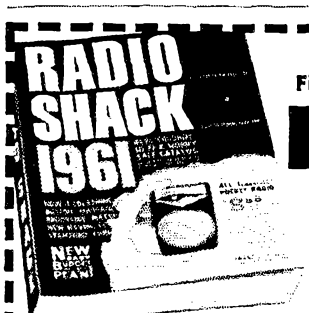

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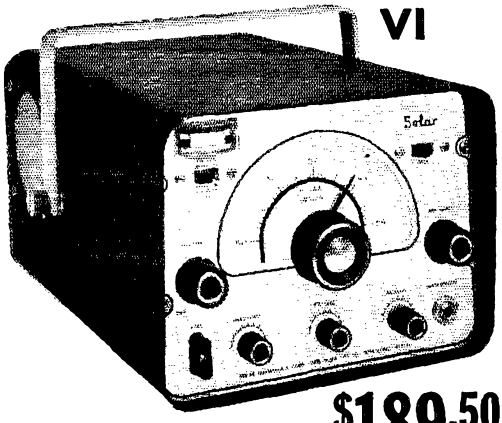

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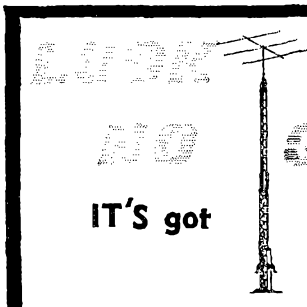

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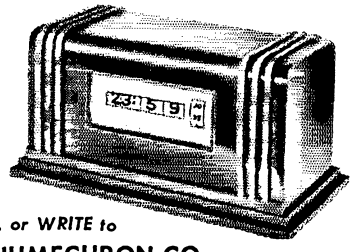

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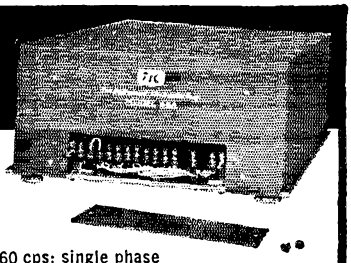

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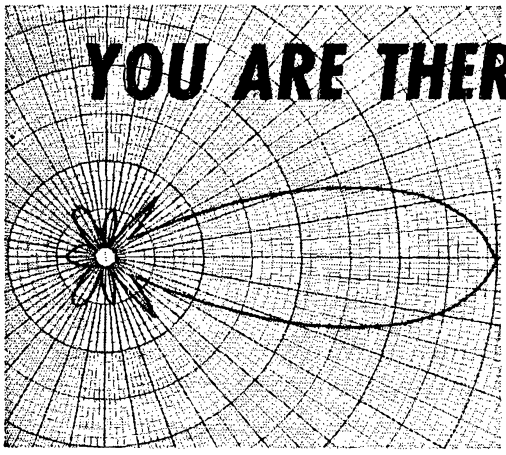

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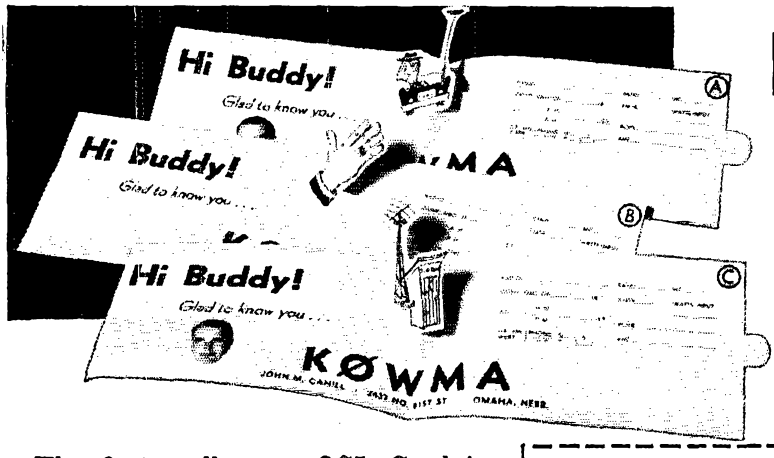

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QSLS. Wide selection, styles, card stocks, ink colors, cuts. Also photo cards. Lowest prices. Fast service. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls, Idaho.

MAKE Your own photographic QSL cards. Complete kit of materials. Albertson, W4HUD, Box 322, High Point, N. C.

COLORAMA QSLS. Dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSLS-SWLS 3-colors, 100 $2.00. Samples dime. Bob Garra, Lehighton, Penna.

NEW Method lowers QSL prices! Particulars free. WAT, Box 1, Brecksville 41, Ohio.

QSL Samples, 25¢ (deductible). DX Card Co., Kulik St., Clifton, N. J.

QSLS. Rush $2.00 for 100 2-color cards. Don, Box 332, Ada, Okla.

QSL Cards, 6 designs, 100 cards, $2.75. Sample brochure, 5¢. Williams Printing, P.O. Box 2597, Van Nuys, Calif.

QSL samples, 25¢. KØMGX Press, 2306 E Street, Omaha 7, Nebraska.

PHOTOGRAPHIC QSLS. Your design your photo. Write "K4HDX Pronto", Box 2352, Spartanburg, S. C.

QUALITY QSLS. Latest designs, samples 10¢. Savory Press, 172 Roosevelt Rd., Weymouth, Mass.

RUBBER Stamps for hams, sample impressions, W9UNY, 542 North 93, Milwaukee, Wis.

FINEST in Electronic parts and tubes at the lowest prices. For the Engineer, Ham, Hobbyist, Experimenter and TV and Radio Serviceman. All our tubes and parts are sold with a money-back guarantee. Send for our catalog and tube list. Allied Radio Electronics, Ltd., 2457 Des Carrieres Street, Montreal, Que. P., Canada.

CANADIANS: HQ-129X, $150; factory-wired 500 watt Viking Courier, in new condition, $250. Bob Hulme, VE3DNG, Box 44, Garson, Ont., Canada

CANADA Ham receivers, transmitters, overhauled, rebuilt or modified Kits assembled, tested. Qualified engineers. Write T. A. Dineen, VE7SV, Dineen Electronic Service Co., 2412 Beacon Ave., Sidney, B. C., Canada.

WANT Hammarlund PRO 310 receiver. VE7SV, 2412 Beacon Ave., Sidney, B. C., Canada.

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.

LOWEST Prices: Latest amateur equipment. Factory fresh sealed cartons. Self-addressed stamped envelope for lowest quotation on your needs. HDH Sales Co., 919 High Ridge Rd., Stamford, Conn.

COMPLETE File of QST for sale: 1915-1951. Landa, R2, Clayton, Ga.

KWS-1, $1200. In top condx. W2ADD.

COLLINS Receivers reconditioned: 51Js, $675; 51J2, $495; 75A-4, $545; HQ-160, $275.00; Hickok, #188, $69; HRO-60 $325.00; Ranger, $210; Teletype printers, converters, etc. SX-111, $205. Alltronics-Howard Co., Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

CASH Paid for short-wave ham receivers, and transmitters. Treger, W9IVJ, 2023A N. Harlem Ave., Chicago 35, Ill. TUxedo 9-6429.

TOROIDS: Unused 88 mhy like new. Dollar each. Five, $4.00. pp. DaPaul, 101 Starview, San Francisco, Calif. After Sept. 1st our address will be at 309 So. Ashton, Millbrae, Calif.

GREAT SURPLUS VALUES! ! BC-603 Receiver New $23.00—BC-683 New $37.00—R-26/ARC 5 Rec 3-6 mc New $15.00—R-27/ARC 5 Rec 6-9 mc New $15.00, used exc $9.95—BC 659 Transceiver with PE-120 $19.95—T-47/ART-13 Transmitters $39.00—BC-603 AC-Supply $9.95—Synchroscopes Model TS-34/AP $49.00—Sound-Powered Dynamic Phones Pr. $4.75—Rec. Microwave R-111/APR-5 $49.00—Collins Mod. Xformer 100 watt 811-PP to 813 final $3.95—RA-62-C Power Supply A-C for SCR-522 VHF 110/60 cyc. New $59.50—Kits only for above, $17.00—Ground-plane VHF antennas 30-200 MC New $9.95—T-19/ARC-5 Transmitters 3-4 mc $9.50 used—T-20/ARC-5 New 4-5.3 $10.00—BC-458 5.3-7 mc New $10.00—BC-459 7-9.1 mc, New $12.00 HiMu Electronic Sales Company 133 Hamilton Street New Haven 11, Connecticut

S.S.B. Xfrmrs. Exact type for "W2EWL Special", and other sideband units, brand new set of 3 for $3.00. Brand new hermetically-sealed half-ampere bias power xfrmrs, 13 lbs., $4.00. No c.o.d., include postage. S. A. Tucker, W2HLT, 51-10 Little Neck Pkwy, Little Neck 62, L. I., N. Y.

WANTED: Communications equipment, late model, base station and mobiles. Also filters for 75A3 rcvr. George Tate, W4AIS, RFD #4, Taylors, S. C.

200 Watt amplifier for 220 Mc. Exc. condx, $39.00 including 4x250M tube. WA6LEN, Box 602, Cardiff, Calif.

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.

REGENCY ATC-1, $55; Heath SSB SB-10, $75, Seneca VHF 6N2 transmitter, $165, RME DB-23, VHF-152A, tape recorder, mobile equipment, multiphase SSB analyzer, $65; BC-453s, transistor course, Gonset Monitor, vacuum variable, electronic flash, telescope, miscellaneous list. W4API, 1420 South Randolph, Arlington 4, Virginia.

HQ-145, timer, calibrator, also Ranger transmitter. Both in like-new condx, $200 each. WV2LIM, Box 505, Jamaica 24, L. I., N. Y.

FOR Spare parts FM eqpt., some 30-50 Mcs, mostly 150 Mcs. Removed working vehicles. 6V DC Federals 144-172 Mcs. PP 5812s; 1 *ufd* rcvr cables control box spkr, $85.00. Shipped collect or money-order. Ken. D. Morgan, KØIEG, Box 611, Ft. Morgan, Colorado.

FACSIMILE. For sale: two TT-1C/TC-1 facsimile transceivers complete with manual, one ream Teledeltos paper, requires no darkroom processing. Also one additional transceiver minus motor, clutch and power supply. Use for spare parts. All three machines for $600. Prefer not to ship. W9WKC.

HAM Licenses, resident courses. Novices and General classes, 3 evenings weekly. Delehanty Institute, 117 East 11th St., N. Y. 3.

TRADE: LM-20, brand new, with book and crystal for Harvey-Wells Bandmaster Deluxe or Senior and VFO; must be perfect condition. Trade FR-70/U secondary frequency standard, in perf. condx, for NC-183D, teletype equipment or sell. W4NZY, 119 North Birchwood Ave., Louisville 6, Kentucky.

MERRY XMAS and a Happy New Year from WØCVU. Thanks for helping me to work and confirm 175 countries on Two Way SSB.

SELLING Out station: Hallicrafters SR-34, 6-2 meter transceiver 6-12-110 volts, $325; Viking Navigator $100; Hammarlund 110C rcvr, $200; Viking 250-23-3 Matchbox, $50.00. Half completed Viking Valiant transmitter (all parts on hand), $250. New York City and vicinity. Will sell any part of above. J. G. Roberts, W2UO, 7 Dolphin Green, Port Washington, N. Y. Phone PO 7-7525.

FOR Sale: CE Model B Slicer, excellent, $40. K8MYO, 48282 Cardinal, Utica, Michigan.

WANTED: Both fixed and variable vacuum condensers and 4-1000-A sockets. Heavy duty swinging chok. Sell B&W L-1000-A amplifier in original box and in new condx. John W. Thomas, Shelby, Miss.

SELL: AF-67 and James 3-way P/S, $135; PMR-7 and PSR-612 P/S, $125; Globe Scout 680A F/W, $65; Heath V.F.O., $15; six-meter converter, $10; Vibroplex presentation bug $10; BC-603, $10. All excellent. F.o.b. 5847 South Pittsburg, Tulsa, Oklahoma, K5JZV.

SALE: HT-32, all xtals included. New condition, $450. C. R. Nissen, W4BWR, RR2, Box 190, Melbourne, Fla.

COMPLETE Station, on the air, ready to go. 75A4 rec. HT20 with Matchbox and VFO, $795. W9BDL, Kendall North, 55 E. Washington, Chicago 2, Ill.

SELLING Station: Johnson Viking Valiant, factory-wired, purchased new in 1960 with Electro-Voice 729S microphone and Dow 115V antenna relay, only $375; Hallicrafters SX-101, $250; Gothard 1K-20 rotary converter 115V DC input, 110V AC 1.82 amps. rated output, $25. All in exc. condx. Package deal can be arranged. Pick up or pay shipping. Irv, WA2CUJ, 8 Berkshire Lane, Levittown, N. J. TRiangle 7-2741.

WANTED: BC-312M, in gud condx, New England area. K1JAP, 21 Pine Lane, Wildwood Park, Portland, Me.

COMMUNICATOR IV, 2-mtr, Gonset transceiver 110V or 12V plugs; in perfect condx. In original carton. Firm price $299.00. Certified check or cashier's check only. Price F.o.b. Anaheim, Calif., 100V Central Elec. xmttr, Ser. #212. Used less than 4 hrs. Perfect condx. Orig. carton. Firm price $595. Cert. chk. or cashier's chk. only. Price f.o.b. Anaheim, Calif. Edward A. Petro, WV6MKR, 1338 S. Placentia Ave., Anaheim, Calif. Phone KE 5-1169, 9 to 5.

100V Central Electronics xmttr, Ser. #212, used less than 4 hours. In perf. condx, in original carton. Firm price $595.00. Certified check or cashier's check only. Price F.o.b. Anaheim, Calif.

WANTED: Windmill type tower, 60 ft. or taller. For sale: Factory-wired L.P. filtered Ranger, $185. Gamma matched 2-el. Hy-Gain Tri-bander, $25. R. S. Cole, 123 Santa Cruz Rd., Arcadia, Calif.

FOR Sale: Gonset III, 6 meters with six (6) thin crystals and Saturn Halo, all in like-new condx, in original cartons, with instruction booklets, $195. Dr. Herman Slutske, K9QZN, 1801 N. Natoma Ave., Chicago, Ill.

FOR Sale: Globe Chief with homebrew modulator, VFO and T-17 mike, $70; Precise 7" oscilloscope $50, BC-455, power supply and speaker, $15; homebrew Q-mult., $5. Shipped express collect. W5KAG, 4409 Maryland Dr., Jackson 9, Miss.

CODE Instruction machine, TG-34A. Inked tapes. With tapes, $25.00. W8WSP.

MERRY Christmas, best wishes to you. The best of DX for friends old and new. Uncle Charlie How.

TRADE: Have two sports cars, can drive only one. Will trade 1955 4-passenger Singer sports roadster for KWM-1 and 12-volt DC supply. Mike Rosenberg, W2FNF, 35 Strawberry Lane, Roslyn Heights, L. I., N. Y. Phone MAyfair 1-4798.

FOR Sale: 75S1 (#2603), 32S1 (#2177), 516F2 (#1956) with speaker. All in perf. condx, $1000, F.o.b. Peace Dale, R. I. Also hi-power linears, 5" Panadapter, etc. Going out of business. W1ALJ, Peace Dale, R. I.

WANTED: January 1959 copy of the Bulletin of the RSGB. Will pay one dollar plus postage. Elmore Fitz, Lanesboro, Mass.

WANTED: Type CME 50063 RME Preselector in gud condx. Write: Mike Delgado, Box 1542, Caracas, Venezuela.

VHF Gamma Match Yagis, 5-el. 6M, $15.95; 10-el. 2-M, $11.95. Catalog available. Dale's Electronic Supply Co., 1125 E. Michigan St., Michigan City, Ind.

SELL: HQ-100C with 6 meter converter, xtal BFO and calibrator. Like new condx. $160. W2YNR, 321 Holly Ave., Pitman, N. J.

SELL: Linear amplifier 80-10 meters, similar to Gonset GSB-101, 4-811As, in HT-33 cabinet, $250.00. Dr. Charles Thompson, 103 West Main, Napoleon, Ohio.

BC-342 receiver, excellent with speaker, $75; 22w audio amplifier, $20; Astatic T3 mike, $10; field strength meter, $12; Stancor choke, 5-25 hy, 300 Ma., $4.00; tubes: 809 pair, $8; 812 pair, $7; 335 issues QST 1930-1958, lot for $20 or 30¢ per copy singles. Add shipping. B. Wade Smith, 2000 N. Fairview, St. Paul 13, Minn.

WANTED: Typing reperforator, late serial 75A4, new condition, reflecting telescope with drive mount. W1WL.

DX-100 with mike, for sale. Like new condx. Wired by FE, $170.00. O. Grann, 3604 Mt. Pleasant Drive, Midwest City, Okla.

HRO-60 receiver, A.B.C.D. coils xtal calibrator, matching spkr, NFM adaptor, Selecto-O-Ject., $360.00 Apache transmitter, D-104 mike/stand, push-to-talk, coax relay, $270. BC-221, power supply, modulated, $60.00. Selling out. Postal card for list. Alian Poe, 8127 Morningside, Wichita 7, Kansas.

FOR Sale: Johnson Matchbox, $35.00; low-pass filter, $8.00; standing wave bridge, $30.00; Morrow CM-1, $20.00; B&W 5100 and 51SB, $425.00. J. J. Gillen, W3ARI.

WANTED: Boehme recorder driving unit. Claude Sweger, 307 Norris, McCook, Nebr.

MOBILE Rcvr, Elmac PMR 6-A, in exc. condx, $65.00; A.C. supply; new E-V Cardioid, #729 mike, $10.75. L. Wecker, 18 Secatogue Lane East, West Islip, L. I., N. Y.

RANGER: Clean, just checked out by Henry Radio service department, $185.00. Firm. Marcus, K7KIS, 941 North Genesee, Los Angeles 46, Calif.

SWAP Gravely tractor, rotary plow, 5 ft. sickle mower, cultivator, rotary saw and other equipment for NC-300, Collins or any other good SSB receiver. John Bagwell, 612 Somerville, Somerville, Tenn.

WE repair Communication receivers, ham vmttrs. Park TV. W4OLØ. Jernigan, Rte. 2, Louisburg, N. C.

FOR Sale: Going mobile, SX-110 rcvr, in exc. condx, original carton & manual, $105; R-48 spkr, $10; DX-40 and VF-1 VFO, in perf. condx, w/manuals, $75.00; Collins TCS-12 xmtr, $60. Joel Herbsman, WA2GZD, 1510 Unionport Rd., N. Y. 62, N. Y. TA 2-7215.

GO SSB Johnson Pacemaker, used only a few hours. Works perfectly, in new condx, $290; 75A-4 rcvr, late serial number (3009), like new condx, $515.00; HRO-60 rcvr, like new condx, $320; Johnson KW Matchbox, $80; Central Electronics Mod. B slicer, $40; W. A. Barker, W5LLV, P.K. Box 1219, Denton, Texas, USA.

WANTED: Coil set AC for HRO-50. State price. K7IUJ, Box 201, Harlowton, Montana.

HT-32 465; DX-100, $150; Jennings 3.5/500 *mfd* 22Kc 40.00; UCSXF 1500 *mfd* 12KV max. 35.00; fixed vacuum condensers, 50 *mfd*, 20KV 3 for 10.00; 175 modulation xfrmr for 811s, 10.00; CHT 500 ohms to modulator grids, 3.00. B&W butterfly PP variable CX-40A with HDVL jack bar, 5.00; 1-222A signal generator 9.00; 522 transmitter, 9.00; KW linear, 20M only, PP 4/250A, TVI suppressed, 3 meters, completely stable, 50.00; self-addressed stamped envelope brings list of bargains. Al Waring, W2CFT, Box 483, Lake Ronkonkoma, N. Y.

LOCAL Sale, Heath RF gen, $18; VFO, $20; power supply PS3, $40; grid dip, $15; Knight R-100 rcvr w/xtal calib., S-meter, $100; $170 takes all. K8KVQ, J. R. Howard, 720 Chesterfield, Birmingham, Mich.

SELL-Trade: SX-43 with manuals, in gud shape: $99.00 or will trade SX-43 and $20 for NC-109. Klafter 6423 Broad, Brookmount, Md.

SELL: DX-40, VF-1, dipole ant., like new, $75; BC-224D rcvr, AC power supply, in gud condx, $55.00. Sry, no shipping. WA2EXW, Tel. UL 4-5701, 230 Ocean Pkwy, Brooklyn, N. Y.

SELL: DX-100, $169.00. In like-new condx. Harvey, W4UI, 21 Orchard Rd., Bellair, Charlottesville, Va.

FOR Sale: DX-20, cash and carry deal: $20.00, 250 copies QST, CQ, Radio from 1924, 15¢ each, all or none. Cash & carry. W1FDN, Bill MacKenzie, 29 John Carver Rd., Reading, Mass.

SELL: Like-new condx, HQ-100 w/clock, $100.00; Lettine 240 xmtr, w/lo pass filter, coils and xtals, T/R sw., $50.00; Wilcox-Gray tape recorder, 2 speeds, 3¼-7½ IPS, tapes, reels & mike, $35.00. Call Rich, K2GTG, Fairbanks 4-0671, Bronx, N. Y.

SELL: Compact exciter, Johnson Navigator, $95, Howie Roberts, WA2ESW, 635 Jayne Blvd., Terryville, L. I., N. Y. Tel. PO 8-1743J.

FOR Sale: QSTs, 1932 thru 1957; CQs, 1950 thru 1955. Best offer takes all. W3JE.

FOR Sale: DX-100, $150; HQ-100, $120; DX-40, $60; Heath SWR bridge; Dow-Key relay; JT-30 mike and Novice crystals. K2RBB, John Carlson, 708 Shadowlawn, Westfield, N. J.

SELL: SX-100 with R-48 speaker, in exc. condx, $225 plus shipping. James Hicks, K4JPE, Box 237, Glen Raven, N. C.

VIKING Valiant transmitter. Excellent appearance and operating condx, $300. K5UNX, 3706 Hogan Drive, Mesquite, Texas.

75A1 and speaker, $220; DX-100 and antenna relay, $160; both in perf. condx. E. G. Keiffer, K5EAB, 948 Greencastle, Dallas 32, Tex.

HAMMARLUND HQ-140-X (miniature tubes, 15M bandspread, xtal filter, S-meter) $130; Viking 250-23 Matchbox with 250-24 SWR bridge, $30. All in gud condx. Paul Meier, K2EEP, 175 E. 151st St., Bronx 51, N. Y. Tel. MO 9-0642.

FOR Sale: Central Electronics 100V and Collins 75A-1 H. T. Cervantes, 190 Croton Ave., Mt. Kisco, N. Y.

CENTRAL Electronics signal slicer wanted. J. Vernon Pace, W4WXY, 203 Sycamore Drive, Paducah, Ky.

SALE: Telcplex self-teaching code machine. Make own tapes; plays back any speed. Pre-recorded tapes, 500 feet blank tape, manual, $25.00. Kenneth S. Teeple, 718 E. 33rd St., Baltimore 18, Md.

SALE: 2—AFD recvrs BC433F-110V. Unused $50 ea: 2—Dynamotors BD77D $10.00 ea. 1—Sig. Corps. Field Set, like new, $60.00. W1SVH, 31, Brookside Drive, Greenwich, Conn.

SELL: Hallicrafters SX71 with matching speaker. Viking Ranger, QSTs in binders 1950 thru 1960 complete run. Make an offer. Lowell Ray Anderson, Box 546, Riverton, Wyoming.

FOR Sale: TMC GPR-90, GSB-1 (SSB slicer/adapter) and GPS-1 matching speaker. All one year old and in perf. condx. Handbooks and original cartons included: $490.00. Will ship. John A. Svenningsen, 25 Birch Brook Lane, Bronxville, N. Y.

WANTED: Experienced technician to wire oscillator coil, mixer coil to band switch. I have schematic S19R four range short wave receiver. Would prefer to send only the coils and switch for wiring, which I would mount in a cigar box to show space occupied in receiver and correct length of wiring. The remaining connections to the receiver to be numbered. However, if deemed necessary, I will ship the entire receiver. J .R. Ottinger, 91-34 Lefferts Blvd., Richmond Hill, N. Y.

FOR Sale: G4ZU Minibeam, 2 months old; $77.00; will ship. WZKVL, 138 Cypress St., Floral Park, L. I., N. Y. Tel: PRimrose 5-9626.

KWM-2, #565 and 516F-2 AC supply, like new. Purchased May 1960. Must sell to pay college expenses, $950. W5YAD, 4936 Perrier Street, New Orleans 15, La.

FOR Sale: 32S1, 516F2 A.C. supply, 75S1, 312B4 station console, $1050 prepaid. HT32A, new in factory carton, with warranty card, $575 prepaid. James Craig, 172 W. Third, Peru, Indiana. Tel. GR 3-9306.

CRYSTALS Airmailed: SSB, MARS, Net, Novice, Commercial, etc. Custom finished FT-243, .01% and kilocycle 3500 to 8600, $1.49. (10 or more FT-243 99¢) all Novice 99¢, 1700 to 20.000, $1.95, 20.001 to 30.000 $2.25. All frequencies 60¢ additional for HO-6/u hermetic holders. Builders crystal packages: November QST "Phasing Sidebander" $9.95: June 1958 QST or SSB Handbook, "SSB Package", 5 mixer FT-243 $9.95, hermetics $13.95, seven matched filter $6.90. Crystals for QST, CQ and other magazine construction projects. All types, if you don't see it, be specific, write. Airmailing 9¢ per crystal. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

GLOBE KING 500 with HT-18 VFO, perfect condx, $325 for both. W8EKW, Al Ketzler, 419 Manor Groose Pointe Farms, 36 Michigan.

SELL: Hallicrafters SX-101 Mark III in gud condx with matching speaker, $250. John S. Morgan, P.O. Box 645, Cary Hall, West Lafayette, Indiana, Telephone 92-81247.

APACHE, $225; DX-20, $30; SX-99, $110. F.o.b. Port Crane, N. Y. WA2FBL.

BC-221AK, $45. Less calibration chart. Bob Hanway, 823 Vermont Ave., Fairmont, West Va.

SELL: BC221 freq. meter, reg., pwr. supply, $50; National 1 to 10 rec. pwr. supply and matching speaker, $35; BC645 xmttr and rec orig. sealed carton, $15.00; PE214B 300 watt gas gen. in orig. box, $35.00; GE CRO-3A oscilloscope, never used, $25.00. W9TRD, Charles O. Stimpson, 1525 Sunset Ridge Road, Northbrook, Ill.

SELLING Out: Complete sideband and AM station: Central Electronics 10B exciter, Central Electronics 458 VFO, Central Electronics Sideband slicer, 807 buffer, and power supply, 304TL linear and 2500V 500 mill power supply; QT-1, National ARO-7 rcvr., Heathkit DX-40, Hammarlund HQ-140X recvr—Microphone and accessories, etc., $475. K4PGY, 703 Fourth Ave., Albany, Ga.

SELL: Apache xmttr, HQ-110 receiver with matching speaker, Bud low-pass filter, Dow coaxial relay, Telex Twinset headphones; Vibroplex key, Astatic JT-30 mike. This equipment is in 1st class condx. A terrific buy for $450.00. T. J. Zespy, WØYJC, 410 19th Ave. North, East Grand Forks, Minn.

G-63 Gonset rcvr, 80 thru 6 meters, new. Priced at $215.00. Wm. K. Kern, K9BEH, 1807 12th St., Bedford, Ind.

KNIGHT R-100, with meter and calibrator, less than 30 hours use, in perf. condx. $130. K4KMW, 3 Quinn St., Hampton, Va.

SELL: HC-10 converter, excellent condition with instruction book and adapters in factory carton, not needed with my HQ-180 $95.00. You pay freight. Mel Dilbeck, 174 Liberty St., San Francisco 10, Calif.

HALLICRAFTERS S-38, $13; S2OR, $10; S-81 (152-173 Mc), $30; S27 (27-144 Mc.), $50.00; Summer 1960 Callbrook, $3.00; Pilotuner (88-108 Mc), Needs work, $7.50. Priced F.o.b. W9WFT, 2029 Bradley, Chi., Ill.

FOR Sale: Viking Valiant $325.00: going mobile. Also D-104 mike and co-ax relay, Martin Manes, K2ZGB, 148 West 23rd St., New York 11, N. Y. AL5-1718.

SELL Barker & Williamson L-1001-A linear amplifier, $215 with spare pair 813s. Tecraft CS-21 converter, covers 21.0 to 21.5 Mcs. with receiver tuning of 3.5 to 4.0 Mcs. $30. A. L. Hammerschmidt, 8 Oakwood Drive, Woodcliff Lake, N. J.

JOHNSON Kilowatt in excellent condition. Pick up here for $795. W5DYL, Forrest City, Arkansas.

SELL: Two selsyn motors. Both $13.00, postpaid. Andrew Travis, 2002 West 8th, Ausin 3, Texas.

TRADE: Guns, model radio control equip., H-O trains for commercial ham gear. K4SCT, 1340 NW 190 St., Miami 69, Fla.

SELL: SX-100, $190; Heath DX-20, $30, Lettine VFO, $20; Heath SB-10, $85; Drake Q-multiplier, $15.00; or the whole works for $310.00. All gear in unaltered A-1 shape in use at present time. Am looking for Heath mobile gear. Don, K2GBN, 174 Ramsey St., Paterson 1, N. J. Tel. MU 4-0690.

COMPLETE Station: Heathkit Cheyenne xmttr, Comanche rcvr, (UT-1), utility pwr. supply, mike, cables, all manuals. $225.00 plus the postage. All in exclnt condx. WA6EKY, Paul Gerald, 7716 Sale Ave., Canoga Park, Calif.

HT-32, like new condx, in orig. carton, $400. W5IAO, Walter L. Bourgeois, 1501 Stafford, Gretna, La.

AMARILLO Texas area only: Super Pro rcvr, pwr. supply, cabinet, $150; RA-62 pwr. supply, $40; 32 ft. Spaulding anchor base tower, $45.00; 2-el. Triband beam, w/100 ft. coax, $35; Ham M rotator, $100; CE2OA w/458VFO incl. 10M conversion and deluxe cabinet; QT-1, $250; NC-300 rcvr, w/spkr, $290; 300 W linear, 811As w/pwr supply and cabinet, $75; 28" relay rack cabinet, $20; misc. fil & pwr. transf., antenna traps, etc. Back to school. Trade commercial transceiver? Sam Hooper, 1647 Kimberly, Amarillo AFB, Texas.

AT College: DX100 and Johnson Matchbox for $160.00, both in vy gud condx. NC-109, spkr, headphones, $125.00, in exc. condx. SWR (Heath), Vibroplex bug, JT30, and more included with everything else for $300.00. Will deliver free in general metropolitan area. K2LCM, 340 Main St., Islip, N. Y.

QST Run from 1934 thru 1960, $40.00; also run of the Institute of Radio Engineers magazine (IRE Proceedings) from 1946 thru 1960, $30.00. Buyer pays shipping charges. Gleason, Steeplebush Road, Levittown, Penna.

SEND No money! Guaranteed, B&W 600 dip, $25.00; PS 225Ma, 800-900V, $16; BC453 Q5er and PS double rack, $10; Eico Signal generator, $10. RCP, 322 Tube-tester, $8.00. W4UYH, 11421 SW 40 Ter., Miami, Fla.

FOR Sale: Viking 500, factory-wired, used 25 hours. NC-303 with matching speaker, SX-108, new in sealed carton. DX-40 with 9 extra xtals. All in mint condition. Will sacrifice. K1KVB, Fred H. Chase, Topsfield, Mass.

FOR Sale: HRO-60 coils E-AC-AD. Crystal calibrator. R. G. Armstrong, W1JTL, 10 Fourth St., Leominster, Mass.

SELL: DX-100B, $195; BC348N, Gonset 10M conv. w/p.s., $80; new sixer, $55. All in excint condx. $320.00 takes all or will trade for SSB gear. K9IHG/9, Box 585, West Lafayette, Ind.

TRADE: Camera Ikoflex, 120, 3.5 lenses, new cost $168.00; need Viking 6 & 2, receiver or any ham gear. Bud Harmening, KØIYK, R. #3, Sleepy Eye, Minn.

ELDICO SSB 1000F, 1 year old. $475 or best offer. Consider trade on good 16 ft. or 17 ft. boat, Thompson, Lymann or equivalent. Local deal preferred. K8DAT, 15333 Rutherford, Detroit 27, Mich.

SELL: DX-40 with VF-1, in exc. condx, $65; Heath "Sixer", new in August, exc. with xtal, $37. W. J. Christoff, K8RCA, 3509 Harding Rd., Jackson, Mich.

FOR SALE: Drake 1A (excellent), $199.50; Elmac PMR-7, $119.50; Gonset G-66B with 3 way pwr., $175.00; S-40A, $55.00; SX-99 with "Q" Mult., $135.00; SX-101 Mk. III, $275.00; HQ-110, $196.50; HQ-160 (like new), $279.50; Morrow Conelrad Monitor, $27.50; NC-98, $99.50; HRO-7 with spkr., A,B,C,D,AC coils, $152.50; RME 4350 with matching spkr., $185.00; Alpha 6 meter xmtr., $64.50; C.E. 20A with 458 VFO, $225.00; 32V-1, $200.00; 32V-2, $300.00; 32V-3, $350.00; KWS-1, $1250.00; KWM-1, $610.00; Globe LA-1, $69.50; HT-30, $325.00; HT-32, $495.00; HT-37, $380.00; Viking Ranger, $195.00. Write Art Brown, W9IHZ, Brown Electronics Inc., 1032 Broadway, Ft. Wayne, Ind.

KWS-1, $1000; 75A-4, $475; 32S-1, unopened carton, $566; Drake 2-A, $225.00; Drake 1-A, $200; HT-37, $350; "1960" 20A, $195; LA-400B, $95. W8WGA.

FOR Sale: Altec 633A "Saltshaker" broadcast microphone, new, $20; two Kenyon 5V 60 amp. 115v. pri. transformers, $7.50 each. WØATP, Ernie Thelemann, 6210 West 76th Place, Prairie Village, Kans.

WANTED: Plug-in mechanical filters for Collins 75A4. Any bandwidth except 3.1 Kc. Send price and description. W5TGQ, 8207 Fairhope Place, Houston, Texas.

CE20A Link coupling, QT-1, Bandhopper VFO, 150W GG amplifier, trade for 3000W AC generator or $250.00; Globe Scout 65B, 9 Novice xtals, trade 6N2 transmitter or $60; two 813s at $5.00; pair 117V selsyns, $6.00. F.o.b. Great Neck, L. I., N. Y. WA2FSD, 11 Burbury Lane.

SPECIAL Ham Christmas postal cards, greeting, call letters, name in glittering show-print. 48-hr. service. 3-D QSL. 5 Wood End Road, Springfield, Mass.

SX-101 Mark III, $225; Collins 51J3 receiver, $450; 75A3, in mint condx with 800 and 3100 cycle mechanical filters, calibrator, speaker, $400. Pair new RCA 813s, not surplus, $20.00; B&W 650 Matchmaster, $25; RG14U 100 ft., $10; filament transformer 5 volts, 60 amps, fully encased, $7.00; pair Taylor 822s, $15.00. John Huey, W9AMU, 390 Hill Ave., Elmhurst, Illinois.

SELL: Gonset GSB-100 SSB transmitter, #A1062, $325.00. Ralph Ankeny, W9FV, 2023 Bates, Springfield, Ill.

SELL 1960 factory Thunderbolt (a jewel!), $499; LM frequency meter w/AC supply, calibration book, $60; ART-13 for parts, Heath 5" scope needs some work, $15 each. W2MQB.

MOBILE Complete 12 volt AF-67/PMR-6A, all accessories. Operating. $165.00. Want beam, rotor, tower, RX. Sell or trade. K1BRI, Bill Kimball, Box 344, Topsham, Maine. Tel. PA 9-9264.

WANTED: Collins 75A3, state accessories, condx and price in your first letter. E. Shafer, 3479 Kersdale, Cleveland 24, Ohio.

QST complete run from June 1924 to date, like new condx. Cash and carry or C.o.d. $75.00. M. Rieger, 216 Rutledge Ct., North Plainfield, N. J.

CALLS: Labels: Embossed self-adhering plastic identifications 3/16" white lettering on ½" colorel tape. Red, Green, Blue, Brown, 10¢ per inch. Clear, Black, Aluminum, 12¢ per inch. Call letters, 15¢. Minimum order, $1.00. Estling, K7ETV, 1351 Grant St., Walla Walla, Wash.

IMMACULATE: Collins 75A-3 with matching speaker, $350.00; Valiant, factory-wired, $325.00; both rarely used, complete with instructions books. Also, Telrex Triband TB-7E, Donner 60 ft. crank-up tower, AR-22 rotor, D-104 mike, Dow coaxial relay, coax cable. K6TNP, 530 Homewood Rd., Los Angeles 49, Calif. Tel. GRanite 2-7320.

WEBCOR Record-changer, G-E cartridge, $12; approved A800 Audio Preamplifier-control unit, $12.00; G-E clock-radio, $12. V. R. Hein, 418 Gregory, Rockford, Ill.

75S-1, CW xtal and fltr, $436.00; 32S-1, 516F2—$556; 312B4, $148.00. In perfect condition. W. L. Sypal, KØPFW, 4514 Waveland Court, Des Moines, Iowa.

HARVEY-WELLS Bandmaster Deluxe TBS-50D with VFO and APS-50 power supply; 80-2 meters, exc. condx, $75; Globe Matcher, Jr., $10; ARC-5 VHF receiver modified for CAP use, $15. Paul Wade, Rt 2, West Paducah, Ky.

WANTED: QSTs for personal collection: Dec. 1916; Jan. 1917, February 1917, May 1917 and September 1917. W1CUT, Box 1, West Hartford 7, Conn.

TRADE: Hewlett-Packard 624B; 8.500-10,000 Mc. Want: 32S-1, 75A4, 75S1, HT-32, HX-500 or equal. W4JWG, 7853 Caxton Circle E., Jacksonville 8, Fla.

2 METER FM taxicab xmtr-rcvr. RCA (conversion July QST), brand new, $60.00. K8JMC/1, Baker, 51 Aldrich, Watertown, Mass.

FOR Sale: Collins 75A-4 #427, excellent, $500. Will deliver within 75 mile radius. R. Warren, W1FKO, 20 Edgehill Rd., New Haven, Conn.

JOHNSON Viking Ranger, latest model. In perf. condx throughout. Also many extras: beam, SWR bridge, Vibroplex bug, etc. Best offers. K1EIT, 7 Lewis Court, Hingham, Mass.

STUCK With absolutely unused NC-270 receiver, $213.00 and B&W 5100-B, $420. W2PKO, Lieberman, 117-01 Park Lane, Kew Gardens 18, N. Y.

LOOK! B&W 5100-B, brand new, and SX-101 with matching speaker, in perfect operating condx: $500. Ed Savage, WA2-JXU, 147 Ridgecrest Road, Ithaca, N. Y.

TRADE: Ham for Hi-Fi equipment or vice-versa. New or used. TV!? Send name. Amateur Radio Exchange, Div. of Audio Exchange, 153-21 Hillside Ave., Jamaica 32, N. Y. Tel. AX 7-7577.

FOR Sale: Motorola signal generator, Mod. No. TU576. Built by Measurements Corporation. Lampkin Frequency meter and also Lampkin modulation meter. This equipment all perfect, complete with manuals. WØOHX, Kiowa, Kans.

LAMPKIN 205A FM modulation meter, like new condx: $175.00. Dick Cook, W4YML, 40B Orchid Ave., Eau Gallie 7, Fla.

NC-183-D, excellent condition with speaker, $215.00; Viking I, mike with push-to-talk and spare 4D32, $120. T. J. McCormick, W3CQX, Box 2323, The Johns Hopkins Univ., Baltimore 18, Md. Tel. CH 3-9041.

FOR Sale: Ranger, Elmac PMR6 with power supply, both in perf. condx, AT1 xmttr and 40-watt mod. Priced to sell. Clyde Williams, R #1, Box 409, Leaksville, N. C.

MUST Sell excellent Heath Cheyenne transmitter, transistor power supply, Gonset Triband converter, load coil and whip, $175. DX-100, $165.00. K2YBM.

SELL: DX-40 and VF-1, in perfect condx, $75.00. Paul Jagnow, 212 5th St., Coralville, Iowa.

KWS-1, SC-101 integrated control unit and 75A-4. A complete and superb station in top condition. Package $2000. W2ADD.

ANTENNA Mast 75 ft. high tubular steel, $65; Heath AR-3 with cabinet and V-7A with two probes, $45.00. W7NLR, 2433 Cameron Visa, Tucson, Ariz.

SELL: Elmac combination mobile/fixed rig; AF-67; PMR-7; M-1070 pwr. supply; 10 thru 160 whip; mike, $250.00. Write for full details. John Wentland, 122 Jackson St., Ripon, Wis.

SELL Dirty but usable Model 26 teletype with table and DC power pack, $45.00; two .5-.5 mfd. (1 mfd. each) capacitors, 7500V, $9.00 each; Mosley 2-element 40M Shortbeam, $50.00; Mosley 2-element 20M Shortbeam, $30.00. Beams may be combined on 40M boom, combination price, $75.00. W9ERU, Box 273, R.R. 4, Rockford, Ill.

GO MOBILE! Gonset G-77, 6-12V, w/mod. power supply, looks new, $165.00; Regency ATC-1, $45.00; Shure Mike push-to-talk, $8.00, $190.00 takes all. R. N. Gregory, K6CNH, 2751 Tucker Lane, Los Alamitos, Calif.

WANTED: To borrow or buy: Instruction manual or circuit diagram for McMurdo-Silver 906 generator, also need DC scope. Jackson, 36 Shepard, Cambridge, Mass.

A-1 reconditioned equipment. On approval, Trades. Terms. Hallicrafter S40B $69.00, SX99 $109.00, SX100 $199.00, HT37 $359.00. S85, SX110, SX111, SX101A, HT32, HT32A, HT33A; Collins 75A1, 75A2, 75A3, 75A4, KWM1, 32S1, 75S1, KWS1; Central 10A $79.00, 20A $159.00, 600L $299.00; Elmac PMR6 $69.00, PMR7 $109.00, AF-67 $109.00; Gonset G66B, G77A, G50, GSB100, GSB101; Hammarlund HQ100 $129.00, HQ110 $179.00, HQ129X, HQ140X, HQ140XA, HQ150, HQ160, HQ170, HQ180; Johnson Adventurer $39.00, 6N2 $99.00, Navigator $99.00, Viking II $179.00, Ranger $179.00, Valiant $279.00; National NC98 $99.00, HRO50T $199.00, NC300 $209.00. HRO60 $349.00, NC183D, NC303; Heath, Globe, RME, other items. List free. Henry Radio, Butler, Mo.

LEECE-NEVILLE 50 amp. rectifier or 24 volt 10 amp. bridge, $5.00; 1 KW tube, #251 new, $5.00; 125 watt isolation xfrmr, $3.50; 500 watt $10.00; 2600 volt CT 1 KW power xfrmr or 4700 volt CT 700 watt, $12.50. B. J. Kucera, 10615 So. Highland Ave., Cleveland 25, Ohio.

COLLINS 75A4, 75A3, 75A2, accessories: Central 20A, 10B, 10A; Hallicrafters SX-101, III, S-108, SX-71, S40A; Hammarlund HQ170, HQ-150, HQ-129X; Heath Apache DX-100, SB10, Cheyenne, Comanche; Johnson Viking II, Challenger; National NC-300, NC-109, NC-98 and many more. Send for list and details. Radio Distributing Co., 1212 S. High St., South Bend, Ind.

75 METER Heliwhips, 2, $7.00 each: Central Electronics 100V xmttr-exctr, new, with factory guarantee, $680.00; KWS-1, perfect, $950; 6V. mobile power supply, $20.00; Fisher 101R stereo tuner, $150; Fisher PR66 stereo preamp, $18; Bell 3030 stereo preamp and ap., $100; Roberts stereo 4-track record and playback with preamps and amps. for speakers, $375; Concertone (American Electronics), Custom 33 series, 7½ and 15 i.p.s., stereo recorder, preamps, 10" reels, 4 heads and room for a 5th, carrying cases, $690. W3VDE, 1219 Yardley Rd, Morrisville, Penna.

HEATHKIT Cheyenne and UT-1, $100. Hallicrafters S-38E, $30. Good operating condx. K9UFV, 501 McKinley, Libertyville, Ill.

FOR Sale: SX-99, built-in squelch, audio filter network, $100; DX-40, new, $60; Heath Q-multiplier, $10. All equipment is in excellent condition. Robert Kujawski, 30 Rose St., Florida, N. Y.

HEATH Apache, 6 months old, $200.00; Hy-Gain 3-element 10-m. beam, excint, $20.00. WA2KVD, 3601 Country Club, Endwell, N. Y.

DX-100 with vacuum tube keyer, $170; HQ-129X, with Q-multiplier, $120; Elmac PMR6 converted to 12V $65.00. Heath TC2 tube checker, $18. W2RLG, 325 Morgan Ave., Old Bridge, N. J.

WANTED: Old Mims beam direction indicator, mainly solenoids. Braun, W7HRV.

SELL: Hallicrafters SX-100 $150. Top Condx. W1MGD. Earl Roberts, Box 67, Ridgefield, Conn.

SALE: Johnson Valiant, like new, in perf. condx: $275. Ben Sherman, 2243 E. 26th, Brooklyn 29, N.Y. K2ZEX

"HORSE Trader" Ed Moory, plays Santa Claus! Drake 2-A receiver, used 3 hours, $209.00; HT-37 Demonstrator, $369.00; B&W grounded grid linear LPA-1 and matching B&W supply, $395; Collins 75A4 receiver serial #5100, new demonstrator, $595; KWM-2 used 4 hours, $799.00; 32S-1 Serial 2320, $469.00; used 100-V, $595.00. Terms cash, no trades. Ed Moory Wholesale Radio, Box 506, DeWitt, Arkansas. Phone WHitney 6-2820

DX-40: In perf. condx and brand new: $45.00. Must sell. Write Bill Ewan, WA6IMD, 2201 12th, Kingsburg, Calif.

FOR Sale: Globe Champion 300A, trans. Hallicrafters SX-101 receiver with R-46B spkr. Telrex rotator R-100V with indicator and selsyns and 125 ft. control wire. Best offer. W5RMK, Art Copeland, 208 N. Olive St., Carlsbad, N. Mex.

SELL: Globe King 500B xclnt condx, crated, $450.00. WA6HXC, 1221 Magnis St., Arcadia, Calif.

MOTOROLA used FM communication equipment bought and sold. Ralph Hicks, W5BCO, Box 6097, Tulsa, Okla.

FOR Sale: Hallicrafters SX-99 with spkr; Heathkit DX-35, Ameco code practice oscillator with key; Drake Q-multiplier, Precision signal generator, mod. E-200-C; Heathkit oscilloscope OM-3 with probes. Best offer each item. Will ship express collect. Bob Soehnlein, K9IIO, 308 South Few St., Madison, Wis.

GLOBE-KING 500-B with 4-400 final. Will deliver in Ohio area: $550.00. Forrest E. Hothem, W8OVJ, Box 128, Coshocton, Ohio.

HALLICRAFTERS SX-71 for sale. In excellent condition. Need money for college. Dave Alberts, 166 E. 92nd St., New York 28, N.Y.

TWO Wilcox kilowatt transmitters, 3 to 18 mc., 60 cycle input, fully metered modern units. Only $20 each. Sorry, cannot ship, local sales only. Richard Beckert, W6DBG, 17088 Summit Way, Los Gatos, Calif. Tel. El 4-7460.

SELLING Complete station: Valiant, factory-wired, 9 months old, $320 or best offer; TA-33 Jr., $37.00; NC-188 rcvr, Q-mult., Selecto-O-Ject, spkr, $85; "Mercury" mike. Vibroplex bug, Johnson low pass, Heath Conelrad, Dow-Key relay, $8.00 each; all in excellent condition. Richard Stec, K1JUR, 287 High, Medford, Mass.

WANTED: HRO Coil "F", 480 to 960 Kc. W8QMN.

ALUMINUM for every ham need. Write to Dick's, 62 Cherry Avenue, Tiffin, Ohio, for list of tubing, angle, channel castings, plain and perforated sheet, and complete beam kits.

SELL: NC-300 w/phones, $260. Gary Tighe, 2909 W. Oak, Sioux Falls, S. D.

HT-32, $415; linear amplifier, filtered, a beauty, $350 or make offer on pair; S-77 receiver, $50; 20M Telrex beam, $35.00; 44 ft. Rohn tower with accessories $75; prop pitch rotator with wall indicator and cables, $35.00 or $125.00 for complete antenna system; R-46B spkr, $10; Bud LP filter, $12; TR relay, $10; pair 250TH tubes, $30; 40M dipole, $3.00. Offers or mobile gear considered. K6ZZE, 5776 Nottingham Drive, El Sobrante, Calif. or phone LAmbert 6-1887, Fullerton, Calif.

COLLINS 75S1 and 32S1, like new, used less than 100 hours. Will sell for best offer or would prefer to exchange for old player-piano rolls. Bill Dodson, 210 Arterburn Rd., Lyndon, Ky.

BEGINNERS: Code memorized in one hour. New method. Used in armed services, Ham radio, Scouting. "Ketchum's Hour Code Course", $1.00 postpaid. Money back guaranteed. O. H. Ketchum, 10125 Flora Vista, Bellflower, Calif.

FOR Sale: Like new Cush Craft 4-element, 10 mteer beam $25.00; Shure 777 Mike and stand, $11.00. W9DGV, 711-44th St. Rock Island, Ill.

FOR Sale: HRO-7, complete, coils 1.8 to 30 Mc. In exc. condx: $95.00. Local delivery. C. Astor, 80 Arcadia Rd 6B, Hackensack, N. J.

HAVE: Coils—MHRO-50. A, B, J,G,D; HRO-60A, $20 each. K3EOF.

KURE Battery trouble! With VX-6, $2.98! Money back guarantee! Literature mailed on request! Eddie Wyatt, National Dynamics Corp., P.O. Box 325, Norwood 12, Ohio.

NATIONAL: receiver 240-D. In exc. condx. $140.00 w/spk. John Heyl The Loomis School, Windsor, Conn.

FOR Sale: 6 new Eimac 4CX300A tubes, $25.00 ea; one socket, $5.00; new Adjust-A-Volt 7.5 amp. Variac 500 Bu. $10; 1 Kw 75Ω lo-pass filter, $5.00; new Stancor A3894 125w. modulation transformer, $10; new Chicago xfrmr 1500V CT 250 Ma., $5.00; new UTC choke, CG-40. 10 hy. 200 Ma., $3.00; SSB mixer 14 to 144 Mc. with tubes regulated P/S, $15.00; 90 watt 2½ mtr. final with tubes, meters and P/S, $20.00; HQ-129X, $120. Charles Copp, W2ZSD, 3 West Drive, Port Washington, N. Y.

COLLINS, like-new, KWM-2, $1095.00; 75S1, $475.00; 32S1, $495.00; 312B4, $185.00; Hallicrafters SP44 Panadaptor, $65.00. W4VHW, 510 Nelson Ferry Road, Decatur, Ga.

75A4 serial 4427 $575; 75A4, ser. 1880, $495. Both units guaranteed like new. Will sell either. W4TVN, 304 North Colonial Homes Circle, N.W., Atlanta 9, Ga. Telephone TRinity 3-1757.

WANTED: 2-meter plate tank chassis for VHF-62, state condition and cash price. K9VMQ, Harlan V. Hippensteel, Box 107, Auburn, Ind.

ATTENTION! Easy-Method Morse System Only $2.00. Send money, name and address to Box 86, Schellpfeffer, Perrysburg, Ohio. It's brand new, copyrighted 1960. It revolutionizes learning—teaching of the International Morse Code. Radio (Ham operators, 1st Class Scouts, members of the U. S. Signal Crops or plane pilots.

DEAR John: Won't you please come home. I have decided to let you get a "Satellite 60" for Christmas. After Studying the features, I'll have to admit that I like the idea of "No Guys". You're the only guy for me. W4EZWAY.

WANTED: Back issues of QST from first issue 1915 to December 1929, and January 1960 to July 1960. K3NCU.

TRIAL Plan: Reconditioned: Terms: Guarantees: BW5100 $245.00; 51-SB $159.00; CF600L $299.00; KWS-1 $999.00; KWM-1 $595.00; 32V-1 $259.00; 32V-2 $299.00; 32V-3 $399.00; Elenco 77 $259.00; SSB-100A $349.00; SSB-100F $435.00; A54-H $69.00; Scout 65B $65.00; Champ 300A $349.00; King 400C $255.00; King 500 $375.00; 755VFO $37.00; King 500B $565.00; Gonset 500W Linear $149.00; HT-30 $309.00; HT-31 $219.00; SR-500 console $675.00; HT-32 $435.00; SB-10 $75.00; Pacemaker $249.00; Phasemaster II $159.00; 75A4 $549.00; S53A $65.00; SX101 $255.00; HRO-60T $345.00; NC-173 $114.00; NC183D $234.50; RME 4350 w/cal. $169.00; SRT-120 $59.00. Leo, WØGFQ, Box 919, Council Bluffs, Iowa—World Radio Laboratories.

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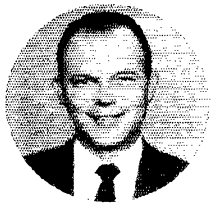

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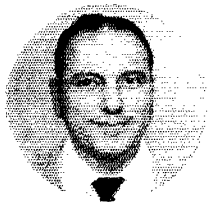

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- Pepping Up the SPARC Transceiver
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- Resurrect Broken Transistors
- Bottling Up Chemical Fumes
- Transistor Gain Checker
- Use of Bug Key as Sideswiper
- 12-Volt System for Volkswagen

I.A.R.U. NEWS

KEYING, BREAK-IN CONTROL CIRCUITS

MEASUREMENTS AND TEST EQUIPMENT

MISCELLANEOUS — GENERAL

MISCELLANEOUS — TECHNICAL

MOBILE

MODULATION

(See Audio-Frequency Equip. & Design)

OPERATING PRACTICES

POWER SUPPLY

RECEIVING

RECENT EQUIPMENT

REGULATIONS

SINGLE SIDEBAND

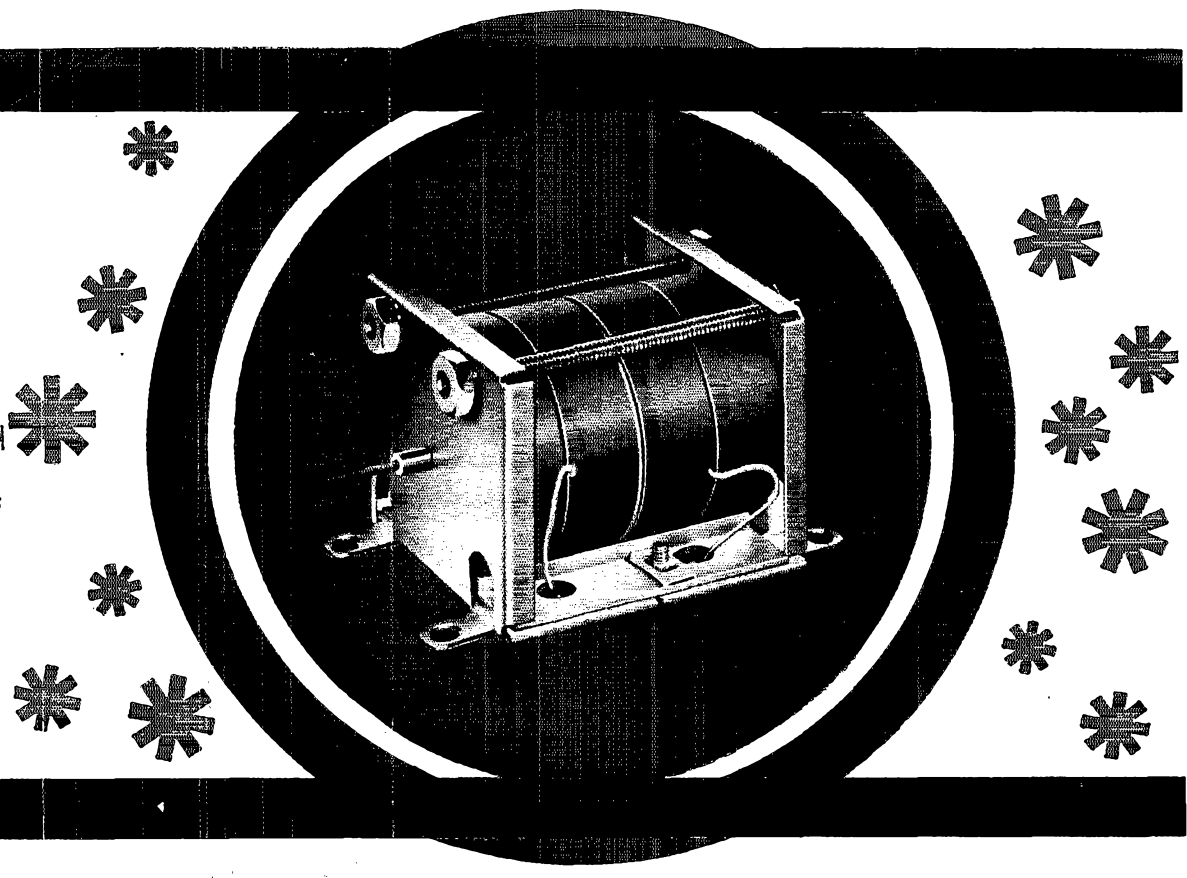
TRANSISTORS

TRANSMITTING

TRANSMITTERS

TVI

V.H.F. AND MICROWAVES



INSTANT SSB–CW–AM–SELECTION WITH NATIONAL'S FERRITE FILTER* IN THE NEW NC-270

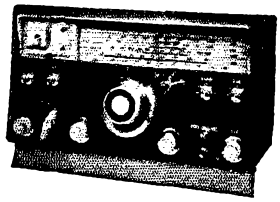
National's patented Ferrite Filter provides instantaneous selection of 5 kc, 3 kc, and 0.6 kc bandwidths *plus* 2.5 kc selectable sideband with no extra filters to buy! It's available only in National's new "Cosmic Blue" NC-270!

The compact high permeability construction of the Ferrite Filter provides an average "Q" of 500 at 230 kc. The higher filter frequency in the NC-270 means superior secondary image rejection—none of the blocking problems or spurious signals characteristic of receivers using very low intermediate frequencies. And—*stable* "IF Shift" selectable sideband means . . . the NC-270 does not rely on mixing oscillators to maintain zero-beat.

Make Sure You Check These Features Of The NC-270: 6 meter band included, (no converters to buy); sensitivity—1.5 uV for 10 db signal to noise ratio; product detector for SSB and CW; Bi-Filar T-Notch Filter with external depth control; built-in 100 kc calibrator; extreme mechanical and electrical stability; compact, modern styling—the NC-270 includes National's "Flip Foot" for maximum operating convenience . . . plus many other features.

Only $24.99 down**

Suggested cash price: $249.95. NTS-3 Matching Speaker: $19.95 (slightly higher west of the Rockies and outside the U.S.A.). **Most National distributors offer budget terms and trade-in allowances.



NATIONAL RADIO COMPANY, INC.

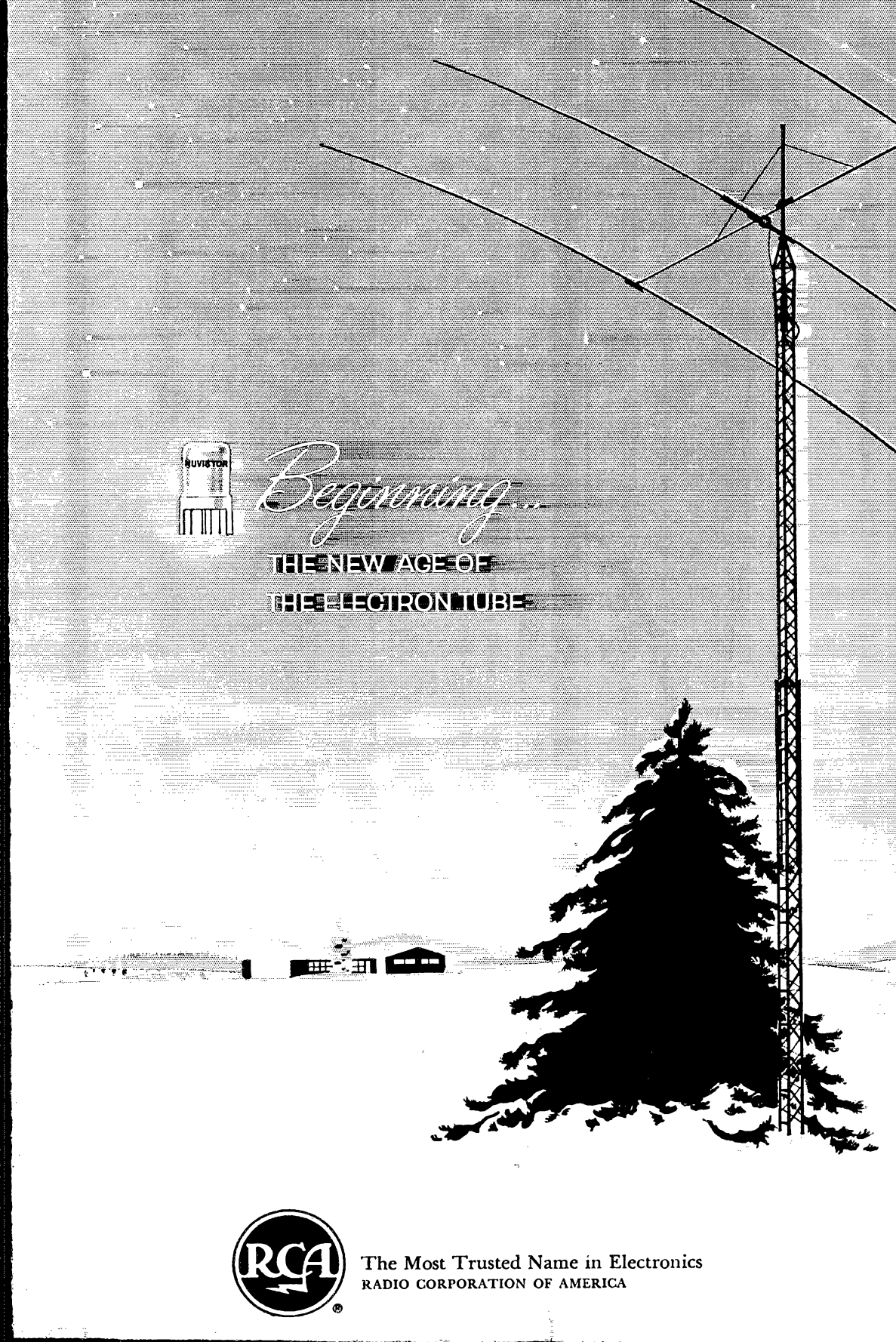
A WHOLLY OWNED SUBSIDIARY OF NATIONAL CO., INC. MELROSE 76, MASS.

Export: AD AURIEMA, INC., 85 Broad St., New York, N.Y.

Canada: CANADIAN MARCONI CO., 830 Bayview Ave., Toronto 17, Ont.

*PATENT PENDING

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



Beginning...

THE NEW AGE OF

THE ELECTRON TUBE

RCA

The Most Trusted Name in Electronics

RADIO CORPORATION OF AMERICA

Attention, All U.S. and Canadian Amateurs

How Best to Use our Bands?

Your Views on Frequency Usage, Please

The League's Board of Directors has voted (Minute 31, page 64 July '60 *QST*) "to conduct a study of desires of ARRL members as to the mode of usage of the amateur frequencies between 3.5 and 29.7 Mc." To determine your preference and operating plans and wishes, *QST* includes this insert and return post card this month. We request that you indicate your wishes for personal amateur operating on the card which is a part of this page. Please stamp and mail the card promptly to ARRL. Thus your desires in band use will become part of this official survey.

This information is primarily for ARRL Directors. Referring to the other side of this page: the data you put in column one on the card will show your current use of our bands. This will assist analysis and also help our Communications Department's planning in operational matters. Column two is used to show us how you would like to work in the upcoming months. Your column two report should reflect your desires or expectation to undertake any new projects or spend more time in one mode or another in the future. At the right of this second column write in your preferred future operating as to RTTY, a.m., s.s.b. or other (estimated figures, please). Your figures here should add so that the total for the different modes of work on each horizontal line exactly equals your column two estimate, opposite which the figures are written. Director Eaton, VE3CJ, asks that all Canadian amateurs return their cards to ARRL fully filled out also, the analysis of these to be in terms of the Canadian (DOT) assignments for the given bands under study. — *F. E. H.*

Please Detach and Mail This Card Now

PLACE
POSTAGE
STAMP
HERE

American Radio Relay League,

West Hartford 7,

Conn.

U.S.A.

112A

How to Fill Out the Card

1. In column one (1) show for each mode, on the line provided, the ESTIMATED PER CENT of your present total operating interest.

This may be one entry of 100%, if you work entirely one band and mode. However, should your operating include various bands (E.g., for DX, rag chewing, traffic and v.h.f.). you need to estimate the percentage of *each* mode in the different bands used. You may even review your log for a fair period dividing the hours in each category to help you show percentages on the card. Example: You find that your log covers several sessions: 16 hours in all on your Section 3.5-Mc. traffic net, 32 hours of ragchews on 75 phone, 24 hours chasing 14-Mc. DX (c.w.) and 8 hours of v.h.f. mobile on 2 and 6 meters. Total 16 + 32 + 24 + 8 = 80 hours. This works out to support column one entries: 3.5 Mc. c.w. 20% (16/80); 3.5 Mc. phone 40% (32/80); 14 Mc. c.w. 30% (24/80); V.h.f. 10% (8/80).

2. In column two (2) show, by putting in another ESTIMATED PER CENT just how you would like to use your operating privileges as to bands and modes in the future.

If you expect to work more phone and less c.w., or vice versa, use different bands more, or install s.s.b. or RTTY soon, your plans and expectations should reflect this in the proper parts of the blank chart, and in column two. (A DX man may feel the lower frequency bands will deserve more of his operating time in the coming months — or, if you are going v.h.f., the chart should reflect your increasing time to be spent in that direction.)

3. Under MODES OR SPECIAL INTEREST you should detail the kinds of amateur operation you prefer in future operation.

Estimate your work by s.s.b., amplitude modulation, c.w., RTTY or other method. The "other" column is for any operation you would like to engage in (by estimated percentage) in case such does not come under standard column headings. A note under "Remarks" will show us what specialty you have in mind. Things like facsimile, slow-scan picture transmission or items you would favor, if regulations could provide, can be shown as such entries.

4. At the bottom of the form show your call, name, division, and kind of license so as to help us interpret your plans and take proper account of trends in interest that may be indicated in the study, results of which are to be reported to the Board. We want to hear from *each* Full Member. Let us hear from you soon. Thanks and 73.

Detach the postcard below.

Fill it out carefully.

Mail without delay.

In col. 1 below, I am indicating my current division of operating time, estimated per cent, by bands and modes, as now used in my on-the-air work. Then in col. 2 my desired future use by bands and modes. AT THE RIGHT of column two each col. 2 entry is broken down to show my wishes and preference as to MODES or the KINDS OF OPERATING INTEREST OR EQUIPMENT.

	BAND SECTORS (1) Now in Use (%)	(2) Desired Use (%)	MODES OR SPECIAL INTEREST (Figures here should add left-right to equal the % shown in column 2.) a.m.	s.s.b.	n.f.m.-f.m.	RTTY	c.w.	other
Mc.								
3.5 c.w.	_____	_____	.....	.....	.....	.....	.....	.....
3.5 phone	_____	_____	.....	.....	.....	.....	.....	.....
7 c.w.	_____	_____	.....	.....	.....	.....	.....	.....
7 phone	_____	_____	.....	.....	.....	.....	.....	.....
14 c.w.	_____	_____	.....	.....	.....	.....	.....	.....
14 phone	_____	_____	.....	.....	.....	.....	.....	.....
21 c.w.	_____	_____	.....	.....	.....	.....	.....	.....
21 phone	_____	_____	.....	.....	.....	.....	.....	.....
28 c.w.	_____	_____	.....	.....	.....	.....	.....	.....
28 phone	_____	_____	.....	.....	.....	.....	.....	.....
Above 50 Mc. c.w./phone	_____ 100%	_____ 100%	.....	.....	.....	.....	.....	.....

Remarks .....

My Call ....

Class Opr's License ARRL Division Signature