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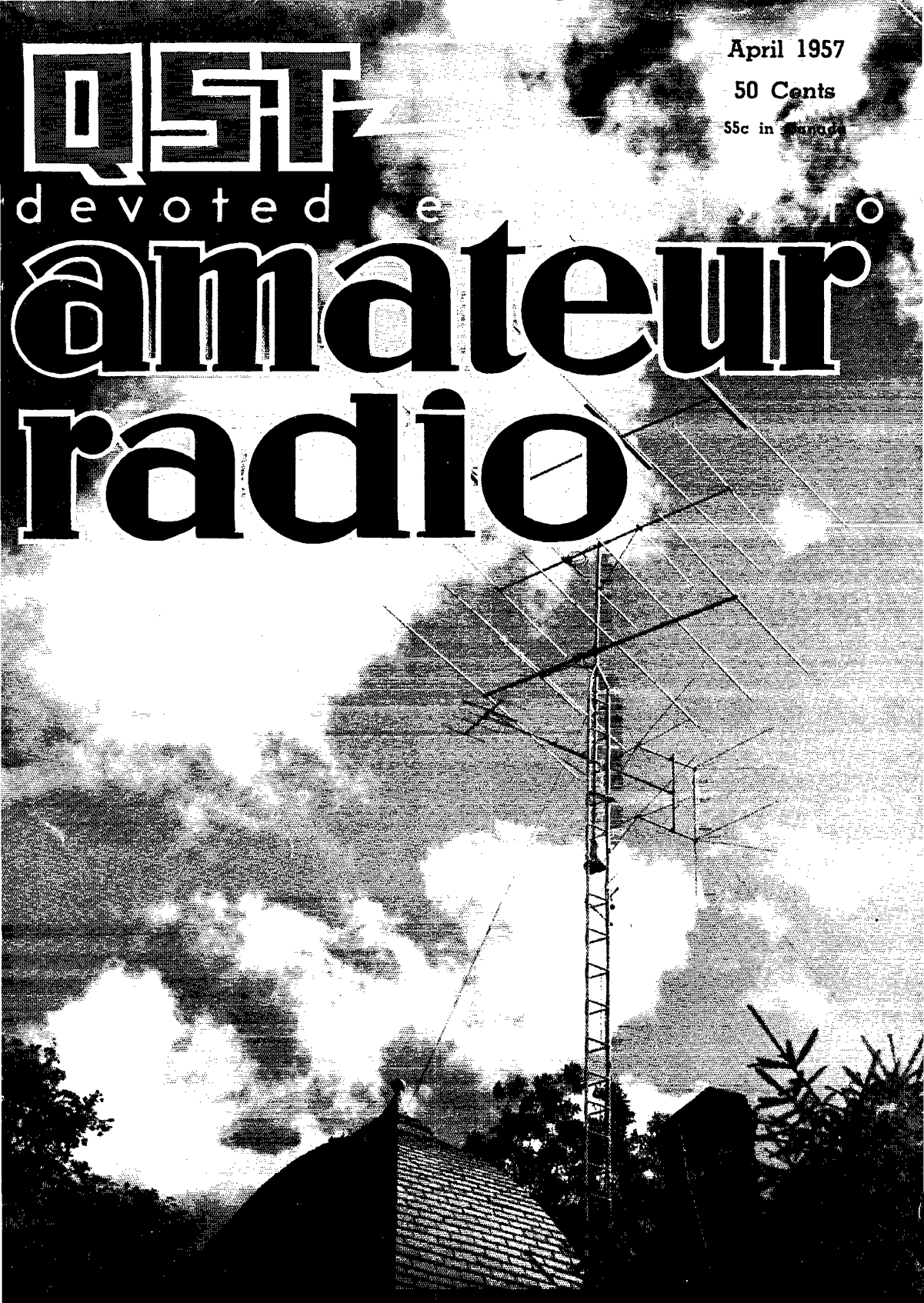
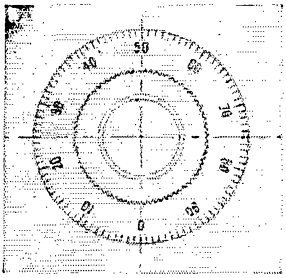


PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE



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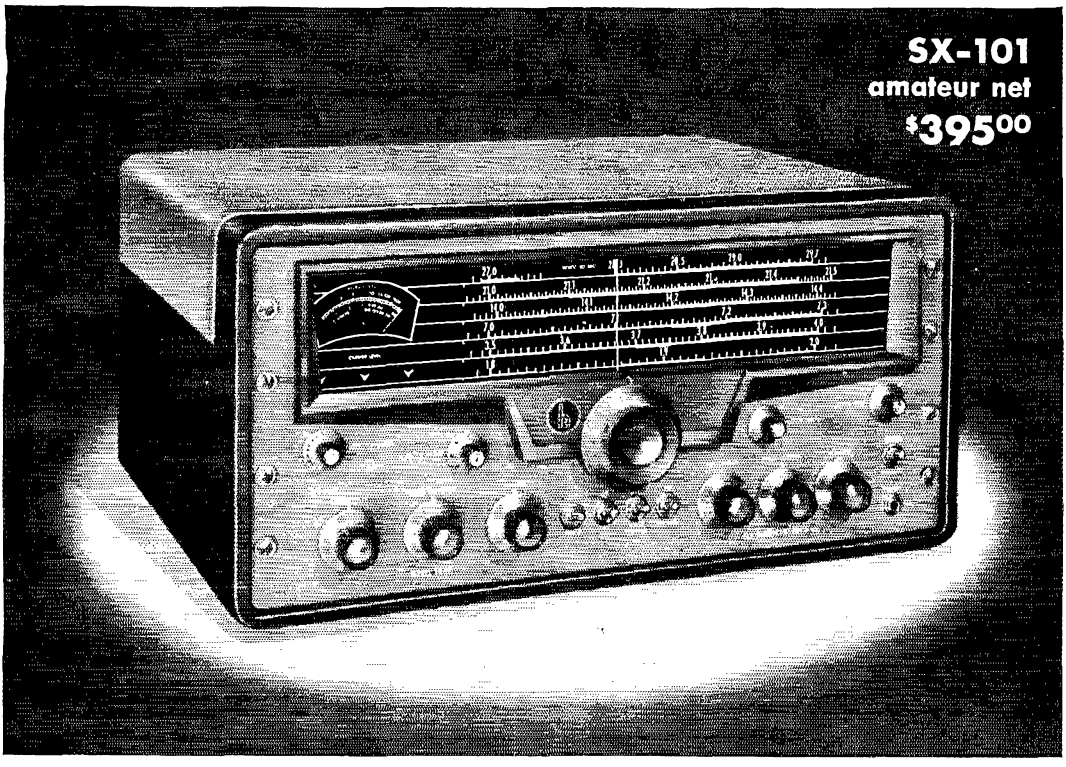
Hallicrafters new SX-101 receiver employs heaviest chassis in the industry . . . offers selectable sideband . . . has complete coverage of seven bands.



It's all amateur—and as rugged as they come! Hallicrafters presents the complete answer to ham reception, with every essential needed for today and for the future.

First—built like a battleship. Bigger. Heavier. Second—a marvel of stability—the result of 22 years of experience and development. Third—it brings you a long list of new features:

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PLUS: Band in use individually illuminated...built-in crystal calibrator...antenna trimmer...dual conversion...full gear drive from tuning knob to gang condensers...five steps of selectivity from 500-5000 cycles...sensitivity—less than 1 microvolt on all bands...direct coupled series noise limiter...50 to 1 tuning knob ratio...and many more.

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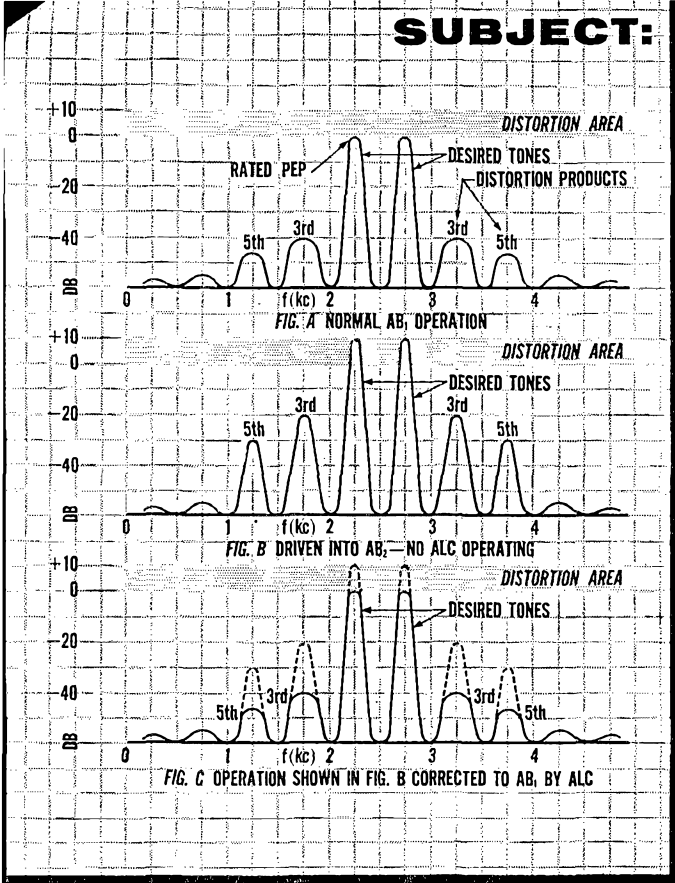

Over-driving of the power amplifier in a transmitter reduces the effective talk power of the unit by wasting power in distortion products. An important feature of Collins KWS-1 is an Automatic Load Control that automatically keeps the signal level adjusted to its rated Peak Envelope Power, and keeps distortion products at a negligible level.

ALC's effect on distortion is illustrated in the drawings of a two-tone test above. Figure A shows a transmitter operated at rated power. Without ALC, a tone driven into AB_2 operation (Fig. B) enters a distortion — or non-linear — area and greatly increases 3rd and 5th order products. ALC takes control and reduces the signal peaks to the rated power (Fig. C). The net result of the correction is an increase of some 8 db in average talk power.

This is but one of the features that make the KWS-1 the most versatile kilowatt on the market. Coupled with the 75A-4 Receiver, you'll have the top-performing station in operation.

Collins CREATIVE LEADER IN COMMUNICATION

COLLINS

QST

APRIL 1957

VOLUME XLI • NUMBER 4

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

OFFICES

38 La Salle Road
West Hartford 7, Connecticut
TEL.: ADams 6-2535 TWX: HF 88

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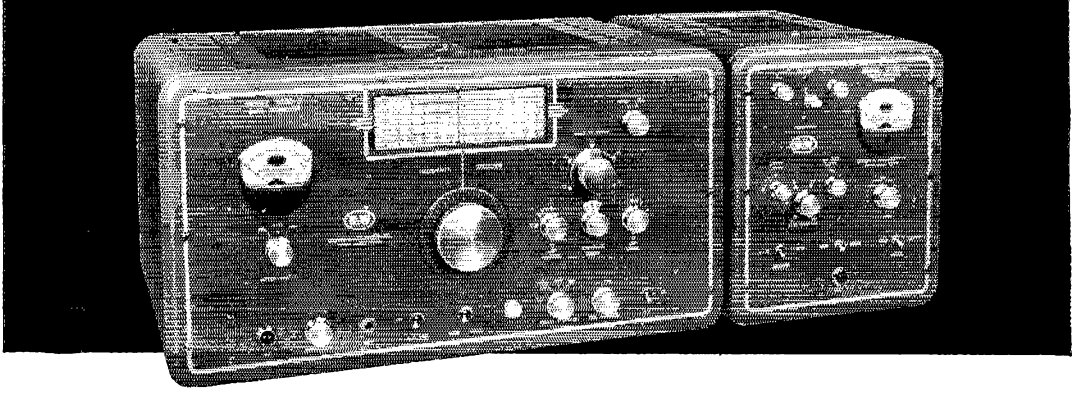
—CONTENTS—

Superlative AM-CW and SSB with the B&W MODEL 5100-B TRANSMITTER, MODEL 51SB-B SSB GENERATOR



Here's unsurpassed performance on all three . . . AM-CW and SSB! The Model 5100-B gives you:

- *high level push-to-talk AM telephony*
- *clean CW keying—break-in on all bands*
- *sparkling SSB combined with the 51SB-B companion sideband generator*

Check *all* the features built into this fine transmitter: input power of 180 watts CW-SSB,*140 watts AM phone; bandswitched throughout with integral VFO or crystal frequency control; coverage of 80 through 10 meter amateur bands; *plus* unitized construction, pi-network final, and integral low-pass filter. Skillful layout and imaginative circuitry assure effective transmission of signal with minimum harmonic content. Functional design within the r-f section, careful shielding, filtering, and by-passing are your assurance of the most dependable TVI suppression.

*Peak envelope

Trouble-free operation, ease of control and tuning, coupled with excellent quality of signal output with the Model 5100-B are sure to meet the exacting requirements of the most discriminating operator.

FOR OUTSTANDING SSB PERFORMANCE on the same amateur bands, combine the 5100-B with the completely bandswitched 51SB-B companion sideband generator. Powered by the transmitter, the 51SB-B can easily be hooked up to the 5100-B in less than a half hour. Tuning and operation are a breeze, with no test equipment required for installation or operation. And you'll begin immediately to enjoy such features as: voice operated control, push-to-talk, speaker deactivating circuit, true unitized construction, and TVI suppression.

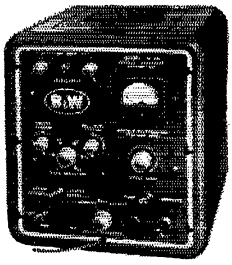
*Net Price { Model 5100-B Transmitter.....$475.00
Model 51SB-B SSB Generator.....$265.00

FOR SPARKLING SSB WITH YOUR PRESENT TRANSMITTER . . . THE B&W MODEL 51SB SIDEBAND GENERATOR

Enjoy superb single sideband transmission just by adding the Model 51SB generator to your present B&W, Collins, Johnson, or other commercial or composite home built transmitter. Using factory engineered modification kits and step-by-step instructions, you'll find it easy to achieve outstanding SSB operation on all the amateur phone frequencies 80 through 10 meters provided by your present transmitter. And the self-powered Model 51SB gives you all the advanced features of the Model 51SB-B generator.

*Net Price: Model 51SB SSB Generator $279.50

*All prices subject to change without notice



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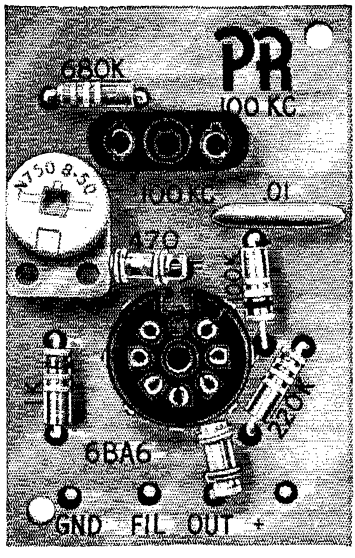

Actual size illustration.

Amateur Net, $4.50

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Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. *All amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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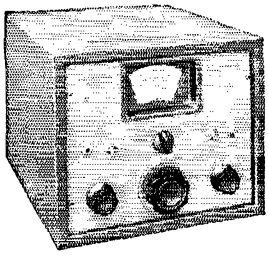

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ON THE RIGHT FOOT..

GPR-90
COMMUNICATION RECEIVER

GSB-1
SINGLE SIDEBAND ADAPTER

Once upon a time . . .

. . . It was the joy and delight of the budding ham to take soldering gun in hand and tenderly sort, assembla and wire the latest model regenerative "two tuber" and tune around for some DX on the other side of town . . . and then came the "superhet"—a truly great construction accomplishment to be proud of,—we know. But, that was long, long ago and we've come a long way since then. Today it is the accepted custom to just as carefully choose a "boughten" receiver, with all the very latest features, because now, as then, the receiver is the very heart of the shack, the very life of radio. "You can't work 'em if you can't read 'em."

Here are the main features of today's newest and latest designed receiver, with its matching companion for the SSB enthusiast.

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- Frequency Range — 452-458 kc.
- Type of Reception — AM-SSB (upper or lower) CW.
- IF Input Voltage — 0.3 Volts rms (normal) for 0.3 Volts rms Audio Output.
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- Input Impedance — High from IF.
- Output Impedance — To match Audio Grid.
- Input Power — 115 V, 50/60 cy. 55 Watts.
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GPR-90

- Six Bands — .54 to 31 mc., AM, CW, MCW, FS.
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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

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

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

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

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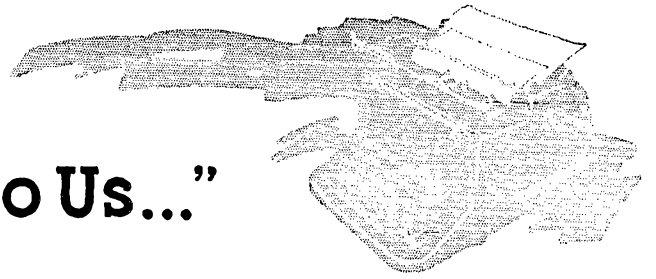


"It Seems to Us..."

MOBILE ACROSS THE BORDER

It's not yet time to take down the storm windows and put the red flannels back in mothballs, at least not around our QTH, but the occasional warm days are a reminder that the vacation season is getting closer. For many of us, that means a trip somewhere, and quite possibly mobile operation enroute.

If you're planning a trip into Canada, and want to continue your "mobiling" while there, it's about time to fire off a letter to:

Telecommunications Division
Department of Transport
Ottawa, Ontario, Canada

Give your full name, address and call letters and outline briefly the nature of the trip and the approximate date. You will be sent two copies of a form which should be filled out carefully — preferably on a typewriter — and mailed back to Ottawa. If everything is in order, the duplicate will be authenticated and returned to you. It's not a license in itself, but merely an extension of your FCC ticket, so the latter must be carried as well.

On the application, the space marked "license number" does not apply to amateurs, and should be left blank. Where the form asks for "authorized communication service and area in Canada where station will be operated," fill in your route or location, the correct dates, and that the service is amateur.

When you operate under the reciprocal agreement, sign your own call, followed by the country and area prefix (i.e. W1XXX/VE3). Once each QSO either phone or c.w., you must state your approximate geographical location.

Don't forget to notify your own District FCC Engineer-in-Charge if you're going to be operating outside the U. S. for more than 48 hours. Only one notification is necessary for one continuous stay across the border.

For VEs heading south, the procedure is about the same. The address to write:

Authorization Analysis Division
Federal Communications Commission
Washington 25, D. C.

As you (a VE) enter each U. S. district, send a notice to the District Engineer*, referring to your FCC authorization, and stating your name, call, date and route or location. A postcard will do, and no reply is needed. If you "stay put" for more than a month, an additional notification is required.

In either country, the visitor is to abide by the rules set up for that country. In the main, this doesn't create any hardship, for the privileges are quite similar. U. S. phone bands are a trifle smaller — see page 70, *QST* for March, 1957 — and Canada allows 500 watts in the antenna, based on a final-amplifier efficiency of 70 percent.

Have a good time, fellows — and if you come near here, be sure to drop in.

* Listed in the *License Manual*.

ABBREVIATIONS

The other day we received a letter from a brand-new League member, and will-be ham, who had nothing but praise for *QST* — but said he had difficulty, as a neophyte, in translating the many abbreviations used freely in our pages. Shucks, we thought, this fellow wants his dope sugar-coated. He just doesn't want to bother digging a bit for the information. Besides, we use only a very few abbreviations and most of 'em ought to be obvious. To prove the point to ourselves, we skimmed through a copy of *QST* picked at random.

It was something of a shock. The first sentence that caught our eye was, "In plain words, this simply meant turning off the a.v.c. and reducing the r.f. and i.f. gain until the peaks of the nearby s.s.b. signal didn't overload the receiver." That's four in one short sentence! Plain words they are indeed to those of us familiar with the jargon, and only common sense to use in saving precious space. But maybe the guy has a point. We thumbed through the pages, jotting down abbreviations that are strictly old-hat from common usage but perhaps mystifying to the newcomer the first time around. The result is that we can think of no better purpose to be served by one of our pages than to run such a list. See page 74.

The list doesn't purport to cover standard symbols (such as *L* and *C* for inductance and capacitance), surplus equipment type numbers (such as BC-453), manufacturers (such as B&W), Q Signals, or ham slang (such as XYL, BCNU). But from an inspection of the texts, diagrams and charts of several *QST* issues we have compiled a list of abbreviations that are common, everyday jargon.

We hope newcomers will find it useful.

OUR COVER

As we write this, the weather here in West Hartford is anything but spring-like, yet by the time you read this there will (we hope) be balmy weather throughout the land. And balmy weather brings with it thoughts of new and better antennas. Perhaps this month's cover will whet *your* enthusiasm to get up a new beam or two this spring. Don't forget, things are really buzzing on the DX bands. The sunspots are gyrating and now's the time to get with it!

Our cover this month shows the antenna installation at W1VRK, Swampscott, Mass. At the top, 85 feet above ground, is a Mosley VP20. Just below that is a Gonset 4-element for 6 meters. And right below that is a 5-element Telrex on 10 meters. W1VRK obviously follows *The Amateur's Code* and is balanced, for those other things in the picture are TV antennas. Also included on the tower are a pressure-type wind indicator and a red blinker (the latter to impress the neighbors).

The tower itself is a Kuehne, while the top mast section is a 23½-foot piece of high pressure steam tubing 1½" o.d., ½" i.d., which weighs 129 lbs. The rotator swings out of the way and a winch arrangement allows the top mast section to be raised and lowered in order to work on the antennas.

COMING A.R.R.L. CONVENTIONS

June 1–2 — Oklahoma State, Tahlequah, Okla.

June 7–8–9 — Dakota Division, St. Paul, Minn.

June 15–16 — Rocky Mountain Division, Estes Park, Colorado

July 27–28 — West Gulf Division, San Antonio, Texas

August 16–17–18 — Southwestern Division, Long Beach, California

August 30–31–Sept. 1 — ARRL National Convention, Chicago, Illinois

September 21–22 — Midwest Division, Kansas City, Kansas

October 18–19 — Ontario Province, Toronto, Ontario

A.R.R.L. OREGON STATE CONVENTION
Eugene, Oregon — April 13–15, 1957

The Valley Radio Club of Eugene has again been selected to sponsor the ARRL Oregon State Convention to be held at the Eugene Hotel, Eugene, April 13th-14th. Many activities are planned and pre-registrations at $7.50 will be accepted until April 1; thereafter, $8.00. Non-hams may register for $4.50. More than 700 attended last year. Reservations may be obtained by writing L. J. Oswald, W7SPB, 751 E. 14th St., Eugene, Oregon.

HAMFEST CALENDAR

Connecticut — The Tri-City Radio Council will hold its 13th annual hamfest at the Crocker House Hotel, State Street, New London, Saturday, May 4th. Attendance will be by reservation only, and tickets are $3.75 each, including a steak dinner. Also anticipated are a visit to the Submarine Base and a prominent after-dinner speaker.

Florida — The Orlando Amateur Radio Club, Inc., will hold its annual hamfest at Rock Springs near Orlando on Sunday, April 28. Registration fee, including dinner, is $2.00 in advance; children under 12 — $1.00. The closing date for advance registration is April 15th. Send reservations to the Orlando Amateur Radio Club, Inc., P. O. Box 2067, Orlando.

New Jersey — The Twelfth Annual Old Timers' Nite Round-Up and Banquet will be held on Saturday evening, April 20th, in the Grand Ballroom of the Stacy-Trent Hotel, West State Street at Willow, in downtown Trenton. As in the past the party will be *stag*.

A turkey dinner will be served *promptly* at 6:30 o'clock in the hotel ballroom, and the program will include personalities prominent in early radio and wireless history. Bring along your oldest amateur and commercial licenses, as awards will be made to those holding the earliest dates. A special award will go to the "Grand OM," whose radio operating experiences date back to the earliest days of wireless. W2ZI's now famous collection of old-time wireless gear will be on display. Tickets are $6.00 by reservation and may be obtained by mailing a self-addressed envelope by April 15th with your check. Late-comers will be assessed $7.00 at the door. Plan to bring along as many guests as you wish, everyone is welcome. Even the Novices come along to join in the fun. Tickets and special seating arrangements for twenty or more persons may be obtained from E. G. Raser, W2ZI, 315 Beechwood Ave., Trenton.

New York — The Crystal Radio Club, W2DMC, Valley Cottage, N. Y., is holding its 26th annual dinner affair at Martens Falls Inn, on So. Paseack Rd., Pearl River, N. Y., on April 27th, at 8:00 P.M. Tickets are $3.50 each, and limited. For all information, please contact Tony Maiorano, W2EHZ, 14 Peck St., W. Haverstraw, N. Y.

New York — The Rochester Amateur Radio Association is sponsoring another of its now famous Western New York Hamfests this year. A fast-moving, interesting program is scheduled to start at 2:00 P.M., Saturday, May 4th, with something for everybody including the YLs and XYLs. There will be contests, exhibits, speakers, and lots of conviviality. The place will be the Doud Post of the American Legion on Route 33 just west of the city line of Rochester. Lots of space for parking and mobile activity. Advance registration is urged to assure a place at the banquet. Price will be $3.75 which includes registration, the banquet ticket, and participation in all the parts of the program. Advance registration may be obtained by writing to RARA Hamfest, Box 1388, Rochester, N. Y.

Pennsylvania — The 12th Annual Banquet of the Lancaster Radio Transmitting Society will be held Saturday April 27th, at the Arcadia Cafe, 27 West Orange St., Lancaster. Festivities will begin at 6:30 P.M. and entertainment has been planned for all. Registrations must be made in advance and may be obtained from Arthur C. Jacoby, W3OY, 136 Springhouse Road, Lancaster.

Washington — The Amateur Radio Association of Bremerton will hold its anual Hamfest May 4th, at the Sons of Norway Hall, 1018 18th Street, in Bremerton. Registration will begin at 1300 followed by mobile hunts, code competitions, and other activities. A banquet dinner will begin at 1900 during which there will be special entertainment. The rest of the evening will be spent dancing. Advance ticket price $3.50; $4.00 at the door. For further information, contact Ray McCausland, W7UWT, 3236 Wright Avenue, Bremerton, Washington; telephone ESsex 7-5140.

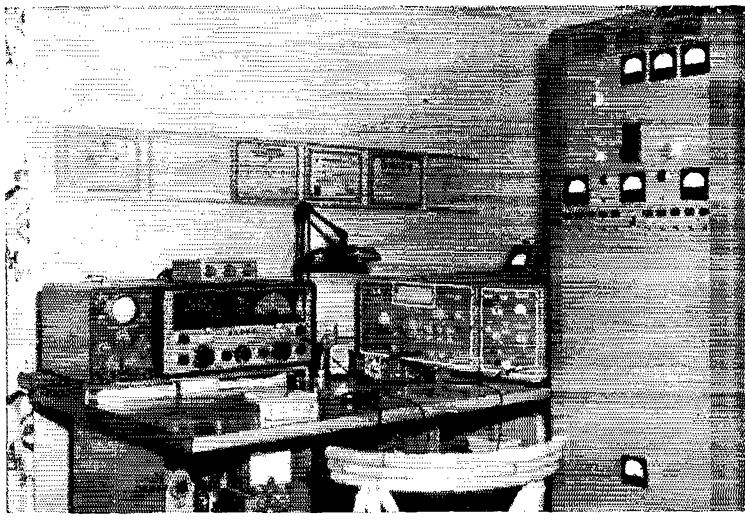
NEXT MONTH!

In our May issue the feature story will deal with the most astounding do-it-yourself project in radiocommunications history. When you read it, you'll agree that it's almost out of this world!

In this article

BY DAVID MUIR,* W9DZY

you'll find a description of a high-power amplifier, designed both for c.w. and as a linear for s.s.b. or a.m., in which either 4-125A, 4-250A or 4-400A tubes can be used. Making full use of the output of any "100-watt" transmitter for driving, it's a



Grounded-Grid Tetrode Kilowatt

AFTER OPERATING a transmitter in the 100-watt class for a few years, the desire for greater power became more pressing as the DX became a little more elusive and the competition keener. The particular transmitter, a B & W 5100, was quite convenient to operate and so we wanted to continue to use it — as a driver for a higher power final amplifier if possible. But in order to avoid neutralizing and to minimize the possibilities of TVI, tetrodes were the natural choice for power tubes for the new amplifier. However, if the tubes were grid-driven in the usual way, either the output of the driver would have to be reduced, or some of its output would have to be dissipated in a dummy load.

Neither of these alternatives was attractive, nor was the further thought of an associated high-*Q* grid circuit that would require tuning. Cathode drive, available statistics seemed to indicate, would require extremely high driving power for the tube types available, but with most of the driving power contributing useful output. However, there is some question as to the desirability of operating the tubes triode connected, because of the dissipation limits of the control grid. The most attractive solution seemed to be to use cathode drive with the tubes tetrode connected and with d.c. voltages on the screen and the control grid to establish the operating parameters.

C.w. operation was the prime requisite, with linear operation for single side band next in importance. At the time the final was being considered, operation as an a.m. linear at full input also seemed desirable, establishing a further requirement for roughly 660 watts of plate dissipation. Therefore a pair of 4-400As was selected, although 4-125A or 4-250A tubes would have been equally adaptable without the a.m. requirement.

In the interests of convenience and operating simplicity, we planned to attempt to devise some method of cathode drive that would not require tuning. Fortunately, before construction began B & W made available their ferrite-cored bifilar-wound filament chokes, one of which is incorporated in the amplifier. No low-capacitance filament transformer is required, and the input is untuned. The pi network in the driver loads noncritically over a wide range of frequencies on all bands from 80 to 10 meters, inclusive. As an example, v.f.o. operation across the first 100 kc. on 20 meters is possible without retuning the driver, and with no significant loss in excitation. With an antenna essentially flat over the same range, the amplifier does not need to be redipped either. This makes the system very desirable for DX and contest work.

Results

The operation of the amplifier has been extremely satisfactory to the author. It has complicated station operation not at all, since band switching is almost as easy as with the small transmitter alone. No TVI difficulties have been encountered although a low-pass filter has not been used, but probably it would be well to add one as a precaution, particularly in those areas with low TV signal strengths. On-the-air reports have been indeed gratifying, and there is the additional satisfaction of knowing that a good percentage of the driving power is getting into the antenna.

*8942 Linder Ave., Morton Grove, Ill.

Construction

The amplifier is mounted on a standard 12 × 19-inch aluminum rack panel and a 13 × 17 × 4-inch aluminum chassis. The latter is spaced from the panel by six ½ × 2-inch spacers, tapped for 10-32 screws. Top shielding consists entirely of do-it-yourself aluminum available at hardware stores. The framework is constructed from ¾ × ¾-inch angle stock, the front and sides are sheet stock, and the top and back are perforated sheet stock. Four ⅝-inch wide angles are cut from the angle stock to form mounting feet for the four 7⅛-inch uprights, which are butted to the top frame. The top frame is made from four pieces of angle stock which have been mitered. Four 1¼-inch pieces of angle stock are used to join the uprights to the top frame. Holes are tapped in the uprights and top frame to fasten the joining pieces, and also for attaching the sheet stock. The resulting frame is strong and rigid, and while the sheet stock may seem quite light in gauge compared to thicknesses ordinarily used in radio chassis work it affords a rigid shield with more than adequate strength, since it acts only as a shield and has no structural function.

In order to reduce the over-all height of the shield by 1½ inches, the B & W pi-network tank coil was modified slightly, with no detriment to its operation. The ten-meter ribbon inductor was carefully removed from the assembly and, looking at the rear, the left-hand termination of the coil was bent in the opposite direction from its original position. Thus the coil extends to the rear instead of above the assembly. An inch or so of the ribbon on the right-hand side was uncoiled and a right-angle bend made so that the coil terminates at the unused hole in the upper right-hand corner of the rear ceramic plate. It may be necessary to remove an inch or so of the ribbon and redrill the coil for a good fit. A jumper of half-inch brass or copper strip runs from this terminal to the switch point where the coil was originally connected.

A continuous length of half-inch brass strip is used for the lead from the coil assembly to the vacuum tank capacitor and the plate blocking capacitors. The plate sides of the blocking capacitors are mounted on a bracket attached to the top of the plate choke and extending midway between the tube plate caps. Connection is made to the plate caps by heavy copper stranding. The small bottom insulator on the plate choke was removed and replaced by the 500-$\mu\mu$f. by-pass capacitor. The vacuum variable is mounted vertically, and is driven by a right-angle drive over the chassis from the Groth counter dial on the front panel. The output coax connector is mounted above the chassis on an aluminum bracket, and is connected to the coil assembly by a short piece of half-inch brass strip. A connection midway along this strip goes

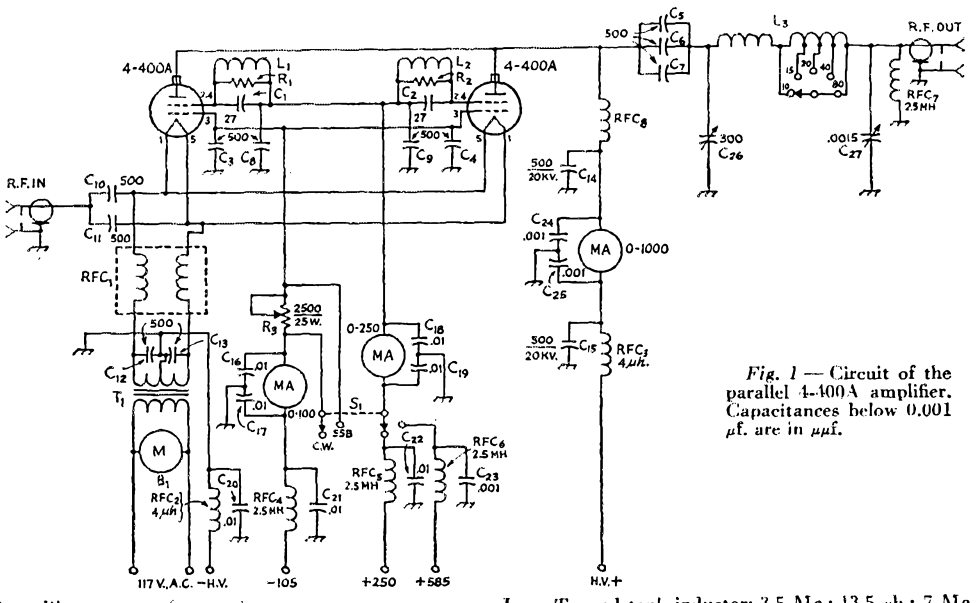
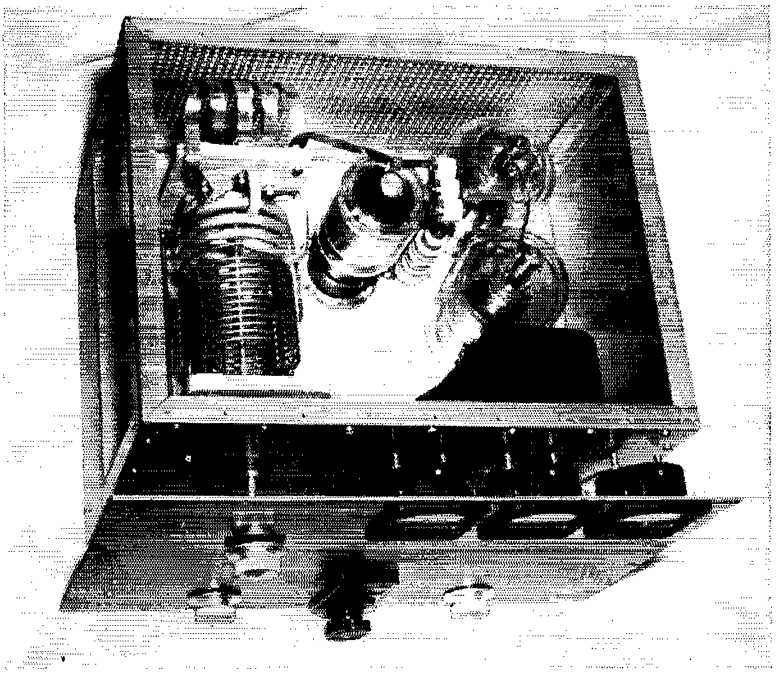


Fig. 1 — Circuit of the parallel 4-400A amplifier. Capacitances below 0.001 μf. are in $\mu\mu$f.

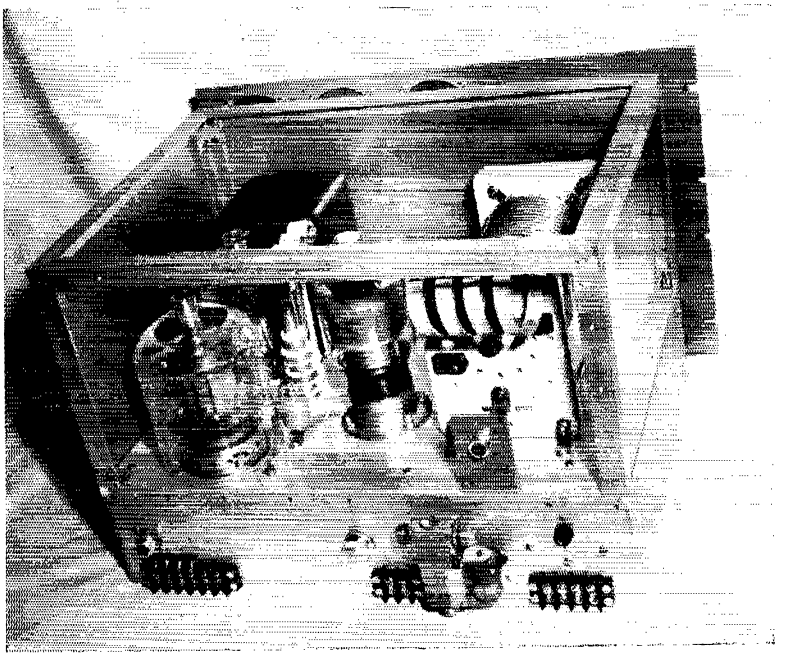
B_1 — Blower motor (see text).
C_1, C_2 — Mica (20 to 50 $\mu\mu$f. satisfactory).
C_3–C_7, inc. — 500-$\mu\mu$f. ceramic, 5000 volts (Centralab 858S).
C_8–C_{15}, inc. — 500-$\mu\mu$f. ceramic, 20 k. v. (Sprague 20DK-T5). See text.
C_{16}–C_{22}, inc. — 0.01-μf. disk ceramic, 1600 volts.
C_{23}–C_{25}, inc. — 0.001-μf. disk ceramic, 6000 volts.
C_{26} — 300-$\mu\mu$f. vacuum variable (Jennings UCS).
C_{27} — 1500-$\mu\mu$f. variable, 0.03-inch spacing (Cardwell PL-8013).
L_1, L_2 — 4 turns No. 12 spaced wire diam., wound over R_1 and R_2.
L_3 — Tapped tank inductor; 3.5 Mc.: 13.5 μh.; 7 Mc.: 6.5 μh.; 14 Mc.: 1.75 μh.; 21 Mc.: 1 μh.; 28 Mc.: 0.8 μh. (B & W 850).
R_1, R_2 — 100 ohms, 2 watts, carbon.
R_3 — 2500-ohm 25-watt rheostat.
RFC_1 — Special bifilar filament choke (B & W type FC30).
RFC_2, RFC_3 — 4 μh. (National R60).
RFC_4–RFC_7, inc. — 2.5 mh. (National R100S).
RFC_8 — National R175A.
S_1 — D.p.d.t. wafer, separate ceramic section for each pole.
T_1 — Filament transformer, 5 volts, 30 amp.

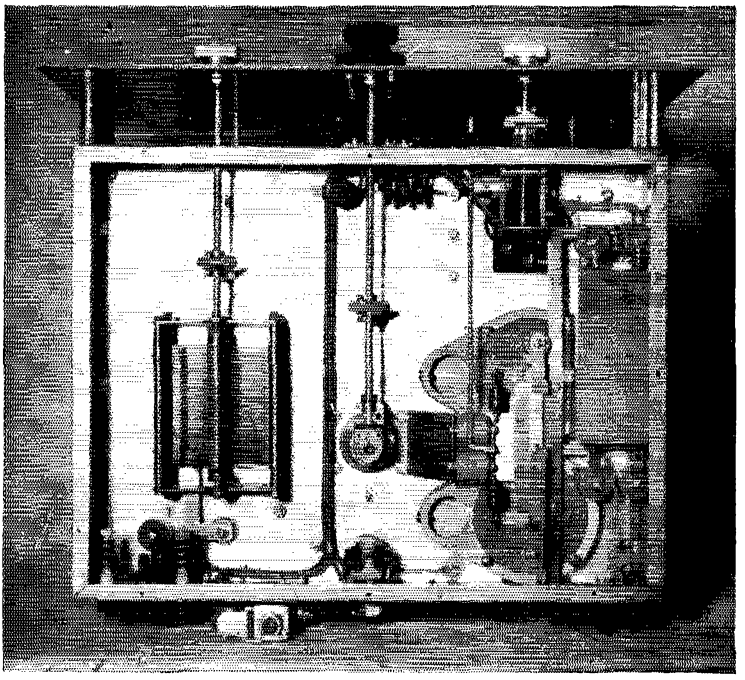


The tapped tank inductor and variable vacuum capacitor are becoming familiar sights in the "de luxe" high-power amplifier. The two 4-400As in this layout provide ample plate-dissipation capability for operation as an a.m. linear at a kilowatt input.

The counter dial drives the vacuum variable. Controls at the left are (top) the band switch and (below) the pi-network loading capacitor. Control-grid, screen, and plate currents are measured by the three panel meters. The knob below them operates a "c.w.-linear" switch that changes grid bias and screen voltage according to the type of operation.

Some of the layout details are shown in this rear view. The knob at the center of the chassis wall operates the variable resistor used as a grid leak in c.w. operation. Plate voltage is introduced through the high-voltage connector at the right. Other voltages go to the connection-blocks along the bottom edge.





The use of brass strip for r.f. connections around the tube sockets makes for neat "wiring" as well as low-inductance ground returns. The filament choke is in the rectangular can mounted on the chassis wall next to the tube sockets. The variable capacitor is for control of loading.

through a feed-through insulator to the loading capacitor under the chassis.

Beneath the chassis, the Eimac Air-System sockets are mounted with their filament terminals adjacent. All element interconnections on the tube sockets are made with $\frac{3}{8}$-inch brass strip. The filament choke is mounted on the side of the chassis, and is connected to the tube sockets and filament transformer by short lengths of No. 12 wire. The blocking capacitors at the filament end of the choke, as well as the by-pass capacitors at the cold end, are connected to the choke with leads as short as possible. The lead from the input coax connector is $\frac{3}{8}$-inch brass strip, as is also the ground return from the by-pass capacitors. All r.f. grounds are terminated at a 2-inch wide piece of brass shaped somewhat like a "T," with the arms of the "T" extending over the sockets. The foot of the "T" is fastened under two of the mounting bolts for the vacuum variable.

All d.c. leads are TV high-voltage wire, shielded with copper braid. Bypassing is used at the terminal strips for meter connections at the front of the chassis, and chokes and bypassing are used at all d.c. power terminals at the rear of the chassis. In the rear view, the terminal strip to the left (immediately below the r.f. input connector) is for connecting 117/230 volts a.c. to the filament transformer, and to supply 117 volts a.c. for the blower motor. The knob in the center is for R_3, and the terminal strip to the right and below it is for the antenna relay coil. The terminal strip at the far right, below the Millen high-voltage connector, is for the two screen voltages, bias voltage, and common connections.

In the front view, the meters from left to right are for plate, screen and grid current, respectively. The upper left-hand knob switches the pi-network coil, and the knob below it is for the loading capacitor. The Groth counter dial in the center tunes the vacuum variable, and the remaining knob is on the c.w.-s.s.b. switch.

Circuit Notes

When the amplifier was first tested, a potent 190-Mc. parasitic appeared during operation as a linear amplifier. Its frequency remained unchanged regardless of the addition of parasitic chokes or traps in the normal positions in any and all element leads. A grid-dipper revealed that the grids, when disconnected from all circuitry, seemed to be floating at the parasitic frequency, which could also be "dipped" in the screen and cathode circuits. An Eimac Engineering Newsletter provided the solution. Briefly, the parasitic trap $C_1R_1L_1$ loads the parallel-resonant parasitic circuit formed by the screen-cathode capacitance and the lead inductances of the screen and cathode, while the 500-$\mu\mu$f. capacitor continues to function normally as a low-frequency bypass. No other means of parasitic suppression were needed, nor is neutralization in any form required. The amplifier is completely stable at all operating frequencies.

Initially, disk ceramic capacitors were used in the cathode circuit for blocking and bypassing, but the driver loading was found to be critical in the 10- and 15-meter bands even though the capacitor leads were kept short. After replacing the disks with the specified capacitors, the loading was no longer critical, even with different lengths of coax between the driver and amplifier.

The length of the coax should be as short as practicable; a length of 6 feet of 72-ohm cable gives satisfactory operation.

Tuning

Tuning is much the same as in any conventional amplifier, although at least one important precaution must be observed: Full driving power should not be applied without plate voltage on the amplifier, or without an output load. The resultant high grid current would damage the tubes. Screen voltage may be removed for tuning, but a d.c. path from screen to ground must be maintained; otherwise the grids will be forced to dissipate the entire driving power.

During initial tune up, it is suggested that reduced driving power and reduced plate voltage be used. On c.w., adjust the antenna coupling for maximum output, and with full plate voltage applied adjust the bias control, R_3, and the driving power for desired plate and screen currents. As a linear, adjust the antenna coupling for maximum output (with single-tone input), and then reduce the driving power until no grid current flows. The output of any of the 100-watt class transmitters is more than adequate to drive the amplifier to the maximum legal input on all bands between 80 and 10 meters. As a linear, the amplifier takes approximately 75 watts of drive.

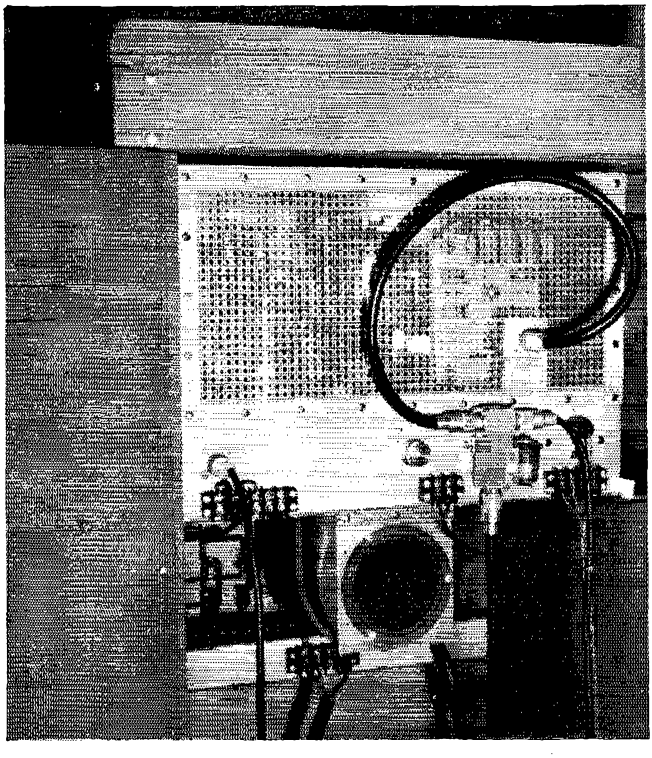
After initial adjustments, a simple tuning chart permits quick band change without a lot of key-down operation, since there are no critically tuned circuits.

Power Supply

Since little published information is available on screen and bias voltages for the type of operation selected, the choice was made on the basis of highest efficiency on c.w. and best linearity on s.s.b. for the available plate supply of 2500 volts. Higher efficiencies could undoubtedly be obtained with higher plate voltage, but at greater cost in power-supply components. Fortunately, a common fixed bias of 105 volts from an 0C3 serves on both c.w. and s.s.b., with additional bias on c.w. furnished by R_3. A screen supply of 250 volts with this grid bias provides high efficiency on c.w. with full plate input, a screen current of 90 ma., and a grid current of 20 ma. for the two tubes. The bias cuts off the amplifier completely, and keying is accomplished in the driver. Reasonably good screen supply regulation is needed, because under key-up conditions plate current would flow if the screen voltage increased materially.

For linear operation the resistor bias is switched out and a screen voltage of 585 volts switched in. Resting current is approximately 180 ma., and no grid current is drawn under full peak-envelope input. Screen current is 36 ma. at peak input. The screen voltage for linear operation is supplied from a VR string which is connected across the 2500-volt d.c. supply in series with a 50,000-ohm resistor. The screen voltage is established for the proper resting current by changing the VR tube combinations. Variation from 500 to

(*Continued on page 140*)



The completed amplifier installed in the rack, with shielding and blower mounted in place. As suggested in the text, a smaller blower can be substituted to make the unit completely self-contained, since there is ample space available in the chassis.

A Three-Band Cubical Quad Antenna System

With Constructional Details of a Pipe Mast

BY GLEN R. LEACH,* W4NNQ

• A beam antenna for 10 and 15 meters, consisting of two 2-element antennas of the quad type on a single framework, was described by W8RWW in *QST* for May of this year. In the system described here by W4NNQ, a third pair of elements for 20 meters has been added. The unique mechanical design of the supporting framework permits the same spacing (in terms of wave length) between all driven elements and their corresponding parasitic elements (in this case reflectors).

I AM A MAN nearly 70 years of age who is interested in amateur radio as a hobby. I have been helped repeatedly by other amateurs and articles in *QST*, and have often wished to create something which would be of benefit to other amateur radio enthusiasts and I hope that this article helps in a small way to repay those who have helped me.

The antenna system shown in the sketches consists of cubical quad antennas for 20, 15 and 10 meters suspended in a single framework. There is nothing unusual about the circuitry of these antennas. However, the mechanical design is, I believe, different from any that has been published to date. It is this mechanical design which I wish to pass on to those who are interested. The cost to me was very little; and to those amateurs who have to watch their pennies, I'm sure you will be agreeably surprised at the results you will get.

Details of the Mast

First you need something on which to mount the antennas and to those of you who already have a tower or mast, there is no reason why you should change, since the weight of the complete assembly is less than 40 pounds.

I needed a mast on which to mount the unit, as I did not want to put it on the 83-foot mast which I have for other types of antennas. I built this mast similar to, but shorter than, the 83-foot mast which has proven to be very satisfactory. It consists of one 21-foot section of 2½-inch, one 21-foot section of 2-inch and one 21-foot section of 1½-inch and one 9-foot section of 1-inch galvanized pipe. The mast can be assembled on the ground and raised in the conventional manner, or as follows: The 2½-inch section of pipe was capped at the bottom and lowered into the ground 11 feet, leaving 10 feet of pipe above ground. Be sure you get this section of pipe in a vertical position as it cannot be bent and still telescope the next section inside of it.

Turn out on a lathe the inside of the 2-inch end of a 2½- to 2-inch reducing coupling to slide over the 2-inch pipe, and screw the coupling onto the 2½-inch pipe. This will prevent side sway in the joint. Next, turn out the 1½-inch end of a 2- to 1½-inch reducing coupling to slip over the 1½-inch pipe, and screw this coupling onto the 2-inch pipe. Paint a dark ring around the 2-inch pipe, 18 feet from the coupling. This is merely an indication point so that when you raise the section you will not raise it beyond this point. Raise the 2-inch pipe into a vertical position, and let it down inside the 2½-inch pipe.

Next, turn out the 1-inch end of a 1½- to 1-inch reducing coupling, to slide over a 1-inch pipe, and screw this onto the 1½-inch pipe. Paint a dark ring around the 1½-inch pipe, 18 feet from the coupling. Place a guy ring around the 1½-inch pipe. Raise the pipe to a vertical position and lower it inside the 2-inch piece of pipe which was previously lowered inside the 2½-inch pipe.

Next, place the 9-foot section of 1-inch pipe, with a cap and a guy ring around the pipe at the top end, inside the 1½-inch pipe to a depth of 1 foot, and drill a ¼-inch hole through the 1-inch end of the 1½- to 1-inch reducing coupling and also, the 1-inch pipe. Place a ¼-inch bolt in the hole so that 8 feet of the 1-inch pipe is above the coupling. Connect four guy wires (galvanized solid No. 12 iron wire preferred) to the guy ring around the 1½-inch pipe. The length of these guy wires will have to be determined by yourself to suit your local conditions. A guy wire at a 45-degree angle from the pole is a safe guy wire.

Raise the 1½-inch pipe 8 feet and drill a ¼-inch hole through the 1½-inch pipe, place a ¼-inch bolt in the hole. Be sure the guy ring is above this ¼-inch bolt so that the guy ring cannot be less than 8 feet below the center of the cubical quad when it is installed and raised in position.

You are now ready to raise the mast to its full height. Raise the 1½-inch pipe so that you can see the painted ring and drill a ¼-inch hole through the 1½-inch end of the 2- to 1½-inch reducing coupling and also the 1½-inch pipe. Insert a ¼-inch bolt. This places the top of the 1½-inch pipe 28 feet above ground level. Now raise the 2-inch piece of pipe to the painted ring and drill a ¼-inch hole through the 2-inch pipe directly above the 2½- to 2-inch reducing coupling. Place a ¼-inch bolt through this hole.

* R. R. #1, Nokomis, Fla.

This raises the top of the 1½-inch pipe 46 feet above ground level, or full height. The mast will remain in the vertical position *if no strong* winds are blowing.

Next, connect the four guy wires to their corresponding anchors, which might be trees; iron anchors placed in the ground, or whatever means for anchoring which you may have. Do not stretch the guy wires too tight. Now lower the mast to its fully-telescoped position or so that the top of the 1½-inch pipe is 10 feet and a few inches above ground level. You are now ready to assemble and mount the three-band cubical-quad framework.

The Quad Framework

This cubical-quad framework does not have a boom for support. It is entirely supported from the mast as follows: Obtain eight pieces of 1¼ × 1¼ × 3/16-inch angle iron 20 inches long, and one 2-foot length of 1¼-inch pipe. (Note: Some makes of 1¼-inch pipe will not slide over a 1-inch pipe. Make sure the piece you get will slide over a 1-inch pipe.) Shape the ends of two of these angles (A and B, Figs. 1 and 2) to fit the pipe when they are in one plane and at a 55-degree angle to the pipe, and weld on at 6 inches from one end of the pipe.

Now, below A and B, but as close to them as possible, fit and weld on a second pair of angle irons (C and D, Fig. 1) at the same vertical angle (55 degrees) but displaced 70 degrees around the pipe from A and B.

Next, turn the pipe end for end so that the bottom end is now on top. At 6 inches from this end, weld on four more lengths of angle iron of similar dimensions and in a similar manner, except that pieces C and D should be *above* A and B. This is to keep the same vertical distance between similar pairs. Similarly-lettered members should be in the same vertical plane, of course. This gives us a framework that we will call the "spider" and it is the only part of the entire unit which is difficult to construct.

Obtain eight bamboo fishing poles approximately 25 feet in length, and wind about four turns of copper wire midway between the joints of each pole. This will prevent the weather from cracking the poles between the joints. Solder the four turns of copper wire together and paint the poles with at least two coats of good paint. Obtain 16 hose clamps of sufficient size to hold the fishing poles in the groove of the angle irons.

Remove the 9-foot section of 1-inch pipe from the top of the mast and slip it through the pipe of the "spider" so that the pipe protrudes 12 inches below the bottom of the "spider." Dig a 12-inch hole in the ground so the "spider" can set on all four legs on the ground.

Set the "spider" on the ground with the four upper angles pointing up. Fasten four fishing poles with the hose clamps to these four upper-pointing angles, one hose clamp near the pipe and one clamp near the end of the angle away from the pipe.

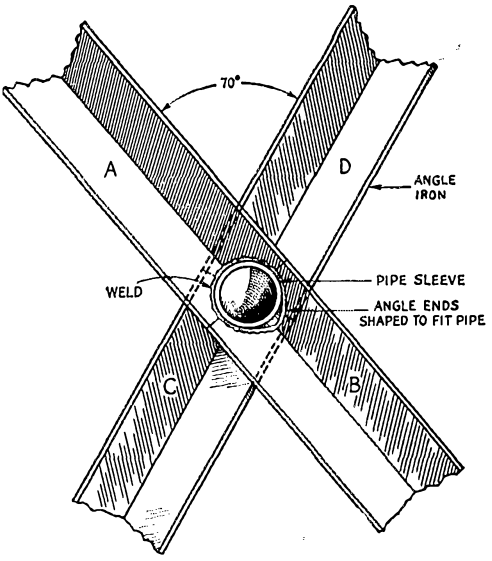


Fig. 1 — Top view of "spider" assembly. A, B, C and D are separate lengths of angle iron shaped to fit and welded to the pipe sleeve. C and D are displaced from A and B by a horizontal angle of 70 degrees. See Fig. 2 for vertical angle.

The Antennas

Referring as necessary to Fig. 3, stretch a length of copper wire about 68 feet long (I used No. 12 stranded) along the ground and string five ordinary small insulators numbered 1, 2, 3, 4 and 5 (this will be the 20-meter antenna). Place insulator No. 5 on the end of the wire and fasten. Fasten insulator No. 1 8 feet 4½ inches from insulator No. 5. Fasten insulator No. 2 16 feet 9 inches from insulator No. 1 and insulator No. 3 16 feet 9 inches from insulator No. 2, and insulator No. 4 16 feet 9 inches from insulator No. 3. String the remaining wire through insulator No. 5, completing the 16-foot 9-inch square loop, as shown in Fig. 3. Do not fasten this end of the wire until after tuning the loop. Construct another loop of wire similar to the above for the reflector, adding a tuning stub of spaced wire about 6 feet long at the center insulator, as shown in Fig. 3.

For 15 meters, construct another similar loop of wire, except that the sides and top shall be 11 feet 3 inches each, and the bottom 5 feet 7½ inches each side of center. Construct another similar loop of wire; the sides and top shall be 11 feet 3 inches each, and the bottom 5 feet 7 inches each side of center. A stub of 5 feet should be added.

For 10 meters, construct another similar loop of wire, except that the sides and top shall be 8 feet 3 inches each, and the bottom 4 feet 1½ inches each side of center. Construct another similar loop of wire; the sides and top shall be 8 feet 3 inches each, and the bottom 4 feet 1½ inches each side of center. The stub should be about 4 feet.

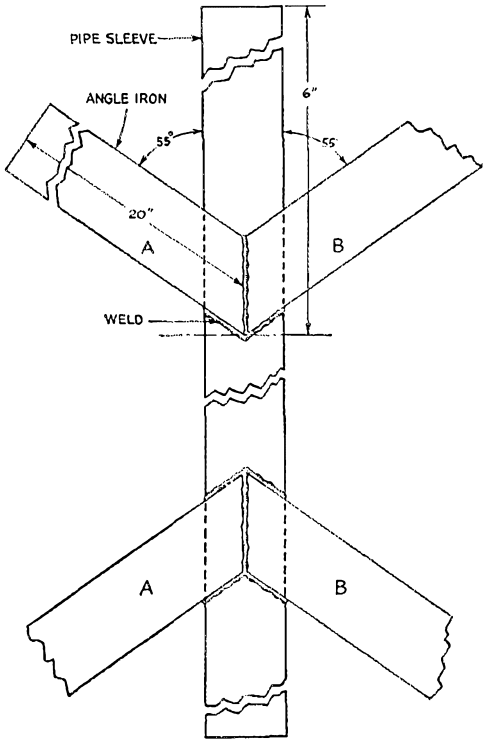


Fig. 2 — Side view of "spider" assembly, showing upper and lower pairs of A and B sections shaped and welded to the pipe sleeve at a vertical angle of 55 degrees. Upper and lower pairs of sections C and D (Fig. 1) are not shown, but are attached at the same vertical angle (55 degrees).

Fastening Wires to Poles

If you have followed instructions, you now have the spider on the ground with four fishing poles fastened to the "spider" and pointing upward.

Connect a length of nylon cord (about ⅛-inch diameter will do) to the upper end of each fishing pole approximately 15 feet from the large end of the pole. Connect the other end of the nylon cord to the guy ring around the 1-inch pipe. This merely takes the weight off the fishing poles and prevents their sagging.

Fasten the 10-meter driven element to poles No. 1-U and 4-U so that the plane of the element is 3 feet 4 inches from the center of the mast. You will find that there will be a little sag in the wire until all four corners have been fastened in place.

Fasten the 10-meter reflector to poles 2-U and 3-U so that the plane of the element is 3 feet 4 inches from the center of the mast. This gives you 0.2-wave-length spacing, or 6 feet 8 inches between reflector and driven element.

Fasten the 15-meter driven element to poles 1-U and 4-U so that the plane of the element is 4 feet 7 inches from the center of the mast. Fasten the 15-meter reflector to poles 2-U and 3-U so that the plane of the element is 4 feet 7 inches from the center of the mast. This gives a 0.2-wave-length spacing, or 9 feet 2 inches between driven element and reflector.

Fasten the 20-meter driven element to poles 1-U and 4-U so that the plane of the element is 6 feet 8 inches from the center of the mast. Fasten the 20-meter reflector to poles 2-U and 3-U so that the plane of the element is 6 feet 8 inches from the center of the mast. This gives a 0.2-wave-length spacing, or 13 feet 4 inches between the 20-meter driven element and reflector.

Connect a length of nylon cord to pole 1-U at the point where you fastened the 20-meter driven element. Connect the other end of the nylon cord to pole 2-U at the point where the 20-meter reflector has been fastened. Connect a length of nylon cord to pole 4-U at the point where the 20-meter driven element has been fastened. Connect the other end of the nylon cord to pole 3-U where the reflector has been fastened. Tighten both nylon cords until most of the sag in the wires is removed.

You are now ready to lift the "spider" and upper four fishing poles and connected wire to the top of the pipe mast. If, however, you are using an existing tower or mast which cannot be lowered, you should remove the nylon cords from pole 1-U to 2-U and temporarily mount the "spider" about 10 feet off the ground so the lower fishing poles 1-L, 2-L, 3-L and 4-L can be fastened in place, and the wires connected and tuned. Reconnect the nylon cord from pole 1-U to 2-U and tighten as before.

With the "spider" and poles 1-U, 2-U, 3-U and 4-U lifted to the top of the mast or to a temporary position by the side of an existing tower or mast, proceed as follows:

Fasten fishing poles 1-L, 2-L, 3-L and 4-L to the bottom four angles with hose clamps in a similar manner to the top four poles.

Connect the lower sides of the 10-, 15- and 20-meter driven elements to poles 1-L and 4-L in a manner similar to the upper side, keeping each element in a vertical plane.

Connect the lower sides of the 10-, 15- and 20-meter reflector elements to poles 2-L and 3-L in a manner similar to the upper side, keeping these elements in a vertical plane.

Connect the stubs of the 10-, 15- and 20-meter reflectors as shown in Fig. 3, or some similar manner. Insulate each stub from the others.

Connect nylon cords from poles 1-L to 2-L and from 3-L to 4-L as shown in the drawing of Fig. 3.

Drill a ¼-inch hole through the pipe of the "spider" and the 1-inch pipe and put a ¼-inch bolt in the hole.

Tuning the Quads

Well, here is where I get into trouble with my fellow amateurs because what I don't know about tuning an antenna would fill a very large book, but, anyway, here is the procedure I followed for each quad.

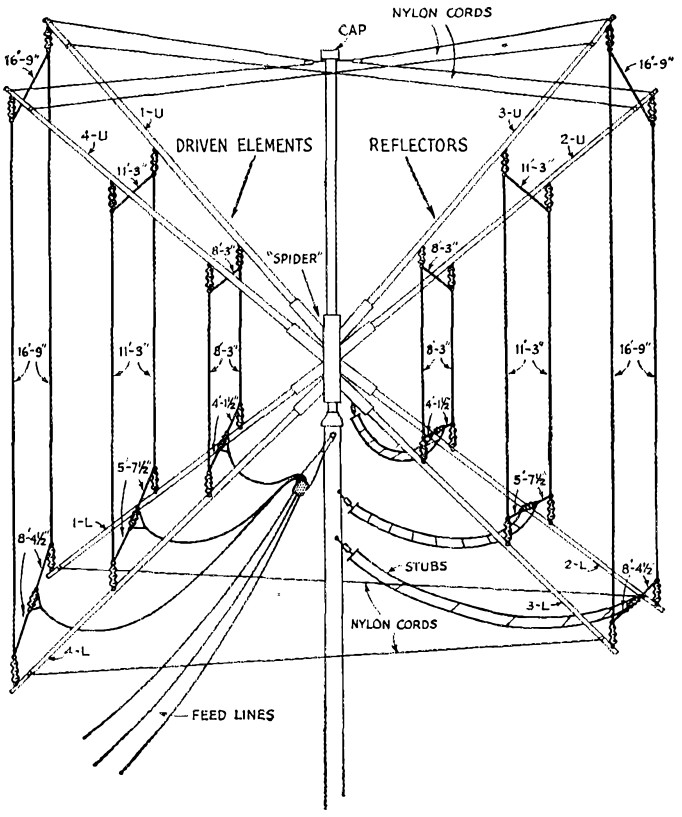


Fig. 3 — Assembled view of the three-band quad antenna. Bamboo poles, clamped in the angle-iron section of the "spider" at the center, form a supporting framework for the three sets of quad elements. Spacing between elements is given in the text.

Excess bamboo at the "flimsy" ends are cut off after all elements are in place.

1) Do not connect the coaxial cable until later.

2) I used a Heathkit antenna impedance bridge and a grid-dip meter.

3) I connected the bridge to the driven element of the antenna on the bottom leg across the insulator with as short a connection as I could get.

4) I inductively coupled the grid-dip meter to the bridge.

5) I tuned in my radio receiver to the frequency which I wanted for the quad and turned on the beat oscillator.

6) I then shortened the wire of the driven element until a null was obtained at the frequency that the receiver was tuned to.

7) Next, the reflector was tuned to a 5 per cent lower frequency than its associated driven element by moving the shorting bar.

8) A 52-ohm coax was connected to each driven element, in my case it had to be about 75 feet in length.

9) The coax was supported at the mast to take the weight off the driven elements. I used V wedge blocks similar to those used by the power companies for supporting their lead-in cables.

10) The entire antenna was then raised to its ultimate height.

11) The bridge was then connected to the transmitter end of the coax and I found that it did not tune to the same frequency that the driven element was tuned to, so I cut off a few inches of the coax at a time, until the entire system resonated at the desired frequency. This may or may not have been necessary, but I have received such wonderful reports on all three bands that I can't help but believe that it was the correct thing to do. The meter on the bridge returned to zero at the desired frequency with the potentiometer in the 50- to 75-ohm position.[1]

Conclusion

The rotating mechanism is another story and you will have to figure out your own method of doing that. In my case, I rotated the entire mast from the top of the 2½-inch piece of pipe and the rotating device consisted of a flywheel from a Cadillac motor, a starter gear to match the flywheel, a worm gear and a belt connected ½-h.p. motor with reversing windings.

My various antennas, and I have a number, are connected to a matching network through a

(*Continued on page 146*)

[1] If the impedance appears to change as the length of the line is changed, the antenna is not accurately matched to the line. Changing the line length will not affect the mismatch. However, if difficulty is experienced in loading the final amplifier, pruning the line (or lengthening it) may bring the impedance at the input end of the line to a value within the range of the transmitter's pi-network output system. The degree of mismatch is not indicated by the author, but from the experience of others with antennas of this type, it is probably not so great as to cause serious transmission-line losses with lines of customary length. — Ed.

V.H.F. Meteor Scatter Propagation

Hints on Using Meteor Trail Ionization for 2-Meter DX

BY WALTER F. BAIN,* W4LTU

• If practical results mean anything, few v.h.f. men are better qualified to write on the subject of meteor scatter than W4LTU. Since he moved to Orlando from Ithaca, N. Y. (where he was W2WFB), Walt has been providing first Florida contacts for station after station on 144 Mc. Almost wholly as a result of this meteor-scatter work, W4LTU now has 13 states in 6 call areas on 144 Mc., ranging from Rhode Island to Wisconsin. Here he tells us how he does it.

SINCE 1953, when W4AO and W4HHK first observed meteor-scattered signals on 144 Mc. while attempting a tropospheric contact, this medium of communication has been of increasing interest to serious v.h.f. amateurs. And well it might be, for it provides a means of making 2-meter contacts over distances of 500 to 1500 miles. Meteor scatter is no mode for the casual operator, however, for it requires some power, large antennas, sensitive receivers, and no small amount of patience and operating skill at both ends of the path.

Other factors that have not received much attention to date are the choice of date, time and antenna orientation. If the material to follow can help in some small way to pin down these aspects of meteor scatter, and bring about increased and more effective use of the medium, it will have served its purpose. Anyone who is interested only in results, and is willing to take the information on faith, can turn right now to Table I, and pick his path, shower and time. Those who want to delve into the how and why, as well as the when, are encouraged to read on.

Meteor Trail Structure and Properties

As is generally known, the meteor signal is reflected, not from the particle itself, usually about the size of a grain of sand, but from the stream of ionization left by the meteor as it is heated and vaporized by friction with the atmosphere. The density of this ionization determines to a great extent the type of signal reflected by it.

Meteor trails may be divided between two categories. First is the underdense, so-called because the ionization density is too low for complete reflection of the signal. The result is more of a scattering than a true reflection. The amount of signal scattered is proportional to the density at any instant, and as a consequence the signal tapers off gradually as the trail thins out and diffuses away. The result is the familiar "ping" that may last up to two or three seconds. This provides the majority of meteor signals heard on 144 Mc.

The second form is the overdense trail. Here ionization is greater than the critical density, as with the ionosphere when you are working below the m.u.f. Reflection of most of the incident signal is obtained, and the signal strength is essentially constant until the ionization density drops below the critical value. These trails provide strong signals of up to two minutes or more duration, but unfortunately, they are not too common in 144-Mc. experience. Meteors giving such bursts are particles of roughly a quarter-inch or more in diameter.

The signal strength from an underdense burst has been found to drop off as the third power of the wave length, while the duration drops off as the second power. Thus it can be seen that 144-Mc. signals should be both shorter and weaker (by about 15 db.) than those obtained on 50 Mc.

Trail Orientation

We have no choice of overdense or underdense, but we do have some control over trail orientation. Let's see what effect it has on the signal.

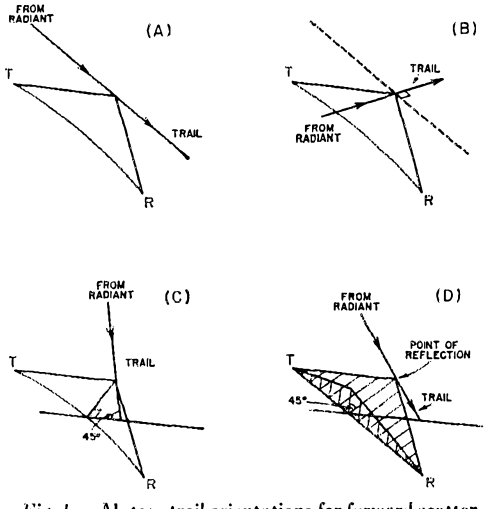


Fig. 1 — Meteor trail orientations for forward scatter. A trail parallel to a line between the two stations and parallel to the surface of the earth is shown at A. B shows a trail perpendicular to the line between the stations, but still parallel to the earth's surface. The trail in C is perpendicular to the line between the stations, but at a 45-degree angle to the earth. The optimum position is shown at D. Here a trail similar to C is displaced so that the antennas must be aimed 7 degrees off the true heading.

* % Systems, Incorporated, 2326 Diversified Way, Orlando, Fla.

The master equation for meteor scatter, a cumbersome thing, indicates that the strongest signal should be obtained when the trail is along the line between the two stations, and parallel to the earth's surface at the mid-point, Fig. 1A. This is all well and good, until we realize that there is very little chance of finding a meteor in that position, just grazing the atmosphere at exactly the right height! We must therefore look for good orientations that give us a more favorable *number* of meteors. (Signal strength isn't everything.)

Considering meteor paths at right angles to the line between the two stations, Fig. 1B, we find the same situation as before. Few meteors would properly graze the atmosphere to give a trail. But if we tilt the trail so that it forms an angle with the earth's surface, Fig. 1C, we have something. The nearer the meteor path is to vertical incidence, the greater is the probable meteor density per unit area. At the limit of vertical incidence we have carried a good thing too far. The trails are coming down directly between the two stations, and would not be expected to provide signals, as the meteor equation also indicates that the signal must hit the trail perpendicularly.

A compromise is in order, and we find that a trail orientation of about 45 degrees to the surface of the earth gives a balance between signal strength per meteor and number of meteors. One further consideration remains. For both stations to hit the trail perpendicularly they must beam toward trails that are off center from the path away from the direction of the meteors, Fig. 1D. (It is assumed that all these meteors are travelling in parallel paths.)

For trails hitting the atmosphere at 45 degrees, the correction in antenna heading is only about 7 degrees. This is likely to prove important only for very sharp beams, but for the perfectionist it is just the thing. If we agree that trails directly between contribute nothing, and that those off path by an excessive angle give little, then the only region of interest is that about 7 degrees wide, centered 7 degrees off path. Our antennas need illuminate only this, so the beam width can be narrowed to 7 degrees in the horizontal plane — if we wish to construct such a behemoth. Narrower beams would give stronger signals, but fewer of them, a poor compromise in our opinion.

What is the upshot of all this argument? If we agree that there is an optimum orientation for meteor trails, we now need only determine whether it is possible to set up practical circuits that will coincide more or less closely with this optimum. For the case of *shower* meteors, which are of greatest interest to us, this is indeed possible.

Using Meteor Shower Information

With information available as to the point in the sky from which meteors appear to come, the *radiant*, we need only time our tests to correspond to the proper radiant position in respect to the path we wish to work. The radiant will rise in the east, swing through the sky at a height determined by its angle from the pole star, and set in the west. Such conventional behaviour can be plotted very easily on a projection of the visible hemisphere of the sky, drawn as a circular area with the north at the top, south at the bottom, east to the left and west at the right. (East and west are reversed from their usual positions, as we must consider ourselves viewing the sky on our backs, with our heads north.) Such a plot is shown in Fig. 2A. The pole star is shown at a height above the northern horizon that depends on one's latitude.

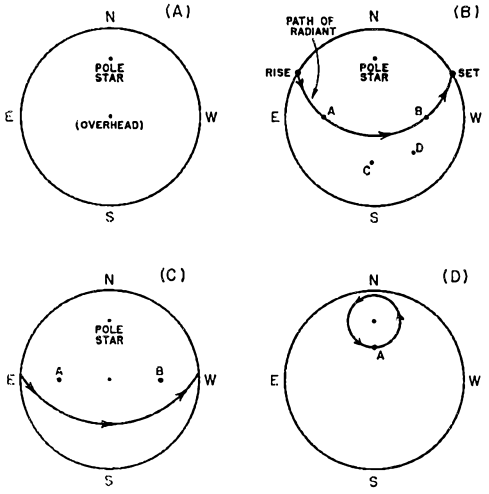


Fig. 2 — Radiant paths and locations. The observer is lying on his back looking up at the sky, feet south. A flat projection of the sky from this observing position is shown at 2A. Optimum radiant positions for north-south paths (A and B) are shown at 2B. To be optimum for east-west and northwest-southeast paths the radiant would have to pass through points C and D respectively. In 2C we see a radiant path having no optimum point for north-south work. A and B would be the proper points. A radiant so close to the pole that it never goes below the northern horizon is shown in 2D. Point A is optimum for east-west work.

If we plot the radiant declination and right ascension (celestial latitude and longitude) of a shower we can construct a very simple slide-rule type of calculator that will trace the radiant path across the sky as a function of the time of day. From this we can obtain the times of radiant rise and set, and its height in the sky and azimuth at any time. Since meteor propagation will be enhanced when the radiant azimuth is at right angles to the desired path and above the horizon by between 30 and 60 degrees (a compromise with the 45 degrees mentioned previously) we can easily determine the optimum times for given paths and shower radiants. This is what was done to derive the information in Table I.

Radiant positions that are desirable for various paths and times are shown in Fig. 2B. Fig. 2C illustrates a condition in which no radiant orientation is found for a certain path. In Fig. 2D we see an example of a radiant that is sufficiently close to the pole star that it does not set, but reaches a minimum height in the northern sky.

The information in Table I is largely self-explanatory. (If you followed what went before, you should have no trouble now.) The showers and their most probable dates of occurrence are listed at the left, followed by the times of rise and set of the radiant. Optimum times for north-south, northwest-southeast, east-west and southwest-northeast paths are listed. No optimum time is given for cases similar to that shown in Fig. 2B. The letters following or below each optimum time are the directions in which the 7-degree antenna bearing correction from true heading should be applied. Example: W1KCS wants to set up a schedule with W9WOK during the Quadrantids Shower, Jan. 1st–4th. This is an east-west path, so the information in the third column applies. The best time is between 0800 and 0900, this being local time at the mid-point of the path. The time-zone boundary is well toward the western end, so EST should be close enough. The S below the time indicates that the antennas should be aimed about 7 degrees to the south of the true bearing between the two stations.

Major showers are marked with an asterisk, and for these showers we also have information concerning probable burst rates, velocities in the atmosphere, periodicity of major peaks, and the years when they may next be expected to reach these peaks. Meteor streams the earth encounters are debris of comets that have gone to pieces or are in the process of doing so. Thus meteoric material in the portion of the comet's orbit where the comet is (or was) is much more dense than that spread out through the remainder of the orbit. If the comet makes a full revolution in, say, 30 years, then at 30-year intervals we would expect to pass through this dense portion of the orbit, and experience a spectacular shower. The best example of this in amateur v.h.f. experience was the Giacobinids Shower of October, 1946, which is expected to peak again in 1959. (See Note 2, Table I.) In intermediate years we get only a moderate shower when our orbit intersects that of the comet.

Other meteor streams have had time to become almost evenly distributed throughout their orbits (Note 1) and give almost equal showers each year. Such a stream is the old reliable, the Perseids of August. Use of the information on hourly rates is self-evident; the showers with the highest rates are most useful for our purposes. This rate can vary considerably from year to year, however, and occasionally a normally-good shower will not show up at all.

Now we consider the matter of meteor velocity. The previous discussion has (I hope) shown that 0600 is not necessarily the best time for shower contacts. It is optimum for sporadic meteors, but we will get to them later. 0600 has attained this undeserved reputation because of the classical knowledge that the greatest numbers of sporadic meteors are seen then. This is the result of the earth's moving through space at 31 km./sec., while the greatest meteor velocity through space is 42 km./sec. Thus at 0600 overhead meteors are moving toward the on-rushing earth, and even those that are almost stationary in space are swept up. At 1800, however, only those meteors of velocity greater than that of the earth are able to catch up and enter the atmosphere. This results in a much smaller *number* of meteors at the latter time, the difference being about 3 to 1, according to measured distributions of meteor velocity.

Note that what is affected by velocity is the number of meteors, not the intensity. Though it may be difficult to swallow intuitively, the density of meteoric ionization per unit length is dependent only on the mass of the particle, and is not affected by the velocity. In fact, it has been found experimentally that the slower meteors give longer-duration signals. Duration to half amplitude is proportional to 1/vel. Therefore, it is to be expected that, other things being equal, the lower velocity showers in Table I will provide better chances for 144-Mc. contacts. (All due apologies to the high-velocity Perseids!)

The daylight showers in Table I were discovered recently by radio observation. Only those that have been found to be annual events are listed. Others have put in only one appearance and are not included. Burst rates for daylight showers cannot be compared directly with those of the night showers (measured by visual means), but it should be emphasized that they are all worth some attention on the part of 2-meter men. In fact, the daylight Arietids, June 8th, exceed the Geminid Shower, and rival the night-time Perseids. Better try these!

Sporadic on Non-Shower Meteors

Showers are great, but unfortunately, they are not in evidence continually. In between them there is a continuous background of meteors, of almost random direction and velocity, that can put across some signal if you wait long enough and satisfy other conditions. Optimizing the effect of the sporadics is fairly simple. The 0600 peak mentioned earlier is essentially the best time, with 1800 the worst. Signals can be obtained on either side of the true bearing, but both stations should use the same side, of course.

For paths with a north-south component it will be found that one side is slightly better than the other. More meteors are picked up when the earth is moving into them than away from them. For the hours of darkness the antennas should be *west* of true, and for daylight work they should be *east* of true. For paths roughly east and west the antennas should be off true bearing to the *north* for both day and night. It has been found that there is a somewhat greater meteor density in the plane of the ecliptic, so the greatest number will be coming from the southern sky. With northwest-southeast or southwest-northeast paths try to satisfy both requirements, if possible — or flip a coin!

Burst rates on sporadic meteors are low. Reception of W4LTU by W3GKP, near Washington, D. C., has shown monthly averages under

Table I — Meteor Shower Data for V.H.F. Use

Shower and Date	Time Visible Rise	Set	Optimum Paths and Times N-S	NW-SE	E-W	SW-NE	Hourly Rate Visual	Radio	Velocity, km/sec.	Period, Years	Next Maximum
* January 1–4 Quadrantids	2300	1800	—	0300–0800 SW	0800–0900 S	0900–1400 SE	35	45	39	7	1960 ?
January 17 Cygnids	0230	2130	—	0600–1100 SW	1100–1300 S	1300–1800 SE	—	—	—	—	—
February 5–10 Aurigids	1200	0330	—	1400–1730 SW	—	2130–0100 SE	—	—	—	—	—
March 10–12 Boötids	2200	0830	2330–0030 W 0530–0630 E	0330–0530 NE	0230–0330 N	0030–0230 NW	—	—	—	—	—
March 20 Coma Berenices	1800	0630	2130–2300 W 0100–0300 E	2000–2130 SW	—	0300–0430 SE	—	—	—	—	—
* April 19–23 Lyrids	2100	1100	0230 W 0530 E	2330–0100 SW	—	0700–0830 SE	8	12	51	400	2261
* May 1–6 Aquarids	0300	1200	—	0830–1000 NE	0630–0830 N	0500–0630 NW	12	12	66	76	1986
May 11–24 Herculids	1800	0630	2130–2300 W 0100–0300 E	2000–2130 SW	—	0300–0430 SE	—	—	—	—	—
May 30 Pegasids	2300	1200	0300–0430 W 0630–0800 E	0130–0300 SW	—	0800–0930 SE	—	—	—	—	—
June 2–17 Scorpiids	2000	0300	—	0100 NE	2300–2400 N	2200 NW	—	—	—	—	—
June 27–30 Pons Winnecke	Does not set; min. at 0900		—	1500–1830 SW	1830–2330 S	2330–0300 SE	—	—	—	—	—
July 14 Cygnids	1800	1000	—	2100–2330 SW	0130 S	0330–0600 SE	—	—	—	—	—
July 18–30 Capricornids	2030	0400	—	0100–0200 NE	2300–0100 N	2200–2300 NW	—	—	—	—	—
July 25–August 4 Perseids	2230	1430	—	0130–0430 SW	—	0830–1130 SE	—	—	—	—	—
* July 26–31 Aquarids	2200	0600	—	0300–0500 NE	0100–0300 N	0000–0100 NW	10	22	50	3.6	—
* August 10–14 Perseids	Does not set; min. at 1730		—	2330–0300 SW	0300–0800 S	0800–1130 SE	50	50	61	108	(Note 1)
August 10–20 Cygnids	1200	0700	—	1700–1930 SW	2130 S	2330–0200 SE	—	—	—	—	—
August 21–23 Draconids	Does not set; min. at 0900		—	1500–1830 SW	1830–2330 S	2330–0300 SE	—	—	—	—	—
August 21–31 Draconids	Does not set; min. at 0700		—	1300–1630 SW	1630–2130 S	2130–0100 SE	—	—	—	—	—
September 7–15 Perseids	2130	1200	—	0030–0200 SW	—	0700–0830 SE	—	—	—	—	—
September 22 Aurigids	2100	1230	—	0030–0200 SW	—	0700–0830 SE	—	—	—	—	—
October 2 Quadrantids	0500	0000	—	0900–1400 SW	1400–1500 S	1500–2000 SE	—	—	—	—	—
* October 9 Giacobinids	0600	0300	—	1100–1600 SW	1600–1700 S	1700–2200 SE	(Note 2)		20	6.6	1959
October 12–23 Arietids	1900	0700	2130–2330 W 0230–0430 E	—	—	—	—	—	—	—	—
* October 18–23 Orionids	2230	0930	0000–0200 W 0600–0800 E	0430–0600 NE	0330–0430 N	0200–0330 NW	15	30	68	76	1986
November 1–7 Taurids	1900	0630	2100–2300 W 0300–0500 E	0130–0300 NE	0030–0130 N	2300–0030 NW	10	16	27	3.3	1957
* November 14–18 Leonids	0000	1230	0300–0500 W 0800–1000 E	—	—	—	12	(Note 3)	72	33.2	1965
November 22–30 Andromedids	1300	0600	—	1600–2000 SW	—	2300–0300 SE	(Note 4)		22	6.7	1958, 1959
* December 10–14 Geminids	1900	0900	0030 W 0330 E	2130–2300 SW	—	0500–0630 SE	60	70	35	1.6	(Note 1)
December 22 Ursids	Does not set; min. at 2030		—	—	0130–1530 S	—	13	13 (Note 5)	38	13.5	1958, 1959
* May 19–21 Cetids	0530	1430	—	1100–1230 NE	0900–1100 N	0730–0900 NW	—	—	20	37	—
* June 4–6 Perseids	0500	1730	0800–1000 W 1300–1500 E	—	—	—	—	—	40	29	—
* June 8 Arietids	0330	1530	0600–0800 W 1100–1300 E	—	—	—	(Note 6)		70	38	—
* June 30–July 2 Taurids	0500	1700	0700–0900 W 1300–1500 E	1130–1300 NE	1030–1130 N	0900–1030 NW	—	—	30	31	—

* Major showers—Last four are daylight showers.

NOTES

1. These streams are evenly distributed and little year to year variation is to be expected.
2. Very concentrated stream. Peak years give up to 400 meteors per *minute* but shower lasts for only 6 hours. During off years the count is negligible. See December, 1946, QST, page 43.
3. Peak years give 60/hour visual. In the peak years of the 1800s, prior to being deflected by Jupiter and Saturn, this shower gave 1200 per *minute*.
4. *Before being deflected by Jupiter this stream gave peak year rates of 100/minute. No notable rates have been observed since, though the stream could return.*
5. Short duration shower. Peak years the radio rate is 165/hour.
6. This intense daylight shower begins June 2 and runs to June 14 with radio rates from 25 to 70/hour.

1 per minute. This is on an evening schedule, and doubtless early morning tests would yield higher counts.[1] During intense shower activity the short-time burst rate has run as high as 12 to 14 per minute. This was on W8KAY, as received by W4LTU during the 1956 Geminids. The visual rate on sporadic meteors runs about 5 per *hour*. Visual and radio rates are given in Table I where they are available. The radio rates were taken at frequencies lower than 144 Mc., but with less sensitive equipment in general, so direct comparison with 144-Mc. conditions is not accurate. An important point for the 144-Mc. DX enthusiast: the percentage of the helpful overdense bursts is definitely higher in the showers than in the non-shower periods.

Distance and Antenna Height

The range of meteor-scatter signals is a function of the meteor height and the wave angle. Most meteor trails are found at heights around 100 km., which is roughly the height of *E* layer. Thus 2-meter DX by this medium is similar to that encountered in E_s and ionospheric-scatter work on 50 Mc. The peak around 100 km. is not sharp, however. The Perseids, for example, range from 65 to 150 km. The number of trails at the extremes is about one-tenth that at the mean height of 100 km. In general, high-velocity meteors appear at higher altitudes, than those of lower velocity.

On the basis of 100 km., the maximum range to be expected for zero angle radiation is about 1500 miles, and this assumes that you are being helped by standard refraction in the atmosphere. Table II shows the expected range as a function of wave angle, and gives the antenna height for this wave angle. Antenna height will control the wave angle in this way only when there is flat reflecting ground in the direction of propagation. If you are fortunate enough to have this ground lobing effect, you can pick up as much as 6 db. effective gain, due to reinforcement of the direct by the ground-reflected wave.

Choice of antenna height can thus affect the ranges at which you put down or receive maximum signal. If your free-space vertical pattern is broad enough you will have several lobes, placed at odd multiples of the angle of the first lobe. Even multiples of the first lobe angle will give a null, and should be avoided. Thus an antenna height of 40 feet over good ground will give a first maximum at 2.5 degrees, a minimum at 5 degrees, and a second maximum at 7.5 degrees. From these we would expect maximum signals at 1125 and 700 miles, and no signal at 875 miles. These calculations should be fairly accurate for 100-km. meteor heights, except at wave angles below one degree. Here the variability of atmospheric refraction can foul things up. In locations where no ground pattern is expected (cities and terrain with steep hills and valleys) the best thing is to get the beam high enough to clear obstacles and their diffraction effects, and fire away.

[1] Daily observation of the signal of W4HHK around 0700 showed averages around 3 bursts per minute during non-shower periods at W1HDQ. — Ed.

Table II

Antenna Height, Wave Angle, and Range (for 100-km. Meteor Height)

Height		*Wave Angle*	*Distance*
	Feet at 2		
Wave Lengths	*Meters*	*Degrees*	*Miles*
1	6.8	14.5	430
2	13.7	7.0	720
3	20.5	4.7	900
4	27.5	3.5	1020
5	34	2.8	1090
6	41	2.4	1130
8	55	1.75	1230
10	68	1.4	1280
12	82	1.2	1310

During the 1956 Perseids W7LEE reported reception of W8KAY and W2CXY, distances of 1800 and 2200 miles. How could meteor signals cover these distances? A form of double-hop propagation from two overdense bursts is possible, but highly unlikely. More reasonable is the idea of a single overdense burst at extreme height. This would have to be around 300 km. for a 1-degree radiation angle, and 220 km. for zero angle. Such heights have been observed visually on rare occasions.

So far we've considered only forward scatter, or propagation along the shortest path between the two stations. Back-scatter is mainly of academic interest for 144-Mc. purposes, but a few comments are in order. With the latter, signal *strength* should be the same as for forward scatter, but the *duration* drops off rapidly for small scatter angles. The information on a single burst is thus greatly reduced, but the mode might still be useful for short distances where obstructions limit other forms of propagation.[2] The two antennas would be aimed, not at each other, but at a common volume of space no more than 700 miles distant. The optimum time for such contacts (here we go again!) would be when the meteor radiant is directly overhead, the trails then being perpendicular at the point of reflection. The radiant position may vary within a plane that remains perpendicular to a line between the point of reflection and the mid-point of the direct path between the two stations. If it is out of this plane specular reflection will no longer be had, and the signals will drop.

Operating Techniques

Everyone who has worked meteor scatter seems to have come up with his own ideas on how contact may best be made, but the procedures boil down to two basic systems. Both involve cooperative work on a prearranged schedule.

1) Station A spends 5 minutes calling and

(*Continued on page 140*)

[2] Such back-scatter has been observed on 50 Mc. by several workers. W0CNM and W0FKY, Grand Junction, Colo., have had fairly good results with W7QDJ, Clearfield, Utah, with all stations aiming at the San Francisco area. — *Ed.*

Variable Band Width Q Multiplier

Continuously-Variable Selectivity for the Receiver

BY RONALD L. IVES*

• Since its appearance in one form or another in several kits and communications receivers, the *Q* multiplier is no stranger to most amateurs. If you are not already using one to improve your receiver performance, this article tells how to build and adjust one that is continuously variable in its band width. Some good construction hints are included.

THE Q MULTIPLIER enjoys a well-deserved popularity these days, for several reasons. It is an outrigger device that can be added to an existing receiver with practically no receiver modification, an important factor these days when one must consider the resale value of receivers. In its most popular version it will provide either a "peak" for c.w. reception or a "null" for phone or c.w. work. The peak or null can be moved across the pass band of the receiver. As its name indicates, the *Q* multiplier is a device that "multiplies" or increases the *Q* of a circuit many times, and the high-*Q* circuit is then used as an equivalent parallel-tuned circuit (peak) or a series-tuned circuit (null) across an i.f. amplifier stage. It is an application of the principle of regeneration, but it is a stable and readily-controllable one.

* 251 Lincoln Ave., Palo Alto, Calif.

[1] Villard and Rorden, "Flexible Selectivity for Communications Receivers," *Electronics*, April, 1952. Villard also developed the well-known "Selectoject."

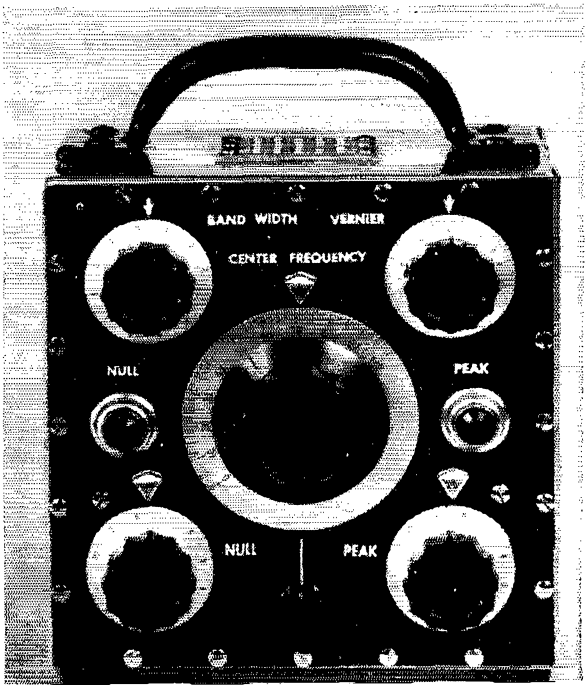
Circuit

The specific circuit described here (Fig. 1) provides for the peak and null functions and, also, variable band width in the peak position. This is the basic circuit devised by Villard,[1] but a few minor changes have been made for operating convenience.

To make tuning easier, a 10-to-1 electrical vernier, in the form of a 10-$\mu\mu$f. variable shunted across the 75-$\mu\mu$f. main tuning capacitor, is provided. This vernier ratio seems optimum for the writer's tuning practices. Other operators have different choices; some may wish to omit the electrical vernier and use a reduction drive on a 75-$\mu\mu$f. tuning capacitor. Regardless of the control method used, the main tuning capacitor (and vernier, if used) should be mechanically rigid, with a minimum of slop and end play in the bearings.

As connected, the heater and plate circuits of the *Q* multiplier are always "live" when the receiver is turned on. To indicate clearly what function the multiplier is switched to, two pilot lights are used. One is lighted when the *Q* multiplier is switched to PEAK, the other when the multiplier is switched to NULL. Both pilots are out when the switch is in "off" (center) position.

To prevent intercoupling with other circuits in the receiver, the plate and heater circuits of the multiplier are isolated with some care. Plate isolation is obtained with a two-section *RC* filter consisting of two 10K resistors and three 0.01-μf. disk ceramic capacitors. Heater bypasses are



Black crackle finish on the panel and the generous use of decals dress up the *Q* multiplier. The panel is 6 inches square.

used, and to eliminate hum modulation resulting from heater-cathode leakage and diode action, the heater center tap is biased approximately +40 volts with respect to ground.[2] The *Q* multiplier will work excellently, however, with the heaters connected in any conventional fashion.

Construction

The case for this instrument is made from a Seezak 6 × 6 × 4-inch expandable aluminum chassis. Rail tongues are backed with ⅜ × 3/32-inch strip brass, held in place with 3–48 flat-head machine screws, and the tongue bosses are drilled and tapped 6–32. This permits assembly and disassembly for servicing without either wrestling with the sheet-metal parts or stripping screw threads in thin sheet metal. The interior shelf is a piece of 4-inch wide Seezak rail, shortened to just under 6 inches long, and equipped with a flange on both ends. Both flanges are backed with brass strip, to increase strength and screw-holding capacity.

The front panel is finished in black crackle enamel to reduce glare and reflections. Panel markings are made with decals ("Tekni-cals"), which are protected against wear by coating them with clear lacquer after thorough drying (24 hours or more). Small ventilating grilles are mounted in the centers of the top and bottom rails, in the upper center of the back plate, and in the front center of the interior shelf. These grilles are made from Seezak type MP-12 mounting plates by drilling out the holes to ⅛-inch diameter and lightly countersinking to remove burrs. A handle (Stanley No. 3 door pull) is mounted on the top with 10–32 oval-head rack screws; and four husky rubber feet are attached with 6–32 screws to the bottom corners. The ventilating grilles and rubber feet assure good air circulation no matter where the instrument is placed, so that thermal stabilization is rapid and frequency drift minimized.

Mechanical assembly is quite simple, and the exact arrangement of parts is not critical. They must, however, be firmly anchored in place, so that pressing on the panel, or any other part of the case, will not change the tuning.

To insure that the components stay in place, liberal use is made of tie points, and shielded leads are anchored by soldering to lugs. Wherever a lead passes through the interior shelf, the hole is protected by a rubber grommet. A tube shield is placed over the 12AX7 to act as a mechanical hold-down. It is not electrically necessary, and any other type of hold-down can be used if preferred. Because of repeated unhappy experiences with the screwdriver slots in core screws of coils, each core screw is fitted with a 4–40 hex nut, held in place with solder. This permits tuning the coils with a hex socket wrench, which stays in place, instead of a screwdriver, which not only tends to slip out of the socket but also usually splits out the slot in a short time.

[2] Mr. Ives has rewired all of his receiving equipment (SX-62, NC-88, Q5-er, homemade portable) to put a positive bias on the tube heaters. He finds that it reduces hum and seems to extend tube life. — *Ed.*

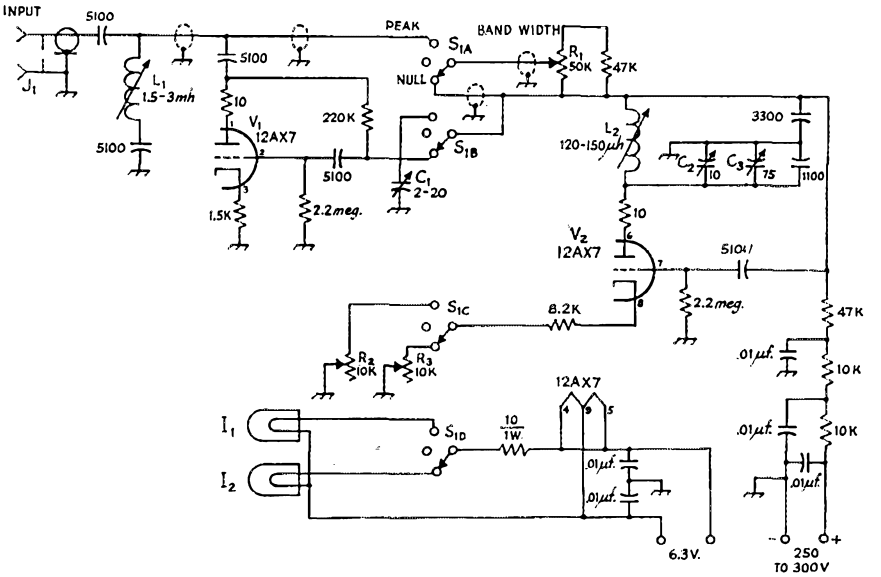
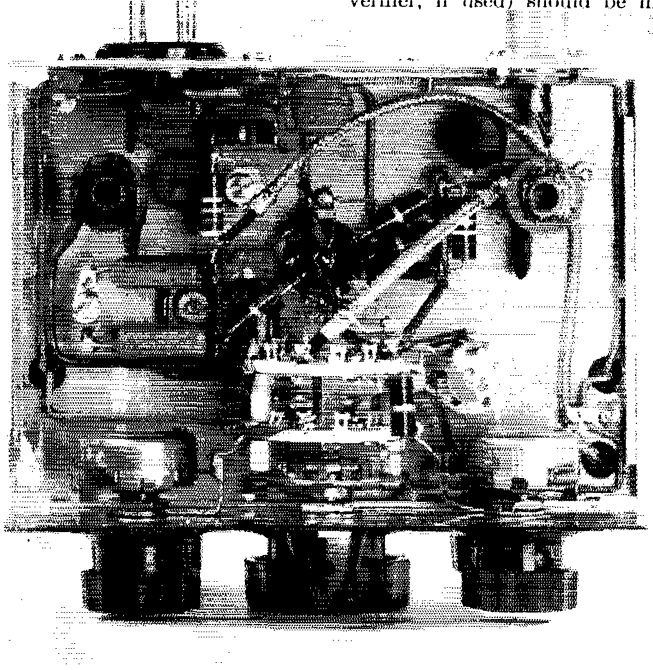


Fig. 1 — Schematic diagram of the *Q* multiplier. Resistors are ½ watt unless specified otherwise. All capacitances are in μμf. unless specified otherwise.

C_1 — Air trimmer (Hammarlund MAC-20).
C_2 — 10-μμf. variable (Johnson 167-1).
C_3 — 75-μμf. variable (Johnson 167-4).
I_1, I_2 — 6-volt pilot lamp.
J_1 — U.h.f. cable receptacle, SO-239.
L_1 — Adjustable cup-core inductor (North Hills 700A).*
L_2 — Adjustable cup-core inductor (North Hills Type 700 form, close-wound with 45 turns No. 32 d.s.c.).
S_1 — 2-gang 4-pole 6-position (3 positions used) rotary switch.

*North Hill Electric Co., 402 Sagamore Ave., Mineola, L. I., N. Y.

vernier, if used) should be mec



The power connector and the input jack are mounted on the rear panel below the shelf. Shielded leads are used between the bandwidth control, coils and switch. The shielded lead to the bandwidth control runs through the rubber grommet at the lower right-hand corner of the shelf.

Using the Multiplier

Theoretically, the Q multiplier can be connected across any coil of the receiver i.f. amplifier, and it will work after a fashion if shunted across any grid or plate coil tuned to 455 kc. (in this case). For best results, however, the Q multiplier must not be overloaded. This should be obvious when it is remembered that a tuning fork will vibrate at any frequency if driven hard enough. So will an iron anvil!

The preferred electrical position for the Q multiplier is in the plate of either the mixer or the first i.f. stage. The connection can be made with a short length of shielded wire or, preferably, RG-58/U coaxial line. Connect one side of a 0.01-μf. disk ceramic to the plate of the mixer or first i.f. tube and connect the other side of the capacitor to the inner conductor of the coax. Ground the outer conductor of the coax to the receiver chassis close to the tube socket. Power for the Q multiplier can usually be "borrowed" from the receiver at the accessory socket, since the plate current demand is very small and the required heater current is only 0.3 ampere.

Before connecting the Q multiplier to the receiver, check the receiver i.f. alignment, so that the receiver functions normally with the Q multiplier disconnected. The circuit the multiplier is to be connected to may require a slight touching up.

When the signal cable and the power connections are completed, and the receiver is known to be functioning normally, remove the top of the Q-multiplier case, to make the alignment adjustments accessible. Set switch S_1 at "off", tune in a steady phone signal. Center it in the receiver i.f. pass band, using the S meter to insure proper tuning.

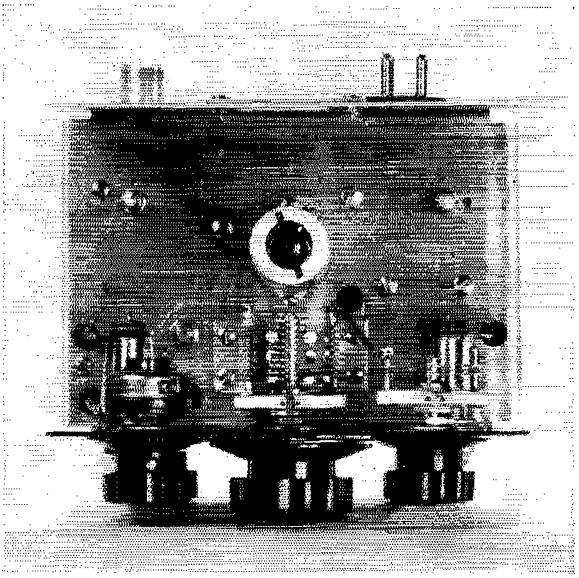
Now adjust the input coil, L_1, for maximum signal. This insures that the receiver will function normally whether the Q multiplier is connected or not.

Next, center the center-frequency and vernier dials, set the null depth control to center scale, and turn the function switch to NULL. Adjust coil L_2 for minimum signal (lowest S reading). Then, adjust the null depth control R_3 for lowest signal level, and reduce it still further, if possible, by fine adjustment of L_2. This adjustment removes the carrier and the low frequency side bands on each side of it, giving phone signals a tinny and overmodulated characteristic. Keep the BANDWIDTH control at minimum resistance during these preliminary adjustments.

Leaving the tuning unchanged, switch the function to PEAK, and advance the peak height control R_2 until a squeal is heard. The oscillating Q multiplier is now beating with the incoming carrier. Back off on the height control until the squeal stops, and then adjust trimmer C_1 for maximum signal, as indicated by the S meter or the "boomiest" bass response. The PEAK and NULL settings now coincide in frequency.

After checking operation with a number of signals, replace the top on the cabinet, and the Q multiplier is ready for use.

Troubles likely to be encountered in aligning a Q multiplier are few, and their correction usually is quite simple. Other than wiring blunders, most common troubles are bad tubes and parasitic oscillation. A bad tube is suggested when the maximum adjustments of PEAK and NULL are at widely differing settings of the null and peak controls. Replacement of the tube by one in which the two triodes are more nearly alike in characteristics will remedy the trouble. Parasitic oscilla-



A top view of the *Q* multiplier with the top and side plates removed. The rear plate is a 6-inch square of aluminum, similar to the front panel. The shelf is mounted about 2 inches up on the panel.

tion is evidenced when signals are garbled at all positions of both controls. The oscillation is usually at a high frequency, such as 75 to 100 Mc., and is eliminated by inserting resistors in series with one or both tube plates. The 10-ohm resistors shown in Fig. 1 are usually adequate, but this value can be increased considerably, if necessary, without impairing any useful function of the device.

The *Q* multiplier does exactly what is claimed for it in the original description.[1] In the NULL position, it provides a slot of adjustable depth to about 30 db., with a 6-db. width of about 0.1 per cent of the intermediate frequency. This slot is tunable across the i.f. pass band. It is a simple slot, not a combination of slot and peak as with a conventional crystal filter.

In the PEAK position, with the BAND WIDTH setting at a minimum (zero series resistance), the multiplier provides a peak, of approximately the same width as the null slot, with height adjustable through a range of about 30 db. This peak, just like the slot, is tunable across the i.f. pass band.

Increasing the band width, by means of the BAND-WIDTH control (not a part of Villard's unit), broadens the tunable peak somewhat, increasing the intelligibility of phone signals by retaining more of the side bands. This control operates most conveniently when the resistor is quasi-logarithmic, and was made so by paralleling a 50,000-ohm "logarithmic" potentiometer (Ohmite type CA) with a 47,000-ohm fixed resistor. With about 20,000 ohms in series, the *Q* multiplier might as well not be there, as the broadening of the pass band due to the series resistor just about matches the sharpening contributed by *Q* multiplication.

As preliminary tests will demonstrate, the *Q* multiplier tunes *very* sharply, even with the 10-to-1 electrical vernier here provided. Operation is logical, simple, and straightforward, but, like riding a bicycle, skillful operation requires some practice.

Because there is no interlock between the controls of the *Q* multiplier and those of the receiver, the *Q* multiplier can be used in conjunction with other band-narrowing devices, such as a crystal filter, a Q5-er, or even one or more additional *Q* multipliers, which can be connected in other i.f. stages. A receiver with a *Q* multiplier in the mixer plate and others in the plate circuits of each of three following i.f. stages will be perfectly stable, and all of the *Q* multipliers will function, but you will need more arms than the Hindu goddess Kali to operate them all!

Other Frequencies

The *Q* multiplier here described is designed for operation at 455 kc. Quite obviously, as the operating principles are sound, it can be made to work at almost any other frequency. Unfortunately, however, its utility is not the same at all frequencies. The *Q* multiplier is substantially a percentage band-width device, the effective percentage being very roughly 0.1 per cent of the intermediate frequency.

If we make a *Q* multiplier to operate with a 50-kc. i.f. system, we will have a tunable slot approximately 50 cycles wide. If we switch to PEAK at 50 kc., using commercially available tuned circuits, the resultant *Q* at maximum peak setting is in the higher thousands, and the circuit rings so badly that we can't be sure whether or not the carrier is being keyed. It is for these reasons, among others, that the Hallicrafters SX-100 uses a T-notch filter, in place of a *Q* multiplier, in the 50-kc. i.f. amplifier.

As we increase the i.f., the peak and slot width are increased proportionately, so that at 3.5 Mc. we can just about peak or slot an entire phone transmission.

A Compact All-Band Antenna

Advanced Techniques for the Modern Amateur

BY LARSEN E. RAPP,* WIOU

• This article should be read carefully by all amateurs interested in the fine points of antenna design. The startling innovation disclosed here for the first time is proof positive that nothing is impossible for an amateur with enough imagination and determination.

With the ever-increasing complexity of contemporary amateur radio, as evidenced by available all-band transmitters and receivers for home and mobile work, has come a demand for packaging the gear in ways that will occupy a minimum of space. This process is often referred to as "miniaturization," and great strides have been made in some directions. One notable achievement has been the introduction of the so-called "external-anode" vacuum tube, which saves space by eliminating the vacuum *outside* the anode and thus the need for an envelope of some kind. Another good example of miniaturization has been the more widespread use of the higher frequencies, where smaller coils and capacitors can be used than on the lower frequencies. Transistors and other applications of semiconductor technique permit the design of compact equipment.

However, there is one area of amateur radio that still remains a fruitful field for miniaturization, and that is antenna design. Referring to such standard works as the *ARRL Antenna Book*, one finds that the same formula for a half-wavelength antenna[1] has been carried for years, with apparently no thought being given to its further development or simplification. Band-switching transmitters (made compact by the techniques outlined in the first paragraph) have increased the demand for suitable all-band antennas, preferably fed with coaxial line, but up to the present time the approaches to a solution to the problem have been rather primitive, to say the least. Increases in population over the past pentad have crowded the country to the point where many amateurs are forced to live in small dwellings and apartments that offer no room for the old-fashioned types of antennas or even for the newer all-band types, and something should be done about it.

Something can be done about it. The present approach to the all-band problem is to use a multiplicity of half-wave-length antennas based on the old formula[1] and feed them with a common transmission line, or to use a single antenna with "traps" in it. The trap idea is noteworthy but it has not been carried far enough.

Ferrites

Ordinary a.m. broadcasting uses the frequencies between 535 and 1605 kc., and old timers may recall that originally large outdoor antennas were required for satisfactory reception. However, modern technique in broadcast reception calls for a small "Loopstick" that can be installed inside the receiver. The heart of the Loopstick is a core of high-permeability ferrite, and it is to the credit of the broadcast engineers that they immediately appreciated the potentialities of the material and applied it to their receivers. Why no one but the writer has seen fit to apply it to amateur frequencies must forever remain a mystery.[2]

A "trap" antenna using ferrite cores in the coils offers many interesting possibilities. The properties of the ferrite are such that the antenna is *all coil;* you can visualize this as a trap antenna compressed by exerting pressure at the ends. The sketch in Fig. 1 shows an all-band antenna (80 through 10 meters) based on this principle.

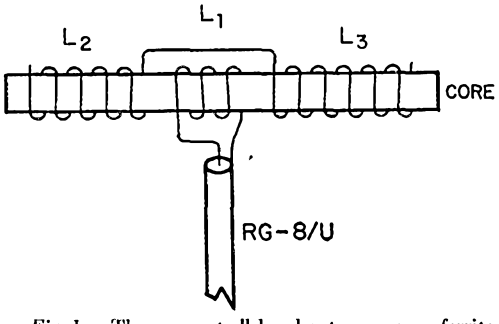


Fig. 1 — The compact all-band antenna uses a ferrite core measuring 3 inches in diameter and 3.6 feet long. L_1 — 5 turns No. 10 Formvar, close-wound. L_2, L_3 — 40 turns ¼-inch copper tubing, ¼ inch between turns. Spacing between coils is ½ inch.

Including the weatherproof housing, the all-band antenna occupies a volume of not more than one foot in diameter and four feet long. Using a simple broadband matching transformer with the same ferrite core, a suitable match for 52-ohm coaxial line can be obtained, with the s.w.r. running not more than 1.3 over the entire range and dropping as low as 0.77 at some points.

Mounting the prototype ferrite all-band antenna at the top of a 50-foot flagpole brought

(*Continued on page 136*)

* Kippering-on-the-Charles, Mass.

[1] L(feet) = 468 ÷ f(Mc.).

[2] This is not strictly true. The B & W TR Switch and the GPR-90 Receiver use ferrite-cored inductors in broadband applications.—*Adv. Mgr.*

How Well Do You Know the Regulations?

A Multiple-Choice Quiz on the F.C.C. Rules and Regs

BY LEWIS G. McCOY,* W1ICP

• In these days of self-administered personality and psychology tests, it is only fitting and proper that the amateur be given an opportunity to rise and shine. And here it is: Twenty questions complete with possible, probable and improbable answers. There is a scoring system but, alas, no multipliers or certificates. Despite these shortcomings, we trust you will enjoy finding out how much you know — or don't know — about the regulations that govern your hobby.

IF YOU are a Novice getting ready to become a General Class ham, you must, of course, be familiar with FCC regulations. The following quiz is designed to test your knowledge of some of the laws. Let's make one point quite clear before going further: the questions in the quiz are not necessarily the ones you'll be taking in the General Class exam. However, they cover part of the laws you must know as a radio amateur.

If the reader happens to be a holder of a higher class license than Novice, we have no objections if he takes the quiz. However, we realize that he will know all the answers! ("I don't care if he is from the FCC. I'm not home to anyone.")

The correct answers and your rating are given on page 144. Don't peek now — take the test and then see how you did.

1. When operating portable or mobile the operator:

a) Can use a photocopy of his operator's license.

b) Must have his original license in his possession.

c) Doesn't have to carry his license with him.

2. When another amateur operates your station he must:

a) Get permission from the nearest FCC office.

b) Have a photocopy of his operator's license with him.

c) Sign your log.

3. Anyone speaking over your radiotelephone station must:

a) Speak English.

b) Sign the log.

c) Be named in your log.

4. A visitor who does not hold an amateur license can make contacts from your radiotelephone station if:

a) You personally turn the carrier on and off.

b) You make the initial call and the sign-off.

c) You turn the carrier on and off and make the sign-off.

5. Which is correct:

a) "This is W1ICP transmitting, go ahead W1DX."

b) "This is W1ICP, with W1DX to transmit, over."

c) "W1DX from W1ICP."

6. In order to give the written portion of the Conditional Class license examination the examiner must be:

a) The holder of an Extra, Advanced, or General Class license.

b) The holder of an Extra, Advanced, General Class, or Commercial Radiotelegraph license.

c) Over 21 years of age.

7. Your log must be preserved:

a) At least two years from date of last entry.

b) At least one year from the date of last entry.

c) For the duration of your license term.

8. The FCC should be notified in the event that portable or mobile operation away from home is, or may be:

a) More than 24 hours.

b) More than 48 hours.

c) More than one month.

9. Which is correct:

a) "This is W9RRX operating portable on Lake Michigan, 20 miles northeast of Chicago."

b) "This is W9RRX maritime mobile on Lake Michigan, 20 miles northeast of Chicago."

c) "This is W9RRX mobile on Lake Michigan, 20 miles northeast of Chicago."

10. You are calling a mobile station; the following is recommended FCC procedure:

* Technical Assistant, *QST*.

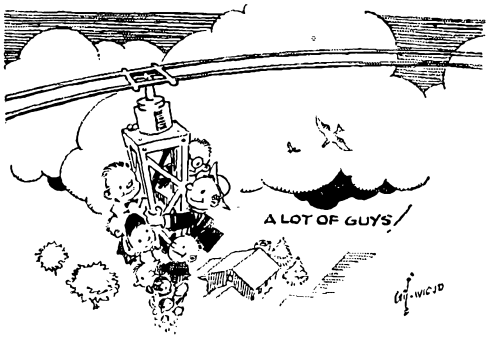
a) "W1DX portable mobile, this is W1ICP, over."
b) "W1DX mobile, this is W1ICP, over."
c) "W1DX, this is W1ICP, over."

11. A Technician Class licensee is permitted to operate c.w.:
a) In the 80-meter Novice band, if crystal control is used.
b) In the 11-meter band.
c) In the 6-meter band.

12. In order to renew your license you must:
a) Have made at least 3 contacts in the last three months, or a total of 5 contacts within the last year of the license term.
b) Have a total of 5 operating hours in the last three months, or a total of 10 hours within the last year of the license term.
c) Have a total of 2 operating hours in the last three months, or a total of 5 hours within the last year of the license term.

13. A Novice Class license holder:
a) Can operate a Technician Class holder's station.
b) Cannot operate a Technician Class holder's station.
c) Can operate a Technician Class holder's station if the Novice is crystal-controlled, operates within the Novice bands, and runs no more than 75 watts input.

14. In order to put up an antenna structure over 170 feet high, you need:
a) A lot of guys.



b) To fill out CAA Form 22-A-675b and send it to your local CAA office.
c) To obtain permission from the FCC.

15. In order to comply with the Conelrad regulations when operating your station you must:
a) Have a continuous monitor on a broadcast station.
b) Check a broadcast station at least every five minutes.
c) Check a broadcast station at least every ten minutes.

16. When operating c.w. mobile or portable domestically, you must:
a) Give the approximate geographical position.
b) Sign your call with fraction bar and number of call area you are operating in plus the approximate geographical position.
c) Sign your call with fraction bar and number of call area you are operating in.

17. If you fail a Conditional Class amateur exam:
a) You must wait 60 days before trying it again.
b) You can try the same exam again the next day.
c) You can take the General Class exam the next day.

18. If your company sends you temporarily to another city for a six-month training course you should:
a) Apply to the FCC immediately for modification of your amateur license to the new, temporary address.
b) Send a notice to FCC in Washington and monthly notices to the engineer of the district in which you will be operating on a "portable" basis.
c) Ask the district FCC engineer to endorse your license for temporary operation at the new location.

19. When you pass the Amateur Extra Class examination at an FCC office:
a) All papers have to go to Washington for issuance of a new license.
b) The FCC engineer will endorse your license for the higher grade and a new five-year term.
c) You have a choice of immediate endorsement without change in the expiration date, or sending papers to Washington for issuance of the new license and a new five-year term.

20. A General Class licensee may operate an amateur station aboard ship on Lake Michigan:
a) Only on the 21- and 28-Mc. bands.
b) On any amateur band.
c) Only on the 28-Mc. band.

Strays

Quite appropriately, Al Johann, of the Meredith Publishing Co., which prints *Better Homes and Gardens*, received Novice call KNØINK.

—•••—

Another weird coincidence. W5GWD and K5GWD are both named Hall and both live in Oklahoma.

—•••—

K6RFE wonders if he is the most westerly ham in the U. S. A., since he knows he's the farthest west in California. We wonder too, and also, who is the farthest east, north and south? Drop the managing editor a line.

—•••—

W4FIN reports that he knows of a phone man who ordered a steak dinner and insisted on A3 sauce.

—•••—

W3DVB and W3BVD are members of the same club.

(*Now turn to page 144*)

Simplified Design of Impedance-Matching Networks

In Three Parts — Part II, Pi and T Networks*

BY GEORGE GRAMMER, W1DF

THE L SECTION has the advantages of great simplicity and optimum efficiency, but it is an inflexible arrangement in that only one set of constants will give the required match. The circuit Q, for example, cannot be chosen at will because it is fixed by the ratio of the two resistances. When an amplifier tube is being matched to a load, it is often just as important to have the proper operating Q in the tank as it is to have the proper loading.[6] Also, there are cases where the presence of reactance in the load makes it desirable to use a more complex network.

Two L sections can be combined to form either a pi or T network. Both the pi and T are useful arrangements for increasing the circuit Q and thus improving selectivity, and for increasing flexibility in adjustment.

The design methods used for these — or any other — combinations are practically identical. Basically there is just one method — the one used for designing the L section.

The Pi Network

Of all the possible configurations, the pi network is probably the one most familiar to amateurs because of its application as the tank circuit in r.f. power amplifiers. It lends itself to simple design methods when it is considered as two "back-to-back" L networks constructed to match an assumed "virtual" resistance at the meeting point.[7]

The principle is shown in Fig. 7. R_{P1} is the load (power-receiving device) to be matched to the

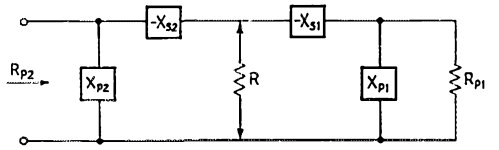


Fig. 7 — Development of the pi network from two back-to-back L networks.

source of power, which requires a load R_{P2}. R_{P1} is the parallel resistance of the L section consisting of X_{P1} and $-X_{S1}$, while R is the virtual resistance and corresponds to R_S in the circuits discussed in Part I. Using R as the load, a second L section is formed by $-X_{S2}$ and X_{P2} to transform R to the desired value of resistance for the

[4] Part I of this article appeared in March, 1957, *QST*.

[6] For discussion of tank-circuit Q, see chapter on transmitters in *The Radio Amateur's Handbook*.

[7] Bruene, "Pi-Network Calculator", *Electronics*, May, 1945.

• In this second part it is shown how pi and T networks can be formed quite simply from the basic L network discussed in Part I.

power source to see. Each section is calculated separately by exactly the method described previously. The virtual resistance R must be smaller than either R_{P1} or R_{P2}, since it is in the series arm of each section, but aside from this may be chosen at will or determined from other circuit requirements. The principal one of such requirements, in the case of an r.f. amplifier tank circuit, will be the desired operating Q.

The design of such a circuit may be shown by continuing with the same resistance values used in the earlier example: a 52-ohm resistive load and a tube requiring a load of 2000 ohms. Let us now impose the requirement that the tank Q (Q_2) be 12. From Equation 2B,

$$X_{P2} = \frac{2000}{12} = 167 \text{ ohms},$$

and from Equation 3A,

$$R = \frac{2000}{(12)^2 + 1} = 13.8 \text{ ohms}.$$

This is smaller than either of the two resistances being matched, and so is a proper value. Using Equation 3B,

$$X_{S2} = 12 \times 13.8 = 166 \text{ ohms}.$$

This completes the design of the L section on the input side of the network. Note that since Q_2 is greater than 10, X_{P2} and X_{S2} are practically equal (although they must be of opposite types), which simply means that this much of the network is identical with an ordinary parallel-resonant tank circuit of the same operating Q.

We can now find the required Q (Q_1) in the output section, since R and R_{P1} are known. Their ratio is 52/13.8 = 3.77, so from Equation 5 the required Q is

$$Q_1 = \sqrt{3.77 - 1} = 1.66.$$

The same result could be found from Fig. 3. From Equation 3B,

$$X_{S1} = 1.66 \times 13.8 = 23 \text{ ohms}$$

and from Equation 2B,

$$X_{P1} = \frac{52}{1.66} = 31.3 \text{ ohms}.$$

The network design is now complete and is shown in Fig. 8A. The virtual resistance does not

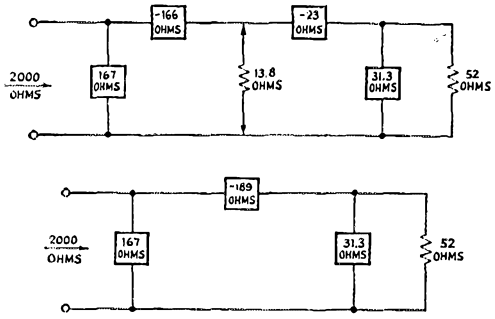


Fig. 8 — Combining L-section elements into the pi configuration.

actually appear in the circuit, of course, so X_{S1} and X_{S2} can be added together and only one physical component is required. In this example it has a reactance of 166 + 23 = 189 ohms. The minus sign in Fig. 8A is used only to indicate that the reactance is of the opposite type to that chosen for X_{P1} and X_{P2}.[8]

Reactance Combinations

The design so far is quite general and we are free to choose types of reactance as we please, within the restriction that opposite types must be used in the two arms of each L section. There are four possibilities, as shown in Fig. 9, each leading to a different-looking final circuit but all providing the proper match between the two resistances. Fig. 9A is the best one for matching a tube to its load because it utilizes the components to best advantage in suppressing harmonics. Fig. 9B is a high-pass configuration and would be undesirable in a tank circuit. Note that in C and D the reactance of the connecting element in the practical circuit at the right is the *difference* between the reactances of the two series elements of the individual L sections, since opposite kinds of reactance are used in the series elements in these two cases.

The four circuits are shown primarily to illustrate the variety of networks, all of different appearance in the final version, that can be formed from simple L sections having fundamentally the same constants. They are alike only in that each will match 52 ohms to 2000 ohms. In other respects, such as relative suppression of frequencies higher and lower than the operating frequency, they are not identical. In some applications one or another of them might be preferable to Fig. 9A, but a decision cannot be made on this point until the nature of the problem is known.

[8] In particular, the use of the negative sign in this and similar examples should not be confused with the use of the same sign to indicate capacitive reactance. The method of calculation described here does not require such use of signs nor is it necessary to bring the operator j into the calculations.

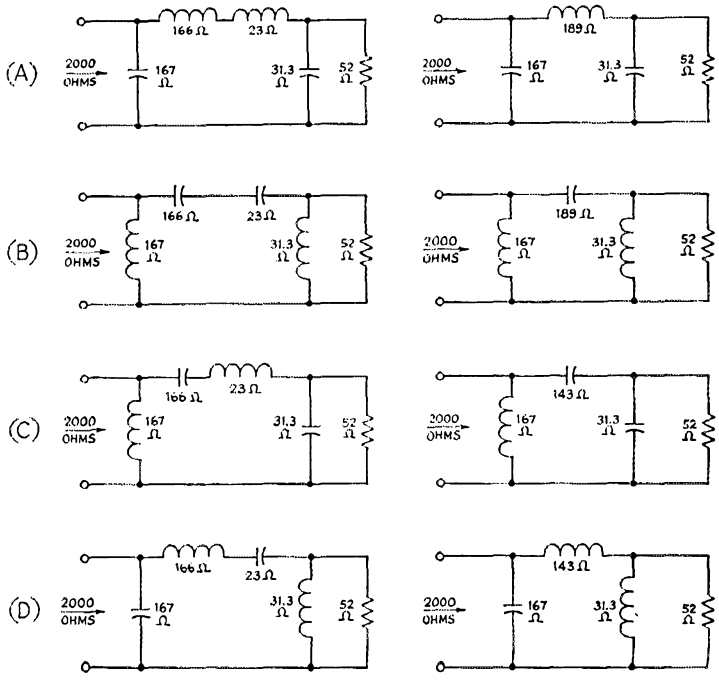


Fig. 9 — The four possible combinations of L-sections into pi networks. Drawings at the left show the basic L sections; those at the right show the final forms.

Summary of Pi Network Design

1) Break the proposed network into two L sections as shown in Fig. 7.

2a) If the input section is to have a specified value of Q, use Equation 3A to find R. The value of R must be smaller than either of the two resistances to be matched. If it is not, a higher value of Q must be used.

2b) Or, if there are no restrictions on the Q of the input section, select some value for R that is less than either of the two resistances to be matched.

3) Calculate the constants of the input L section to match the desired resistance, R_{P2}, to R.

4) Calculate the constants of the output section to match R to the other desired resistance, R_{P1}.

5) Add the values of the reactances in the series arms of the L sections (X_{S1} and X_{S2}) to find the value of the series reactance in the pi network.

6) Convert the final reactance values to inductance and capacitance.

Covering a Band

The reactance values obtained from the design method apply at any frequency, so it is a simple matter to determine the range of variation that must be supplied to cover an amateur band. For example, using Equations 7 and 8 with the right-hand circuit of Fig. 9A for 3500 and 4000 kc. will give the following values for L and C:

Reactance	*3500 kc.*	*4000 kc.*
31.3 ohms (C)	1450 $\mu\mu$f.	1270 $\mu\mu$f.
167 ohms (C)	272 $\mu\mu$f.	238 $\mu\mu$f.
189 ohms (L)	8.57 μh.	7.5 μh.

Note that all three tuning elements must be continuously variable within these limits to produce a match at any frequency in the band while maintaining a constant Q of 12.

Only two elements need be continuously variable to give a match if the consequent variation in Q is permissible. In this event the network should be designed for a minimum value of Q. It is convenient to use a fixed value of inductance and adjust the capacitances to achieve a match, in which case the minimum Q will occur at the high-frequency end of the band. The inductance should be chosen accordingly. In the example above this would mean that an inductance value of 7.5 μh. should be chosen. The problem then is to determine the capacitances required for matching at 3500 kc., in order to establish the necessary range. Although the simplified design method under discussion will not give an exact solution in this case,[9] because there is no specific way of finding the individual values of X_{S1} and X_{S2} when their sum is fixed, a close-enough approximation will result if we assume that the Q of the network on the input side will be inversely proportional to frequency. Thus the Q at 3500 kc. will be 4000/3500 times the Q (12) at 4000 kc., or a Q of 13.7. Then

$X_{P2} = 2000/13.7 = 146$ ohms; $= X_{S2}$, approximately.

$R = 146/13.7 = 10.6$ ohms

$R_{P1}/R = 52/10.6 = 4.88$

$Q_1 = \sqrt{4.88 - 1} = 1.97$

$X_{P1} = 52/1.97 = 26.4$ ohms

$X_{S1} = 10.6 \times 1.97 = 20.9$ ohms.

The accuracy can be checked by adding X_{S1} and X_{S2}, the sum being 167 ohms, and comparing this with the reactance of the 7.5-μh. coil at 3500 kc. This is 165 ohms, which is amply close agreement. The capacitance values corresponding with 146 ohms and 26.4 ohms at 3500 kc. are, respectively, 311 $\mu\mu$f. and 1720 $\mu\mu$f. These values differ considerably from those of the constant-Q network tabulated earlier.

T Networks

Fundamentally the same method is used for constructing T networks, the difference being that the two back-to-back L networks have their *parallel*-reactance sides joined together. This requires that the virtual resistance be *higher* than either of the two resistances to be matched. The T is often a convenient form when low values of resistance are to be matched, and when for some reason — e.g., suppression of off-frequency radiations such as harmonics — a higher Q is needed than would be provided by a simple L network.

Fig. 10 is the basic circuit used for the T; this circuit may be compared with Fig. 7 for the pi.

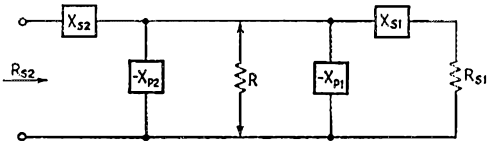


Fig. 10 — T network formed from two L sections.

Each L network is calculated in the same way as in the previous examples. As an illustration, suppose that the load, R_{S1}, is 10 ohms and is to be transformed into 50 ohms (R_{S2}) at the network terminals. Then R may have any desired value larger than 50 ohms. If we choose to make the Q (Q_1) of the first L section 10, then X_{S1} is

[9] Somewhat more complicated formulas must be used for finding the exact values when the series inductance (not reactance) is constant. They are

$$X_{P1} = \frac{-R_{P1}X}{R_{P1} \pm \sqrt{R_{P1}R_{P2} - X^2}}$$

$$X_{P2} = \frac{-R_{P2}X}{R_{P2} \pm \sqrt{R_{P1}R_{P2} - X^2}}$$

where X is the total reactance of the series inductance, Fig. 9A. For Fig. 9A, use the plus signs in the denominators, in which event the minus signs in the numerators indicate that the shunt reactances are capacitive. In the general case, the same sign must be chosen for both denominators, but X may be either positive or negative. This leads to the four possible combinations shown in Fig. 9. For further details see W. L. Everitt, *Communication Engineering*, McGraw-Hill Book Co., New York.

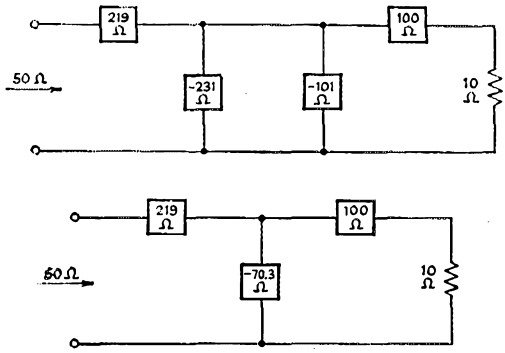


Fig. 11 — Combining L-section elements into the T configuration. Note that since the shunt element is formed from two elements in parallel the resultant reactance is less than either alone

$10R_{S1} = 10 \times 10 = 100$ ohms. From Equation 2A,

$R = 10\ (10^2 + 1) = 10 \times 101 = 1010$ ohms

and from Equation 2B,

$$X_{P1} = \frac{1010}{10} = 101 \text{ ohms.}$$

The Q required for matching R to R_{S2} is found from Equation 5:

$$Q_2 = \sqrt{\frac{1010}{50} - 1} = \sqrt{19.2} = 4.38$$

so

$$X_{P2} = \frac{R}{Q_2} = \frac{1010}{4.38} = 231 \text{ ohms}$$

and

$$X_{S2} = Q_2 R_{S2} = 4.38 \times 50 = 219 \text{ ohms}$$

The elements of the complete network are shown in Fig. 11, which compares with Fig. 8. The choice of signs is again arbitrary, since the only requirement is that the signs be opposite for the two elements of each L network. In Fig. 11A the parallel or shunt elements have been chosen with the same sign, and so can be combined into a single element, as shown in Fig. 11B.

If different signs are chosen for the reactances, there again result four possible combinations as shown in Fig. 12. As compared with the pi configurations in Fig. 9, the reactances that can be combined are in parallel instead of series, and so the net reactance is not given by simple algebraic addition. However, it is easily found: it is equal to the product of the two reactances divided by their sum, if they are of the same kind (i.e., both capacitive or both inductive); or to the product divided by their *difference*, if they are of opposite kinds. In the latter case, the net reactance has the same sign as the smaller of the two; in Fig. 12C, for example, the capacitive reactance, 101 ohms, is smaller than the inductive reactance, 231 ohms, and so the net reactance, 179 ohms, is capacitive. The opposite is true in Fig. 12D.

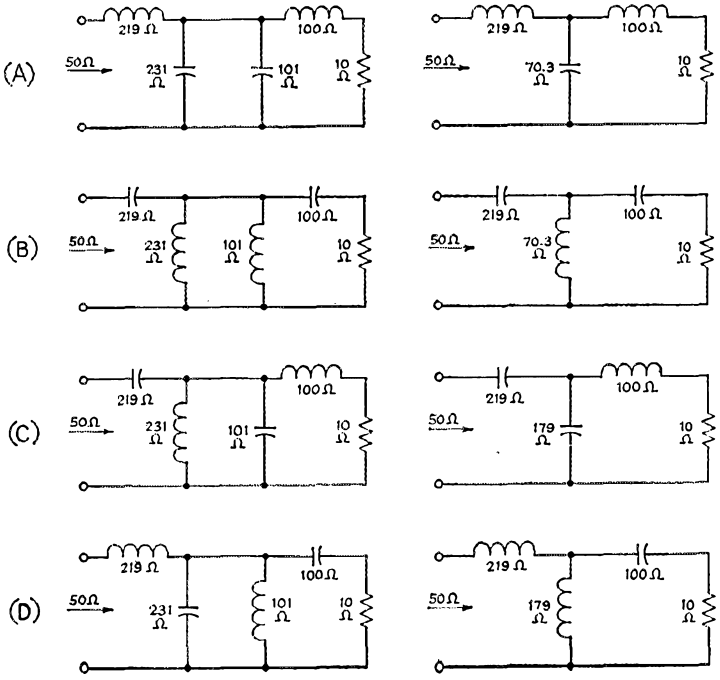


Fig. 12 — The four possible combinations of L sections into T networks. The development is shown at the left; final forms at the right.

• Recent Equipment —

The Gonset G-77 Mobile Transmitter

If you react the way the writer does, your first comment on seeing the G-77 mobile transmitter will be "Heck! *No one* could build a complete mobile transmitter *that* small!" Oddly enough, you would be right. At least, Gonset didn't build a complete transmitter that small. Instead, they came up with one of those I-wish-I'd-thought-of-that-first ideas and combined the audio section with the power supply, to be tucked away somewhere out of knee reach, leaving only the radio-frequency package to be mounted near the operator. The closest anyone ever came to this, in our recollection, was the "ash-tray mobile" described about a year ago in *QST*.[1]

But the G-77 is no ash-tray mobile; it's good for a husky 50 to 60 watts input on the bands 80 through 10 (excluding 11), a.m. or c.w. The frequency can be crystal-controlled (crystal socket on the front panel) but we suspect that most operators will use the variable-frequency oscillator and the convenience of its directly-calibrated slide-rule dial. Each band occupies practically the entire dial scale, and it takes 18 turns of the tuning knob to get from one end to the other of the 5⅛-inch scale.

The block diagram of the transmitter becomes a two-part affair, as shown in Fig. 1. The oscillator grid and plate circuit tuning is ganged with the multiplier plate tuning. The oscillator grid circuit is never on the same band as the output: it's on 160 for 80-meter work, on 80 for 40, 20 and 15, and on 40 for 10-meter operation. No oscillator plate tuning is used during 80- and 40-meter operation; here the oscillator plate is coupled to the multiplier grid via a common 100-μh. choke. On the other bands the oscillator plate is tuned to the second harmonic of the grid-circuit frequency. The multiplier triples for 15-meter operation and doubles for the other bands. The oscillator circuit is an electron-coupled high-*C* Colpitts; it is switched to the grid-plate circuit for crystal-controlled operation. The screen voltage of the oscillator is stabilized by the 0A2 in the power supply.

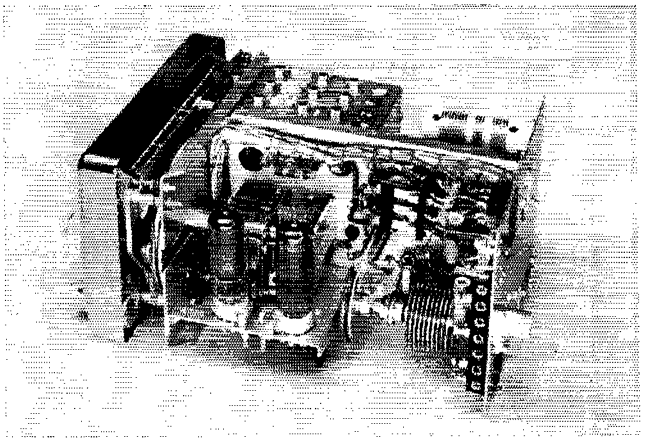
To maintain constant drive to the 6146 on each band, suitable screen-dropping resistors for the 6CM6 multiplier are switched in by the band switch. A potentiometer accessible at the rear of the transmitter is used for setting the screen voltage initially; this is adjusted at the factory and would only need attention if you had abnormally high or low battery voltage.

The 6146 output stage uses a pi-network circuit in the plate (what commercial rig doesn't these days?). The familiar capacitive-bridge neutralizing circuit is used, a feature that any user of high-gain tetrode stages will applaud, and we suspect that you will see more commercial gear from now on using neutralized tetrodes.

One meter is used to monitor the transmitter currents, switchable from the panel to read 6146 cathode current, 6146 grid current and modulator cathode current. Two other positions on the same switch provide for c.w. operation and oscillator frequency spotting. On c.w. the 6146 cathode is keyed, quite a welcome departure after all these years of oscillator keying of commercial transmitters. When the "meter" switch is turned to cw the oscillator and multiplier turn on, so the c.w. standby position is one of the current-indicating positions. Push-to-talk is used during phone operation.

As indicated in Fig. 1, an antenna relay is provided. The relay is a 3-pole affair, and of course one pole is used for the obvious job of

[1] Pfost, "The Ash-Tray Mobile," *QST*, Feb., 1956.



The oscillator and multiplier tubes are on the right-hand side of the G-77; the associated tuning capacitors can be seen in back of the two tubes in this photograph. The variable capacitor at the right is the output stage plate capacitor.

The drive for the tuning gang is a spring-loaded gear train; only the dial indicator is string-driven by the frequency tuning knob.

That small switch at the lower right-hand corner of the panel turns on the heaters of the transmitter.

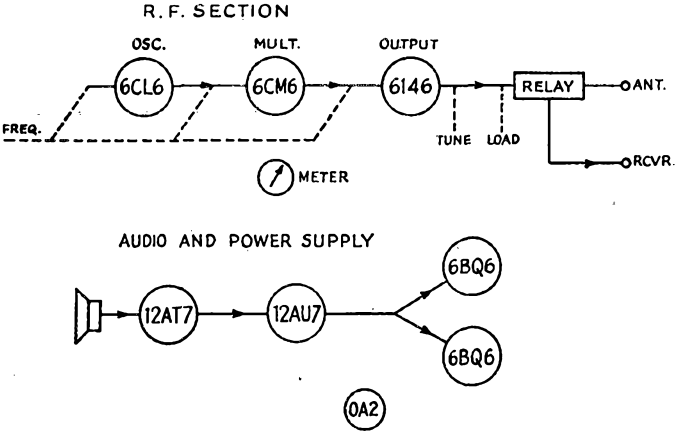


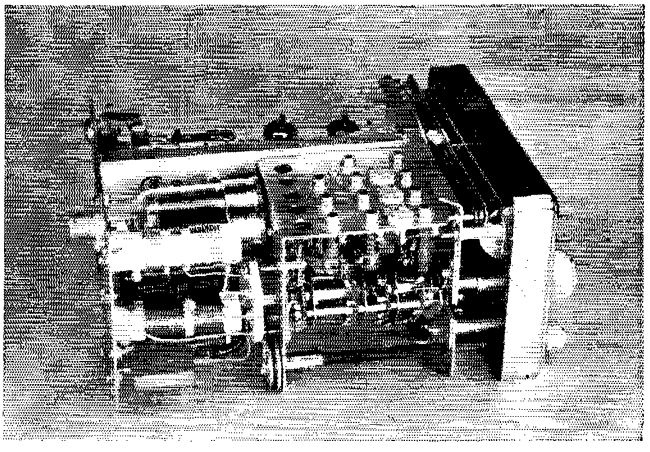
Fig. 1 — Block diagram of the G-77 mobile transmitter. The complete transmitter is two packages: the r.f. section mounts under the dashboard for easy access by the operator, and the audio and power supply unit mounts in the luggage compartment. Selenium rectifiers are used in the power supply.

switching the antenna from receiver to transmitter. A second pole can be used to disable the receiver during transmit periods, and the third pole cuts in a low-resistance bleeder across the power supply when the plate power is turned off, to hasten the discharge of the power-supply filter and reduce the time the oscillator might "hang on."

It was mentioned earlier that the audio and power supply section is a separate unit that can be mounted well away from the r.f. package. In the audio section, which is designed to work with a high-impedance dynamic or reluctance microphone, the cascaded triodes of the 12AT7 are resistance-coupled to the paralleled triodes of the 12AU7 driver. The driver is transformer-coupled to push-pull 6BQ6-GA modulators. The modulator tubes are used with the control grids grounded and the signal applied to the screen grids, to give zero-bias Class B operation. For phone work, the screen of the 6146 is fed through a dropping resistor from the high side of the modulation-transformer secondary; when the G-77 transmitter is switched to c.w. the 6146 screen voltage is obtained from the low-voltage power supply.

The low- and high-frequency components of speech are restricted through the values of coupling capacitors and shunt capacitors in the speech amplifier, to conserve audio power and to reduce the background noise encountered in mobile operation. A measure of speech clipping is obtained by offering a high plate-to-plate load to the modulators through the modulation transformer, and the consequent high-frequency components are attenuated by the transformer leakage reactance and the secondary shunt capacitance.

The power supply uses a vibrator, transformer and four heavy-duty selenium rectifiers. To protect the rectifiers from the initial charging-current surge, a relay in the power supply shorts out a series resistor to the rectifiers only after the power supply is up to voltage. The vibrator is one of the center-resting type with a separate armature coil. The power supply is energized by turning on this armature coil and, as a result, no heavy-duty relay is required to handle the heavy current in the battery circuit. With 6-volt operation the standby current is 5 amperes and the operating current is 17; 13-volt operation requires a standby current of 3 amperes and an operating current of 9. To change from 13- to 6-volt operation, or back again, a few jumpers



The output-stage inductors are wound on ceramic forms (left), and the oscillator and multiplier inductors are wound on phenolic forms (right). The string drive at the bottom center controls the output-stage plate tuning capacitor; the output loading capacitor is behind the output-stage inductors, under the 6146. A spring-loaded gear train on the output capacitor provides a 2-to-1 reduction drive.

have to be changed in the power supply and the r.f. package.

A phone/c.w. switch and the audio volume control are mounted on the power supply unit, but not too many operators are continually changing microphones or flipping from phone to c.w. and back.

If you have been wondering what good it is to have an audio section (and power supply) that can be mounted anywhere in the car when microphone cords are only a few feet long, have no fears; Gonset thought of that, too. They provide the necessary microphone extension cable, and all of the plugs, fuses and cables (except battery cables) for mounting the audio and power supply 20 feet from the r.f. package. This should take care of the extended-overhang cars for a few years to come. Mounting brackets for the r.f. package are also supplied.

Over-all dimensions of the r.f. section are 4½ inches high, 6½ inches wide and 9 inches deep, matching the G-66 receiver dimensions. The modulator and power supply unit is 7 inches high, 7¾ inches wide and 10 inches high, and the manufacturer suggests that it be mounted in the luggage compartment. Mounting near high-temperature points is definitely discouraged, since operation at ambient temperatures above 135°F shortens the life of some of the power supply components. — *B. G.*

The Crosby Model 67A Single-Side-Band Converter

SIDE-BAND converters, or adapters, or "slicers," are devices for improving the single-side-band reception of double side-band (a.m.) or single-side-band signals. Used with a receiver lacking in the necessary selectivity for this type of reception, the converter provides the requisite sharpness and usually a more appropriate detector. The selectivity is obtained by either a band-pass filter or the "phasing" system.

The 67A converter uses a Collins mechanical filter at 250 kc. for selectivity, and a product detector for effective detector action. The block diagram in Fig. 1 shows the tube line-up. The 6BA7 converter tube takes the 455-kc. signal from the receiver and heterodynes it to 250 kc., the filter frequency. After the filter, audio is recovered in the product detector and then amplified in one of the triodes of a 12AU7 before being passed along to the audio amplifier, which can be a separate one or the audio section of the receiver.

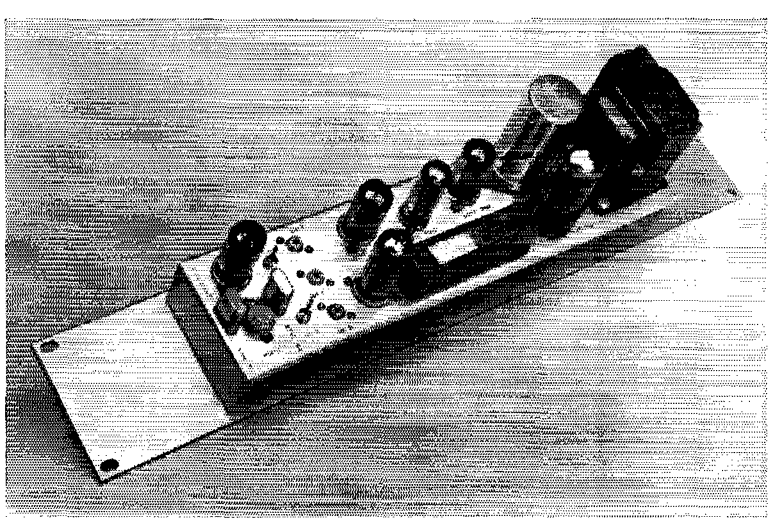
The operator doesn't have to worry about the setting of the b.f.o. in this converter, because the b.f.o. is crystal-controlled. Two crystals are used, one for each side of the filter pass band, and the crystals are switched when the converter-oscillator circuit is switched. This is a variation of the selectable side-band principle described by Ehrlich,[1] where both oscillators are shifted a few kc., in contrast to the selectable-side-band principle of McLaughlin,[2] where the b.f.o. remains fixed and the converter oscillator is switched to the high- or low-frequency side of the signal. The "pass-band tuning" feature of the Collins 75A-4 is a continuously-variable extension of the same principle. The advantage of the selectable-side-band principle is that, once a signal has been tuned in properly, it takes only a flip of a switch to examine either side band, if there are two.

Both triodes of the b.f.o. 12AU7 are used, in a cathode-coupled crystal-oscillator circuit.[3]

[1] Ehrlich, "Notes on a Specialized Phone Receiver," *QST*, April, 1953.

[2] McLaughlin, "Exit Heterodyne QRM," *QST*, October, 1946.

[3] *Electronics*, May, 1945, page 234.



Out of its cabinet, the 67A will fit nicely into a standard 19-inch rack. In its cabinet, a logical mounting place would be on top of the receiver.

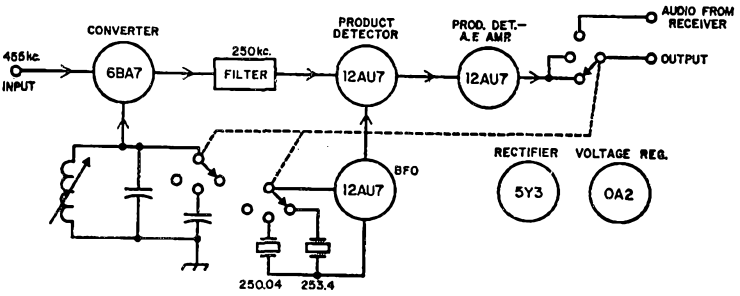


Fig. 1 — Block diagram of the 67A single-side-band converter. The regulator tube stabilizes the voltage for the 6BA7 screen (oscillator anode).

There are just two panel controls on the 67A. One is a toggle switch for turning the power on, and the other is a three-position switch that provides for selection of the side band or straight-through operation of the receiver alone.

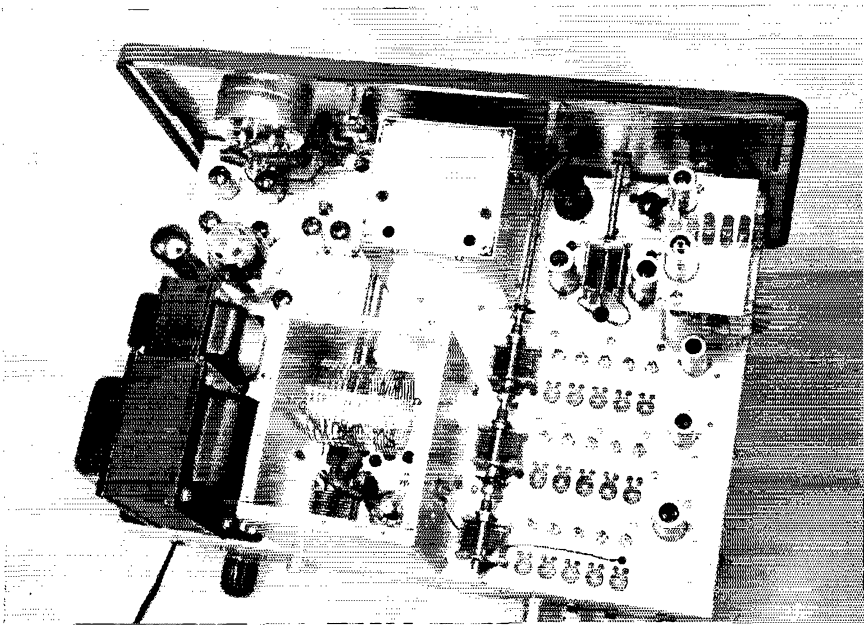
The 67A can be used with receivers having an i.f. anywhere from 440 to 510 kc., as well as with receivers with an i.f. from 800 to 1000 kc. This latter feature permits its use with some of the military gear, like the BC-348. The only modification when using the 67A with a high-i.f. receiver is to transpose the two b.f.o. crystals.

I.f. signals up to 0.25 volts maximum can be handled by the 67A. The audio response through the unit is ±2.5 db. from 250 to 3200 cycles, and audio up to 0.5 volt is delivered at less than 1.5 per cent distortion. The side-band rejection is better than 50 db. — *B. G.*

The Johnson Viking Pacemaker

THE "Pacemaker" is a self-contained c.w.-s.s.b. (with or without carrier) transmitter having a peak-envelope output of 60 watts in each of its communication modes. Except for such conventionally-external accessories such as microphone and key, it is complete and ready to operate when plugged into the 115-volt line and connected to an antenna. The bands covered are 3.5–4, 7–7.3, 14–14.35, 21–21.45, and 28–29.7 Mc. The r.f. output amplifier is a 6146 with a pi-network tank circuit designed for operation into 50–600 ohm resistive loads.

The single-side-band signal is generated by the phasing method, and the scheme used for obtaining output on the various bands is quite different from anything used previously in transmitters of this type, so far as we know. In any frequency conversion system several alternative routes are available for reaching the same end frequency; one commonly-used method, for example, is to generate the s.s.b. signal at a fixed frequency and mix it with the output of a v.f.o. whose basic frequency range then has to be changed to cover the assortment of amateur bands. In the "Pacemaker" the designers chose to maintain the same v.f.o. frequency range for all bands, with appropriate trimming for bandspread. This is more favorable for v.f.o. stability, but means that the s.s.b. signal has to be generated on a different frequency for each amateur band. It is a fixed frequency in each case, of course, and in the "Pacemaker" is crystal controlled. Using the



Top-of-chassis view of the "Pacemaker." The shield box at upper center contains the v.f.o. The crystal oscillator, buffer, and r.f. phase-shift networks are on and under the elevated chassis at the upper right. Progressing down the right-hand side are the mixer, buffer, and driver r.f. stages. The 6146 final amplifier is in a separate box at the lower center (top cover of this box has been removed for this photograph). Power supply section is at the left. The audio amplifiers and balanced modulators occupy the space on either side of the v.f.o. near the panel.

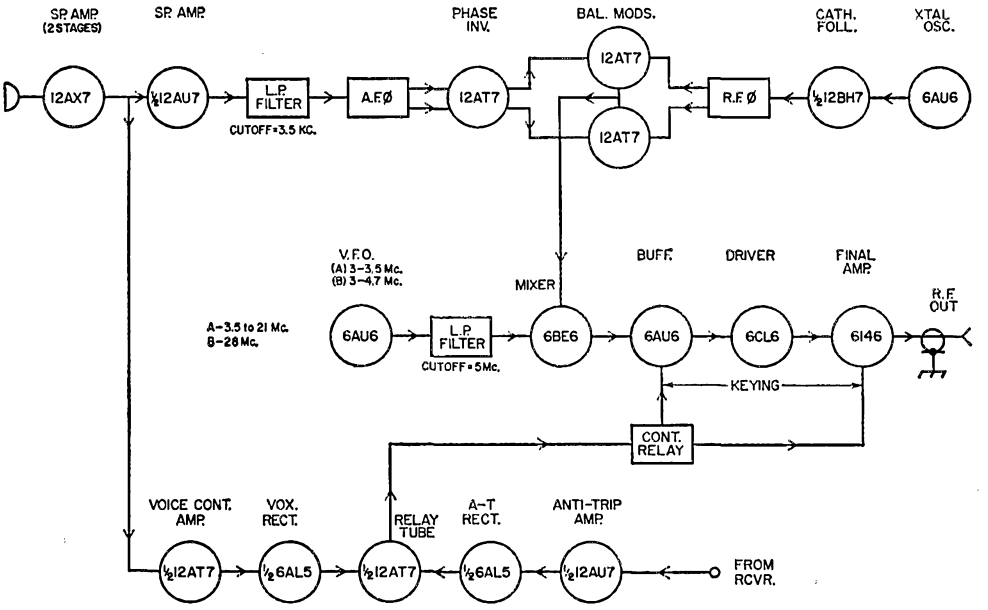


Fig. 1 — Block diagram of the "Pacemaker" r.f., audio and control sections. The single-side-band signal is generated on a separate frequency for each amateur band covered, using the phasing method.

v.f.o. ranges shown in the block diagram, Fig. 1, the crystal-controlled s.s.b. generator frequencies are 500 kc. (for 80 meters), 4 Mc. (40), 11 Mc. (20), 18 Mc. (15) and 25 Mc. (10).

As indicated in Fig. 1, the crystal oscillator tube is a 6AU6. It is operated in a straight pentode circuit with a separate switch-selected plate tank tuned to each of the crystal frequencies listed above. Immediately following it is a 12BH7 cathode follower which acts as a buffer and low output-impedance driving source for the r.f. phase-shift circuits. These are the simple *RC* and *RL* type each giving a shift of about 45 degrees so that in combination the total phase difference between the two r.f. outputs is 90 degrees.

Balanced Modulator and Audio

The balanced modulator circuit will no doubt be of interest to those who build their own equipment, since it is of a type that has not had much attention in amateur gear. It is shown in Fig. 2. Two triodes — in this case the two sections of a 12AT7 — are used, with the r.f. applied to the grids in parallel and the audio applied to the grids in push-pull. The plates are connected in push-pull so that the carrier voltage is balanced out in the output circuit; fine adjustment of balance is provided for by means of the 2000-ohm potentiometer in the bias circuit.

One advantage of the circuit is that no audio output transformer is needed, especially when the r.f. and audio voltages are kept below the grid-current point in the modulator, since the modulator grids represent a high impedance for audio. In Fig. 2, the push-pull audio is obtained from a simple phase inverter.

Depending on the modulator grid bias and r.f.-audio operating voltages, the modulator may operate in much the same fashion as either the familiar grid-bias modulator, or as a Class A modulator of the old Van der Bijl type. As compared with diode modulators, this type of circuit will give a gain instead of a loss. In the "Pacemaker" the modulator output circuit is band-switched along with the crystal-oscillator and phase-shift circuits.

The audio section of the transmitter uses a 12AX7 as a cascade preamplifier followed by a 12AU7 section as the third stage. The latter tube has transformer-coupled output in order to obtain an impedance step-down for working into a low-impedance low-pass filter. The filter cutoff is at 3500 cycles so that the audio is confined essentially to speech frequencies. The filter output is applied to the audio phase-shift network and from there the signal goes to the two sections of a 12AT7, one of which is shown in Fig. 2, for phase inversion to drive the balanced modulators.

R. F. Section

The precautions taken against the radiation of spurious r.f. components in the r.f. section are interesting. As shown in Fig. 1, the output of the v.f.o., a 6AU6 in the series-tuned Colpitts circuit, goes through a low-pass filter before being applied to the 6BE6 mixer. Thus the v.f.o. harmonics are attenuated before they have a chance to mix with the s.s.b. signal from the balanced modulators. The plate circuit of the 6BE6 is tuned to the output-signal frequency, and so also are the plate circuits of the following three linear amplifier stages. There are thus four tuned circuits between the output terminal of the transmitter and the point where the final frequency is created, providing high over-all attenuation of any off-

frequency beats that may be present at the mixer tube.

The driver and final amplifier both are neutralized by the capacitive-bridge method.

Control Circuits

The voice-control setup is shown in block form in the lower section of Fig. 1. The actuating audio signal is taken off after the preamplifier in the speech string, put through a separate amplifier and thence into a rectifier. The rectified d.c. is used to operate a relay-control tube. The relay has four sets of double-throw contacts; one set is used to turn the transmitter on and off through blocked-grid keying of the first buffer and final amplifiers, a second set switches a 115-volt circuit for an external antenna relay, the third set mutes the receiver during transmissions, and the fourth set is available for any use the operator wishes to make of it, such as to switch blocking bias on and off in a high-power linear amplifier. The control system includes an antitrip circuit making use of an audio signal from the receiver for balancing out the effect of microphone pickup from the loudspeaker.

Two "a.m." mode-switch positions are provided. On AM-LO, one side band is used with carrier, giving a carrier input of 35 watts. The AM-HI position is used only when the transmitter is used as a driver for a plate-modulated Class C amplifier, and simply makes the speech-amplifier output available at terminals in the rear. The audio output level is about 1 volt, so additional amplification is needed for driving an external Class B modulator. A separate speech amplifier having 10 watts output is available for this purpose. The 60-watt c.w. output of the r.f. end should be ample for driving a kilowatt Class C amplifier.

For c.w., the same grid-block method of keying the first buffer and final amplifier is used. The two stages are keyed directly, not through the control relay. *RC* networks in the blocking circuits provide shaping of the keying wave form.

Among the operating conveniences built into the transmitter is a mode-switch provision for "zeroing" without putting the set on the air. In this switch position the buffers are permitted to operate but the final amplifier remains cut off. The CARRIER INSERTION control, which is disabled when the mode switch is in SSB, is cut in when the switch is set to ZERO, so a carrier (adjustable as to amplitude by means of CARRIER INSERTION) is available for setting the transmitter frequency exactly on that of an incoming signal. Alternatively, the CARRIER INSERTION control may be left on zero, in which case the operator can "talk himself in" to the desired frequency.

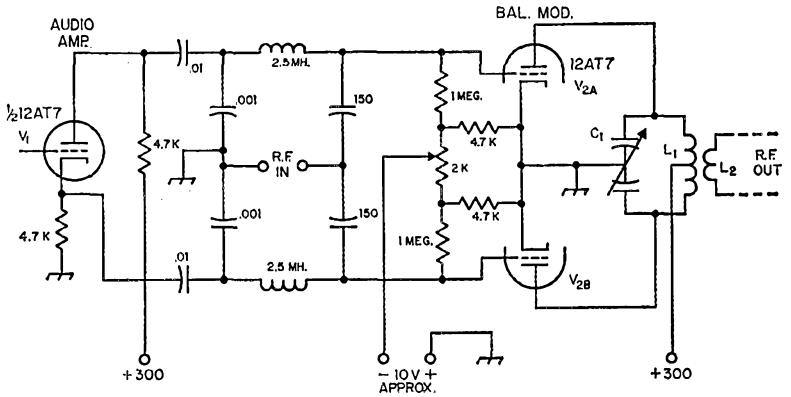


Fig. 2 — Balanced modulator circuit used in the "Pacemaker." The audio driver circuit also is shown.

Power Supply

The "Pacemaker" has three power supplies, one delivering 300 volts for the audio, balanced modulators, r.f. exciter sections, and 6146 screen, using a 5U4G rectifier. Voltage for the balanced modulators, v.f.o., and 6146 screen is regulated by v.r. tubes. A 750-volt supply with a 5R4GY rectifier is used for the 6146 plate. The third supply is for bias; it uses a 6X4 rectifier and delivers approximately 200 volts. All three supplies are from the same power transformer, which also handles all tube heaters.

The "Pacemaker" has the TVI-suppression measures that have been characteristic of the Viking series of transmitters, including complete shielding with "weatherstripping" around the cabinet joints, and filters on leads to external connections. — *G. G.*

Strays

In connection with the 1957 Jamestown Festival, the Richmond Amateur Radio Club offers the VA-JF certificate awarded for proof of two-way contacts with 25 different stations, phone or code, in the Commonwealth of Virginia during the year 1957. Send QSLs to the club at Box 1985, Richmond, Va.

—···—

Add odd coincidences. W5BKH and K5BKH are neighbors and fellow club members in Abilene, Texas.

Calibration of the Mark II Minitrack

Using Radio Stars as Signal Sources

BY ROGER L. EASTON *

• A principal difficulty in installations designed for radio tracking of the Earth Satellite has been that of accurate directional calibration of the antenna system or interferometer. The discovery that radio stars can be used for the purpose means that reliable calibration sources are available on a day-to-day basis. This article outlines the necessary requirements of the receiving equipment and lists the stars that will be useful.

Radio astronomy being somewhat outside the experience of the ordinary amateur, it will be helpful in understanding this article to read the story on that subject in the May, 1956, issue of *QST*. It is necessary, too, to understand the basic principles of the Minitrack system as described by Mr. Easton in his article in the July issue of last year.

IN VIEW of the difficulty in calibration of the Mark II Minitrack by means of aircraft-carried transmitters it is natural to look at radio stars as possible calibration sources. For best results this means of calibration does require some modification of the receiving equipment, but with these modifications it appears that with the brightest stars (Cassiopeia and Cygnus) calibration runs good to perhaps one-fourth minute of arc can be made. With less bright stars the results will be somewhat poorer, perhaps ultimately to one-half minute of arc.

The modifications to the equipment are (1) a wider predetection band width and (2) a narrower postdetection band width. These modifications are required because the radiation from radio stars is broad-band noise and is so weak every effort to improve signal-to-noise ratio should be made.

The maximum modulation frequency appearing at the receiver output of a 50-wave-length interferometer is about 0.004 cycle due to the earth's rotation in the star field.[1] This modulation appears on all of the broad-band star noise seen by the receiver. It can be shown that under these conditions the signal-to-noise ratio is improved by increasing the receiver predetection band width. The signal-to-noise ratio is also improved by using the minimum possible postdetection band width. However, to decrease phase shift the postdetection band width is usually set at about ten times the maximum detected frequency.

While radio astronomers use band widths of several megacycles it is difficult to use such a wide band width for star tracking with the same equipment that must also have, for satellite tracking, a band width of only a few kilocycles. As a compromise, the Mark II receivers we have built are being modified to have predetection band widths of 100 kc. and 5 kc. The band width change is obtained by switching the L/C ratios in the tank circuits used in the 470-kc. intermediate-frequency amplifiers.

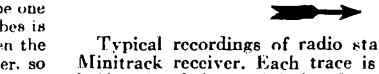
Fig. 1 shows two product-detector outputs for the radio source in Cassiopeia, the most active of the radio stars, for the following conditions: antenna gain, about 50; interferometer spacing, about 50 wave lengths; predetection band widths, 300 kc. and 10 kc.; postdetection band widths, 0.03 cycle. The upper curve shows the output from the narrow band width receiver. The time marks at the bottom of the figure indicate seconds of time.

Fig. 2 shows the product-detector outputs under the same conditions for the radio source in Taurus. The output from this source is down about 10 db. from that of Cassiopeia. (The bottom curve in both Figs. 1 and 2 is a low-gain presentation of the wide-band receiver output.)

Fig. 3 shows Cassiopeia with a band width of 100 kc. and Fig. 4 shows Taurus under the same conditions. Both curves in each figure show the same information, with the upper curve having the higher gain.

For recording these stars a slow recorder can be used since we are trying to resolve time only to one second or so. For Cassiopeia one second corresponds to about eight seconds of arc while for Taurus one second of time corresponds to about 15 seconds of arc (50-wave-length base line).

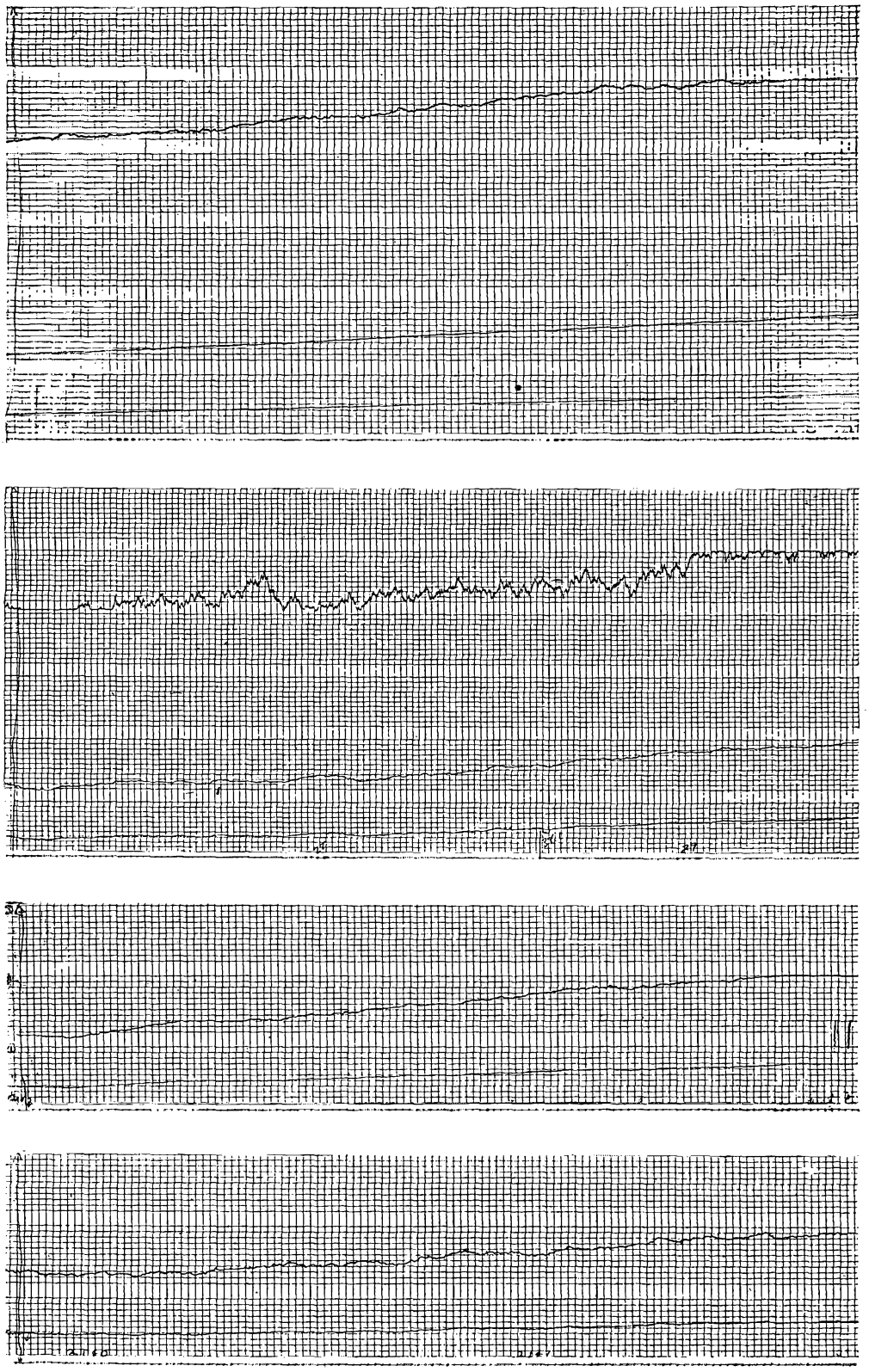
Before going further it would be well to discuss how the parameters of the systems used could be changed to improve the system.



Typical recordings of radio stars as received on a Minitrack receiver. Each trace is approximately one-half cycle of the modulation frequency and shows the variation in d.c. output of the receiver as an antenna lobe sweeps through the noise source. The figures (numbered in order with Fig. 1 at the top) are identified and described in the text.

* U. S. Naval Research Laboratory, Washington 25, D. C.

[1] Since most of us are accustomed to thinking of "modulation" as something of at least audio frequency associated with the signal itself, it is probably desirable to add that the modulation considered here is the change in the noise level in the receiver as the antenna-pattern lobes sweep across the radio star as the Earth rotates. There will be one such cycle for each antenna lobe. The number of lobes is proportional to the separation in wave lengths between the two antennas comprising the Minitrack interferometer, so the wider the separation the higher the modulation frequency. A modulation frequency of 0.004 cycle per second corresponds to a period or time interval of 250 seconds between successive maxima (or minima) in the received noise. — *Editor.*



One change that would improve the system is a longer base line. Doubling the base-line length would give double the postdetection frequency, and as a consequence the error in reading the time of transit could be reduced by nearly one-half as compared with the short base line.

The other parameter change that can improve the system is antenna gain. A higher gain not only gives a higher signal but also decreases the effects of other sources near the calibration source. The antenna gain can be increased only by varying the east-west beam width, since a wide north-south beam width is needed so both a number of stars and the satellite can be received. Probably a gain of 100 over isotropic is about as high as is practical.

One of the reasons a wide north-south beam width is needed is that the better sources for calibration all have northern declinations. Cassiopeia, the brightest of the radio stars, is at N 58° 32′. By declination we mean that at a latitude equal to this declination the star transits at the zenith. If the observer's latitude is 40°N this source transits 18° 32′ north of the observer's zenith.[2]

Table I[3] gives the positions of the sources which will be most favorable for calibration. Addition of the yearly change will give the positions for any new date desired. From this table, one can see that radio stars are by no means point sources as are the visible stars.

Table I

Right Ascension and Declination of Radio Stars Useful for Calibration

Source	Position (1950)			Yearly Change in Position	Size	Flux at 100 Mc.
Cassiopeia A	R.A.	23h 21m 12s	±1s	+2.69s	3′ × 4′	180 × 10^{-24}
	Dec.	58° 32.1′	±0.7′	+19.7″		
Cygnus A	R.A.	19h 57m 45.3s	±1s	+2.08s	2′ × 35″	125
	Dec.	40° 35′	±1′	+10″		
Taurus A	R.A.	05h 31m 29s	±2½s	+3.61s	3.5′ × 5.5′	18.5
	Dec.	22° 00′	±3′	+2.44″		
Virgo A	R.A.	12h 28m 15½s	±2½s	+3.03s	2.5′ × 5′	12.5
	Dec.	12° 44′	±6′	−19.8″		
Centaurus	R.A.	13h 22m 30s	±4s	+3.57s	3′ × 6½′	18.5
	Dec.	−42° 46′	±2′	−18.7″		

Table II

75th Meridian Crossings for Radio Stars on March 1, 1957 (EST)

Cassiopeia	12h	44m	28.5s	±1s
Cygnus	09h	21m	30.8s	±1s
Taurus	18h	53m	51.5s	±2.5s
Virgo	01h	53m	21.4s	±2.5s
Centaurus	02h	47m	30.9s	±4s

The time of transit for any of these sources can be calculated from Table II. Here the time of transit is given at the 75th meridian on March 1st for each of the principal sources. For each degree of longitude west of the 75th meridian the star transits 239.345 seconds later and for each day after March 1st the star transits 235.91 seconds earlier. For long intervals after March 1st the corrections for Right Ascension of Table I must be added.

Another source that has not been described is the sun. The reason for not including the sun is that the flux from the sun varies greatly with time and the center of flux varies about the sun's disc. The flux from the quiet sun at 100 Mc. is approximately the same as that from the brightest of the radio stars[4] while during active periods it may radiate as much as one million times as much 100-Mc. energy. Just how well the sun can be used as a calibration source by averaging its apparent transit over several days cannot be stated exactly but it may be measured in minutes of arc. A very active sun may introduce an error in the Minitrack data if the satellite transits near local noon. To minimize this error the predetection band width should be as narrow as possible.

An error which enters all of these calibration sources is that due to the nonstratified characteristic of the ionosphere, the so-called "wedge effect." According to Smith[5] this effect can be expected to introduce an unknown error of as much as 30 seconds of arc and a calculable shift of as much as one minute of arc. Since the satellite transmitter radiation will suffer part of the same shift, measurement of calibrating stars near the time of satellite transit will aid in calibrating out the wedge effect for the satellite.

Another source of error is due to lack of knowledge as to the exact positions of the centers of the radio stars. However, we can expect the accuracy of knowing these star positions to improve because of the large number of observations being made on them.

Help in the preparation of this article has come from several people. George C. Kronmiller, jr., Ensign, USN, and J. H. Berbert aided in the calculations. The star traces were made by Victor Simas, William Moriarty and George C. Kronmiller, jr. E. C. McClain helped in providing background experience in radio astronomy.

[2] Groups interested in the tracking project would do well to establish contact with local astronomers, professional or amateur, for technical help on the astronomical phases. The star "transits" when it passes over the observer's meridian of longitude. The zenith is the point in the sky directly over the observer's head. Declination and right ascension are elements of an astronomical coordinate system for locating objects in the celestial sphere. — *Editor.*

[3] Pawsey, J. L., "A Catalogue of Reliably Known Discrete Sources of Cosmic Radio Waves," *The Astrophysical Journal* 121, 1955, pp. 1–5.

[4] Pawsey, J. L. and Bracewell, R. N., *Radio Astronomy*, published by Oxford University Press, London, England, Chapter 5.

[5] Smith, F. G., "Ionospheric Refraction of 81.5 mc/s Radio Waves from Radio Stars," *Journal of Atmospheric and Terrestrial Physics*, Vol. 2, pp. 350–355, 1952.

The Governors-to-President Relay

JANUARY'S inauguration ceremonies were also the occasion for amateur radio activity in the 8th ARRL Governors-to-President Relay. Messages originating with 25 state's governors came successfully through to Washington; also one from the Canal Zone outside continental U. S. A. This one on 21 Mc. was the first to arrive in the first 15 minutes of the relay. Message checks ran from 10 to 102 words. The plan for this Relay followed the historic lines. Each SCM in sections having a state capitol was asked to designate an active amateur and station to obtain from the Governor a message to the President of the United States on the occasion of his inauguration.

The Washington D. C. gang, as always, did an outstanding job of organizing and operating on all bands to get the incoming radio messages. Activity on the air started officially Monday, January 21st at 1700 EST, continuing for a 24-hour period. Herbert Hoover, jr., W6ZH, under secretary of state, arranged for official receipt of the messages and their transmittal as a complete message delivery file to the President.

Amateurs who took part were thrilled at a chance to handle a communication to the President. Typical comments: "Thanks much for this opportunity to participate." "I feel very proud to have had a part in the Governor-Presidential Relay." "Ten other stations indicated readiness to help . . . may I for the Santa Fe Radio Club express my appreciation for the . . . relay. The publicity given here for this occasion was a great asset to all amateurs who participated."

Washington area stations, in addition to monitoring the National Emergency and Calling Frequencies, maintained connections with all incoming networks. A Hq. bulletin announcement with full details explained the pattern, including net frequencies, and the Washington calls and centralizing plan put in effect by Route Manager W3WV. This was widely circulated via SCMs. Leo Young, W3WV and other net members covered MDD's 3650-kc. frequency constantly. W3ECP QSYd to various nets in search of GPR traffic. W3AKB besides monitoring 3550 kc. acted as the central collection point (shown as *) for the whole 24 hours; the staff here included W3AKB, W3CDQ and W3BWT. W3PZA operated by W3BHE used 3875 phone. The Md. Emergency Phone Net was active in the Relay. W3CVE brought in several via TCRN and generally covered the 7 Mc. band. VN, VFN, and VSN were ably manned; W4IA says 7080 kc. was watched over by members of the Morning Watch; W3ZSX gave good ESN coverage.

Radio conditions deteriorated swiftly on all amateur bands after direct receipt of the C. Z. message. KP4DJ's filing from P. R., while being worked on by three Washington amateurs, was lost when under stress he made a move to another part of the phone band. Superlative operating, organization and teamwork brought in the GPR traffic. Characteristic comment was that conditions were extremely rough. "The bottom dropped out of the band." "Used a k.w. rig and needed every watt." "The worst in years, signals were weak and fading badly with blurring of characters."

Meet some of the mainstays who made this '57 G.P.R. a success (*L. to R.*): Fran, W3AKB; Ep, W3BWT; Van, W3ECP; Leo, W3WV; and Liz, W3CDQ.

Several examples might be cited showing how tough conditions were. W1BB had the Mass. message and hooked up with W3PZA, but with phone there was extreme relaying difficulty. W2AAO later attempted to take the traffic but again neither operator could be sure so at 2210 the message was sent through W3MCG on c.w. The Maine message took a 5-station relay to get to Washington where it was telephoned direct to the White House. Conditions *were* rugged. In K5HYX's case (no previous arrangement) W4FB, Al Hart of W3WTE, chief engineer for the President's communication system, was contacted. The New Mexico message was passed direct on s.s.b. phone and an earlier routing via W5KWR cancelled as unnecessary.

(*Continued on page 160*)

«

The Indiana PAM, W9SWD, starts the Indiana G.P.R. message!

General Operating With Mike or Key

BY JOHN HUNTOON*, W1LVQ

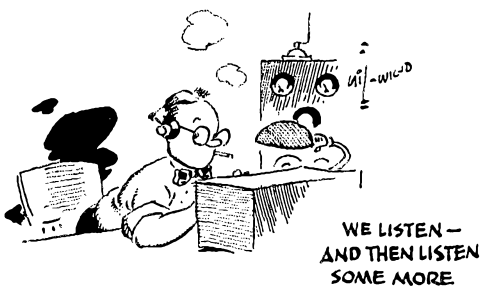
DINNER is finished and the clatter of dishes in the kitchen has subsided . . . the youngsters are in bed . . . the XYL has picked a good book and settled down for the evening.

The old man? Headed for the shack, of course. Tonight is the night for some "general operating" . . . rag chewing . . . just plain hamming.

We warm up the receiver and switch on the transmitter filaments. A crisp light on the operating table discloses log, scratch paper and pencil in readiness. A quick check shows the 100-kc. continuously-running standard and the shack clock right on the button with WWV . . . they always are, but since they're used so often we check each time anyway.

What's doing on 80? We turn the receiver dial, finding out who of the gang are on and what they are working. Say, there's Joe at W4 —, an old crony, but he's busy in a traffic schedule; maybe we can catch him later when he's through. Here's a CQ, with a nice fist—but shucks, it's directional-west, so guess we can't help him out. Let's go up in the band a little further. . . .

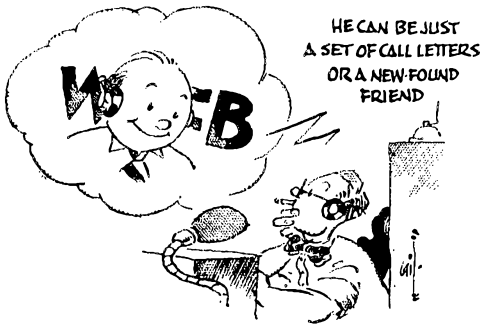
We're getting the "feel" of the band. Good operating starts with the receiver. We've read somewhere that time-recording clocks placed on transmitters of proficient ham operators show a maximum of 20 per cent and as little as 5 per cent of total time in the shack is spent by them in actual transmitting. The rest? — in listening, to make operating time return the most pleasure. A guy who barges into his shack and starts calling CQ while his receiver warms up is a pseudo-broadcaster, hardly a ham communicator. So we listen first. And then listen some more. . . .



Zowie! What a signal *that* one is — clicks 20 kc. away. Why don't some of these guys realize the importance of a clean signal? — to comply with the regulations, sure, but to go even beyond that so that copying is a real pleasure. Just as the neatness of a home tells a lot about the housewife, so a ham signal is a reflection of the operator — our calling card to the amateur world. When a new rig is finished it probably will produce a T9 signal right off, but a few extra minutes with soldering iron and *Handbook* on a simple keying filter will pay off many times: the other fellow wants to copy clean stuff as much as we do. Ah, ha! — no need to bust in and tell this guy about his clicks; the ham he's working is doing a nice, friendly job of that. . . .

Hey, there's another CQ. Close enough to where the transmitter was last set that there's no need to retune the final, but of course we'll have to call him right on or next to his frequency or we won't have a chance of raising him. Nice signal and fist, a W8 — don't think we've worked him before. So we flip the v.f.o.-only switch and zero in on the channel. Yes, v.f.o.-*only*. It's bad enough to have to put full carrier in a crowded band even for the few seconds required to tune up, but high on the list of public enemies is the guy who "swishes" his v.f.o. with the rig on the air. The v.f.o. is a great boon to ham radio but improperly handled can be the greatest bane. Monitoring the v.f.o., we tap out a couple of diddle-de-dah-dits to get the feel of the bug and to make sure it's set for about the same speed as the fellow we're going to call. There, he's signed . . . the big switch goes on, a couple of quick calls and BK . . . yep, there's his snappy break, and we sign.

So now "the door is open" — we're face to face with another amateur. He can be just a set of call letters or a new-found friend. We can mumble,



on our turn, that it's nice to see him, remark what nice weather we're having, and then shuffle off to "ring another doorbell" and go through the same routine all over again — if that's what we want. Or we can develop the greeting into a new and warm friendship — the stuff of which true amateur radio is made — and spend a pleasant half-hour or longer chatting about anything under the sun.

It's up to us.

Into the log goes the date, time, frequency and mode, and we wait for our signal report. Meanwhile, we're thinking of the more-or-less "standard" rut into which many amateurs fall in gen-

* Assistant General Manager, ARRL.
This article is essentially a reprint of one that appeared in *QST* for Nov. 1950.

THE R-S-T SYSTEM

READABILITY

1 — Unreadable.
2 — Barely readable, occasional words distinguishable.
3 — Readable with considerable difficulty.
4 — Readable with practically no difficulty.
5 — Perfectly readable.

SIGNAL STRENGTH

1 — Faint signals, barely perceptible.
2 — Very weak signals.
3 — Weak signals.
4 — Fair signals.
5 — Fairly good signals.
6 — Good signals.
7 — Moderately strong signals.
8 — Strong signals.
9 — Extremely strong signals.

TONE

1 — Extremely rough hissing note.
2 — Very rough a.c. note, no trace of musicality.
3 — Rough low-pitched a.c. note, slightly musical.
4 — Rather rough a.c. note, moderately musical.
5 — Musically-modulated note.
6 — Modulated note, slight trace of whistle.
7 — Near d.c. note, smooth ripple.
8 — Good d.c. note, just a trace of ripple.
9 — Purest d.c. note.

If the signal has the characteristic steadiness of crystal control, add the letter X to the RST report. If there is a chirp, the letter C may be added to so indicate. Similarly for a click, add K. The above reporting system is used on both c.w. and voice, leaving out the "tone" report on voice.

eral operation, when on the first transmission they say something like:

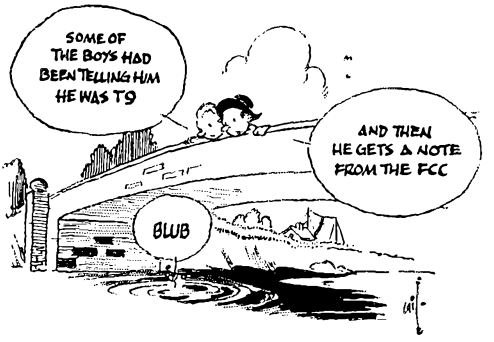
R R OK OM TNX FER CALL UR SIGS RST 579X HR IN EAST HARTFORD CT WX CLR ES WARM WL OM HW? W . . .

And on the next one:

R R OK OM TNX FER RPT OK ON UR WX WL OM GESS QRU HR SO TNX QSO ES HOPE CU AGN VY 73 W . . .

Strictly impersonal and unimaginative. Yet we fell into the same routine when beginning, being self-conscious in our first contacts and so imitating the scope of conversation the other fellow used in the thought that it must be standard amateur practice. And then came that fine day, after our first and very pleasant rag chew, when we realized that on the other end of the circuit was not just a collection of radio equipment but a real, live human being. We'd been in a rut and, as the saying goes, the only difference between a rut and a grave is in the dimensions. Hope this W8 isn't like that.

Oops, almost missed the signal report: RST 489, and down it goes in the log; he says there's a bit of interference locally. Mighty good op, that, who realizes every S8 signal is not automatically R5. Many of us have forgotten that the numbers have definition and meaning. R-Readability is a gauge of *ability to understand* the signal — roughly, what percentage of material is actually being received as communication. S-Strength, an entirely separate measure, of course relates to *strength* of the signal. It is perfectly possible for a weak signal to be 100 per cent copiable, in which case the report might be Readability 5, Strength 3. Conversely, a hefty signal being messed up by even stronger interference might be reported as Readability 2, Strength 8. The customary 579X can be an accurate report in an uncrowded band with average conditions, but is too often improperly used, strictly out of habit, under other conditions. Fairness in RST reports will ensure that the other fellow will do likewise and your log entry under "my sigs" will mean something, too. T-Tone is a particularly-abused measure; a T7 report won't bust up a beautiful friendship if the guy at the other end is any kind of ham; he wants to know the quality of his signal if it's below standard rather than being patted on the back with a false T9 so that he goes along blissfully in ignorance. . . .



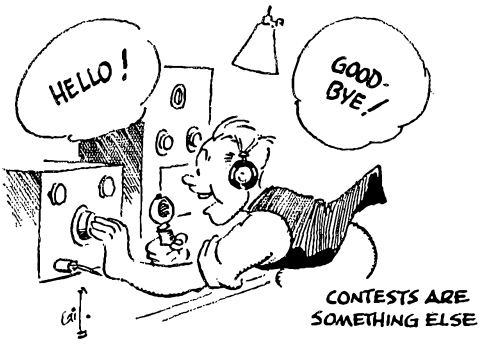
"HR IN MANSFIELD OHIO . . ." Drove through there a couple of years ago headed west on vacation; must ask him if he's ever had steak sandwiches at that little diner west of the city on Route 30N. His name — Bill, and we mark it in the log for future reference. Ho! — says he's just come in from planting early peas in the garden. That means we can swap notes on sweet corn, varieties of winter squash (wonder if he's ever had stuffed zucchini), and whether or not to stake tomato plants. Boy, this is going to be a swell chew!

And it is. Gardening happens to be the opener, but it might have been one of a thousand other subjects, radio or otherwise. We hams have to have standard operating procedures in calling and signing for convenience and speed in communications, but what goes on between the BT signs is up to us. That's where we cease being only radio operators and become individuals.

Contests are different. In an SS, for example, the idea is to make the greatest number of contacts in a given time and therefore each one as short and snappy as possible. That's fair enough for a contest aimed at developing operating proficiency and skill. But we're talking about general operating . . . rag chewing . . . just plain hamming, where "hello-goodbye" contacts have no place, where we forget our secondary status as a bug-pusher or a mike-holder and become an individual.

That's what ARRL's RCC (Rag Chewer's Club) is for — to promote fraternalism in ham

radio and get away from stereotyped contacts. We're mighty proud of that little blue certificate on the shack wall, signed by The Old Sock. A



half-hour rag chew reported to Hq. by postcard and confirmed by the other fellow, already an RCC member, was all that it required. It's a pleasant reminder of the many enjoyable contacts of a half-hour or longer that have occurred since, like this one, and we hope that will continue long in the future. . . .

And so we learn a lot about Bill of Mansfield, his garden, his rig, his family, and we in turn tell him about ours. The contact goes so smoothly we can't help noting his expert use of abbreviations to save time, and Q signals when they fit. He's not trying to break any speed records, though, and keeps his sending rate down to what can be handled on the bug with a minimum of errors. When there is a bust, it is corrected with the standard sign • • • • • • • • (eight dits), the proper indication of error. He doesn't use R at the beginning of a transmission unless he really got us solid. His sending is clean, and a pleasure to copy. We're getting a mighty warm feeling for this fellow Bill. Novel, too, though mighty logical, the way he uses periods (.—.—.—) at ends of sentences and the double-break (BT) to set off paragraphs of thought. Of course in rag chewing there's a minimum of punctuation used.

The contact is enjoyable, further, because we're "reading" him and not copying down his transmission verbatim. Took us a while to break away from the solid pencil copy habit, but now we can sit back and take it easy, of course making notes on items that we specifically want to remember for comment when it's our turn. In fact, once or twice we break in with a particularly pertinent comment, of course remembering that while it's not necessary to sign a comment of less than three minutes' duration, in a series of rapid exchanges we must sign at least every ten minutes.

Yipes! — nearly 8:30 and time for the late session of the section phone net. Where'd this last hour go? Hate to bust it up but want to check into the net tonight. How about a schedule for Thursday, OM? Fine, we'll be there, same time, same spot. A million tnx, Bill, and CU then. 73. No need for a drawn-out, flowery leave-taking, full of multiple 73s and dripping with insincerity.

Up goes the receiver dial. We swing the v.f.o. up, flip the "tune" switch for low power, and adjust the final, then kick in the modulator. All set. And just in time — there's the net control station. We make final frequency adjustment to his channel with the v.f.o.-only switch. Listen to him handle that net call up — his push-to-talk system is a marvel, darned near as useful as break-in on c.w. Got to look up details and fix this old crusher the same way, or maybe even try voice control. Only have two switches now for changeover, but that's one too many in comparison to the punch this fellow gets into — and out of — his hamming.

It's so smooth it seems to "just come natcherly," but he sure knows his voice operating. To start with, there's no confusing background such as a broadcast set running wide open in the next room. Most important, he *says it with words.* Funny, isn't it, how we carry c.w. abbreviations into phone use when probably the reason we got on voice was to use words! When this fellow wants a net member to stand by, he says "please stand by," not "please QRX a minute." And none of the "okay on this, okay on that" sort of thing; when he says okay, he means okay on everything, without feeling obligated to recite a check list to prove it.

Our turn, near the end of the list — at his "break" we make a quick check-in. Couple of the other fellows have traffic and while it's in process let's make out a QSL card to Bill so we can mail it first thing in the morning. . . . Turns out there's not much else doing tonight, so the net breaks up a little early. A few of the boys hang around for a round table. We listen a few minutes, noting their efficient sign overs: "W1AAA [next station to transmit] and the gang in the Blank Net, this is W1BBB, over." No waste of time here. And there'll be no questionable language or indulging in rumor-spreading or pseudo-broadcasting for the entertainment of SWLs in *this* crowd; while the appeal of ham radio to these fellows is the personal contact, they still maintain it on a high plane.

Us? Headed for 20 phone. Need Oklahoma for WAS on that band, and maybe it'll still be open. Hope we can find someone in the Sooner State — and hope he'll be in the mood for a rag chew. . . .

On the way down, though, let's stop off on 40 for a minute. Conditions seem pretty good, and the band is full, as usual. What's this carrier? Oh, somebody testing. He's signing . . . a new ham if his call means anything — and there he starts a CQ. Let's get the rig on 40, quickly. Oklahoma will have to wait. We'll never forget the courtesy and understanding shown us by the ham fraternity in our first contacts, and here's a chance to repay it in part by extending the same hand of welcome. He's a little shaky, but doing his best, and that's all we can ask of a newcomer. In a few weeks he'll be in there handling his station with the best of them. When he gets over that initial nervousness, he'll find ham radio as enjoyable an avocation as it has been to the rest of us these many years. OK, OM, here we come. . . .

1957 V.H.F. Sweepstakes Results

Tenth Running Sets All-Time V.H.F. Activity Records

PUT THE STATISTICS on the 1957 V.H.F. Sweepstakes through your Univac in any way you like and chances are that you'll come out with a record high. There never has been anything like it. Acceptable logs: 837, against last year's record 753; club entries: 41, with 28 in 1955 as the previous high; top score: 11,920 points, more than 5000 ahead of the best work heretofore; ARRL Sections: 53, up from 49; contacts by one operator: 339, a slight increase; high club aggregate: 69,575, a leap of 37 per cent. And so it goes.

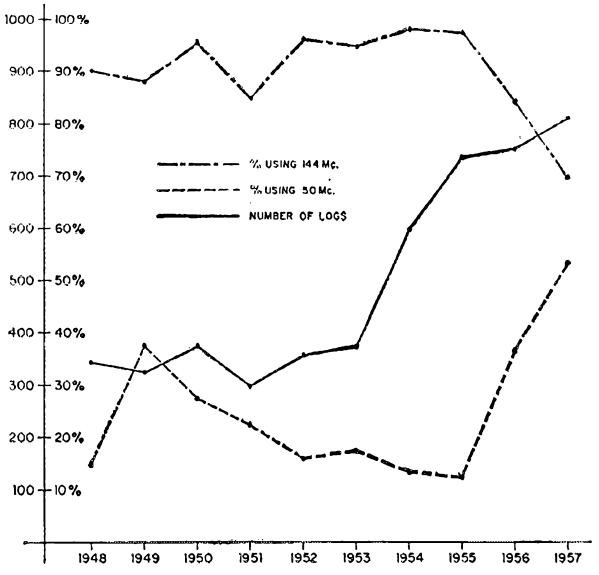
The graph tells the story; several stories, in fact. Growth in over-all participation is shown in the solid line. After passing through TVI Valley, in 1951, we put on steam steadily, and we're still going up. Novices helped to pull us out of the doldrums, and 2-meter activity all but took over the yearly contests from 1952 through 1955. Use of 50 Mc. dropped steadily until the Technicians appeared on the scene in 1955. The 1956 V.H.F. SS is the first in which they participated on 50 Mc., and the curve shot from a low of 12 per cent participation in 1955 to nearly 40 per cent. This year the 50-Mc. percentage swung up to 53 per cent, an all-time high.

The sharp drop in the 144-Mc. curve should not be viewed with alarm by 2-meter men. There were more 2-meter entries in 1957 than in any of the contests prior to 1955. The band curves are for percentage of the total number of logs.

Most of the leaders still work both bands, but not all. For the first time the country's top competitive score was made on 50 Mc. only. Helen Harris, W1HOY, operating under the call of the Waltham Amateur Radio Association, W1BU, ran up a record score of 9000 points on 6 only. Catching the several kinds of DX openings turned the trick for Helen. She worked 20 ARRL Sections and 226 different stations. The record number of contacts, 339, was amassed by W3KKN, Willow Grove, Pa. Ernie hooked only 12 sections, so his combined 50–144 total was 8136 points. W1RFU, Wilbraham, Mass., topped this score with only 272 contacts, making 6 pay off for 15 sections and 8150 points on 2 bands. Several 2-meters-only men did right well. W3ZEY and W3IBH finished one-two in this category, only one contact apart, and with the same section multipliers, for 3690 and 3672 points, respectively.

The 6-meter band offered many kinds of DX for the quick and able. Ionospheric scatter was used for V.H.F. SS contacts for the first time by W4IKK, W1HDQ and K2ITP. Back-scatter from Europe during Sunday morning made possible several extra sections for the fellows who were set up to capitalize on it. Several short bursts of sporadic-*E* skip swelled the totals, and there was just a taste of F_2 transcontinental propagation, mostly between VE1s, W1s and VE7s. VE1EF and VE7ND were the stars of this part of the show. Something that never happened before in v.h.f. contest history: KL7VT, Summit Alaska, worked several Ws on 50 Mc.; 11 contacts in 5 sections. Not to be outdone in the territorial scoring, the Honolulu Amateur Radio Mobile Club organized its own private competition, turning in 7 logs from the Hawaii Section.

Club interest grew in many quarters, but it grew equally in that populous territory between New York and Washington. Result: the South Jersey Radio Association took another v.h.f. gavel, with a record club total of 69,575 points. To show that there is always a chance for an outsider, the Midwest V.H.F. Club put on a tremendous drive and rolled up 57,656 points for second place. This was the first time that other



Rising tide of V.H.F. Sweepstakes activity is shown in these curves of the 10-year history of the contest. The Novice Class license triggered off a sharp rise in overall participation in the years after 1951. Operation on 50 Mc. fell off steadily until the band was opened to Technician Class operators. They were largely responsible for the upswing in 6-meter interest in 1956 and '57. More than half the contestants showed 50-Mc. activity in 1957.

CLUB SCORES

Club	*Aggregate*	*Certificate Winner*
South Jersey Radio Assn	69,575	W2TBD
Midwest V.H.F. Club (Ill.)	57,656	W9WOK
Mt. Airy V.H.F. Radio Club	50,177	W3KKN
Hampden County Radio Assn	45,015	W1RFU
Hartford County Amateur Radio Assn	40,112	W1PHR
Dayton Amateur Radio Assn	22,498	W8SVI
Waltham Amateur Radio Assn	19,712	W1BU[1]
Morris Radio Club	14,416	W2IDZ
North Penn Amateur Radio Club	13,029	W3TDF
Mobile Sixer's Amateur Radio Club	8558	W3HFY
V.H.F. Institute of New York	7616	K2JLR
Lake Success Radio Club	7454	K2JWT
Framingham Radio Club	7240	W1ZWL
York Road Radio Club	5976	W3GRY
El-Ray Amateur Radio Club	5276	W1AQE
Mid-Island Radio Club	4496	K2IEJ/2
Keystone V.H.F. Club	4184	W3DEX
IBM Radio Club (ENY)	4028	K2GCH
Connecticut Wireless Assn	3969	W1FTX
MIC Amateur Radio Club	3062	W3ZFM
Albany Amateur Radio Assn	2922	K2HPN
Chesapeake Amateur Radio Club	2664	W3LMC
Cathay Amateur Radio Club	2294	K6EOW
Springfield Amateur Radio Club	2092	W8EHW
Seneca Radio Club	1804	W8MVE
Rochester V.H.F. Group	1586	W2UTH
Motor City Radio Club	1284	W8SSO
Amateur U.H.F. Club of Jamaica	1247	K2LDK
Southeastern Michigan Amateur Radio Assn	968	KN8AKQ
Stratford Amateur Radio Club	826	W1RFJ
IBM Amateur Radio Assn. (WNY)	792	K2ERQ[2]
Aero Amateur Radio Club	672	W3KLA
Nashville Amateur Radio Club	566	W4RFR
Midwest V.H.F. Club (Mo.)	489	KØBVL
Bandhoppers Radio Club	356	W9GEP
Totem Amateur Radio Club	356	VE7ND
Harford County Amateur Radio Assn	294	W3QKC
Mohawk Amateur Radio Club	204	VE3BOW
Honolulu Amateur Radio Mobile Club	148	KH6OS
Greensboro Radio Club	76	W4ACY & W4NHW
Silvergate Amateur Radio Club	20	K6HLQ

[1] W1HOY, opr. [2] W2YLM, opr.

29 other clubs mentioned, but with less than the required 3 logs.

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than an East Coast club has made the Number 2 spot, and their aggregate was well above any previous winning total! Another newcomer, not even in being a year ago, the Mt. Airy V.H.F. Club of the Philadelphia area, put over 50,177 points to land in third place. Long-time rivals for places in the upper brackets of club scoring, the Hampden County Radio Association, the Hartford County Amateur Radio Association, and the Dayton Amateur Radio Association, in that order, posted the only other club totals over 20,000 points.

The country's top Novice was a midwesterner, KN9EZN, with 117 contacts in 4 sections for 936 points. *Somebody* must tune above 145 Mc., though we heard one lone KN1 on 146.5 Mc. say that he called for four hours before making his first contact! Something of the activity available to the W9s can be judged from the total of W9WOK: 208 QSO's on 50 and 144 Mc., for 3744 points, the Illinois Section award, and the club high for the Midwest V.H.F. Club.

Too few logs came from West Coast sections, but there must have been somebody operating — W6SDW/6 made 297 contacts on 50 and 144 Mc., in only 2 sections. We received a total of 10 logs from the Los Angeles and San Diego Sections. Where were the other 287? The return from the Bay Area was better. W6RLB showed the way here, with 161 contacts on 6 and 2 in 6 sections for 1932 points. In the Northwest, W7VOG in Seattle was the leader. Max worked 54 stations in 11 sections on 6 only, for 1177 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. The highest-scoring Novice and Technician also receives a certificate in each section where at least three such licensees submitted valid contest logs; footnotes denote these winners. Columns indicate final score, number of contacts, number of different sections worked, and the bands used. A represents 50 Mc., B 144 Mc., C 220 Mc. and D 420 Mc. Multioperator stations are shown at the end of each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3KKN...8136-339-12-AB
W3TDF...5980-231-13-AB
W3HYJ/3...5520-230-12-AB
W3TYX...5500-250-11-AB
W3HFY...5016-228-11-AB
W3ZEY...3690-205- 9-B
W3IRH...3672-204- 9-B
W3VOC...2808-156- 9-B
W3GHM...2681-192- 7-AB
W3HYO...2240-160- 7-B
W3ALR...2212-158- 7-B
W3SAO...2128-152- 7-B
W3FTP...1960-140- 7-B
W3GRY...1888-118- 8-AB
W3RZU...1680-105- 8-B
W3FSC...1572-131- 6-B
W3DHH...1568-112- 7-B
W3ZKG...1554-111- 7-A
W3VGN...1310-131- 5-B
W3CLQ...1284-107- 6-B
W3ULC...1248-104- 6-BB
W3AJF...1225-123- 5-AB
W3CUB...1106- 79- 7-A
W3HWV...1100-110- 5-B
W3AMO...1040-104- 5-A
W3CCX...1008- 84- 6-B
W3UMI...1008- 84- 6-B
W3DEX...996- 83- 6-AB
W3NKD...944-118- 4-B
W3IMW...940- 94- 5-B
W3UZF...912-114- 4-B
W3VMJ...868-110- 4-AB
W3FOZ...728- 91- 4-B
W3YWW...708- 59- 6-A
W3GBO...705- 71- 5-B
W3OZP...700- 70- 5-B
W3CPT...678-113- 3-B
W3ZFM...660- 67- 5-A
W3SXD...624- 52- 6-A
W3UQJ...576- 48- 6-AC
W3YEA...576- 96- 3-B
W3CL...516- 86- 3-B
W3JAY...498- 83- 3-B
W3OWW...492- 41- 6-AB
W3QXV...480- 60- 4-A
W3SST...480- 48- 5-ABD
WN3JXT[2]...440- 55- 4-B
W3GBT...432- 54- 4-B
W3ULB...392- 49- 4-B
W3NXT...370- 37- 5-B
W3ZHF...330- 55- 3-A
W3OCI...320- 40- 4-ABD
WN3GTC...312- 52- 3-B
W3FEY...310- 31- 5-B
W3FUL...284- 71- 2-B
W3WIJ...270- 45- 3-A
WN3GVW...270- 27- 5-B
W3BQU...260- 66- 2-B
W3ZTL...234- 39- 3-A
W3SOR...232- 58- 2-AB
W3DRC...228- 38- 3-B
W3ZRR...228- 38- 3-A
W3BUR...222- 37- 3-B
W3CUO...208- 26- 4-A
W3GDV...204- 34- 3-B
W3TXO...204- 34- 3-A
W3ZOR...180- 30- 3-A
W3YRB...144- 18- 4-A
W3YNC...136- 17- 4-A
W3DYL...120- 30- 2-A
W3HFG...120- 20- 3-B
W3BRU/3...114- 19- 3-A
W3GCR/3...96- 24- 2-B
W3DRF...90- 15- 3-B
W3CRL...84- 14- 3-A
W3ZYO...80- 20- 2-A
W3EDO...52- 13- 2-B
WN3FLD...40- 20- 2 B
W3BUC...24- 12- 1-B
W3UKI (W3s DGI IBN UKI) 3504-220- 8-AB
W3JNT/3 (8 oprs) 1729-124- 7-AB
W3TF (9 oprs) 1704-142- 6-AB
W3FZC (W3s GCR YJQ) 1160-116- 5-AB
W3CXU (W3s CXU OQG) 870- 88- 5-AB
W3WHK (W3s FIO WHK) 56- 14- 2-B

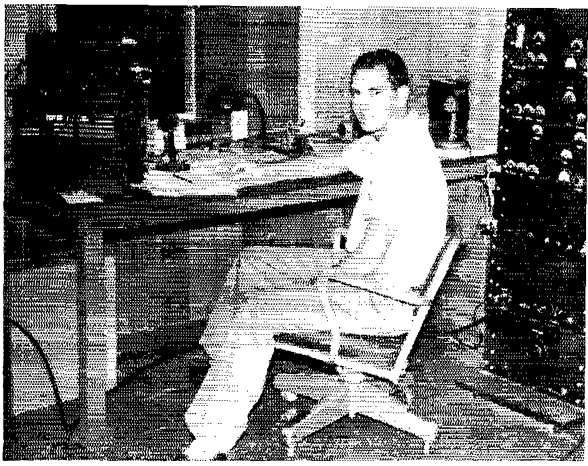
Md.-Del.-D. C.

W3CGV...2317-168- 7-ABCD
W3TOM...1750-125- 7-AB
W3LMC...1188- 99- 6-B
W3GKP...1024- 64- 8-B
W3OTC...1008- 63- 8-A
W3LZZ...740- 74- 5-B
W3UCR...688- 86- 4-AB
W3KLA...624- 52- 6-AB
W3DDS...616- 77- 4-A
W3KMV...600- 60- 5-A
W3AHQ...522- 87- 3-AB
W3UYJ...432- 54- 4-B
W3DVN...384- 48- 4-AB
W3HB...336- 42- 4-B
W3ONP...304- 38- 4-B
W3BYM...288- 36- 4-A
WN3GNQ...272- 34- 4-B
W3EAW...231- 39- 3-A
W3QKC...224- 28- 4-B
W3MSR...216- 36- 3-B
W3IQA...192- 32- 3-A
W3MAR...132- 22- 3-A
W3JXN...80- 20- 2-A
W3YPU/3...52- 13- 2-B
W3QLG...24- 12- 1-B
WN3JDF...24- 12- 1-B
W3ETU...18- 9- 1-B
W3AUN (W3s AUN DWU GCO)...700- 70- 5-A

Southern New Jersey

W2TBD...5357-244-11-AB
K2HOD...4086-228- 9-AB
K2DCF...4004-182-11-AB
K2JVX...3736-234- 8-AB
W2JAV...3660-183-10-AB
W2PAU...3360-211- 8-AB
W2BLV...3186-177- 9-B
W2REB...2448-153- 8-AB
W2EIF...2226-159- 7-AB
W2PHV...2160-135- 8-B
W2BAY...1848-154- 6-AB
W2EH...1764- 98- 9-B
W2NFL...1722-123- 7-B
W2EWN...1686-141- 6-AB
K2UBR...1458- 81- 9-A
W2ADA...1332-111- 6-AB
W2LBX...1308-109- 6-B
W2DAJ...1272-106- 6-B
W2NSJ...1210-121- 5-AB
W2OQN...1210-121- 5-AB
W2ZUL...1160-145- 4-AB
W2GQO...1150-115- 5-B
KN2THX...816-102- 4-B
K2PTJ...776- 97- 4-B
K2BPX...736- 92- 4-B
K2CJK...686- 87- 4-B
W2HBE...680- 85- 4-B
W2OSD...680- 85- 4-B
W2EXT...624- 78- 4-B
W2UCV...600- 75- 4-B
W2QBH...570- 95- 3-B
W2YRW...512- 64- 4-B
K2KIQ/2...510- 85- 3-AB
K2BGO...480- 80- 3-B
W2LY...474- 79- 3-B
W2JRO...438- 73- 3-B
K2SMZ...420- 42- 5-A
W2ASG...400-100- 2-B
W2TAV...366- 61- 3-B
K2WAO[3]...348- 58- 3-B

John Chambers, W6NLZ, Palos Verdes Estates, Calif., used 50, 144 and 420 Mc. to win the Los Angeles Section award.



W2SDO....318- 53- 3-B
K2HJY....310- 81- 5-B
K2DFE....246- 41- 3-B
K2DNF....236- 59- 2-B
K2PDR....228- 38- 3-AB
W2OGZ....212- 53- 2-B
KN2RRC...180- 45- 2-B
K2PDH....168- 42- 2-B
K2HHO....160- 40- 2-B
K2PPV....136- 34- 2-B
W2VX.....132- 33- 2-B
W2ZX.....132- 33- 2-B
K2BG.....104- 26- 2-B
W2SDZ.....76- 19- 2-B
W2OXV.....72- 18- 2-B
K2ITQ (K2s ITP ITQ)
6048-252-12-AB

Western New York

W2UTH...1400- 70-10-AB
W2LXE...810- 81- 5-B
K2IAX....656- 41- 8-A
W2QNA....584- 73- 4-AB
W2RCK....520- 65- 4-B
W2SOK....496- 62- 4-B
K2ERQ[4]..468- 39- 6-A
W2VCI....416- 52- 4-B
W2DV.....264- 22- 6-B
W2PST....204- 34- 3-AB
W2MYN....184- 46- 2-B
W2QY.....152- 38- 2-B
W2KIJ.....86- 22- 2-A
W2YIK.....72- 18- 2-AB
K2CWD.....72- 18- 2-AB
K2QIG.....68- 17- 2-B
KN2UXF....34- 17- 1-B
W2RHQ.....30- 15- 1-A
K2DCI.....22- 11- 1-B
K2QLE.....14- 7- 1-B
W2QYV (K2s PMP UWW)
116- 52- 4-B
W2SFW/2 (W2s OW SFW)
48- 12- 2-B

Western Pennsylvania

W3FPH....750- 75- 5-AB
W3KWH (W3s ANX RXT WHY ZUZ)
464- 58- 4-AB

CENTRAL DIVISION

Illinois

W9WOK..3744-208- 9-AB
W9QKM..1848-154- 6-AB
W9OBW...1760-176- 5-AB
W9ROS[1]..1750-125- 7-A
W9REM...1680-105- 8-B
W9DRN...1675-168- 5-ABC
K9DOE...1250-125- 5-A
W9JYG...1220-122- 5-B
W9PBP...1164- 97- 6-B
W9EQC...1120-112- 5-B
W9ALD...1068-134- 4-AB
W9ULF...1016-127- 4-AB
W9RPH...944-118- 4-AB
W9VNW...940- 94- 5-B
KN9EZN[2]..936-117- 4-B
W9YOI...904-113- 4-A
W9EET...896-112- 4-AB
W9MYC...864-108- 4-AB
W9IIO....800-100- 4-B
KN9EZT...768- 96- 4-B
KN9ESB...752- 94- 4-B
W9QBJ....744- 93- 4-B
W9YLY....712- 89- 4-B
W9KZS....704- 88- 4-AB
W9ZIH....696-116- 6-B
W9AKR....672- 84- 4-A
W9MVJ....664- 83- 4-B
W9DEN....648- 81- 4-A
W9PUW....648- 81- 4-B
W9IJG....640- 80- 4-A
K9AGU....640- 80- 4-AB
K9ANC....640- 80- 4-A
W9BOZ....608- 76- 4-B
W9CT.....608- 76- 4-B
W9KLD....600- 60- 5-B
W9UMD....592- 74- 4-B
K9EWV....592- 74- 4-A
W9NW.....584- 73- 4-B
W9HXF....568- 71- 4-A
W9BBA....560- 70- 4-A
W9AYM....544- 68- 4-B
W9PPW....544- 68- 4-AB
W9ALR....536- 67- 4-B
W9HQZ....500- 50- 5-A
KN9ERT...496- 62- 4-B
W9FTT....480- 80- 3-B
W9HXK....480- 60- 4-A
K/KN9CSS
480- 60- 4-AB
W9ZEX....460-115- 4-B
K9BCJ....448- 56- 4-A
W9PPA....440- 55- 4-B
W9BUB....438- 73- 3-A
W9QKE....438- 73- 3-B
W9INF....420- 70- 3-B
KN9EEC...420- 70- 3-B
W9RON....400- 50- 4-B
K9AEC....390- 65- 3-B
W9GCH....384- 64- 3-A
W9DJ.....378- 63- 3-B
W9FPO....376- 47- 4-B
KN9DOC...372- 62- 3-B
W9GKD....348- 58- 3-A
W9HPG....348- 58- 3-B
K9BDJ....348- 58- 3-A
W9BUK....336- 66- 3-B
W9QJO....336- 56- 3-B
K9ADB....336- 42- 4-A
W9UCF....330- 55- 3-A
K9APQ....324- 54- 3-A
W9SPM....312- 52- 3-B
K9CEM....288- 36- 4-B
W9YNQ....273- 46- 3-A
W9LUL....268- 67- 2-A
W9RON....264- 66- 2-A
W9BBR....240- 40- 3-B
W9OGA....240- 60- 2-AB
W9RYI....240- 40- 3-A
K9ACZ....240- 30- 4-A
W9BOD....216- 36- 3-AC
W9RSD....196- 49- 2-A
W9SID....160- 40- 2-A
W9MGN....156- 26- 3-A
K9AEY....156- 39- 2-A
W9CX.....152- 38- 2-B
W9NYO....152- 38- 2-A
W9ELV....150- 25- 3-B
W9OMU....136- 34- 2-A
K9AOG....136- 34- 2-A
W9ZFM....132- 33- 2-A
W9ADO....108- 27- 2-B
K9BBK....104- 26- 2-A
W9GOB....100- 50- 1-A
W9JGL....98- 49- 1-AB
W9RPK....88- 22- 2-A
W9HXH....84- 42- 1-A
KN9DKG/9
84- 42- 1-B
W9KCW....82- 41- 1-B
W9FRO....72- 18- 2-A
K9GGE....72- 18- 2-A
W9TRP....68- 34- 1-B
KN9DNG...64- 16- 2-B
W9VGT....50- 25- 1-A
K9AMG....48- 24- 1-A
K9BEO....46- 23- 1-A
W9PVZ....42- 21- 1-B
K9AIA....42- 21- 1-B
W9HKA....36- 9- 2-B
W9KBP....36- 9- 2-A
W9VGU....34- 17- 1-B
W9DYX....28- 14- 1-A
K9BDI....28- 14- 1-A
K9BDK....26- 13- 1-A
K9DTE....26- 13- 1-A
W9HXI....24- 12- 1-A
W9NLF....24- 12- 1-B
K9ALR....24- 12- 1-A
W9UJC/9...22- 11- 1-A
W9RSU/9...16- 8- 1-A
K9DOI....16- 8- 1-A
W9SLZ....14- 7- 1-A
W9SEK....10- 5- 1-A
W9VX.....8- 4- 1-B
W9ZIV (W9ZIV K9EBC)
300- 50- 3-B
K9DPG/9 (3 ops8)
212- 53- 2-B

Indiana

W9SWH...712- 89- 4-A
W9CAW...700- 70- 5-B
W9HLY...656- 82- 4-A
W9LPT...648- 54- 6-A
W9ORW...536- 67- 4-B
W9MHP...372- 47- 4-AB
W9OVL...360- 60- 3-A
W9YIL....198- 33- 3-A
KN9EEK..176- 22- 4-B
K9AQP....162- 27- 3-B
K9EFU....102- 17- 3-A
K9GFK.....4- 2- 1-A
K9GFL.....4- 2- 1-A

Wisconsin

W9JAQ...1253- 90- 7-B
W9GAB...600- 60- 5-AB
W9TQ....600- 75- 4-AB
W9NVK...568- 71- 4-AB
W9ZBO...348- 58- 3-A
W9RXS...312- 39- 4-B
K9EWT...300- 50- 3-A
W9JFP....186- 31- 3-A
K9CAL....162- 27- 3-B
W9ZBO....90- 15- 3-A
W9RTZ/9...48- 12- 2-A
W9QNM....10- 5- 1-A
W9JCI (W9s JCI JFP)
1212-101- 6-A

DAKOTA DIVISION

South Dakota

WØRSP....60- 15- 2-B

Minnesota

WØOFZ...1222- 48-13-A
WØOGW...891- 12-11-A
WØDXY....48- 12- 2-B

DELTA DIVISION

Arkansas

KN5IPL....12- 3- 2-B

Tennessee

W4RFR....306- 26- 6-AB
W4HHK...265- 27- 5-AB
K4DNG...124- 31- 2-A
K4CWB....96- 24- 2-A
W4YRM....40- 20- 1-A

GREAT LAKES DIVISION

Kentucky

W4VLA....750- 75- 5-AB
W4KZF....328- 41- 4-A
KN4MEE...120- 20- 3-B
K4HTO....108- 14- 4-A

Michigan

W8URO...2064-129- 8-B
W8SDK[1]..1512-108- 7-A
W8PT....1176- 84- 7-AB
W8ARR....930- 93- 5-ABD
W8JXU....848-106- 4-AB
W8SSO....780- 75- 5-A
W8CVQ....750- 75- 5-AB
KN8BOU[2]..700- 70- 5-B
W8HJR....480- 60- 4-A
K8CZP....480- 60- 4-A
W8PYQ....460- 46- 5-AB
W8SEB....376- 47- 4-B
W8YFQ....368- 46- 4-B
KN8AKQ...360- 45- 4-B
K8AOY....352- 44- 4-A
KN8CPO...328- 41- 4-B
W8JUV....288- 36- 4-B
W8VRH....288- 36- 4-B
KN8CWB...280- 35- 4-B
W8CBM....276- 46- 3-B
W8CRY....264- 33- 4-B
W8EYJ....240- 40- 3-A
K8AYC....210- 35- 3-A
W8DDO....184- 46- 2-B
W8EKK....160- 20- 4-B
W8VIX....152- 38- 2-AC
KN8BXP...129- 22- 3-B
W8TIN....102- 17- 3-A
W8GWA....80- 20- 2-B
W8ION....60- 30- 1-A
W8UJC....40- 20- 1-A
W8NUE....18- 9- 1-A
W8MAH....8- 4- 1-AB
W8VYG/8...6- 3- 1-A
K8CFY (W8WAO, -K8CFY)
51- 26 1-A

Ohio

W8LPD...5304-205-13-AB
W8SVI...1938-162- 6-ABC
W8NRM...1834-131- 7-ABC
W8LOF...1736-124- 7-B
W8MVN...1536-128- 6-A
W8SQU...1526-109- 7-A
W8MVE...1428-102- 7-B
W8HOH...1230-123- 5-AB
W8GFN...1216-152- 4-AB
W8JSW...1170-117- 5-AB
W8SDJ...1056- 88- 6-B
W8EHW....996- 83- 6-B
W8TPL....990- 99- 5-AB
W8NAF....882-147- 3-AB
W8VOZ....876-73- 6-BC
W8SVU[1]..864- 72- 6-A
W8LUZ....840-105- 4-B
W8KDW....664- 83- 4-AB
W8FPZ....660-110- 3-AB
W8CWL....630- 63- 5-A
W8MVL....630-105- 3-AB
KN8DOH[2]..628- 79- 4-B
W8INQ....608- 76- 4-A
W8JRN....504- 84- 3-B
W8DPW....498- 83- 3-B
W8NEE....492- 82- 3-AC
W8RHA....486- 81- 3-B
W8IPT....474- 79- 3-B
W8ILC....470- 47- 5-B
W8ZCV....462- 77- 3-AB
W8KJT....444- 74- 3-B
K8BCW....426- 71- 3-A
W8EDS....424- 53- 4-B
W8DSQ....416- 52- 4-B
W8CJC....412- 52- 4-B
K8BYP....400- 50- 4-A
KN8AEW...396- 66- 3-B
W8RKL....372- 62- 3-A
W8KFC....366- 61- 3-B
W8HTD....360- 60- 3-AD
W8IJL....360- 45- 4-B
W8BAX....352- 44- 4-ABC
W8IMK....352- 44- 4-A
W8IGI....344- 86- 2-AB
W8QGT....344- 43- 4-B
W8GNX....342- 57- 3-B
KN8BSE...312- 95- 3-B
W8BMO....300- 75- 2-AB
W8KSE....300- 50- 3-A
W8PLQ....276- 69- 2-AB
W8ZSK....276- 69- 2 B
W8JPQ....274- 69- 2-B
W8GHX....270- 45- 3-A
W8QFA....258- 43- 3-A
W8FNH....256- 64- 2-B
W8LCY....256- 32- 4-B
W8WUP....252- 63- 2-AB
W8MVA....234- 39- 3-B
W8AQ.....232- 29- 4-AB
W8WRN....228- 38- 3-ABC
W8TEX....226- 57- 2-B
W8ZOF....216- 54- 2-B
W8SEL....208- 52- 2-B
W8PQZ....200- 50- 2-B
W8JSR....188- 47- 2-A
W8WPH....156- 39- 2-A
W8LIL....122- 31- 2-A
W8IED....120- 30- 2-B
W8MCW....120- 60- 1-B
W8VPG....118- 63- 1-B
W8QDI....116- 58- 1-B
W8UDE....112- 56- 1-A
W8FKC....100- 25- 2-ABC
W8CUJ....94- 47- 1-B
W8FV.....94- 47- 1-A
W8OEI....94- 47- 1-AB
KN8BUG/8..94- 47- 1-B
W8ZKH....90- 45- 1-B

(*Continued on page 148*)

Field Day Statistics

For many of us, Field Day is a carefree picnic-type activity. Each June we sashay out to the country with the XYL and harmonics in tow, or with the fellows in the club. The primary object is to get the emergency-powered gear alive and kicking, but we may manage to sneak in a fast round of golf or maybe a bit of swimming or fishing. We don't knock ourselves out and we have a jim-dandy week end.

For others, competitive incentives are foremost. Clubs often pair up to wager dinners on the outcome, or strenuously strive to improve their own results from year to year. For those so inclined, much skullwork is devoted to squeezing the last drop of efficiency out of transmitters, to use of better skywires, to development of infallible logging systems. December *QST*'s final standings become an all-but-limitless source of idea material, a gold mine for trend-analyzing. Contact-per-hour averages and like data receive close scrutiny. Field Day is not a blood-in-your-eye grind even for such perfectionists, but you can bet your batteries that — at their setups anyhow — no op will be traipsing off on a golfing trip when the bands are hot and QSOs are to be made!

On page 69 of *QST* for May, 1955, there appeared, via the good graces of WØIUB, statistics covering the nine postwar Field Days. These have been updated, in the figures below, to encompass 1955 and 1956.

Observe the many pace-setters new to the scene in the biennium. Among them W5EKK/5's four operators, while high in New Mexico's Manzano Mountains, averaged a cool 27½ QSOs per hour to become undisputed champs in the club one-rig class. West Coast groups have seized records for five, nine, ten, 13 and 14 transmitters, including an all-time high of 3069 contacts by Pacifico Radio Club's red-hot K6BAG/6. Cleveland's Westpark Radiops continue to zip along atop the club aggregate mobile listings, and K2OFQ and W3QQO have proved that sport is to be had even from the home station. Yet totals amassed by portables W2GSA/2 and W4KFC/4, and W6MBA/6's mobile accomplishments have stood the test since 1950 and 1951.

Simultaneous Transmitters	*Most Contacts*	*Call Used By Club*	*Year*
1	660	W5EKK/5	1956
2	983	W3BES/3	1954
3	1151	W4KFC/4	1951
4	1425	W6PD/6	1954
5	1395	W6CG/6	1955
6	1434	W4FU/8	1953
7	1570	W4FU/8	1954
8	1593	W2GSA/2	1951
9	2316	K6BAG/6	1955
10	3069	K6BAG/6	1956
11	2252	W2LI/2	1956
12	1626	W1OC/1	1953
13	2285	W6UF/6	1956
14	723	K6RXC/6	1956

Class of Entry	*Most Contacts*	*Call*	*Year*
One transmitter (unit or individual), 1 op	318	K6DQA/6	1955
One transmitter (unit or individual), 2 ops	520	W6TSW/6	1953
Two transmitters (unit or individual), 2 ops	535	W6AOA/6	1951
Mobile, 1 op	277	W6MBA/6	1950
Mobile, multiop	274	W6MBA/6	1951
Home rig on emergency power, 1 op	240	W1TIA	1952
Home rig on emergency power, multiop	435	K2OFQ	1956
Home rig on commercial mains, 1 op	463	W3QQO	1955
Home rigs on commercial mains, multiop	833	W4KFC/4	1954

Year	*Number of Participants*	*Number of Log Entries*
1946	1936	187
1947	2702	288
1948	4660	305
1949	4942	495
1950	5935	609
1951	6118	644
1952	6451	522
1953	7007	692
1954	8380	819
1955	10,190	1112
1956	9815	1053

Largest Number of Participants:
87, Northern N. J. Radio Assn., 1951

Biggest Mobile Aggregate Score:
95,948 points, Westpark Radiops, 1956

The 1957 FD hovers on the horizon and already the shop talk has begun. Peruse the figures, pick your target, set your sights. Then good hunting June 22nd and 23rd. May all your breakdowns — whether equipment or nervous — be minor ones!

— *P.S.*

Malibu and Morrill's Landing

Amateurs Perform Outstanding Service in Emergencies at Opposite Ends of the Nation

• Within two weeks of each other, disasters struck at the northeast and southwest extremeties of our country. Although greatly in contrast both as to distance from each other and type of emergency, the two operations had one thing very prominently in common — that amateur radio figured very heavily in each. The stories of the disasters you have seen on television, heard on the radio, read about in newspapers. This is the story of amateur radio's part in them, related to us by amateurs who were on the scene.

MALIBU FIRE

THE yuletide season seems to be getting to be a favorite time for Old Man Disaster to hit California. In 1955 it was a flood. Last year a quite contrasting type of disaster struck Southern California. Shortly before dawn on December 26, 1956, a fire of unknown origin began to spread through the dense and tinder dry brush of the coastal maountains behind Malibu, California. Within a week, 20,000 acres were blackened with the loss of sixty-seven homes and millions of dollars of damage to other structures and the watershed.

The Radio Amateur Civil Emergency Service of Los Angeles County played a vital role in the fire fighting. RACES was activated at 0400 on the 26th by W6EVL and K6AYJ. W6PNN, District Radio Officer for Malibu was also notified and in turn called K6PCX, and the amateur effort was under way. K6CPT-10, RACES NCS for Malibu, went on the air on 1995 kc. and 145.46 Mc. This station remained in action continuously for six days, eight hours and twenty-one minutes, and was operated by W6EVL, K6AYJ and relief operators at Pt. Dume. Flying cinders made operation continuously hazardous and heat from the fire made for shirt sleeve weather.

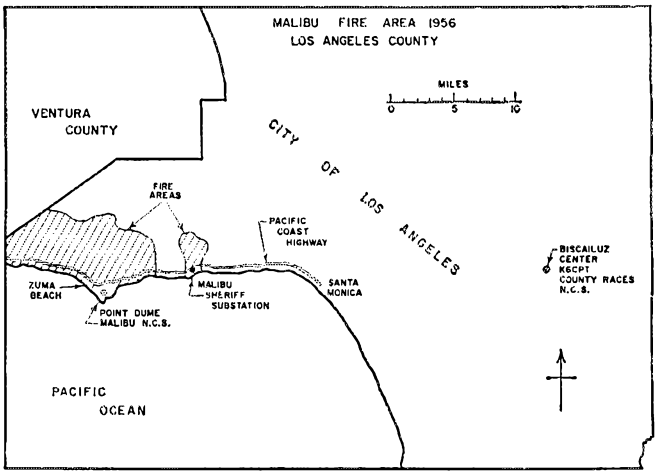
W6PNN put the prearranged disaster plans into operation and all RACES members in the Malibu area were picked up on the nets. Situation reports were relayed to the Malibu Sheriff's Station by mobile units and specific jobs were assigned as other disaster services were effected. A 2-meter RACES mobile communications unit was dispatched to Pt. Dume, manned by W6FIY and W6OQA to establish communication with the Malibu Sheriff's Substation. Once established, this link carried all traffic to and from the sheriff's patrol cars until the fire was controlled. At times there were over 100 patrol cars in the area so the importance of the job done by this RACES link cannot be over-estimated.

By 0900 on the 26th, it became apparent that a major disaster was threatened. The entire Los Angeles County RACES was activated from control station K6CPT in Los Angeles, some 40 miles from the Malibu area. District Controls, representing all 14 districts of the county, spread over more than 4,400 square miles, responded, and in minutes District Nets on 2, 6, 10 and 75 meters were checking in over 500 certified RACES operators. W6QJW, Deputy Los Angeles County Radio Officer accompanied by W6PCO, drove to the Malibu control station to assist the Malibu District Radio Officer and to provide for county-

This is the installation of K6CPT-10, Malibu District RACES Control Station, with operators W6EVL and K6AYJ on duty. Equipment is available for operation on 28, 144 Mc. and 1995 kc. from left to right respectively.

wide control. Their progress to Pt. Dume was halted at one point by flames sweeping across the Pacific Coast Highway near Paradise Cove.

In mid-afternoon of the 26th relief operators were requested to go on duty throughout the night. County NCS at Biscailuz Center arranged for these replacements by calling upon the other districts that were standing by. This procedure was repeated many times as the days passed and the response of the RACES group was extremely gratifying. At no time was any emergency circuit shut down for lack of operating personnel. Many non-RACES amateurs volunteered to help, some of whom could be and were used, and did yeoman jobs. Other RACES groups, particularly the Los Angeles Civil Defense and Disaster Corps, remained on an alert status.



In addition to the 145.46 Mc. net dispatching the sheriff's traffic, local nets were established on 6 and 10 meters to provide communication for an evacuation center at the Webster School in Malibu. Also a two meter net included the Zuma Beach Fire Station, the control point for the fire equipment that was brought from all over the greater metropolitan area and from surrounding cities more than 100 miles away. Some RACES units were assigned to accompany fire apparatus which lacked radio equipment, thereby permitting the coordination of their activities. Early evaluation of the extent of the fire was obtained from W6PDL/AM.

While communications were increasing in the fire area, W6ONC, Los Angeles County Radio Officer; W6UQL, Alternate R.O.; W6AEJ, Alternate R.O.; and K6VJU, C.D. Communications Officer, worked in shifts at the County Information and Control Center to speed replacements for defective equipment, to arrange personnel clearance and to assist in keeping frequencies clear for emergency traffic. W6ONC and alternate ROs W6ZGC and W6QYY provided on-the-spot assistance at Malibu as the fire emergency passed into its fourth and fifth days.

At last the fire-fighters gained the upper hand and the 7-day battle ended. Even before President Eisenhower's December 29th declaration of Malibu as a "major disaster area," the RACES staff began to evaluate the strength and weakness of the radio plan in this type of disaster. Revisions are now being placed into effect so that the amateurs may render even more effective aid in the future. As it was, W6AEJ reports 3400 messages handled by 68 operators, most of them in mobile units.

A complete list of additional operators whose work should be acknowledged is not available before the deadline for this publication, therefore credit is due not only to the calls below and above, but also to the many other hams who responded to the call: *W6s* AEP BME BRC BXJ BZN CAR CEE CYM DQO EOE FNE FTJ GBQ BHZ GTE BY HWM HX IKJ ILW JFJ KBA KMT LUZ MTI NHP NSE NSV ORS PFR POP PTE QDD QID RBW RMK RRL RUY RXH SNE SOF SRE SXJ TLI TPN TTN TTU TTW WKC WXR VDS VLN VON VVT VZA YSK ZDO ZGF, *K6s* AHH AMN BAW BAY BSW BXW CPF EFW EIA GCT GHJ GSM GVI HLZ HQQ IDJ IRY IVB JCB JDF JFS JKN KIX KLK KQS KVB KXI KXR LBA LBE LDR LGL LLY LOX LQL MVH VYF OLO OPV PDL PTE PXW QLK QPW QYM QZZ TFK TDN TRC VJW, *KN6s* QAB RIK RWX SYJ TEE TRW, VLC, W4LKW/6.

We are indebted to W6QJW, Deputy Radio Officer for Los Angeles County, for the above account of this emergency.

BOMBER CRASH IN NEW BRUNSWICK

From hot to cold, amateurs in Maine were precipitated into action when a B-52 bomber based at Loring Air Force Base near Limestone, Maine, crashed in the wooded hills of New Brunswick, Canada. Rescue and search operations were conducted with the aid of amateur mobile operations and the Maine Sea Gull Net in twenty-below-zero temperatures. W1TZ provides us with the following details:

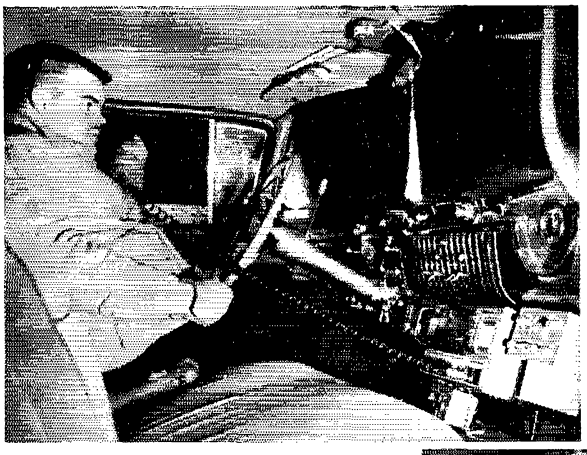
The crash and explosion occurred at approximately noon on January 10th, most of the wreckage landing near a small farm community called Morrill's Landing, N. B. Royal Canadian Mounted Police were notified by local residents and an immediate search party was organized consisting of the RCMP, French Canadian Guides, Air Force and Anti-Aircraft personnel, some 200 persons in all. One crew member had

parachuted to safety. Two were missing. The remainder had perished in the crash.

As soon as the downed aircraft had been located, K6MPJ moved his mobile unit to the scene and established contact with W1ECF at Loring and details of conditions and equipment and personnel needed were passed back to the base. Interference on the 75-meter frequency being used was so bad that W1VYA (Maine SCM) was contacted to make arrangements for possible relief. W1VYA contacted the Transcontinental Phone Net, where W1TZ gave him information on how to contact Boston FCC office for a declared voluntary emergency. At 2000 FCC declared the frequency segment 3935–3945 cleared for emergency operation on a voluntary basis, and W1TZ put a bulletin on 3950 to that effect.

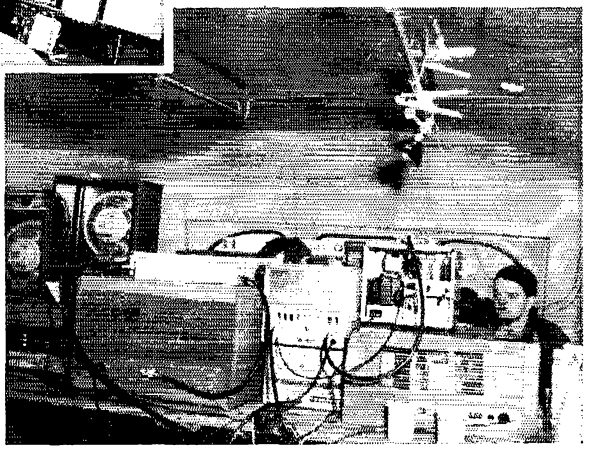
Traffic between K6MPJ/VE1 and W1ECF resumed under continuing difficulties as the skip grew longer and stations farther and farther away had to be cleared off the frequency. Traffic had to do with dispatch of ambulances, wreckers, "weasels," tank trucks, emergency power generators for lighting, etc. At 0300, W1ECF and K6MPJ/VE1 were still at it, although Rusty reported that his battery was getting weak — whereupon one of the wreckers put a jumper cable to one of their batteries. At 0530, with the temperature at —22°, the Air Force tank trucks were ordered back to base for a refill as the weasels, searching the surrounding countryside for the missing airman, had not yet returned. At daybreak, helicopters took over the search and things quieted down, although amateurs all up and down the East Coast were guarding the emergency frequency, warning away unknowing newcomers to keep the circuit clear for the K6MPJ/VE1–W1ECF circuit. By 1020, the helicopters were in contact with their base on Air Force frequencies and walkie-talkies at Andover had established contact with the searching 'copters, so the FCC voluntary declaration was terminated. Amateur operation continued on a "free-lance" basis, however, K6MPJ/VE1 setting up equipment in the back of an Air Force bus.

W1TZ lists the following other amateurs as having participated in the emergency operation: *W1s* BBS BSL FMP FMT TBZ TGW UDD UTR VDM WRZ YYW ZYB, *W2s* AI FCQ IUX KHU LQL VHS, K2SCQ, *W3s* APK PLL, *W4s* CLH ISX YJE ZCL, W9SQH. Amateurs participating were officially complimented and gratefully thanked for their assistance both by Brig.-Gen. W. K. Martin, Commanding General of the 45th Air Division at Loring, and by Maj.-Gen. H. N. Ganong, New Brunswick Provincial Coordinator of Civil Defense. Said the latter, in a letter to ARRL: "Please express to your membership the appreciation of the New Brunswick Civil Defense Organization for a job well done."



«

Most of the operation from K6MPJ/VE1 took place from this mobile installation. Rusty, K6MPJ, maintained contact with W1ECF at Loring Air Force Base for many crucial hours during the early stages of the emergency. The 20-below-zero cold did nothing to contribute to his comfort during this activity.



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Once the necessary equipment arrived, K6MPJ/VE1 was installed in the rear of an Air Force bus, as shown by this rear view. Complete station equipment was installed for operation on 2 and 75 meters.

YL News and Views

CONDUCTED BY ELEANOR WILSON,* W1QON

YL 1956 Edison Award Winners

YLs everywhere can be proud of the two women amateurs who were accorded high honors in the 1956 Edison Radio Amateur Award. "For her efficient and continuing service in the amateur message handling field," Mrs. Mary Burke, W3CUL, of Morton, Pennsylvania, was proclaimed award winner. A photograph and further details about W3CUL appear on page 68 in this issue.

A special citation was accorded Mrs. Martha Shirley, WØZWL, of Black Hawk, South Dakota. Her nomination for the Edison award was for operating twenty-four hours during a two-day sleet storm that isolated several South Dakota towns last April and for operating four days and three nights during the blizzard emergency which kept her snowbound alone in November.

Heartiest congratulations to both YLs!

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

1956 Edison Award Special Citation winner Martha Shirley, WØZWL, is shown checking the temperature and amount of precipitation at a weather installation at her Black Hawk home. Since 1955, WØZWL has been conducting the South Dakota Weather Net, which meets each morning on 3870 kc. for the purpose of collecting weather reports for the U. S. Weather Bureau from sparsely settled areas in and around South Dakota. The XYL of WØYQR, Martha is the holder of six public service certificates and was the first amateur in her state to receive a BPL medallion.

Clarifying a Point

After a few kind introductory remarks, an OM friend launches into the point of his letter:

> "There seems to be one disturbing thread of propaganda that runs through your writings which may border on the subversive. I refer to your sustained, active, and one-sided support of hams who wish to convert their wives to amateur radio. You have maintained this party line for so long that now you even have people writing you letters saying that every ham hopes his wife will someday get a ticket too. This comes pretty close to brain washing.
>
> Now I realize that a lot of women are successful and happy in ham radio. I know also that there are women who are excellent big game hunters. I have seen women on television acquit themselves quite creditably in Australian tag team matches. Now, in defense of my own sex, I want to point out that this ranging versatility is not confined to women. There are many men who can do a lovely job of decorating interiors and arranging flowers. Some men are quite handy at the kitchen stove and can whip up a very toothsome souffle.
>
> These are fine and noble endeavors, but I wonder if we should insist upon them. It seems to me that a man should be entitled to a position of respect if he wishes to smoke cigars and attend sporting events rather than cook and sew. It occurs to me that there should be some niche in our social structure for the woman who does not want to be a radio ham, but would prefer to join a garden club and spend a little time bringing up her children. Furthermore, I might go so far as to feel that a certain degree of honor and dignity might be accorded her if we are to be truly tolerant people.
>
> You understand I am not trying to needle you or to be controversial, because these ideas may, or may not, represent my own personal viewpoints. I give you these thoughts quite timidly in the hope that you may foster a broader and more compassionate attitude on the part of those who must share the connubial noose." — W9VOX.

Never have we intended that all ham's wives get their own amateur licenses. Such a "party line" would be unreasonable and one we could never endorse.

We agree that there is versatility in the abilities of the sexes. Some men sew and some ladies wrestle professionally, but these are the exceptions rather than the norm. Up until now amateur radio has been primarily a man's hobby. The fact that a few thousand women have become amateur radio operators during the past forty years, however, indicates that the hobby is not reserved exclusively for males. There has been no outstanding resentment registered by the men against the intrusion into their hobby. In fact, some OMs rather enjoy it, and a number have concluded that amateur radio makes a fine hobby to mutually share with their spouses, and, by one method or another, have succeeded in interesting their wives in obtaining their own licenses. These cases are still in the minority;

the majority seems content to let their "better-halves" pursue their own interests, without any lessening of marital bliss, and that is well and good.

That there are women who are successful and happy in ham radio is a fact we advertise each month on these pages. But those women, married to amateurs who have no desire to follow their husbands into amateur radio, are happy too with other interests quite unrelated to radio communications. You must concur that a YL column in a radio magazine is scarcely the place to discuss Landowska's latest Mozart release, evaluate progressive methods of education, or question the message of Dali's newest abstract. These too are fine and noble endeavors, but our business is amateur radio, and campaigning for new recruits, whether they be Miss or Mrs., we feel is part of the job.

Hence, the thread of propaganda you refer to we cannot deny, but it is not intended to be malign, and it stems from enthusiasm. While we proclaim the virtues of ham radio, we seek no goal of total conversion. Should interest be expressed, we'll do all we can to foster it.

Thank you for airing the subject and prompting a declaration of intentions, for surely we don't wish to be responsible for strangulation by that connubial noose!

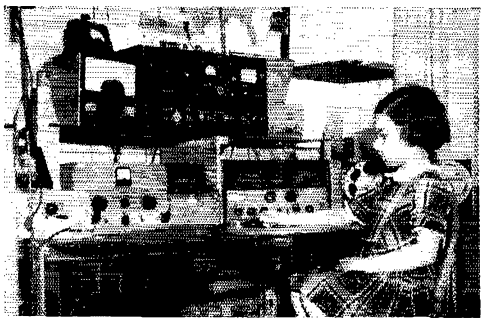
All of which startles us onto a new question. Was there ever a woman who *regretted* getting her amateur license? To be continued, if there is response to this one.

Keeping up With the Girls

CLUBS:

Young Ladies Radio League: Secretary W3VLX reminds all members that 1957 dues are payable. Send two dollars to Lolly Keller, W3VLX, 3316 Unionville Pike, Hatfield, Penna. Nineteen foreign YLs have been "adopted" by the club thus far this year. K2DYE, Jessie Learned, has been appointed second District Chairman, to fill a vacancy. The Wednesday C.W. net — 9:00 P.M. EST, 3610 kc., W1YPH NCS — has chosen the name East Coast YL Net.

Camellia Capitol Chirps, a new YL club in the Sacramento, Calif. area. (Members felt their selection of name would be appreciated by the Chamber of Commerce, for Sacramento is known as the camellia city of the world.) Nine YLs attended the charter meeting on Jan. 25th. Officers elected were Pres. W6ENK; V.P. W6HTS; Secy. K6UZA; Treas. K6ENH; and Pub. Chairman K6HOI. Meetings will be the fourth Friday of the month at members' homes.



Mother and daughter teams are now common combinations among our YLs, but Ruthella Reynolds of Messick, Virginia, has introduced a new one. Becoming KN4LXL shortly before her eighth birthday, Ruthella is the daughter of K4GKO and the granddaughter of KN4GUD! The third grade student has already worked a number of states using her small fist on 80 c.w. Photo courtesy of OM W4POB, who gave all three of the Reynolds YLs their novice exams.

Penn-Jersey YLs: Presiding over the club's twenty-one members are Pres. W4VCB/3; V. P. W3ZCF; Secy. W3APT; and Treas. W3FTP.

San Francisco YLRC: K6HIW has offered her home as a permanent meeting place for the club (2183 44th Ave., San Francisco) the third Friday of each month. New officers are Pres. K6HIW, Vp. K6CUV; Secy. W6QMO, and Treas. K6EEE.

Coming YL Get-Togethers

Dayton Hamvention

April 6th, Dayton, Ohio. For details see last month's column. A change in the program has been announced by Women's Activities Chairman W8MDK. Speakers in the YL Operators' Roundtable will be W8s ABM, HPP, MDK, and W9s JYO and RUJ, instead of as previously listed.

Orlando Hamfest

April 28th, Rock Springs, Florida. The St. Petersburg Amateur Radio Club YLs invite all Florida YLs to meet at the hamfest for the purpose of organizing a statewide YL club. A constitution will be adopted and officers elected.

Midwest YL Convention

May 24th thru 26th, Autorama Motel, Flint, Michigan. The Genessee County Radio Club is sponsor, with Esther Stuewe, W8ATB, Chairman. Friday there will be a luncheon, tour of local industry, buffet supper and QRM Party; Saturday — shopping tour, luncheon, and YL-OM Banquet; Sunday — tour of ham shacks. Two dollar registration fee should be sent to W8ATB, G-4098 E. Atherton Rd., Flint, Michigan, before May 10th.

New Certificate

The Texas YL Round-Up Net is offering another certificate, akin to its YL-OM 10CC certificate, the rules for

(*Continued on page 152*)

Some one hundred guests enjoyed the Los Angeles Young Ladies Radio Club's annual YL-OM banquet in February. Gladys Eastman, W6DXI, with her committee of W6s CEE, JZA, KER, and TDL, chairmanned the affair. Guest speakers were Danny Weil, VP2VB, of Yasme fame; Mr. Bernard Linden, FCC District Engineer; and Mr. Walt Joos, W6EKM, ARRL Southwestern Division Director. The fact that it was Valentine's Day may have had something to do with the display of friendship at the head table — photo, left to right: W6UTZ, W6WRT, B. H. Linden, W6QGX and W6GQP.

Navy Salutes W1BCR . . .

On February 12th it was our pleasure to attend a most colorful ceremony at the Navy Construction Battalion Center, Davisville, R. I. Surely, few amateurs have had their efforts rewarded with the receipt of a certificate and medal in the presence of three admirals and a correspondingly-large number of captains and commanders, a color guard, drill manuevers by three companies of bluejackets, and music by a Navy band. The occasion was the presentation of the Navy Distinguished Public Service Award to C. Newton Kraus, W1BCR, for his work in handling traffic between the Sea Bees in the Antarctic and their families back in the States.

The special citation and medal were presented by RADM Martin Kehart, Director of the Bureau of Yards and Docks' Atlantic Division. RADM H. C. Bruton, who is W4HH and Director of Naval Communications, also spoke and expressed his gratitude for the cooperation extended to the Navy by W1BCR and other amateurs.

Besides a sizeable contingent of Navy brass, the ceremonies were witnessed by a number of W1BCR's ham friends from around the eastern part of the country, a large group of civilians and Navy dependents, and members of the press. Included among the latter was the Channel 12 news crew from WPRO-TV, Providence, who recorded the ceremony on film for their local newscast.

Incidentally, W1BCR has also received a Special Citation in General Electric's Fifth Annual Edison Radio Amateur Award for outstanding public service, as reported elsewhere in this issue. — *R. L. B.*

. . . and Other Amateurs

CHIEF OF CIVIL ENGINEERS
DEPARTMENT OF THE NAVY
WASHINGTON

19 February 1957

American Radio Relay League
38 Laselle Road
West Hartford 7, Connecticut

Gentlemen:

During the past year amateur radio operators in the United States have contributed much to the success of Operation DEEP FREEZE by giving their time and services to the men of Mobile Construction Battalion (Special) in the Antarctic. They have made it possible for personnel in the Antarctic to talk to their loved ones and friends back home and I know this has contributed immeasurably to the morale of the men and their families.

So many of the amateur operators have been involved that it is not feasible for me to commend each one individually. Accordingly, I would appreciate it if you would express, through your organization, my heartfelt thanks to all amateur operators participating in this effort. We are most grateful for their services.

Sincerely yours,

R. H. Meade
Rear Admiral, CEC, USN

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

Regarding our January jabbering on T/L ratios, W7DET exhibits prima-facie evidence to corroborate our theory that DX men can be proud of their measly QRM output. "In my recently completed new layout I installed two hours-time meters, one on the transmitter filament circuit and the other in the plate circuit. Readings at the moment: filament time, 281.4 hours; and plate (transmitting) time, 35.4 hours." This comes close to a transmit/listen ratio of 1/7. Bill, a 170-country man, has been listening about 86 per cent of his operating time.

—•••—

Your ARRL DX Century Club made its own "DXCC" years ago, and now amateurs in well over 100 countries have qualified for such certification. Question: Has anyone amassed QSLs from DXCC members in 100 or more countries? Though nonendorsable, we could term this deal DXCC-DXCC or DXCC.² Nope, *don't* ship us the cards; but we're interested in clear black-and-white photos of the first DXCC² QSL collections called to our attention. Last December *QST*'s complete DXCC roster, plus Honor Roll "New Members" listings since then, will aid your research.

—•••—

And while on the subject of bizarre DXCC work, how about DXCC-BL? Have you worked phonies "in" 100 countries? This one is no cinch because the commonplace come hardest. Inasmuch as QSLs or lack thereof prove nothing, we suggest that the bootleggers themselves be referred to the nearest office of radio authority for proper primary certification.

—•••—

Dust off your crystal balls, Ouija boards and planchettes, DROBs! Required DX regalia this time of year, you know. Definitely here to stay, the happy neologism *DXpedition* annually comes into heavy usage as the North American vacation season bears down upon us. Who? Where? When?

Yes, make way for rapturous rumors of impending ham assaults on such out-of-the-way North American targets as Clipperton, Navassa, the Revilla Gigedos, Cocos, Saint Martin, Sint Maarten, Sandy Hook and lesser lights. . . . Europe will engender succulent scuttlebut concerning Vatican City, Albania, Andorra, the Alands, San Marino, Jan Mayen, Svalbard, Monaco, Crete, Rhodes and what have you. . . . Oceania lip and key service will be fervently rendered regarding the Kermadecs, Tonga, Nauru, the Tokelaus, Phoenix, Wallis and Bali-Hai. . . . South America will encourage tantalizing tidbits implying increased Aves, San Andres, South Sandwich, Easter, Galapagos and Brazilian Trinidad emanations. . . . Africa's gossip go-around will intimate imminent invasions of Ascension, St. Helena, Ifni, Tromelin, Seychelles, the Amirantes, Aldabars, Zanzibar, the Comoros and so forth. . . . Asia's wealth of DXpeditionary objectives will flap the grapevine, including the Andamans & Nicobars, the Maldives, the Laccadives, Wrangel, Yemen and Nepal, to name a few.

Come now, guys, just where would *you* like to go? It's good clean harmless fun. Merely pick DXotic QTHs — they need not show on any countries lists — and let your speculative cogitations radiate. Then sit back and count the many modified versions of your "plans" that come back to you in no time at all. You may even find yourselves peremptorily provided with calls, frequencies, on-the-air dates and QSL managers. But it's all part of the game.

Like spring, this fever's in the air!

What:

And it's likely that even if you don't show up as rare ones according to grapevine specs, some screwballs will fill in for you from their home stations. Anyway, we can't count you till we clutch your QSLs (*after* DXCC certification!). . . . OM Ionosphere affably oozes equinoctial equanimity right now and DX bands rock 'n' roll. A record number of riders climb aboard your "How's" Bandwagon this month and we iterate its simple legend: Frequencies (in number of kc. above the lower band limit) appear within parentheses, times without. E.g., (9) = 14,009 kc. if the paragraph treats on 20-meter work. Times are GMT using the nearest whole-hour figure such as 7 for 0720, or 0 for 2349. Space considerations invoke the rule that each DX-station suffix appear no more than once per band paragraph. We're off! . . .

* 4822 West Berteau Avenue, Chicago 41, Ill.

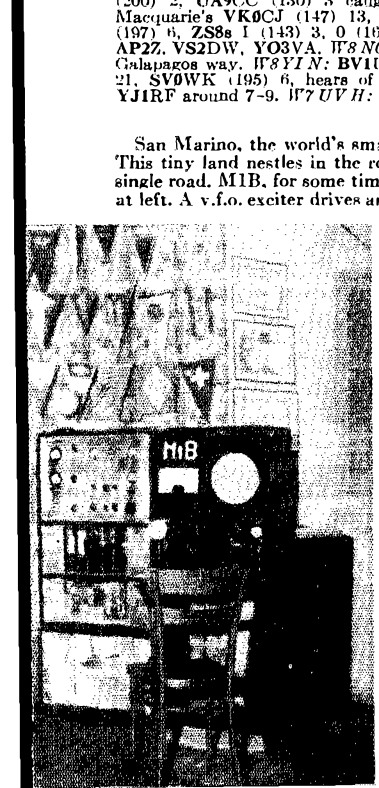
10 phone used to be a whistle-stop but my! how the place has grown! Recent trophies down the line, at *W0QGI:* VQ3AC for No. 123 on voice. *W9NDN:* KA2MIA 20, OQ5*RU* (460) 18; and s.s.b.ers YU1AD (650) 14, ZL3AR (645) 1. *W9RBI:* F9YP/FC (670) 14. *W9YVF:* EL1C. GC2RS, M1D. PI1VKL, VQ2JN. *W8NOH:* EL1H (300) 18, FQ8AK (224) 20, GD3GMH (300) 14, TF2WBG (445) 12, VQ4FK (408) 18, ZD6JL (155) 17, GC VQ3. *W8YIN:* KR6AF (430) 0-1. *K6BHM:* CR5AC (410), now 84/45 with lots of "easies" unaccounted for. *W5ERY:* BV1US. CRs 7AH 9AH. EA8CF. EL2F, KT1AG. OE6DK, UAs 1AB 1BE, UC2KAB, UQ2AN, VK9DR, VS6AE, ZP5CG, 4X4AB, 5As 2TZ 5TE, KR6 VQ3. *W5EYH:* CN8JW. CR7DS, DU6IV, HH2DB, KA2AD, KB6BC, KM6AX, KR6KS, KX6BQ, K5HNY/KG6, BV1 VP5 VR2. *W4HVH:* puts B'ham on the 'Bama DX map with DU1VVS, EA9EE, HP1BR, KA2s KS MR WK, VR2BC, TF ZLs. *K4HNA:* FF8AP, OQ5EI, VQ4s DT KP, ZE2KL, ZP5AM, 5A5TD, EA8 TF VQ3. *W3QMG:* CT2AH (525), DU1AP (520), EA8AX (510), ET2MZ (510), HE1RS (550), HI6EC (505), KGs 1LH (850), 4AC (850), KW6CA (850), KX6AF (580), MP4KAC (530), OQ5CJ (540), OY1R (690), SV0WE (510), TF2WBH (700), VPs 2MY (560), 3YG (550), 8BU (510), VQs 2AS (505), 4GF (510), VU2EJ (525), W0BLV/KG6 (720), YO3AG (520), YS2AG (550), YU3JN (515), ZC4IP (550), ZD4BL (600), ZSs 3AB (540), 7C (660), 3V8AX (550), CR5 CR9 UQ2, now at 148. *W3RPG:* M1D, YO3VA (240). *W2GBC:* CR4AP 0, EL2LC 1, ET2US 0, KG6AGS (550) 0, OK1MB 16, OQ5BK 18, OX3LD 17, VP1MA 23, ZL1CG 1, CR5 KG4 KX6 UA1 VP5 ZD4 5A, now at 109 on voice. *K2KDM:* s.s.b.d. with HZ1AB two-way (650). CN8GG, EA9EH, VQ4DP. *W1ICP:* reached 185/153, HE9LAA (450), UB5KAA (560), UC2, hears UN1AB (330), also hears Leningrad UA1s griping about TVI! *W1PNR:* Kuwait, UC2. *KA3CY:* most U. S. call areas, VSs 2CR 6AE 6CY, ZL2IY. *KZ5DX:* VQ5GC, 4X4BD, VQ3 VR2 YU.

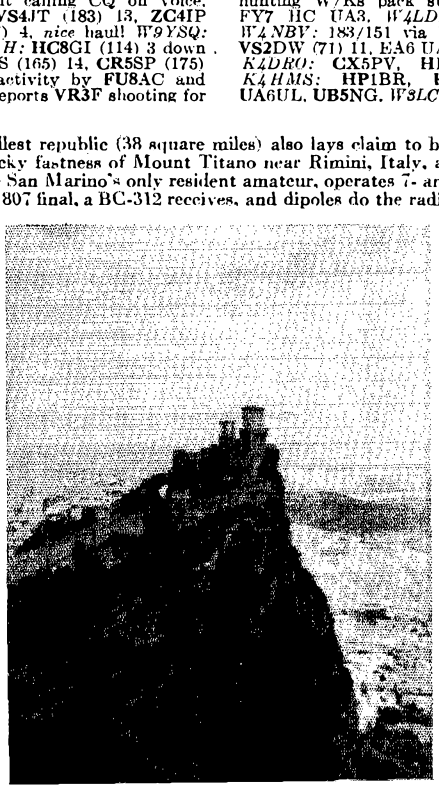
10 c.w. was tapped at *W0IUB:* OEs 2KF 5JK, OQ5CP, SPs 2AP 6CB 8CK, TF2WBG, UA1DG, YU3EU, 4X4FS, 9S4s AL CM, now 119/94 (almost there!). *W9NDN:* JA3AH (82) 1, OKs 1AJB 2KBE, UA3AA (94) 13, YO8MS (45) 14, YU1NM (80) 18, SP ZS 9S4. *W9YVF:* OE1HV, OK1VB, YU3EU, ZC4VP. *W8BUT:* LA8MC, other Euros. *W8CSK:* XE2KF for No. 13. *W8IBX:* OK1MB, more Euros. *W8NOH:* FA8RJ (39) 15. *W8YIN:* UA3KAN (100) 14-15. *W7DJU:* CX2FD. *W4LDD:* GD3UB (50) 17, KG1LH (100) 18. *K4HNA:* OH1RU, SP2SJ, OK3s ZC4. *W3QMG:* VK9DB (60), VQ4FI (75). *K2GMF:* ZE3JO (80). *K2OIL:* OQ5RU, ST2NG, UB5UW, 9S4AX, ZS. *K2PSV:* SP5AR. *W1CTW:* first crack at 28-Mc. c.w. since '39, VE8PB, 3V8AD on attic folded dipole. *KL7BPK:* UA0LA (150) 4. *HEAR:* six Yank call areas all the way to California.

20 phone, somewhat more lively than heretofore, is highly esteemed at *W0QGI:* HA5BI. *W9RBI:* CE0AC (150) 2 of Easter Isle, CR9AH (148) 13, ET3RL (200) 2, UA9CC (130) 3 caught calling CQ on voice. Macquarie's VK0CJ (147) 13, VS4JT (183) 13, ZC4IP (197) 6, ZS8s I (143) 3, 0 (167) 4, *nice* haul! *W9YSQ:* AP2Z. VS2DW, YO3VA. *W8NOH:* HC8GI (114) 3 down Galapagos way. *W8YIN:* BV1US (165) 14, CR5SP (175) 21, SV0WK (195) 6, hears of activity by FU8AC and YJ1RF around 7-9. *W7UVH:* reports VR3F shooting for Gs. *K6KYH:* HR1EZ 3, KX6AF 7, YN4CB 5. *W6YY:* hears of VQ8AF. *W4HKJ:* CN2BD (180) 19-20, CR6AU, EL2L, FB8BC, HZ1AB, KA2KS, OQ0DZ, SP5KAB, SU1AS, VE8MB on Resolute Bay, ZE4JU, BV1. *W2GBC:* EA6AR. *W1PNR:* FP8AP (185), YO3GM (155), now 121/104. *KA3CY:* JZ0PC of Biak, VQ4s GB KRL, Marion Islander ZS2MI. *KZ5DX:* CN2AK, CTs 2AC 3AI, ET2US, KB6BD, KC6UZ, KJ6BR, ZD3BFC, 4S7WP, BV1 CR5, passed A3 100-mark, will try s.s.b. *SWL S. Terry:* notes Spanish-speaking CE9s AI in Graham Land, AR of So. Shetlands, and s.s.b. fan CE9AO on Deception using English.

20 c.w. reverts to the fine form displayed last fall, and here's *W9NDN:* UA1AU (82). *W9NXU:* FK8AS (7) 13, VU2s CR 13, JG (70) 3, curious ZD9AF (32) 1, 4S7MR (65) 13 to reach No. 84. *W9PNE:* FF8AP (75) 9, KA2YA (22) 9, UA1KFA (90) 4. UB5s KCA KEP, ZB2J (71) 9, 4X4BX (97) 7 for 142/125. *W9UBI:* SP2CJ, UAs 1KAK 6AQ, VQ6LQ. *W9YYG:* LU3ZS, PJ2ME, UC2KAB. *W8NOH:* EA6AZ (97) 2, KR6US (35) 4, UA1DG (23) 1, ZD2DCP (15) 3. *W8WOJ:* CE9AI, VK9XK, ZD3A on one of those 108-ft. loaded dipoles. FE8AE (40) 20-21, I5RAM (75) 20-21, UF6KAF (77) 14, VK9AJ (82) 13, VU2JA (60) 2-3, YA1AM (50) 4. *W7DJU:* JA3AB. *W7RVD:* CR7CI, ET2US, LZ2KBR, UAs 9KCE 0KJA, UB5AI, UC2AD, UF6FF, UG6AB, UL7KBK, UP2AC, UQ2AD, YO3GY, one ZK2AB, 3V8AO, 4X4II. "The Call" (RAEM), on new 3-el. beam. *W7DET:* FO8AP/MM (42) 8 of raft *Tahiti-Nui* who runs *one* watt, wending eastward toward Chile. *W6CIS:* ZD6BX for 197/165, protests excessive and ill-timed CQ-DXing by W/Ks who should know better, also decries "GLAD CUAGN" heard sent too often to super-rare DX. *W6KG:* I1BLT/T (25) 23-0, KC6AK (40) 4, LZ1WD (20) 7, UAs 3KET (60) 7, 0KHG (15) 1-2, UL7FA (36) 3, one VK8AJ (70) 9, VR3B (55) 3, YO3FT (50) 19. *W6RLP:* FO8AO (82) 7-8, TF5TP (48) 0-0, VP2LH (27) 3. *K6BHM:* LU2ZS, UA0s CD KJA, VP8RM, St. Maarten. *K6ICS:* Half Moon Islands LUs. *K6AAW:* those same LUs, EA8BC, ET3AF (60), SP8s CK ED, UA1s KAG KAP KBD, UC2CB, UR2KAA, YV5HL, notes frequent nighttime 3000-mile skip when nothing but DX (no North Americans) rolls through. *K6CEF:* CN8s FJ JX 23, CR7BN (63) 17, FY7s YE (71) 0, YF (35) 1, GD3FBS (29) 15, HC1LE (20) 2, HP1LO (35) 4, HK3TH (26) 1, KC4USB (91) 2, KW6CM (26) 4, LX2GH (93) 18, OA4FA (46) 2, OH1RT/0, OY1R (7) 23, PZ1AP (28) 1, UR2AK (28) 2, VK9AV (34) 5, VP7NZ (11) 1, VQ2GR (70) 17, VSs 1HC (52) 19, 2FN (28) 17, VU2RM (51) 2, ZE6JX (75) 17, 5A2TY (55) 0, a fast 117/59 with 400 watts to a 304TH grounded-grid final. 55-ft.-high 3-el. twirler, 75A-3. *K6KYH:* CX2CO, KV4AA (80) 1-2. *W6YY:* alerts us for LX1DX (65), MP4BBE (50) 14, SV0WD/Crete, UM8KAA, UO5AA, VQs 5GC 8AB 8AD, VU2s CR DR, ZD2GW. *K6BGB:* CT2BO, EA9AP, FQ8AX, LU5ZC of Deception Isle, PJ2AW, SV1AB, UA4KYA, UA9CM, VQ6 ZD9 3V8 5A, QROd from 60 to 500 watts. *W4CYY:* observes UL7s KAA and KBA hunting W/Ks pack style, KBA with QRP. *W4EJP:* FY7 HC UA3. *W4LDD:* EA6AW (85) 1, KV4 VE8. *W4NBV:* 183/151 via UI8AG (59) 5, UQ2AG (28) 11, VS2DW (71) 11, EA6 UA9 UA0 UB5 UO5 UP2 UR2 ZD3. *K4DRO:* CX5PV, HK3PC, TI2BX, VP9CE, FY7. *K4HMS:* HP1BR, KG1CG. *K4HNA:* MP4BBL, UA6UL, UB5NG. *W3LC:* one USFA (50) 4, soviet antarctic

San Marino, the world's smallest republic (38 square miles) also lays claim to being the oldest state in Europe. This tiny land nestles in the rocky fastness of Mount Titano near Rimini, Italy, and its capital is accessible by a single road. M1B, for some time San Marino's only resident amateur, operates 7- and 14-Mc. phone with the layout at left. A v.f.o. exciter drives an 807 final, a BC-312 receives, and dipoles do the radiating. (*Photo via OTSI's* OEM)





Last December's Suez flare-up saw MD5s DNQ, AMO and ADZ active on 20 c.w. from this Port Said hamshack. Here they are, left to right: G3s DNQ, AMO and ADZ. Seventy watts scared up 302 QSOs with numerous countries during their hectic nine-day field day. (*Photo via G3DNQ, RSGB*)

post, now has 85 countries on indoor wire and BC-459A. *W2CVW:* **FA**9IO, **ZE**5JE, FE8, another attic-dipole man. *W2HMJ:* **AP2**Q (32) 4–5, **CR9**AH (20) 13–14, **FQ8**AF (56) 6–7, **OQ0**CZ (48) 22–23, **UA0**KFF (55) 7–8, **UF6**PB (58) 3–4, *UL7FA* (61) 11–12, **VK9**CK (12) 13 of Papua, **VU2**RM (55) 3–4, **ZC4**GT (58) 22–23, **ZE3**JO (79) 3–4 using the 20-watter of VQ1JO fame, antarctic KC4, Cocos VK9, UM8, Alands, was frustrated by BERU-Testing MP4 again. *W2HQL:* many of the preceding plus **AP2**AD, **OY7**ML, **UD6**AI, **UH8**KAA, **UI8**KAA, **UJ8**KAA, **VK9**AU, EA9 UF6 UG6 UL7 UM8 UR2. *K2BZT:* **FF8**BX (40) 22, **FQ8**AY (22) 21, **HS1**VR (52) 0, **LU8ZW** (80) 0, **UA9**YE (27) 2, UPOL4 (47) 22, **UR2**AO (59) 1, **VP3**AD (57) 2, **ZB2**Q (79) 22, **ZE1**JV (50) 1, **SV0**WS (44) 23, 4X5RE (23) 23 who is 4X4RE in Egypt, AP2 LX OY UD6 VR3 ZD9. *K2GMF:* EL2S (50), **JA5**AB (72), **KA2**YA (26), VE8PB, **9S4**AX (7). *K2MGR:* **FB8**CC, **IS1**GF, EA9 FY7 OY UR2 ZC4. *K2SLL:* VO1T on window-screen antenna. *K2UOY:* **KZ5**PP, **OH7**PI, KA2 KV4. *W1BPW:* made it 78 with **KT1**DM (3) 0, **UB5UW** (50) 21, EA6 LZ KA PZ1 VP7. *W1DBA:* only five to go for the Century, **CN8**FQ, **EA8BK** (60) 6, **GC2**FZC (30) 23, **I5**REX (60) 23, **IS1**CXF (60) 21, **JA1**CJ, **OA4**FT (65) 2, **PJ2**AJ (65) 21, **SP5** 3IDG 4KAI, **UAs** 1KAN 1OT 3BF, **YO8**KAN, **ZC4**BD (60) 23, ET3 SV1 UB5 VR3 9S4. *W1EOB:* **VK0**AB (20) 12, needs info on **TA1**FA. *W1ICP:* now closing in on 200, **UQ2**KAB, Alands. *W1KRL:* one **M1**A. *W1MEG:* **YU1**KF, LZ1 4X4. *VE1PQ:* **JA5**AI (100) 10, **KR6**NI (90) 10, **UA0**s OM SK, **ZD**s 2DCP 8JP, FE8 ST2 UA9 UL7 UR2, lost beam in 100-m.p.h. breeze but wasted no time re-raising it. *VO1DX* (ex-VO3X): that same ZD8, **VP2**LU, **VQ2**AS. *IIER:* all Yank call areas plus VE6 VE7 VE8. *KA3CY:* made big noise down East for **LZ**s 1KBL 1KSP 2KAC 2KRS, **TG**9AD, **TF3**SG, **UA**s 3EG 4KCE **9D**I 9DY **9K**HA 9KOH 9VB 1DI 0KA 0KAD, **UB5**s CA KBB, **VQ2**EW, **VU2**AJ, **YO3**FT, **4S7**GE, UI8 UL7 UR2. *KL7BPK:* **KZ5**GH, KV4, Half Moon LU. *KL7BUZ:* at 106/46 on **CT3**AB, **EA6**AZ, **UN1**AB, **MP4Q**AC, **ZD9**AE of Gough, 5A5TH, FQ8 LX ST2 ZC4 3V8 . _ . _ . _ N. Z. Antarctic's **ZL5** AA and one **ZD7** AH are panicking the pack.

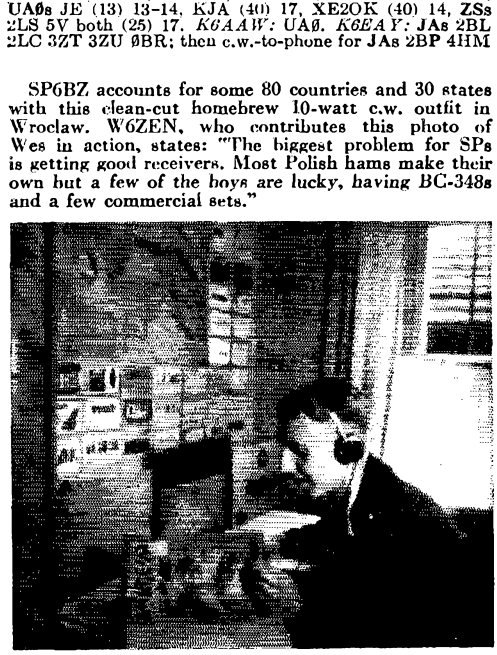
15 phone — say, how in the world did we ever get along without the 21-Mc. band before 1953? — now is the principal route to A3 DXCC. Here and there, we find at *W8QXW:* **CR4**AH (215) 18 available almost daily. *W8YIN:* **KW6**CL (260) 2–3. *K8BLU:* during first week as a General achieved a 24-hour WAC with **G3**CVG, **KA2**MR, **KH6**CEX, **KL7**GL, **LU6**MR, **ZS6**XB. *W6YY:* calls attention to **CR4**AS (232) 0, **ZD1**FG (200) 2. *W6ZZ:* is another who abhors persistent CQ-DXing by rookie DXers plus a few OTs regressing toward second childhood, raised **BV1**US, **HR1**EZ, **KA2**WV, **TF2**WBR, **VK9**DB, **VP6**GN, other VKs, **ZL**s. *K6BHM:* got an impromptu 18,000-mile relay to neighbor W9ZSZ via **4S7**GE, also worked **VS2**DQ. *K6ICS:* K4LPB/VE8, **VP1**EE. *W4USQ:* sports QSL from *ZD8SC*, captured **CP1**CJ (250) 20, **CR**s 4AO (245) 23, 6AH (250) 20, **CT2**AC (230) 21–22, **EA**s 8BV (200) 23, 9EE (200) 18, Deep-freezers **KC4**s USA (430) 4, USB (430) 0, **TF2**WBG (230) 23, **VP**s 2KD (100) 0–1 of Leewards, 8CC (240) 0 of So. Shetlands, **VQ**s 2DC (200) 22, 4DT (150) 19, 5EK (200) 19, **ZB2**I (240) 19, **ZD1**DR (250) 19, **ZS9**G (160) 20. *K4DRO:* **YN1**HF, batch of KZ5s to near KZ5-25 diploma, many /MMs. *K4GIE:* **CN8**EU, **EA8**CF, **EL5**A, **FY7**YE, **HH2**DB, **OK1**AJB, **PJ2**AV, **TI2**BX, **VP**s 1SD 2LU, **YN1**BR, **ZS3**AB, CE 1IR TF. *K4HMS:* **TG**9WB. *K4HNA:* Capt. Carlsen of W2ZXM/MM. **VP2**GC, EA8 VPS VQ5 ZD1 ZS9. *W3EVC:* **HP1**LO, **HR1**LW, YN. *K2OZY:* **OD5**AV, **SV0**WT, **VP**s 2LH 5ML, **ZE6**JD, 4X4HK, CP EA8 HI VQ4 ZH2. *K2SRA:* YN4CB. *W1MEG:* **KS4**AX. *W1PNR:* **SP8**CK (200), ZD1. *IIER:* all W/K areas save Nos. 7, 8 and 0. *KA3CY:* **DU1**GF, **KR6**s AW GT LM SM, **VS6**CO. *KA5ZS:* **JZ0**PC 3. *KZ5DX:* **VP8BT**, **ZD**s 6DT 8SC, CP CR4 ZD1.

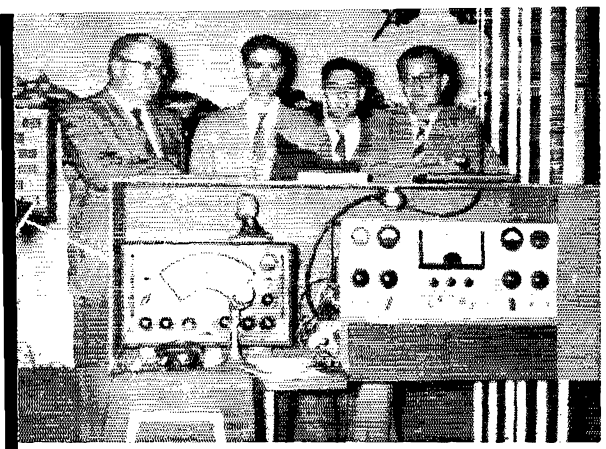
15 c.w. is preferred by *K0ALL:* **DU7SV**, **JA**1s ACB ADN, **OE3**VP, **SP5**KAB, **VP8**BS, **PJ2**ME, ZLs. *W9PNE:* said PJ2. *W8IBX:* numerous Euros including band-hopping **OK1**MB. *W8YIN:* Sint Maarten, **CP1**CJ (60) 20, **UB5**KAA (55) 16. *W7DJU:* **VP2**LH, VKs ZLs Euros. *W6RLP:* **HP1**LO (28) 9–10. *W6ZZ:* **GD3**FXN for 163rd country and 126th on 15 meters, Euros, ZS. *W4EJP:* **KL7**BZA. *W4USQ:* UA1DG (80) 15, **UC2**KAB (75) 16, Dutch St. Martin. *K4DRO:* **EA8**BO, **ZE**s 1JV 6JT. *K4HMS:* **CE3**RE, **9S4**AX, ZE ZL. *K4HNA:* Sint Maarten. *W3EVC:* **CN8**GG, **CR7**LU, **JA**s 8AI 8AQ 9AB, SL3AX of Sweden's military, **SP8**CK, XE1s H PJ, **VQ2**GR, YU3s EJ FK KN, **ZC4**CH, CE PJ2 UA1 9S4. *W2HQL:* **VQ3**TL. *K2BZT:* **CT3**AE (63) 23. *K2ENO:* **SM1**APQ completing WASM requirement. *K2GMF:* Sint Maarten. *K2OIL:* **OY1**R, **9S4**AL, ZSs. *K2SRA:* **OA4**FA, Euros. *KL7BPK:* **JA7**AD (60) 4.

15 Novice reports this month from all mainland call areas but Three and Seven. Luck down the list. *K N0DQI* (now N-less): **EI4**A, **GM3**UU, numerous other Euros. *K N9DWK:* found Ranger and long-wire good for **LA3**NE, OX1XQ (OK1XQ?), **UC2**CB, **WL7**BYA, has 46 states. *K N8BPM:* **EI7**D, more Euros. *K N6SRM:* nailed Canton Island's only Novice, **WB6**BE (155) 2. *K N6SQI:* nifty **VQ6**LQ. *K N6SED:* after seven Novice months on 15 has WAC, WAS, a 40/33 record, and credits K6OPF for guidance. *K N5HEW:* aforementioned VQ6 and WB6, **JA3**BN, **LU8**BAJ, awaits necessary confirmations for WAC diploma. *K N5GLH:* **CN8**s FF JX, **CT1**IQ, **MP4**BL, **PJ2**AL, **VQ**s 2GW 4DT 4RF, **YO3**LM, **YU3**FO, **ZE**s 3JO 6JX, now registers a 53/30 record. *K N4JFE:* CE3AK, **UA**s 1KAC 0KAB, **UB5**s KAA KBV, YN1AA, YO. *K N4HPR:* **VK4**FJ, **ZL1**GW (150). *K N2SYN:* four European countries. *W N1NQT:* **FA8**CR, **YU4NZ** for Nos. 15 and 16 . _ . _ . _ Still no Novice DXCC claimants, fellows — the race is *wide* open!

40 c.w. is wide open occasionally, too, and we find at *W9ZMJ:* **KL7**BSW (40), VE8OW (5). *W8CSK:* several Euros. *W8QXW:* **FA3**OA who QSLd in 11 days. *W8YIN:* **SP3**EV (17) 1, classy **VQ6**LQ (9) 3–4. *W7DJU:* **JA**s 1BU 2JW 3PA 7BE 8FO, **KA3**CY. *W7JLU:* **HR2**AD, KA2KS (20) 10, LA3YF, **OK1**MB, **PY7**s AEE AZW, **UA0**s JE (13) 13–14, KJA (40) 17, XE2OK (40) 14, **ZS**s 2LS 5V both (25) 17. *K6AAW:* **UA0**. *K6EAY:* **JA**s 2BL 2LC 3ZT 3ZU 0BR; then c.w.-to-phone for **JA**s 2BP 4HM

SP6BZ accounts for some 80 countries and 30 states with this clean-cut homebrew 10-watt c.w. outfit in Wroclaw. W6ZEN, who contributes this photo of Wes in action, states: "The biggest problem for SPs is getting good receivers. Most Polish hams make their own but a few of the boys are lucky, having BC-348s and a few commercial sets."





Compact CR7BS, installed and operated by LREM personnel at Mozambique's recent Economic, Cultural and Social Exhibition, collected a fat logful of QSOs on DX bands. Here CR7s AL, fZ, AR and AF confer during a break in on-the-air activities. (*Photo via WTYYM*)

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5BI, plus **JA3RG's** s.s.b. **KR6QW** (25), **UAØKFG** (30), VK6. *K2DGT/6:* **HH3DL** (27), **UAØKKB** (25), **VS1s** FE (40), HB (20), **ZK2AD** (100); then vocalized for **JAs** 1AEO 1AME 1AMZ 1EF 1ON 2NG 2OJ 5BI 6AK 7EM 8DU all around (70-80). *W4EJP:* **VP5s** BL (20), CP (40) both 12. Tratlicker *W3CUL:* SM8AFL/MM out of Las Palmas. *W2HQL:* **GD3UB, UB5KBR, YO2KAB.** *W2JBL:* **HH2LR** (1), **PY7AEW** (1), **ZL2ACV**, skeds **XE1KD** regularly on the low edge and welcomes XE-needers, hears **VP5BL, YV5ES, 4X4CJ.** *K2BZT:* **LZ1s** KNB KPC both (10) 1-4, **PY8TK, UB5s** AU HC WF (11-13) 2-5, **YO6XU** (11) 5, **ZC4IP** (10) 2, GD 4X4. *K2GMF:* **OE5SD** (24), **UC2KAB** (27), YU1FLM (12), LZ. *K2MGR:* **FP8AJ, OK3AL, SP1KAA, UB5KEP**, GD on 75 watts. *K2QDI:* **KZ5NM, OK3MM, VE8TD, VPs** 3YG (15) 6, 6RG (10) 20, GD. *K2STF:* **XE3AH, YU6DZA**, other Euros. *W1AMY:* **CT2BO** (7) 1, VP3. *W1MEG:* **PJ2AV** (4). *KN4HPR:* **WH6BYM** (182) 6. *I1ER:* Wrangel Island's **UAØKSI.** *KA3CY:* Yanks galore, **JAs** 1VR 2AQ 3BP, **UAØFR**, hears tabooed **3W8AA.**

80 c.w. DX now prepares to crawl down into the warm QRN for its usual estivation but the boys took a few parting shots at it. For instance, *W1ECH:* **PJ2s** AN ME, sundry Europeans. *K2BZT:* **KZ5WU, OKs** 1AEH 2BEK, a few Continentals. *K2DGT/6:* **JA7BO** (10), **VP2LU** (10), successfully skeds **VS1GX** (10) 15 almost daily. *K2GMF:* **DM2XLO.** *K6PJT:* **ZL3JT** (5) on 50 watts and Zepp (What's a Zepp? Somehow sounds familiar. . . .). *W8YFJ:* **F8EL, KZ5EM, ZL3RK, PAØ** PJ2, and the previously mentioned Sint Maarten specimen whose 3505-kc. CQs nightly go unanswered.

160 c.w. tapers off after a moderately successful season and the biggest splash was made by **VP2LU.** Fred gave St. Lucia, Windwards, to Ws 2Q1H and 1BB in that order on February 8th. . . . . **VP3AD** hears W1BB, K2KWP and W9CVQ at good strengths, still searching for more Yank QSOs around 1801 kc. . . . . Other DX stations getting across the pond up into March: **G2s** AGR DPP, **G3s** BBF DXJ ERN GGN HRW JEL JVI KOR LOE PU, **G5JU, G6s** BQ GM, **G8ON, GW3KS, DL2ZG** and **YN1AA** were interested, and W1BB learns that YUs will return to 1.8-Mc. action upon forthcoming authorization. . . . . G5JU called CQ one evening and found himself in QSO with "AC5PN." Nice "DX" for 160, eh?

Where:

Regarding himself and fellow VR3s, VR3G comments: "None of us has cards at the moment but QSLS will be sent when they arrive. In some cases this may mean a delay until the return of the operators to the U.K. For incoming VR3 cards I am acting as QSL manager, Christmas Island only." . . . . We note with interest that certain Russian amateurs have had the temerity to grouse about the efficiency, or lack thereof, at Moscow's Box 88 bureau. K2CHS relays the following suggestions from a prominent UA3: (1) Whenever possible use direct mailing addresses in shipping QSLs to U stations; and (2) *do not* use call signs and other radio lingo on the covering envelopes or they'll wind up in the Box 88 backlog. For UAIs in the Leningrad area you might try the UA1KBB QTH to follow . . . . . From ex-ZD4CC (G3KFV) via W1WPO: "During the next few months I am determined to clear up the backlog of QSLs to be sent off. The response to my ZD4 sigs was really terrific, and having no cards on hand meant a big pile-up!" G3KFV's next post will be Singapore . . . . . W1RB received a ZA1AB card from Yugoslavia, of all places . . . . . "During the past few months I have been receiving a number of cards for ZD9AF. I have no record of such a call sign having been issued, and ZD9AE on Gough Island informs me that to his knowledge his own call was the last ZD9 call issued." This from ZS1MU, SARL bureau chief; employ the following ZD9AF address at your own risk . . . . . VP1AA lost certain QSL records by fire, so if your deserved pasteboard hasn't arrived reapply with full QSO data . . . . . From W3CSW at KA2KS: "We receive numbers of cards bearing no indication of the KA2KS operators who made the QSOs. This omission gives us, and I'm sure other club stations, one big headache. We could answer QSLs much faster if this one bit of information is included." . . . . . W2QHH learns that KP4AIO, ex-VP9BM, will forward VP2AH QSLs to the VP2 bureau concerned, although Jules knows naught about him. Howy's busy hunting up Mac of SVØWN/Crete, now reported Stateside . . . . . "Just made out 720 QSLs for W2AIS/MM, W2AIS/VK and KH6ARA. Any cards still due overseas and U. S. hams will be found at their various bureaus." For further QSL inquiries Pat can be reached at the ex-ZC8PM address to follow . . . . . "ZD8SC, promising 100-per-cent QSL, says most of his cards go via the ARRL and RSGB bureaus," informs W9WHM. John, who volunteered VP8 QTH data some months back, desires it made clear that W9WHM does *not* handle QSLs for VP8s . . . . . Courtesy WØQGI: VP6AM shut down for relocation last month and Barbados QSL matters now are in the hands of VP6LT. All VP6AM pasteboards have gone out via bureaus except where sufficient IRCs were received for direct reply . . . . . As indicated in the following, SWL W. Rice is assisting with LZ1KPZ QSL chores for North and South America contacts only. For Bulgarian transshipment he requests that an IRC accompany each QSL . . . . . From W1CP: "W4EMF/KS4 writes to let the gang know that he is waiting for 500 QSLs to arrive — he *will* QSL." . . . . . "Tell the boys who have worked VP3AD and who have not had replies to their QSLs not to be too worried! I'm out of QSLs now — as soon as stock arrives I shall forward same." So writes Dad between 1801-kc. vigils . . . . . VS2DQ, via W9BEK, remarks that a single IRC does not quite cover surface-route QSL return from Malaya to Uncle Sugar; five kewpies are required for reply by air . . . . . SP3PL, QTH to follow, requests direct QSLs with one IRC per card . . . . . W9DSO, back from a Caribbean tour, hears that ex-H18WL confirmed 800 of his 1000-plus Dominican Republic QSOs before running out of stock. Bill will finish the job shortly and can be reached at the address following . . . . . SCDXC organ editor W6OUN is doing his best to clear up the long-standing HKØAI San Andres QSL jam-up . . . . . This year's Australian Antarctic ham complement includes VKØs AC AS DC DJ JP PK RR ZM at Mawson Base and VKØAB (ex-VK1AC-VK3IB) in Princess Elizabethland. All can receive QSLs via WIA but cards for VKØs AB and PK can go as suggested in the following. VKØs AA and CJ hold forth from Macquarie — no action on Heard. The VK1 prefix thus indicates A.C.T. (Canberra vicinity) exclusively . . . . . NNRC lists CE3OK, Casilla 1234, Santiago, as "QSL representative" for CE9 and CEØ stations . . . . . The following directory results from contributions by W1s EOB RDV UED VG WPO YYM ZDP, W2s HQL JBL, K2ENO, W3s QMG RPG SWV, W4s LDD USQ, K4DRO, W5ERY, W6s ERC RLP YY ZEN, K6CEF, W7s DJU FRD UVH ZOH, W8s GLK NOH QXW WOJ, W9s CFT DMY DSO HIX KA, WØQGI, KA5ZS, KL7-BUZ, ISWL, MARC, NNRC, OVSV, SCDXC, WGDXC, WIA and WVDXC:

AP2Q, M. A. Qureshi, 203, The Mall, Rawalpindi, W. Pakistan
CN8EU, P. Owen, VR-24, Box 260, FPO, New York, N. Y.
CN8FJ, M/Sgt. M. J. Shafer, 3150 Maint. Gp., Box 337, APO 30, New York, N. Y.
CN8GG, NCF Box 60, Navy 214, FPO New York, N. Y.
CN8JW, U. S. Nav. Com. Fac., Box 60, Navy 214, FPO, New York, N. Y.
DL4IV, SP-3, 569th Sig. Sup. Co., APO 46 New York, N. Y.
ex-DL4ZC (to W6KG)
EA6AW, A. Escuder, P.O. Box 313, Palma de Mallorca, Balearic Islands, Spain
EA6AZ, L. M. Pons, P.O. Box 303, Palma de Mallorca, Balearic Islands, Spain
FG7XE, Raizet Airport, Guadeloupe, F.W.I.
FQ8HF, Box 819, Brazzaville, French Equatorial Africa
G3KXN, B. M. Bonser, 51 Virginia Rd., Newport Rd., Albrighton nr. Wolverhampton, England
HH2OT (via W4HYW)
HH2SKE (to W2SKE)
HI8SKE (to W2SKE)
ex-HI8WL, Wm. Long, 5308 S. Delaware Pl., Tulsa, Okla.

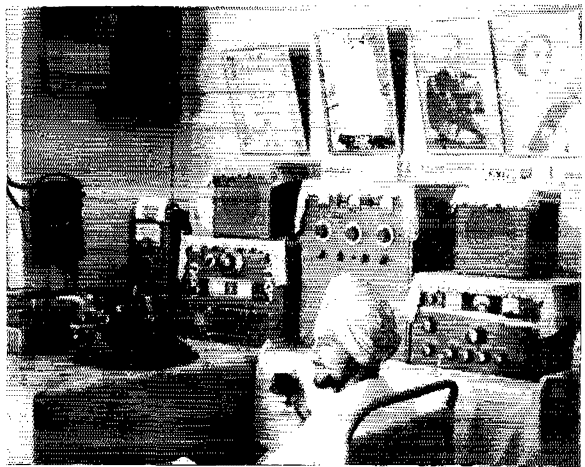
HK5CH, P.O. Box 8, Cali, Colombia
HK5CR, J. B. Delgado C., Carrera 18, No. 5-75, Cali, Colombia
HK5ER, B. Consuegra O., P.O. Box 99, Buenaventura, Colombia
HKØAB (to HK3AB)
HP1LO, L. O'Meally, P.O. Box 4864, Panama City, R.P.
K4LIB/FQ8/AM (via ARRL)
KA2KS, Box 14, Navy 830, FPO, San Francisco, Calif.
KA3BE, S/Sgt. Robt. Eyester, jr., 849 ACWRON, Box 66, APO 47, San Francisco, Calif.
KA3CY, Capt. E. E. Worrell, 1st Com. Sq., Box 226, APO 710, San Francisco, Calif.
KG6AGW, C. Robbins, jr., Qtrs. 221b, NAVCOMMSTA, Guam, Guam, M.I.
ex-KJ6AW (to W7GFA)
KR6RY, RFD 1, Gooding, Ohio
KT1UX, C. W. Cleveland, Box L, Navy 214, FPO, New York, N. Y.
KW6CN, L. W. Chamberlain, Weather Bureau, Wake Island
LX2GH (va DJ2PQ)
LZ1KPZ, c/o Wm. Rice, 4 Plain Dr., E. Hartford, Conn.
MP4BCC, Maj. M. H. R. Carragher (ex-MF2AA), State Police Hq., Bahrein, Persian Gulf
OA4EY, Wm. Rogers, c/o U. S. Embassy, Lima, Peru
OA4FA, J. F. Rosenthal, Apartado 2181, Lima, Peru
OA4ML, P.O. Box 2715, Lima, Peru
OA8G, G. Baker, Pucallpa, Peru
OA8H, Mr. Hunter, P.O. Box 91, Lima, Peru
OY9LM, P.O. Box 195, Thorshavn, Faeroes Islands
PY7AEW, Box 1043, Recife, Pernambuco, Brazil
SP3PL, J. Jarzombek, Niecala 3a/14, Poznan, Poland
SP5KAB, Box 122, Warsaw, Poland
ex-ST2NG (to VS9AG)
ex-SU1MQ (to VR3G)
SVØWJ, Box 134, Salonika, Greece
TF2WBM, J. Roslyn, APO 81, New York, N. Y.
TF2WGO, APO 81, New York, N. Y.
TF2WHM, APO 81, New York, N. Y.
TI5JAP, J. A. Pinto, Apartado 125, Alajuela, Alajuela, C.R.
UA1KBB, Leningrad A. R. C., Fondanka 7, Leningrad U.S.S.R.
UA3CR, Lenoid Labutin, Suscherskitupik 5, KW-9, Moscow-A-55, U.S.S.R.
UB5KAB, Box 27, Stalino, Ukraine S.S.R.
UP2KBA, Box 231, Kaunas, Lithuania S.S.R.
VK9AT, E. J. Roberts, No. 2 Donga 2nd St., Lae, T.N.G.
VK9AV, P.O. Box 56, Port Moresby, Papua Territory
VKØs AB, PK (via VK2EG)
ex-VO3X, H. W. McNeill, VO1DX, St. Anthony, Nfld., Canada
VP2KD, Dr. J. S. Cramer (ex-VP2JC), St. Kitts, B.W.I.
VP2VE (via W4ZHL)
ex-VP4LG (to VP2KD)
ex-VQ4EG-MI3TM, G3LHO, 108 Cannon Hill Lane, Morton Park, London S.W. 20, England
VR3B, Dean Laws, 102 Darling Rd., E. Malvern, Melbourne, Victoria, Australia
VR3E (via VR3G or RSGB)
VR3F (via VR3G or RSGB)
VR3G, Sgt. Cheesman, WO & Sgts. Mess, RAF 160th Wing, British Forces P.O. 170, via Honolulu, Hawaii, T.H.
VS1HQ, D. A. Shepard, Braddell Hill Hostel, Braddell Rd., Singapore
VS2DQ, J. Pershouse, Sungei, Roya Estate, Langkowi Island, Kedak, Malaya
VS2FI, Tham Yen Thin, 9 Concordia Rd., Penang, Malaya
VS2FN, 65 Kelaweis Rd, Penang, Malaya
VS4JT (via VS2EE)
VS9AG, IAL, c/o Aden Airways, Crater, Aden
VU2AC, R. N. Ranga, c/o Govt. Elec., Dept., Erode, S. India
W5HNY/KG6, 96th ATE Sq., APO 334 San Francisco, Calif.
W8GZF/KL7, Lt. J. A. Alexander, Box 3, 433rd FIS, APO 731, Seattle, Wash.
XE1PJ, Arnold G. de Jager, Nieve 165, Pedregal de San Angel, Mexico 20, D.F., Mexico
YN1BR, Box 1869, Managua, Nicaragua
YO3RF, P.O. Box 73, Bucharest, Roumania
YU3LQ, A. Brauno, Pop Hribom 44, Ljubljana, Yugoslavia
ex-ZC8PM, Pat Miller, 2950 Pacific Heights Rd., Honolulu 13, Hawaii, T.H.
ZD4BL, E. Lloyd, P.O. Box 565, Kumasi, Ghana
ex-ZD4CC, P. Davis, Royal Signals Wing, School of Signals, Catterick Camp, Yorks., England
ZD9AF, Box 3037, Cape Town, U. of S.A. (see preceding text)
ZS3E, K. du Buisson, Box 66, Welwitschia, S.W. Africa
ZS3OL, Box 999, Windhoek, S.W. Africa
3V8AO, Box 303, Tunis, Tunisia
4X5RE (to 4X4RE)
5A1TV, M/Sgt. H. E. Le Claire, 7272 AIO Sq., Box 164, APO 231, New York, N. Y.
5A2TY, 542nd Engr. Co., APO 231, New York, N. Y.

»

VS2EF of Selangor has picked off over ninety countries since firing up in '53. Operator Serin Singh, 28, specializes in radiography with Malaya's medical department and has recently earned a scholarship to further his studies. VS2EF prefers 20- and 40-meter action.

Whence:

Europe — Contests headline ham news on the Continent and we're in for a busy bunch of week ends! DARC holds its concluding WAE DX Test c.w. session April 6th-7th (see p. 86, Dec. '56 *QST*) and REF winds up its annual French Contest with a phone spree April 13th-14th (see p. 68, last issue). Then VERON (Netherlands) invites world-wide participation in its 1957 PACC DX Contest, an affair to run (c.w.) from 1200 GMT April 27th to 2400 April 28th, and (phone) May 4th-5th, same hours. Non-PAØs will strive to work as many Hollanders as possible, one QSO per station per band, and the exchange will be the usual RST001, RST002, etc. (omit the "T" on phone). Dutch lads will append province tags to their calls as follows: DC, Drenthe; FR, Friesland; GD, Gelderland; GR, Groningen; LB, Limburg; NB, North Brabant; NH, North Holland; OV, Overijssel; UT, Utrecht; ZH, South Holland; and ZL, Zeeland. For a shot at a country-high certificate ship your log transcript and final score (3 points per band-QSO all multiplied by total band-provinces) to PAØVB postmarked on or before June 15, 1957. Upon request PAØVB also will forward data concerning VERON's PACC award, a certification calling for confirmed QSOs with 100 Netherlands amateurs . . . . . Next month, concurrent with the PACC Test's phone binge, EDR (Denmark) offers us their yearly OZ-CCA DX Contest — 2100 GMT May 4th to 2100 May 5th, and take your pick of c.w. or phone or both — wherein non-OZs will work as many OZ amateurs as possible. Exchanges will run consecutively, RST01, RST02, etc. (forget the "T" on phone) and presumably each Dane can be worked once per band. OZs will include with their exchanges unspecified multiplier designators. For a chance at one or more of the various certificates to be awarded for meritorious Test performance, forward a copy of your log and score (band-QSOs times band-multipliers) to EDR Contest Manager OZ2NU, Postbox 335, Aalborg, Denmark, postmarked no later than May 31, 1957. At the same time you might make inquiry concerning EDR's OZ-CCA diploma . . . . . Overseas amateurs grow more WAS-happy all the time and this fever rages fiercely behind the rusty Iron Curtain. W7FBD, eagerly chased for Idaho QSLs, is informed that UA3BN's 200-watter needs only Utah; UA6UI has 39 states; and UB5DW frantically shakes the DX tree for Utah, Wyo. and Nev. "About eight out of ten DX stations tell me I'm their first Idaho QSOs." Warren is curious about LA5Q/T, so we might remind you that Norwegian calls with alphabetical appendages are portables, and all letters except "G" and "P" (which indicate antarctic and arctic portables, respectively) designate QTHs in Norway-proper . . . . . Spurred by recognition of the Aland Islands as a full-fledged entity on the ARRL DXCC Countries List, OH1s RT and ST lost little time in paying a return visit to OHØ-land. On January 26th-27th they lugged an 807 40-watter, Geloso 14-tube receiver and several antennas into the Gulf of Bothnia for 535 QSOs (301 with W/Ks) with 32 countries on all continents. "Already at the second QSO the W boys seemed awake and the merry-go-round was working!" See p. 60, October '56 *QST*, for photos of OH1s RT and ST on a previous DXpedition to the Alands. OH1ST now is DXCC with 103 confirmed from his home station . . . . . W8GZK calls your attention to DLD, a certification of merit issued by DARC (Germany). This one is based on confirmed QSOs with at least 100 German hams in specified organizational areas, contacts to date after January 1, 1956. Check with DARC, P.O. Box 99, Munich 27, Germany, for amplification . . . . . And



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speaking of certificate-chasing, SP3PL tells W6RLP of a burning ambition to confirm all California counties.

Oceania — "Authority has been given by the British Services for radio amateurs in the three services to operate amateur stations here on Christmas Island (near Fanning). As an immediate result three stations are being set up: VR3E (Les), VR3F (Jack), and VR3G (myself, Bob). The rigs for the most part are lash-ups but a good deal of activity is expected. VR3F opened the ball yesterday and plenty of W/Ks appeared! Our operation is restricted to ham subjects and no discussion of outside matters can be entertained. Any break in this rule could result in the shut-down of all activity from the island. Operation will be mainly on 20 meters, phone and c.w., although trips up to 15 may be possible. A look over the bands shows that U stations can be worked the day through." This Christmas present thanks to VR3G, ex-5A1TQ-SU1MQ-G3KDE. All the fellows call England home and they understandably request that the Stateside pack give them a break when the slot at VR3 is open to G-land . . . . . KB6BC, through W7DJU, brings us up to date on Canton Island DX doings: "There are four other hams on Canton at the present time — KB6s AQ (quite inactive), BD (on once in a while), BF (readying rig) and WB6BE (on 15 c.w.)." KB6BC heads back to Honolulu this month and then possibly Statesward . . . . . F3AT, still pursuing Nevada for you-know-what, tells W8YIN that FU8AJ is activating over New Hebrides way . . . . . SWL W. Rice has Chile-bound raft *Tahiti-Nui*'s FO8AP/MM frequencies as 14,333 and 21,152 kc. Sixteen (16!) IRCs will get you a three-color map of this Polynesian scientific expedition's Pacific itinerary together with other features. For further descriptive details write F8TM at REF, B.P. 42-01, Paris R.P., France . . . . . The real ZK2AB, QRT for several years, tells W9DSO he intends a return to DX action soon.

Africa — ET2RH, formerly W3LBS and KL7AGA, illumines Eritrea's DX picture in lines to W1ICP: "ET2s have the usual trials and tribulations of foreign countries — widely varying line voltages and frequencies, one distribution transformer every ten blocks, etc. Legal input limit here is 150 watts and good thing, too; any more and all the lights would go out! Conditions seem very good except for the Far East and Pacific; have 96 countries worked. Most of the fellows here work phone, and 20 is *the* band with 15 meters running a close second. Have also picked up a few good ones on 40 when I could get through all the 7-Mc. propaganda stations. . . . I've heard much said pro and con about the courtesy of American hams. Believe me, the average W/K is much more courteous than the average in many other countries." ET2 tickets expired on the first of this year, so a gamut of renewal red tape is frustrating Yank hams in Eritrea . . . . . Acknowledging receipt of his A3 DXCC tapestry, FB8BC now concentrates on WAS with nine to go. Vic tells W1WPO he searches for N. H., Utah, Vt., S. Dak., Wyo., *et al.*, on 20 and 15 phone daily from 0300 to 0345 GMT . . . . . K4LIB of TV, radio and recording fame sauntered about French Africa during March, signing /FQ8 or /AM aground and aloft. A mid-February bulletin from W1AW was the tip-off on Art's safari . . . . . W8NOH bumped into W7TAH at the key of CN8JW . . . . . WGDXC informants specify an outburst of ZD8JP activity around 1800–2200 GMT, a rockbound 20-watter near 14,020 kc.

Asia — "I have been trying to get permission to operate in Turkey but so far the personnel I have been able to contact have indicated that there is absolutely no amateur transmitting authorized." So writes W6QOJ, and while Bob hasn't yet given up it does appear that new DX devotees will find TA credit hard to come by . . . . . Afghanistan also still shuns amateur radio (officially, anyway) and YA1AM tells W8YIN that his phone work is limited accordingly. That new final at YA1AM *really* cuts a swath on c.w. . . . . AP2RH had a ball in the ARRL Test this year with a potent 25 watts on 7 through 28 Mc. "The long path to the States hasn't been so good lately on 20. Normally the path is almost due south, so I had a surprise when a W6 came roaring in at 1600Z a week or so ago and told me his beam was almost due north. His was the loudest signal I have ever heard on 14 Mc. from W/K-land." (Ray didn't identify the Six.) "Still trying hard for WAS and to date have worked 37 states with 25 confirmed. Am due to leave Pakistan for the U.K. in July and am hoping that the guy who comes to take over from me here will be a ham willing to carry on the good work." And speaking of *rare* DX, Ray never has heard an AP2 in East Pakistan, 1000 miles across India . . . . . W2HMJ reports K2FC roaming such Far East spots as HS1, CR9 and VS6. W6VX is another Yank touring the Orient. UB5UB tells W2HMJ that UA0KSI still angles from Wrangel near 14,060 kc. around 1800 GMT . . . . . ISWL has it that UP2AS and op Larry of UA1KAI hope to hit Turan City, Tannu Tuva, about the first of July to sign UA0TT and UA0TW around the clock on 10 through 80 meters. Five skywires will be fed with 100-watt phone/c.w. and 15-watt c.w. rigs. Turan is said to be 6000 feet a.s.l. . . . . Communiques from Yanks in Japan: KA5ZS, shooting for DXCC before summer, knocked off 69 countries and 43 states in his first 90 days of activity. Zane reports that KA5CL's 14-Mc. phone

CN8JX, erstwhile KR6LL and W7GGO, shoves solid signals Statesward with this Collins layout and ground-plane. Glenn's forte is twenty and he's bearing down hard for ARRL DXCC and WAS honors.

is ever popular and that VS6CY is due for repatriation to G3JJK. . . . W4WXZ, ARRL's former North Carolina SCM, now radiates from KA2FEC: "DX very plentiful but don't have too much time for DX work as we handle loads of QTC from Honolulu and perform as NCS of the Far East Net." . . . Newly-ticketed KA3BE goes to town with an SX-100 and Viking around 14,080 kc. Bud writes, "Our club station, KA3GG, needs seven more states for WAS — *where* are Vermont and Maine? We have seven ops and the station usually is on the air about 18 hours a day. KA7EG has his Collins KWS-1 perking, mostly 10 meters s.s.b. or a.m. KA2EB still plugs away on 10." . . . From KA3CY: "Very active on 10 now as well as 15, 20 and 40 meters. Just finished getting up a 3-element plumbers-delight on 28 Mc. Come July I will be moving to Tokyo and will get my KA2CY call back, so I'm striking for DXCC before I leave KA3." Everett nears the 1000-QSO mark as KA3CY and his DX scorecard checks at 89/60.

Hereabouts — VO3X, with a 175/160 DX record, surrenders his 20-year-old call sign and becomes VO1DX this month. Other VOs change their spots, too, under official realignment of Newfoundland prefixes and suffixes. VO1DX's brother VE3PK is only 17 countries behind Horace in the confirmed category . . . . . HI8WL's departure from the Caribbean locale temporarily puts the Dominican Republic on the rarer side, although W2SKE dropped in for a batch of recent HI8SKE contacts. Bill was also spotted as HH2SKE by W8QXW . . . . . In QSO W8MWZ recognized HI8WL as the W5DUG he worked 'way back in 1935 . . . . . K2MQP learns that HH8JK left Haiti in favor of Surinam, leaving his station in the hands of HH2DB . . . . . According to W2HMJ, LU3DAB still pounds brass on Half Moon Island as LU3ZS . . . . . W3IOU is reported by W8QXW at the mike of KG4AA with a 20-meter 600-watter and HRO-50T . . . . . YL W9HIX observes that HC1WP's two daughters, attending Missouri's Lindenwood College, keep in touch with the OM via Saturday skeds over WØTGB . . . . . Gosh, TV fringe areas extend ever outward. Here's W8GZF/KL7 complaining of Channel Two difficulties in Fairbanks . . . . . W2WHB, recently KG1AX, gets a kick from a 15-watt 6L6 rig in New York . . . . . After a decade of feeding Arkansas to DXers in 196 countries W5MET signs K6VUH in Downey . . . . . "Seems that the vast majority of KZ5 hams are traffic men and it is truly amazing the number of DX stations who have never worked, let alone confirmed, KZ5-land." That from KZ5DX (ex-DL4BY) now having a picnic with his 32V-3, 75A-4 and 3-element whirler down on the isthmus . . . . . DL4s ZC ZB and ZBD stopped off in 22 countries on four continents during their trek back to California where DL4ZC quickly bought a lot, built a house, and raised a 70-foot-high beam as W6KG. "We had especially enjoyable personal visits with CTs 1JS 3AN, VPs 3YG 4TE 6WR, PY8AB FY7YE, PZ1AH, HK5ER, KZ5DG, YS1O and TI8ECH, traveling by railroad, bus, taxi, horse- and ox-drawn carriage, seven ships, boat, plane, street car and afoot." . . . . . K6ICQ, a Technician, protests somebody's unauthorized use of his call on 15 and 20 . . . . . W2QHH, who spices his DXing with YL QSOs, now qualifies for YLCC-650 and has worked PJ2ME on five bands . . . . . VP6AM, previously VS6HR and G3CDR, closes shop in Barbados after being thwarted by Utah and Nevada in WAS efforts . . . . . DX men were numerous at the Grand Rapids, Mich., hamfest in early March, according to W8NOH. And WØQGI mentions a WØ-DXCC conference to be held in Kansas City on the 13th of this month (check with WØLVA). This year's joint

(*Continued on page 164*)

The World Above 50 Mc.

CONDUCTED BY EDWARD P. TILTON,* W1HDQ

ONE thing about the 6-meter band — you never really know what's going to happen next! Over the years we've learned quite a bit about wave propagation in the v.h.f. range, but the 50-Mc. band can still surprise the best of us.

A classic example: Around February 17th, knowing 6-meter men were watching for something to happen. The F_2 m.u.f. had been running a little below 50 Mc. most of the time for the past month, but there had been two big auroras in January, on the 21st and 24th. If the m.u.f. on North-South paths was due to rise in February, as predicted, the period around the 27-day recurrence of those auroras would be a good bet. There was plenty of checking done Saturday and Sunday, Feb. 16th and 17th, but all was quiet. The week-end watchers got nothing for their alertness then, but the 18th was another story!

A few days previously, W8LPD, Cincinnati, Ohio, had worked ZE2JE, Southern Rhodesia, on 28 Mc. As good 6-meter men, they were interested in the prospects for the first Africa-America 50-Mc. QSO, so they decided to have a go at it each day at 1230 EST. At 1228 on the 18th, W8LPD started tuning the 6-meter band, in preparation for the schedule — and could hardly believe his ears when he ran across an S9-plus signal at the low edge of the band, signing ZE2JE! Contact was made immediately, with tremendous signals each way, for what is believed to be the first v.h.f. QSO between Africa and any point in the Western Hemisphere.

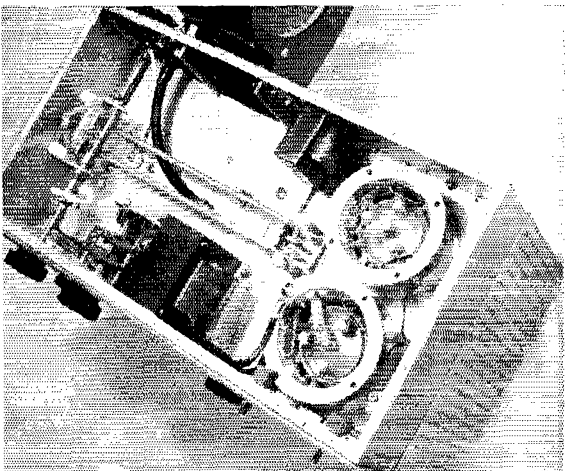
Word from ZE2JE, via W1JXM, lists W8LPD, W8PKL and W8PBU, all of Cincinnati, and K4CTB (location unknown, but probably just across the Ohio River, in Kentucky) as the stations he worked, the band going out for him at 1805 GMT. W8LPD, W8PBU, K4IDX, Cookeville, Tenn., and possibly others, worked VQ2PL, Northern Rhodesia, shortly after. W8LPD reports that VQ2PL was in until about 1330 EST.

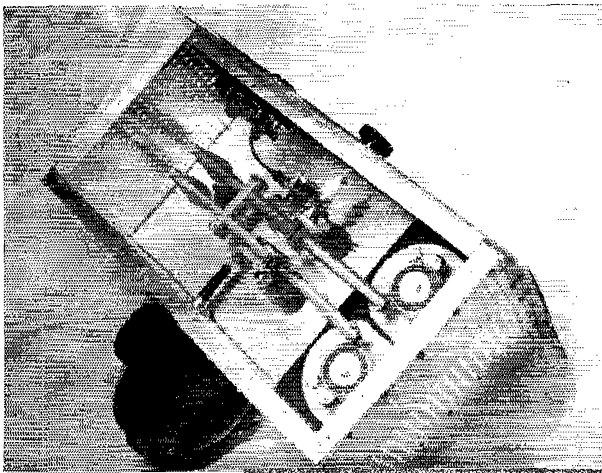
Receiving this news from W8LPD by telephone sent your conductor scurrying for home as soon as the exigencies of a *QST* deadline would permit, but all was quiet at 1745, when we checked the band at Canton. Then just as we were gulping down the last bit of our evening meal, a phone call from W1SUZ in Colebrook (Mrs. W1SUZ handling the information) told us that the band was open to South America. A quick check caught LU8AE coming through S9, calling CQ. A short but solid contact was made at 1850, after which LU8AE promptly faded to about S1 to 2. He was audible from 1825 to about 1930, from checks we've been able to make. Two other unidentified DX signals were heard.

South Americans on 50 Mc. in New England — after dark? Who ever heard of such a thing? Not CRPL, judging from their monthly F_2 Predictions! All the work between Northeastern U. S. A. and South America in the past, dating back to W1ELP's QSO with HC2OT, Feb. 22, 1949, had been done in the morning hours. Trans-equatorial scatter this far north? Multiple-hop sporadic-*E*? You tell us! W4AYV and K4JVX (both in Florida) were audible at the time, but were their signals F_2 back-scatter or *Es*? Questions like these may be cleared up a bit when we have the IGY reports for the period at hand, but we'll lay a bet that it will be some time before we have all the answers on why v.h.f. signals play the tricks they do.

*V.H.F. Editor, *QST*.

A fine example of home construction is the "Fenwick Kilowatt," the work of the Fenwick triplets, W7VMO, W7VMP and W7VMQ. They brought it east with them when they came to Purdue University, and it is presently in use at W9KLR, Rensselaer, Ind. Grid circuit, bottom view, left, is half-wave line. Plate tank has a quarter-wave line. Tubes are 4X500As — a cool and efficient kilowatt on 144-Mc. c.w. or phone.





Would we like the answers if we had 'em? Isn't a large part of the fun in working such DX derived from trying to outguess the ionosphere, or in making the best of the times when it throws us a fast one, when we were looking for a slow curve?

The word got around fast, and many grandmothers died on the 19th. Early-morning checks on 28 Mc. showed that band all but dead, and few guessed that things would be hot again for at least a couple of days. But around noon 50-Mc. back-scatter from the south and southeast began to show up. Stations all over the eastern part of the country were audible with beams aimed southeast. Out of this came PZ1AE,

WØZJB.....48	W4UCH.....45	W8NQD....45
WØBJV.....48	W4QN.....44	W8UZ.....45
WØCJS.....48	W4EQR.....44	W8RFW....45
W5AJG.....48	W4FLW.....43	W8SQU....45
W9ZHL.....48	W4UMF...43	W8LPD....44
W9OCA.....48	W4OXC.....41	W8HJR....43
W6OB.....48	K4DJO.....41	W8YLS....41
WØINI.....48	W4MS.....41	W8PCK....38
W1HDQ.....48	W4AZC.....40	W8NOH....34
W5MJD.....48	W4IKK.....40	
W2IDZ.....48	W4FNR.....40	W9BRN....48
W1LLL.....48	W4IUJ.....38	W9ZHB....48
WØDZM.....48	K4DNG.....37	W9QUV....48
WØHVW.....48	W4AKX.....36	W9VZP....47
WØWKB.....48	W4AYV.....36	W9RQM....47
WØSMJ.....48	W4GJO.....35	W9ALU....47
WØOGW.....48	W4ZD.....35	W9QKM....47
W7ERA.....48	W4ZBQ.....34	W9UIA....45
W3OJU.....48		W9UNS....45
	W5VY.....48	W9MHP....43
W1VNH....47	W5SFW....47	W9MFH....42
W1CLS....47	W5LFQ....47	W9JEP....42
W1CGY....46	W5GNQ....46	W9JCI....41
W1LSN....46	W5ONS....45	
W1AEP....46	W5ML.....44	WØORE....48
W1RFU....44	W5FSC....44	WØQIN....47
W1FOS....44	W5JLY....44	WØNFM....47
W1KHL....42	W5JME....43	WØTKX....47
W1ELP....41	W5VV.....42	WØKYF....47
W1SUZ....37	W5FAL....41	WØMVG....47
W1SPX....36	W5HEZ....41	WØJOL....46
W1UHE....35	W5BXA....41	WØUSQ....45
W1WAS....31	W5HLD....40	WØYJF....44
W1FTF....29	W5PXN....40	WØURQ....44
	W5EXZ....38	WØJHS....43
W2MEU....47	W5FRK....36	WØIPI....43
W2AMJ....46	W5HFF....33	WØCNM....42
W2BYM....46	W5NSJ....32	WØFKY....42
W2RLV....45	W5ZVF....31	WØPKD....41
W2FHJ....45		WØZTW....41
W2RGV....44	W6WNN....48	WØZTW....36
K2JNS....42	W6UXN....48	WØQVZ....36
K2AXQ....42	W6TMI....47	WØVIK....35
W2SHV....41	K6EDX....46	KØBPM....35
W2GYV....40	W6ANN....45	WØWNU....34
K2HPN....39	W6NDP....45	WØYZZ....30
W2ORA....39	K6GTG....44	
W2QVH....38	W6GCG....43	VE3AET....45
K2HRB....37	K6HYY....43	VE3AIB....35
W2ZUW....37	W6ABN....43	VE1EF....35
K2ITQ....36	W6IWS....41	VE1QZ....34
K2ITP....36	W6CAN....40	VE1QY....32
K2LTW....35	W6BWG....39	VE3DER....31
	K6ERG....38	XE1GE....27
W3TIF....47	W6OJF....31	VE1PQ....23
W3KMV....44		VE1WL....21
W3NKM....41	W7FFE....48	CO6WW....21
W3MQU....41	W7HEA....47	VE4HS....20
W3MXW....41	W7BQX....47	CO2ZX....16
W3OTC....40	W7FDJ....46	LU9MA....16
W3FPH....40	W7DYD....47	PZ1AE....15
W3RUE....41	W7ACD....45	JA1AUH....5
W3LFC....37	W7JRG....44	
W3TDF....35	W7BOC....42	Calls in **bold face** are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.
W3AMO....35	W7JPA....42	
W3UQJ....28	W7FIV....41	
	W7CAM....40	
W4EQM....47	W7UFB....31	
W4FBH....46		
W4LNG....45	W8CMS....47	
W4CPZ....45	W8OJN....46	

Surinam, to work a long string of stations in Northeastern U. S. A. LU7PB joined the party shortly after and was a busy man for an hour or so, that we know of. This was more like it; the South Americans were coming in, not quite as early as we would expect them, but at least over an all-daylight path!

This is a sketchy story, admittedly; the events happened too near the *QST* deadline to permit obtaining more details. The examples show, however, that we are unwise to rely too much on either predictions or past experience in determining what hours we will spend watching the 6-meter band. The operators who catch the good stuff check often, and carefully. As far as F_2 DX is concerned, the appearance of back-scatter is the best DX evidence, but remember that nobody hears back-scatter if *everyone* listens.

Late reports, received after the above was written, show more of the extent of the Feb. 18th and later openings. VQ2PL was worked by K9GGF on the 18th, and on the 19th by KØBLD, Lakeville, Minn., at 1034 CST, and by WØAEH, Ogden, Iowa. He was heard by WØQVZ, Ft. Dodge, Iowa, at 1135 CST. WØQVZ worked ZE2JE on the 19th, at 1129 CST. W8ESZ, Grand Haven, Mich., worked PZ1AE on the 19th. A first is reported for the 20th by W4FNR, Ft. Lauderdale. He says that CE1AH worked W4CQP. This would be CE1AH's first 50-Mc. work into the U.S.A. in ten years of trying. W4FNR also reports that OA4C worked W4CQP, K4KNA and K4CZW on the 20th.

Here and There on V.H.F. Bands

Chances to work into Africa may not come too often, but when fate does allow it we can be fairly sure that there will be someone at the other end to work. ZS2Y, V.H.F. Editor for SARL, writes that there are 50-Mc. men in every ZS call area, numbering nearly 50 all told. Southern Rhodesia is represented by ZE2s JD JE JR KM KO and KZ. VQ2PL has VQ2JN to keep him company in Northern Rhodesia. Peter, VQ2PL, is a veteran of 50-Mc. DX in the previous solar cycle. ZD6EF, ZD6DT, OQ5FM and CR7AU are some of the other choice ones now on 6.

Though the work reported above took place after noon EST, the predictions indicate a possibility of the path being open much earlier. Over week ends there will be activity from 0700 to 1300 EST, at least, but other days most of the gang will be on by 1000 EST, or shortly thereafter. They use the low edge of the band as a DX calling frequency. We might bear this in mind before engaging in long rag-chews in the first 100 kc. of the band.

If the reports now coming in to W1VLH's IGY project office are any indication, plenty of fellows are watching the 6-meter band closely. The 2-meter reports also show encouraging awareness of the DX potential of that band, particularly in connection with aurora. From the file on hand Feb. 19th, we see that aurora DX was worked on Jan. 21st, 24th, 25th, 28th and 29th. The 21st and 24th were most widespread, being observed all the way from VE1 to W7, and as far south as South Carolina and Tennessee.

F_2 DX was far down from the first reporting period, but transcontinental work was done on Jan. 17th and 22nd, and there was evidence of the path to England being open as late as Jan. 27th. Sporadic-*E* skip was more prevalent than most people would believe, having been reported Jan. 17th, 20th. Feb. 1st, 3rd and 8th.

We set the limit of possible 2-meter DX via meteors tentatively at about 1500 miles (see W4LTU's article in this issue) but there is nothing very definite about this. W4LTU recently received bursts from W5FAG, Albuquerque, N. Mex., 1550 miles. Of perhaps even greater interest is W5FAG's situation, in back of a 5-degree obstacle (Sandia Crest) in the easterly direction. Walt figures that

this represents a meteor height of at least 160 km., which could provide signals out to 1900 miles in open terrain.

With the boom in the world above 50 Mc., v.h.f. clubs and nets are springing up all over. Here are some we've heard from recently. The Mobile Sixers of the Philadelphia area have 18 members working mobile. Net calling frequency, monitored regularly, is 50.55 Mc. A secondary channel is 51 Mc. A net roll call is made each Sunday at 1000, with W3AMO as NCS and W3FQI alternate. As many as 46 stations have participated.

A 6-meter net was organized in the Corpus Christi area in January. With K5EYL at the helm and W5ZDE as alternate, the group works out Mondays at 2000 CST. Frequency: 50.18 to 50.2 Mc.

Mondays at 2000 EST is the net time of the Six-Meter Nomads of the Cleveland area. W8RAY reports that the Nomads sponsored a 6-meter contest the first three week ends of February; results to be announced March 18th.

Two-meter interest is building up in the Denver area, according to WØACA, who is on nightly at 1900 MST. On Monday, Wednesday and Friday he aims north at this time. Alternate nights his 12-element horizontal is turned to the south. Sundays at 1000 he tries in various directions. Wøs MLH DMC TVV and UHD, KN6QJY/Ø, Lowry Field, and KNØDSW, Longmont, are among the regulars. An informal net is held each Thursday at 1900 MST.

W5JXU, Pottsboro, Texas, wants to know if there is any variation in local v.h.f. coverage during a solar cycle. Sim says that the distances he covers regularly of late on 6 seem to be greater than recent improvements in equipment can account for. Reliable range, even with moderate power, seems to be at least 200 miles. Good contacts are made regularly into Tulsa, Okla., 165 miles, and Ft. Smith, Ark., 175 miles, though several stations run no more than 30 watts. WØUTH, Seneca, Mo., 240 miles, is worked under what appears to be normal conditions. Since weather is presumably the only factor in varying signal strength over a given path, we'll have to leave it to the experts to determine whether there is a correlation between weather and solar activity. If so, v.h.f. propagation should tie in.

Nevada 50-Mc. expedition: During Easter vacation, K6CNM and K6ILY will be hitting the high spots in Nevada on 50.25 Mc.

Our query in February *QST* about European 420-Mc. DX brought a reply, and much interesting information, from DL3FM, DARC V.H.F. editor. Karl says the report of contact between Hungary and Spain on 435 Mc. is not true, but that the hop across the Mediterranean was made, in 1954, by FA8IH and F9BG, a distance of 470 miles. V.h.f. activity is general throughout Europe, with emphasis on 144 and 432 Mc. There is also appreciable interest in the application of high-stability techniques to the 1215-Mc. band. Poland, Czechoslovakia, Hungary and Yugoslavia have been worked on 144 and 432 Mc. by Western amateurs, and Russian stations are now using the same bands. So far no UAs have been worked, which may be due to the use of simple gear by most Russian v.h.f. stations.

Cooperation between amateur societies in Western Europe is excellent, a permanent v.h.f. committee having been arranged at the IARU Conference at Stresa last year. DL3FM is president and ON4BK is secretary of this group. A meeting is scheduled for May, 1957, in Paris.

V.H.F. S.S.B. News

Particularly on v.h.f. paths where the going is roughest, s.s.b. is proving its worth, extending the reliable range well beyond that of conventional a.m. equipment of the same power level.

A good example is the "impossible" v.h.f. circuit between W6NLZ, Palos Verdes Estates, and W6LSB, Hood, Calif. This is a hop of more than 360 miles. The first 200 miles or so is open valley south from W6LSB's location, not far from sea level. At the southern end of the valley, very high mountains intervene. From Bakersfield to W6NLZ's 900-foot elevation the terrain is the sort that was deemed impassable to v.h.f. signals until recently. W6LSB and W6NLZ have been keeping c.w. skeds on 144 Mc. for nearly two years. They have never been without a signal, but your conductor heard the circuit in operation last June, and can say that at minimum it provides only very marginal c.w.

Good tropospheric propagation over this varied terrain is rare. From Hood to Bakersfield is good inversion country, but the rest of the way it is unlikely that a stable weather pattern will develop often. Propagation over the path is probably compounded of tropospheric bending in the valley, tropospheric scattering at higher levels, and perhaps a measure of knife-edge refraction over the mountain peaks. To sum up, it's a good circuit to check out the worth of new techniques. Nothing but the best works at all!

They have had few voice contacts in the past, but they made their first two-way s.s.b. QSO Feb. 12th. It will be interesting to see whether s.s.b. gives a significantly greater proportion of voice QSOs than has been enjoyed heretofore.

How well s.s.b. works during auroral propagation is still a matter of conjecture. W2JJC says that the big aurora of Jan. 21st did not give as readable signals as one encountered early in the winter. Army raised W8DX on c.w. and went to s.s.b., but with only partial success. Later two-way s.s.b. with W3HWN was tried, and again it was impossible

(*Continued on page 166*)

2-METER STANDINGS

	U. S. States	Areas	Miles
W1REZ	24	7	1175
W1FZJ	21	6	1120
W1HDQ	20	6	1020
W1RFU	19	7	1150
W1KCS	19	6	1080
W1AJR	17	6	810
W1IZY	17	6	750
W1UIZ	17	5	680
W1AZK	17	6	850
W1BCN	16	5	650
W1KHL	16	5	540
W1AFO	15	5	810
W1MMN	14	6	800
W2ORI	27	8	1040
W2NLY	27	8	1050
W2AZL	23	8	1050
W2BLV	23	7	1020
W2DWJ	21	6	720
W2OPQ	20	6	970
W2AMJ	20	6	960
K2CEH	20	7	910
W2PAU	20	6	880
W2UTH	19	7	880
W2AZP	19	7	650
K2IXJ	19	6	925
W2CBB	19	6	740
W2KIR	19	6	—
K2IEJ	18	6	745
W2AOC	18	6	660
W2LHI	18	7	620
W2RXG	17	6	675
W2SHT	16	6	650
W2PCQ	16	5	650
W3BGT	28	8	740
W3RUE	25	8	950
W3GKP	23	6	800
W3FPH	21	8	—
W3TDF	21	6	—
W3KCA	21	7	—
W3LZD	20	7	—
W3KWL	19	7	740
W3NKM	19	8	660
W3IBH	19	7	650
W3YHI	19	6	800
W3BNC	18	7	750
W3LNA	16	7	720
W4HHK	29	9	1280
W4HJQ	26	7	750
W4AO	23	7	950
W4UMF	21	6	720
W4MKJF	20	8	725
W4JCJ	20	6	660
W4DWU	19	6	675
W4JFV	18	7	820
W4QLK	18	6	720
W4VLA	17	7	825
W4WNH	17	7	750
W4TLV	16	7	1000
W4CLY	15	5	720
W4ZBU	14	5	800
W4WCB	14	5	—
W4TCR	14	5	720
W4IKZ	13	6	720
W4SOP	13	5	680
W4LTU	13	6	1080
W4CPZ	12	5	650
W4UDQ	11	5	850
W4MDA	11	5	680
W4GI8	9	2	335
W5RCI	21	7	925
W6HEH	15	7	830
W5AJG	15	5	1280
W5ABN	12	5	780
W5QNL	10	5	1400
W5CVW	10	5	1180
W5SWV	10	3	600
W5MWW	9	4	570
W5ML	9	3	700
W5NDE	8	3	520
W5PZ	8	3	500
W5FEK	8	2	580
W5VY	7	3	1200
W6NLZ	6	3	1000
W6WSQ	5	3	1380
W6DNG	4	3	600
W6AJF	5	2	640
W6RRZ	4	2	360
W6PJA	3	3	1390
W6ZL	3	2	1400
W6AJF	3	2	640
W6BAZ	3	2	400
W6MMU	3	2	388
W6ORS	3	2	365
W6LSB	2	2	360
W7VMP	6	4	1280
W7LEE	6	3	1020
W7LHL	4	2	1050
W7JU	4	2	353
W7JIP	3	2	850
W7YZU	3	2	240
W7JUO	2	2	140
W8WXV	28	8	1200
W8RMH	28	8	800
W8SRW	27	7	850
W8SFG	26	7	850
W8LPD	25	8	750
W8DX	25	8	720
W8LOF	24	8	700
W8ILC	23	8	770
W8SVI	22	8	725
W8JWV	22	8	710
W8BAX	21	8	685
W8PT	21	7	810
W8WRN	20	7	670
W8EP	18	7	800
W8ZCV	17	7	970
W8RWW	17	7	630
W9KLR	30	8	950
W9FVJ	26	8	850
W9ZHL	25	8	760
W9EQC	25	8	820
W9GAB	24	7	1100
W9EHX	24	7	725
W9BPV	23	7	1000
W9WOK	22	8	860
W9UCH	22	8	750
W9UED	22	7	960
W9KPS	21	7	690
W9MUD	19	7	640
W9REM	19	6	—
W9LF	19	6	—
W9ALU	18	7	800
W9JGA	18	6	720
W9MBI	16	7	660
W9JYI	15	7	560
W9LEE	15	6	780
W9DSP	15	6	760
W9DDG	16	6	700
WØEMS	27	8	1175
WØIHD	26	7	870
WØGUD	25	7	1065
WØUOP	18	6	—
WØONQ	17	6	1000
WØINI	17	5	830
WØUSQ	14	6	750
WØOAC	14	5	725
WØTJF	13	4	—
WØSMJ	12	5	775
WØZJB	11	4	650
VE3DIR	26	8	915
VE3AIB	25	8	910
VE3BQN	17	7	790
VE3DER	16	7	820
VE3BPB	13	6	715
VE2AOK	12	5	550
VE3AQG	11	7	800
VE1QY	11	4	900
VE7FJ	2	1	365

Edison Award to W3CUL

FOR HER WORK in handling amateur traffic, particularly for servicemen overseas, Mrs. Mac Burke, W3CUL, has been presented with the Fifth Edison Radio Amateur Award for public service. The Award, a handsome gold cup, and a check for $500.00 were presented to W3CUL at a ceremony in Washington, D. C. on the evening of Feb. 28th. Representing the General Electric Company, sponsors of the Award, were Vice-President W. R. G. Baker and Mr. L. B. Davis, general manager of the Electronics Components Division. The principal speaker was Rear Admiral H. C. Bruton, USN, Director of Naval Communications, whose remarks were heard by 200 attending amateurs.

Mac Burke's traffic work has been outstanding for many years, and this Edison Award comes as a fitting tribute to the time and effort she has devoted to serving others. She operates daily in six c.w. networks, and has handled 312,000 messages since 1949. Her longest stretch of operating without missing a schedule was 1825 days — five years without taking a vacation or even a single day off.

When they met in January to make their decision, the Edison Award judges (who included Herbert Hoover, jr., under-secretary of state; FCC Commissioner Rosel H. Hyde; Chairman E. Roland Harriman of the American National Red Cross; and Goodwin L. Dosland, president of ARRL) also named the following amateurs to receive special citation plaques:

James P. Born, jr., W4ZD, Atlanta, Ga.
Julius M. J. Madey, K2KGJ, Clark, N. J.
Harry L. Fendt, W2PFL, Great Kills, N. Y.
George W. Bailey, W2KH, New York, N. Y.
Sam E. Baker, W3FIQ, West Springfield, Pa.
C. Newton Kraus, W1BCR, Warren, R. I.
Mrs. Martha Shirley, WØZWL, Black Hawk, S. D.

The judges also awarded a group citation to the "Operation Deep Freeze" committee of the Radio Amateurs of Greater Syracuse (RAGS).

RAGS, W1BCR and K2KGJ received the citations for traffic handling to the Antarctic; W2PFL received the citation for traffic handling in connection with medical emergencies; W3FIQ and WØZWL were selected by the committee for their communications assistance during blizzards; W4ZD received the citation for civil defense work; and W2KH was selected because of his long record of service to amateur radio.

Because Admiral Bruton's remarks are of interest to all of amateur radio, they are reproduced in full herewith. We quote:

Admiral Bruton's Address

"I can think of no better way to commence my remarks than to pay a tribute to the General Electric Company and its officers for the concept and annual observance of the Edison Radio Amateur Award. Although instituted only five years ago, it has become one of the finest traditions in all of amateur radio. That it has received national recognition is evidenced by the many deserving nominees from all parts of the nation, by the list of eminent men who have served on the judging panel, and by the widespread recognition afforded the winner. I take pride that the first Edison Amateur Award winner was Don L. Mullican, W5HP, of my home state of Arkansas.

"I would like next to commend the distinguished members of the judging panel who selected the 1956 winner from a list of some 50 worthy nominees, all of whom have made outstanding contributions in the fields of public service. As an officer of the military services, I am pleased particularly that the panel selected as the 1956 winner a well-known amateur, whose accomplishments

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Admiral Bruton congratulates W3CUL as G.E.'s L. B. Davis stands by with the Edison Award cup.
(U. S. Navy photo)

through the years, and especially during 1956, were highlighted by the handling of a very large number of messages for personnel of our armed forces.

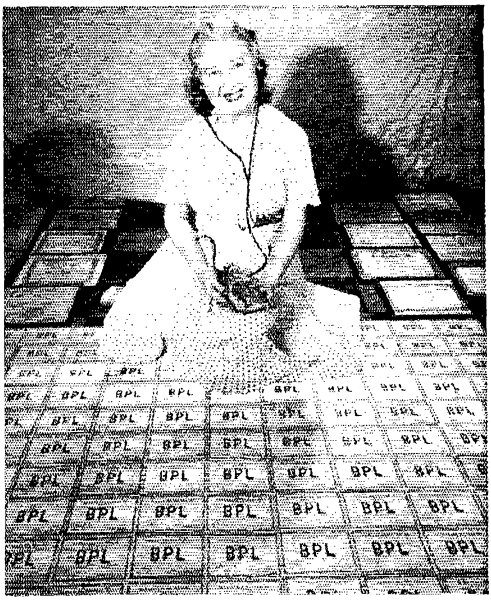
"The 1956 Edison Award winner is known as a highly dependable, able, and effective communicator. She has faced the finest kind of competition and has been declared the amateur radio operator who performed the most outstanding public service in the nation during 1956. I extend to her my warm, personal congratulations. I also felicitate the recipients of the special citations on their meritorious performances.

"Mrs. Mary D. Burke, affectionately known to so many as Mae, W3CUL, is the first woman to receive the Edison Award, but I predict she will not be the last, since the interest and accomplishments of our ladies in the radio amateur field are increasing. I might state, in this connection, that in our Navy and Naval Reserve we have many WAVE radiomen, small but growing numbers of WAVE Electronics Technicians and Communications Technicians, as well as a number of WAVE officers who are valuable and unusually well-qualified communicators and cryptographers. So in the Naval Service, too, communications and electronics skills originally reserved for the male are being invaded — and very successfully, too — by the fair sex.

"The accomplishments of radio amateurs in many fields of public service are well known. These include emergency communications in time of floods, hurricanes and other disasters, provided by such amateur organizations as the American Radio Relay League Emergency Corps, the Radio Amateur Civil Emergency Service, as well as by many individual amateurs. The fine service provided by many radio amateurs in connecting phone patches and in handling messages for members of all our armed forces and their families, represents a contribution to morale so great it is difficult to measure. It is, of course, in this important field of public service that we of the armed forces are so grateful to Mrs. Burke for her splendid performance.

"But I would like to speak briefly of another vital contribution by the radio amateur to public service, i.e., that of active service in our armed forces. The record here is impressive. Of the 6000 radio amateurs in the United States in 1917, approximately two-thirds served in our armed forces during World War I. More than 25,000 radio amateurs saw active military service in World War II. Large numbers serve today on active military duty; thousands more are affiliated with our inactive reserve forces.

"The military services hold the radio amateur in high regard. His operating and technical skills, acquired while pursuing a peace-time hobby, are an invaluable qualification. We have found (and I know this from personal experience) that, in general, radio amateurs adapt themselves readily to military operational and technical procedures, and are unusually quick to learn in the fields of military communications and electronics. Many times I have inquired into the



More proof that W3CUL handles a bit of traffic now and then.

background of a particularly skillful radioman or electronics technician, and learned, not to my surprise, that he was a radio amateur. All things considered, the radio amateur, in the military service and out, is an important national defense asset.

"Because of the importance the armed forces place upon amateur radio, the military services are steadfast in their encouragement and support of its operation. There are hundreds of U. S. military-sponsored radio amateur stations throughout the world. For example, there are more than 500 radio amateur stations at naval reserve training centers and electronics facilities in the United States alone. Another now well-known group of Navy-sponsored amateur stations includes the four in the Antarctic — at McMurdo Sound, Marie Byrd Land, Little America, and the South Pole — later to be augmented by several more stations in that area. These polar stations are operated under recognizedly adverse conditions, but they have established and maintained an enviable record — and continue to furnish a vital link between our military and scientific personnel in the Antarctic and their families and friends in the United States.

"The U. S. military services also lend strong support to amateur radio in obtaining and retaining radio frequencies, the life blood of amateur operation. As many of you know, at all of the international radio conferences held during the past 30 years, the United States delegation has played consistently a leading role in the protection and acquisition of spectrum space for amateur service. This representation on behalf of the United States was due in no small part to Navy insistence in the preparatory work

(Continued on page 162)

PRP—A Progress Report

The Latest on ARRL's World-Wide V.H.F. Propagation Project

BY MASON P. SOUTHWORTH,* W1VLH

QUITE a lot has happened to the ARRL-IGY Propagation Research Project since its kickoff in last September's *QST*.[1] *QST* readers who didn't take us up on our invitation at that time may be interested in a progress report. Perhaps when you hear what we've been up to, you'll want to join us.

For those who missed the announcement article, PRP (*P*ropagation *R*esearch *P*roject) is a program to collect and study information on some of the more interesting varieties of v.h.f. wave propagation. This work is being carried on by a special ARRL staff under contract with the Department of the Air Force. It will continue for at least the duration of the International Geophysical Year — that is, until the end of 1958. If you don't know what the IGY is by now, just look back to the lead article in *QST* for July, 1956.[2]

Observer Recruiting

In the closing paragraphs of the September article, we invited all those interested in the project to write in for more information. Inquiries soon began to come in from v.h.f.-minded amateurs around the world. These fellows were then sent registration forms to be filled out and returned. About this time, also, a letter went out to the headquarters of the International Amateur Radio Union societies in each of the IARU countries. In it we asked for cooperation in publicizing our program abroad.

Personal mail solicitation was also used to enlist observers for PRP, the mailing list being based on "World Above 50 Mc." columns, the OES list, and the VHF/UHF Directory. Invitations to join PRP and registration forms for doing so were then sent them. Observers already enrolled were helpful in "fingering" their more procrastinating brethren.

These and similar steps were all part of PRP's "Phase A" — building up a list of amateurs operating on, or interested in, our v.h.f. bands who had signified their interest in the work by filling in and returning a PRP registration form.

Reporting

You're probably wondering just what these fellows (there are well over 800 of them by now, from almost all corners of the world) are needed for during IGY. We are asking that they send us, twice each month, reports of stations worked and heard via ionospheric propagation modes on the bands above 50 Mc. We are also asking for reports of the times they were operating or listening, and noted no DX of the types we are interested in. These are known as "positive" and "negative" reports, respectively.

The propagation types of interest were covered in the September article, but they are worth a brief review. One type is transequatorial scatter, involving long north-south paths crossing the equator, with openings at the "wrong" times of the day to be otherwise accounted for. Another is sporadic-*E* skip, a field where amateurs have already contributed a good deal of information. Auroral and meteor-scatter data are also being sought. Lastly we would like reports of F_2 openings, both conventional skip and the back-scatter variety. All of these propagation modes involve the ionosphere in some way, and all have been treated in *QST* at one time or another.[3] Most of them were discovered through

(*Continued on page 132*)

*ARRL-IGY Project Supervisor. Correspondence should be addressed to ARRL, 530 Silas Deane Highway, Wethersfield, Conn.

[1] Southworth, "The ARRL-IGY Propagation Research Project," *QST*, Sept., 1956.

[2] Berkner, "The International Geophysical Year," *QST*, July, 1956.

W1VLH and assistant, ex-WN1CIE

[3] *QST* references for more information on the various forms of propagation follow:

Transequatorial scatter: "World Above 50 Mc.," October and November, 1947; May, 1950.

Sporadic-*E* skip and auroral reflection: "V.H.F. Why — How — When?," Feb., 1951. "Aurora and Magnetic Storms," June, 1951. "More About V.H.F. Auroral Propagation," Jan., 1955.

Meteor scatter: "V.H.F. Meteor Scatter Propagation," Bain, this issue.

Back scatter: "World Above 50 Mc.," Jan., 1957

♦

Simulated Emergency Test—1956

The Amateur Radio Emergency Corps Demonstrates Its Readiness in the Annual SET Exercise

BY GEORGE HART,* W1NJM

With the increased interest in emergency preparedness brought about by the RACES boom, the 1956 SET showed a slight but decided improvement over the 1955 affair. If we count "hearsay" reports (i.e., indications by messages received from AREC members that certain groups were active even though we received no word of it from the EC), the 1956 SET topped them all, with 215 reports. Even if we don't include such reports, last year's affair was more extensive than any before or since the peak years of 1950 and 1951 when the initial civil defense fever was running high, with 196 reports compared with 213 and 214 respectively.

So we're pleased, but not satisfied. A total of 196 EC reports out of roughly 1700 ECs is still not a good percentage, especially when only 140 of these took the trouble of sending in the SET report form with a calculated "score" to show our national effectiveness compared with former years. Score-wise, our 1956 SET ranks sixth in the seven years since we adopted a standard scoring system, largely due to the fact that so many reporting ECs did not bother to compute their scores.

But statistics don't tell the whole story—not by a long shot. The 1956 SET was a lot better than the size of the score indicates. This could have been evident just by listening in during the October 13–14 week end. Traffic was flying thick and fast, both locally and nationally. In addition to passing simulated emergency traffic around locally, ECs solicited traffic from their Red Cross chapter directors or disaster chairmen and c.d. directors to be put into long haul circuits to regional or national headquarters, AREC members each were urged to originate a message to ARRL headquarters (over a thousand such messages were received here), and ECs themselves originated summary messages to headquarters indicating what they were doing, when they were doing it and who was doing it. Additionally, we received countless messages from c.d. directors, fire and police chiefs, mayors, governors, Red Cross heads, and what have you. Emergency communication is a traffic-handling activity, and don't let anyone kid you about that. Some of it of necessity can't be reduced to writing in the duress of a bad situation, but a standard procedure to save time and increase accuracy and therefore efficiency is requisite, and we won't approach perfection in this unless we practice it and practice it again, every chance we get and as often as possible.

* National Emergency Coordinator, ARRL

Red Cross Participation

The usual cooperation of the American National Red Cross was very apparent. The regular team of W3PZA, W9DUA, W6CXO, and W2CRD were on deck to handle RC traffic, and this year W4LXE of Macon, Ga., was designated to serve the Southeast Area with headquarters in Atlanta. W6CXO, through the Director of Disaster Services in the Pacific Area Office, sent out 432 messages to virtually all major chapters under the jurisdiction of that office, requesting reply via radio during the week end — and over 100 replies came in to W6CXO and its supporting stations in the San Francisco Bay Area. Of the 314 messages received at ANRC headquarters in Washington, 232 were handled by the above-mentioned key stations and the remainder by others in the area. The routing to area heaquarters turned out to be a great improvement over the past. The Red Cross team also handled a great many messages for ARRL and civil defense.

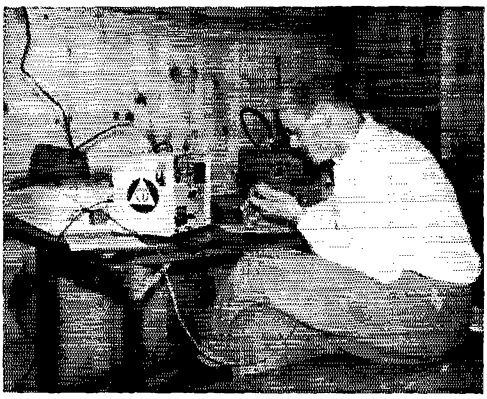
Civil Defense Participation

For the first time in the SET, an effort was made to channel some traffic into FCDA regional and national headquarters. We have no data on just how many messages were handled, but we do know that several FCDA stations were on the air for this purpose during the week end, including W8DUA (and don't think *that* didn't cause some confusion with W9DUA on the same frequency!), W8LBM, W8DGM, W8CAU and W8UTQ all holding up the Battle Creek end, and WØWBC representing FCDA's Denver office. These stations were, for the most part, operated by FCDA amateur personnel from their own stations and consequently were not able to be constantly on the air to receive FCDA traffic.

On the local scene, c.d. of course played a major part in the SET. Most ECs rang in their RACES groups quite heavily, 26 ECs indicating that their SET drills were entirely RACES drills, 34 more saying that their drills were partly on RACES frequencies. Many ECs whose groups are dedicated entirely to RACES did not put on an SET during this weekend because of the frequency with which they conduct regular RACES drills.

ARRL Traffic

The traffic for ARRL was a mere trickle on Saturday night (Oct. 13th) but became a torrent by Sunday night, and kept coming in in diminishing volume for the rest of the week. Several nets conducted special sessions for the purpose



The Eureka (Calif.) AREC conducted its usual realistic SET in the open air (left). That's K6CXB on the key, while W6AEY kibitzes. An emergency generator supplied power. At right is the portable station at Camp Nootening, N. Y., in the Dutchess County SET. At the mike is EC K2GCH. Operation on both six and two meters.

of handling this extraordinary volume of traffic occurring over a week end; probably more did so then came to our specific attention, but we want to acknowledge the special efforts of these: In Missouri, both the Missouri Traffic Net (MON) and the Show-Me Net; in Tennessee, the Tennessee CW Net; in Virginia, both the Virginia Net and the Virginia Fone Net; the New York City-Long Island Phone Net. The Mike Farad Traffic Net, under W3ZSX, handled much SET traffic. The Fifth and Tenth Regional Nets of the ARRL National Traffic System were active over protracted periods to expedite traffic flow. United Trunk Lines routed plenty of ARRL traffic via W1EFW. All in all, a very good job of traffic handling was done on long haul circuits.

If the exercise did nothing else (but it did!), it gave some of the headquarters people and local amateurs a workout. W1AW delivered the most ARRL traffic, 490. Next came W1YBH Connecticut PAM and manager of the Connecticut Phone Net, with 300. W1NJM delivered 253, W1YYM 95, W1BDI 39. Some traffic was mailed in, some telephoned, some delivered in person.

Dignitaries

Lacking space to reproduce texts of traffic from important personages who sent us messages commenting on the work done by local amateurs, we want at least to acknowledge them. Congratulatory messages and pledges of support were received from the Governor of Georgia; state c.d. directors of Kansas, South Dakota and North Dakota; deputy c.d. director of Nebraska; director of FCDA Region 6 (Denver); mayors of Decatur, Ala., District Heights, Md., Miami Springs, Fla., Springfield, Mo., Rouge River, Ore. Bremerton, Wash., San Angelo, Texas; city manager of Springfield, Mo.; c.d. director of Jefferson Parish (New Orleans), La.; and countless police chiefs, fire chiefs, red cross directors and disaster chairmen, civil defense communications officers and other civic officials. Receipt of so many such messages indicated promotional efforts on the part of ECs to bring their activities to official attention, in addition to the support and recognition which these efforts produce. Nice going, gang.

Publicity

Public attention and official attention go hand in hand to bring us the recognition and support we need. The former is best brought about by newspaper publicity, and in this aspect ECs participating in the 1956 SET did an outstanding job. Nearly every SET report we received attached clippings, some of them having appeared on the front pages, others prominently elsewhere in the paper, often with pictures showing the various layouts set up by local amateurs in cooperation with civil defense, the Red Cross, or other agencies. The SET is an admirable time to mend or maintain public relations fences, and the gang last year did an admirable job of it with or without the help of our suggested newspaper release.

Summary

For the first time, this year, we are including in the summary the coverage areas of AREC groups known to have participated by "hearsay." We think they should receive at least this much recognition for their efforts, and wish that specific information had been submitted by their ECs. In some cases the amateur reporting summary information was not the EC, in which case his call appears in the "Station Reporting" column. Otherwise, if no summary information available, only the coverage area is included. But first, some overall statistics, with 1955's comparative figures following in parentheses.

Total Reports of activity — 215 (145)
  By Mail — 140
  By radio — 134
  By "hearsay" — 19
AREC members in areas reported (by mail) — 3688 (3086)
Total known participation — 2276 (1631)
Mobiles & portables — 615 (561)
Fixed stations on emergency power — 85 (98)
AREC member messages to ARRL — 1117 (1189)
EC radio reports to ARRL — 134 (88)
Total points (based on mail reports only) — 15, 984 (14,618)

Area Covered	Station Reporting	Points
Abitibi, Que.[1]	VE2FL[2]	39
Albany Co., N. Y.	W2AWF[2]	103
Asheville Area, N. C.	W4GXR[2]	98
Ashland, Ky.	W4BEW[3]	...
Augusta & Richmond Co., Ga.	W4AAY[2]	87
Baltimore, Md.	W3MAZ[2]	166
Bathurst, N. B.	VE1VC	...
Belleville Area, Ont.	VE3AUU[2]	97
Berkeley, Albany, El Cerrito, Calif.	K6EDN[2]	...
Bethel, Conn.[4]	W1NLM	52
Bibb Co., Ala.[19]	.....	...
Black Hawk Co., Iowa	K9AVM	92
Bloomfield, Conn.[5]	W1PRT	32
Bonita Area, La.	W5CYF	10
Bozeman, Mont.	W7ED[3]	...
Bristol, Conn.[1]	W1RLN[2]	92
Bristol, Va.	W4IYI[3]	...
Bronx Co., N. Y.	W2DUP[2]	...
Broward Co., Fla.	W4EP[3]	...
Brown Co., Wis.	W9WLZ	176
Brownfield, Terry Co., Texas	W5NFO	45
Brownwood, Brown Co., Texas	W5YKT[2]	36
Burlington, Iowa, & vic.	WØQVA[2]	39
Butte, Mont.[1]	W7LER[2]	102
Calgary Area, Alta.[6]	VE6WL	200
Calhoun Co., Mich.[19]	.....	...
Calvert Co., Md.	W3WG[3]	...
Cambria Co., Pa.	W3LXQ[3]	...
Campbellton, N. B.	VE1AEB	33
Cape Breton Island, N. S.	VE1FH[2]	...
Carlsbad, Eddy Co., N. M.	K5DAA[2]	119
Carroll Co., Md.[5,1]	W3FVK[2]	59
Cass & Crow Wing Cos., Minn.	WØTUS	112
Chambers Co., Ala.	W4CHO[3]	...
Chambly-La Prairie-Vercheres Cos., Que.[1]	VE2KG[2]	203
Cimmaron Co., Okla.	W5YPI[3]	...
Cleburne, Texas	W5ATE[3]	...
Cleveland Co., Okla.	W5YJI[3]	...
Commanche Co., Okla.	W5 FEC[3]	...
Cook Co., Ill.[1]	W9HPG[2]	674
Cookville, Tenn.	W4PVD[3]	...
Coos Co., Ore.	W7BLN[2]	128
Cuyahoga Co., Ohio	W8AEU[2]	287
Dade Co., Fla.[19]	.....	...
Danbury, Conn.[4]	W1ADW	113
Danville & Pittsylvania Co., Va.	W4BYZ[2]	69
Dauphin Co., Pa.	W3OGD[2]	31
Delmar, N. Y.[4]	W2GTI[2]	75
Dennisport, Mass.	W1MKW[3]	...
Deschutes Co., Ore.	W7HHH	166
Dewey Co., S. Dak.	WØIYN[3]	...
Duluth, Minn.	WØEJG[2]	203
Duncan, Okla.	K5ACI[3]	...
Dutchess Co., N. Y.[5,1]	K2GCH	233
East Central Nassau, L. I.	W2ZAI	20
East Volusia, Fla.[8,1]	W4RWM[2]	79
ElPaso, Texas	W5KOK	...
Erie Co., Pa.[9]	W3QN	135
Etowah Co., Ala.[19]	.....	...
Eureka, Calif.	W6SLX[2]	97
Evanston, Ill.	W9MCS	107
Everett, Mass.[10,1]	W1PJ	52
Falmouth, Mass.	W1QLT[3]	...
Falls Church Area, Va.[11,1]	W4OP	81
Fall River, Mass.	W1YHY[2]	12
Fayette Co., Ky.	W4JSH[2]	34
Fond du Lac & Green Cos., Wis.	W9MPO	39
Forsyth Co., N. C.	W4TQU[2]	297
Framingham, Mass.	W1MEG[2]	64
Franklin Co., Iowa[19]	.....	...
Fredericksburg, Va.	W4KMS[3]	...
Fredericton, N. B.	VE1CS	...
Fulton-Dekalb Cos., Ga.	W4YEK	258
Garfield Co., Okla.[1]	W5MFX[2]	123
Gaston, Cleveland & Lincoln Cos., N. C.	W4DRC[2]	134
Glen Cove, N. Y.	W2WUQ	18
Grays Harbor Co., Wash.[12]	W7AVM	57
Greater Worcester, Mass.	W1SPF[2]	172
Greene, Jersey & Calhoun Cos., Ill.	W9IFA	134
Groveland, Mass.	W1MRQ	44
Halifax Co., N. C.	W9QNI/4[3]	...
Hamden, Conn.[13,1]	W1NFG	302
Hamilton, Ont.[1]	VE3KM[2]	196
Henry Co., Ind.	W9ZSC	...
Herkimer Co., N. Y.	W2PYC[3]	...
Howard Co., Ind.[3]	W9HUF[2]	70
Huntsville & Madison Co., Ala.	W4YFN[2]	158
Jefferson Co., Ala.[19]	.....	...
Josephine Co., Ore.	W7ZQM[2]	82
Kansas City, Kans.[19]	.....	...
Kingfisher Co., Okla.[19]	.....	...
Kings Co., N. Y. (10 meters)	K2CTK[2]	152
Kings Co., N. Y. (2 meters)	W2JCI[3]	...
Kitsap Co., Wash.	W7UWT[2]	133
Knox, Blount & Sevier Cos., Tenn.	W4TYU[2]	78
Knoxville, Tenn.	W4TZJ[2]	64
Lake Co., Fla.[19]	.....	...
Lauderdale Co., Ala.[19]	.....	...
Laurel & vic., Mont.[14]	W7LBK	125
Lawrence Co., S. Dak.	WØDQK	37
Lexington, Ky.[19]	.....	...
Lincolnton Co., Ga.	W4DDY[3]	...
Linn Co., Ore.[19]	.....	...
Louisville Area, Ky.	W4BAZ[3]	...
Mangum, Okla.	W5SVR[2]	...
Manitowoc, Wis.[19]	.....	...
Mankato, Minn.	WØPBY[3]	...
Mansfield, Conn.[15]	.....	...
Marathon Co., Wis.	W9VHA[2]	108
Marion Co., Ore.	W7TMF	84
Marion Co., Fla.	K4ANJ[3]	...
McKean Co., Pa.	W3LQQ[2]	82
Meade Co., S. Dak.	WØZWL[3]	...
Mellette Co., S. Dak.	WØNEO[3]	...
Memphis, Tenn.	W4BAQ[2]	253
Menlo Park, Calif.[19]	.....	...
Milan, Ill.	W9RYU[3]	...
Missoula, Mont.[1]	W7COH	710
Mitchell, S. Dak.	WØGCP[3]	...
Mobile, Ala.	K4EEH	132
Monroe Co., Ill.[1]	W9ICF[2]	10
Monroe Co., N. Y.[16]	W2QY[2]	120
Monroe Co., Pa.	W3YAZ[2]	72
Montgomery Co., Md.	W3YAE[3]	...
Montgomery Co., N. Y.	W2ZZG[2]	85
Montgomery Co., Pa.[1]	W3CNO[2]	251
Montreal, Que. (South Shore)[19]	.....	...
Morgan Co., Ala.	W4LEN	110
Multnomah Co., Oreg.	W7RCL	90
Nassau Co., N. Y.	W2FI	974
Nassau Co., (Area 4), N. Y.	W2TUK[2]	20
Natrona Co., Wyo.	W7VTB	103
New Bedford, Mass.	W1AVY[2]	50
New Orleans, La. (Westside)	W5INL	72
New York Co., N. Y.	K2IJF[3]	...
Newington, Conn.[1]	W1NJM	51
North Adams, Mass.	W1ZEO[2]	75
N. St. Louis & N.W. St. Louis Co., Mo.	WØMNW	245
Northampton Co., Pa.[1]	W3NNT[2]	148
Norwich, Ohio	W8RVU	...
Nueces Co. & Corpus Christi, Texas	W5LOW[2]	238
Oak Ridge, Tenn.	W4CXY[2]	...
Oglesby, Ill.	W9ZEN[3]	...
Okeechobee Co., Pa.	W4PZT[3]	...
Omaha-Douglas Co., Nebr.[5]	WØQMD	133
Onondaga Co., N. Y.	W2CYD[2]	108
Orange Co., Ind.	W9QVQ[3]	...
Pacific Area, C. Z.	KZ5RV[2]	82
Pasadena, Calif.	W6NTN[3]	...
Phoenix, Ariz.[19]	W7QNO[3]	...
Pocatello & Bannock Co., Idaho	W7BDL	71
Portage Co., Wis.	W9BCC[2]	63
Porter Co., Ind.	W9EHE[2]	142
Prince Georges Co., Md.	W3CVE[2]	161
Pueblo, Colo.	WØDLZ[3]	...
Queens Co., N. Y. (10 meters)	W2IAG	157
Racine, Wis.	W9SZL[3]	...
Reno, Sparks, Washoe Co., Nev.	W7PC[2]	40
Richmond Boro, N. Y.[1]	W2VKF[2]	265
Rock Co., Wis.	W9KLL[2]	...
Rockland Co., N. Y.[1]	W2ZTZ	160
Roswell, N. M.	W5ZU	123
Sacramento Valley, Calif.	W6JEQ[3]	...
Saline-Gallatin, Ill.	W9BLO	73
San Diego Area, Calif.	W6KHU[2]	244
Santa Fe, N. M.[14]	W5FHL	110
Sarnia, Ont.	VE3AML[3]	...
Schenectady Co., N. Y.	W2WWK	97
Scotts Bluff, Nebr.	WØVQR[3]	...
Seneca Co., Ohio	W8WAB[2]	122
Seward Co., Nebr.	WØVEY[2]	70
Sheboygan Co., Wis.	W9MYG[2]	93
Sheridan Co., Wyo.	W7PMA[2]	76
South Brevard, Fla.	W4BWR[2]	102
Southern York Co., Me.	W1LKP[3]	...
Springfield, Mass.	W1NLE[3]	...
Springfield, Mo., area.	WØHUI	159
St. John, N. B.	VE1EE	...
St. Louis, Mo. (Overland Area)	WØNUE	...
St. Mary's County, Md.	W3BUD[2]	21
St. Stephen, N. B.	VE1JP	...
Stearns & Benton Cos., Minn.	WØRVO[2]	126
Suffolk Co., N. Y.[19]	.....	...
Sumter & Schley Cos., Ga.	W4UFD	30
Swampscott, Mass.	W1VRK[3]	...
Taylor Co., Texas[1]	W5ANL[2]	138
Tamaqua, Pa.	W3ZRQ[3]	...
Tillamook Co., Ore.	W7PPG[2]	71
Timmins Area, Ont.[1]	VE3DSX	55
Tom Greene Co., Texas	W5SHN[3]	...
Tompkins Co., N. Y.	K2GQU[3]	...
Toronto, Ont.	VE3DWL[3]	...
Turner Co., S. Dak.	WØEUJ[3]	...
Tuscaloosa Co., Ala.[19]	.....	...
Vallejo, Calif.	W6ZZF	118
Vanderburgh Co., Ind.[1]	W9KEP[2]	170
Wabash Co., Ill.	W9AMA[3]	...
Wabash River Basin[1]	W9TT[2]	254
Wakefield, Mass.[1]	W1ZNG[2]	58
Walla Walla Co., Wash.	W7QHR	34
Waltham, Mass.[5,1]	W1JSM[2]	123
Warren-Henderson Co., Ill.[17,1]	W9VSX	119
Washington Co. Md.[11]	W3OYX[2]	90
Washington Co., Okla.[1]	W5MQV[2]	191
Washington Co., Ore.	W7HJU	46
Wayne Co., N. Y.	W2VEY[2]	75
Waynesville, Mo.	WØVPQ[3]	...
Webster, Mass.[19]	.....	...
Wheatland Co., Mont.	W7INM	104
White Co., Tenn.	K4HJA[3]	...
Whittier, Calif.	W6LVQ	110
Wichita Co., Texas	W5DWS[2]	149
Will Co., Ill.	W9REA[3]	...
Winona & Houston Cos., Minn.	WØLUX[2]	56
Winthrop, Mass.[7,1]	W1BB	259
Wood-Ridge, N. J.[18]	W2DMJ	76
Total Points		**15,984**

[1] Bettered last year's score. [2] Reports by both radio and mail. [3] Report by radio only. [4] Oct. 19. [5] Oct. 15. [6] Oct. 21. [7] Oct. 8. [8] Sept. 14. [9] Oct. 9. [10] Oct. 11. [11] Sept. 13. [12] Oct. 25. [13] Oct. 26-31. [14] Oct. 20. [15] Oct. 4. [16] Oct. 12. [17] Oct. 24. [18] Oct. 17. [19] Participation indicated by messages received but no summary available. [20] Score included with Nassau Co., N. Y., W2FI.

Miscellany: 28 Mc. mobiles from Calgary, Ont., reached Argentina, New Zealand and Nicaragua without difficulty, but had plenty of trouble getting into Ontario and Connecticut. "Was a lot of fun and don t think we will wait for another nationwide test to have another drill. Practice cannot make this gang any more perfect, but it can make them *experts.*" — *WØTUS, EC Cass & Crow Wing Cos., Minn.* "Even though we got a late start, it was the best drill of the year." — *Joe Feeley, W1ADW, EC Danbury, Conn.* A fire occurring at Carrollton, Ill., just after the conclusion of the local SET drill enabled the AREC gang of W9ICF to supplement their SET with the real thing! "As we have done for the past several years, our SET was again 'Operation Goblin,' wherein the AREC patrolled the streets carrying auxiliary policemen to limit damage from Halowe'en pranksters." — *W1NFG, EC Hamden, Conn.* "I expect to stimulate emergency communications in the less formal atmosphere of the AREC, then 'hand pick' members for RACES." — *Donald L. Perry, W7PC, EC Reno, Nevada* "All concerned profited by their experiences. Amateur radio operation went according to plan — in fact it went almost *too* smoothly." — *W9VSX, EC Warren-Henderson Co., Ill.* California's Mission Trail Net assisted W6CXO.

Some QST Abbreviations

A. — amperes
a.c. — alternating current
a.f. — audio frequency
a.g.c. — automatic gain control
a.m. — amplitude modulation
amp. — amplifier
ant. — antenna
AREC — Amateur Radio Emergency Corps
aux. — auxiliary
a.v.c. — automatic volume control
bal. — balanced
BC — broadcast
BCI — broadcast interference
BCL — broadcast listener
b.f.o. — beat-frequency oscillator
BPL — Brass Pounders' League
cath. — cathode
c.d. — civil defense
CD — Civil Defense (agency); or Communications Department (ARRL)
c.f.m. — cubic feet per minute
ckt. — circuit
coax — coaxial cable
conv. — converter
CP — code proficiency
c.p.s. — cycles per second
c.t. — center tap
c.w. — continuous wave (radiotelegraphy)
cy. — cycles
db. — decibel(s)
d.c. — direct current
d.c.c. — double cotton covered
d.p.d.t. — double-pole, double-throw
d.p.s.t. — double-pole, single-throw
DX — distance
DXCC — DX Century Club
EC — Emergency Coordinator
e.c.o. — electron-coupled oscillator
el. — element
e.m.f. — electromotive force
fax — facsimile
FCC — Federal Communications Commission
FCDA — Federal Civil Defense Administration
FD — Field Day
fil. — filament
f.m. — frequency modulation
gnd. — ground
h. — henry
h.f. — high frequency
htr. — heater
h.v. — high voltage
hy. — henry
i.f. — intermediate frequency
K — thousand
kc. — kilocycles
kw. — kilowatt(s)
IGY — International Geophysical Year
l.f. — low frequency
l.u.f. — lowest usable frequency
l.v. — low voltage
m. — meters
ma. — milliamperes
max. — maximum
Mc., meg. — megacycles
mh. — millihenries
mic., mike — microphone
mix. — mixer
m.u.f. — maximum usable frequency
m.v. — millivolts
n.f.m. — narrow-band frequency modulation
NTS — National Traffic System
OBS — Official Bulletin Station
o.d. — outside diameter
OES — Official Experimental Station
OO — Official Observer
OPS — Official Phone Station
ORS — Official Relay Station
osc. — oscillator
PAM — Phone Activities Manager
p.p. — push-pull
pri. — primary
p.t.o. — permeability-tuned oscillator
pwr. — power
RACES — Radio Amateur Civil Emergency Service
rec. — receiver
rect. — rectifier
reg. — regulated, regulation
r.f. — radio frequency
r.f.c. — radio frequency choke
RM — Route Manager
RO — Radio Officer (civil defense)
RST — Readibility-Strength-Tone
RTTY — radioteletype
s.c.c. — single cotton covered
SCM — Section Communications Manager
SEC — Section Emergency Coordinator
sec. — secondary
sig. — signal
s.p.d.t. — single-pole, double-throw
s.p.s.t. — single-pole, single-throw
SS — Sweepstakes
s.s.b. — single side band
s.w.l. — short wave listener
s.w.r. — standing wave ratio
t. — turns
temp. — temperature
tfc. — traffic
t.p.i. — turns per inch
t.r. — transmit-receive
t.r.f. — tuned radio frequency
TV — television
TVI — television interference
u.h.f. — ultra high frequency
v. — volts
v.f.o. — variable frequency oscillator
v.h.f. — very high frequency
v.o.m. — volt-ohm-milliammeter
v.t.v.m. — vacuum tube voltmeter
w. — watts
WAC — Worked All Continents
WAS — Worked All States
w.p.m. — words per minute
xtal. — crystal
μf., μh. — microfarads, microhenries
$\mu\mu$f. — micromicrofarads

Happenings of the Month

NATIONAL AMATEUR RADIO WEEK

As readers of *QST* will recall, bills proposing a National Amateur Radio Week have been introduced in the Congress for several years, but so far have died in committee without action. This year, Congressman Ludwig Teller of New York, responsive to a request of Joseph R. Lebo, W2OEU, has introduced the following joint resolution in the House of Representatives:

> *Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,*
> That the President of the United States is authorized to designate one week in June of each year as National Amateur Radio Week, and to issue a proclamation inviting the people of the United States to observe the week with appropriate exercises to further and stimulate interest in amateur radio in the United States.

This resolution has been referred to the Committee on the Judiciary, to which the League has written urging favorable consideration. Individual amateurs and clubs who are interested can help by writing similar letters, requesting favorable action, to:

Hon. Emanuel Celler, Chairman
Committee on the Judiciary
House Office Building
Washington 25, D. C.

"THAT DERN 405-A"

Every five years most hams must wrestle with the FCC's dandy little Form 405-A — "Application for Renewal of Radio License (Short Form)." Although information on how to tame it is in the *License Manual* and periodically in *QST*, many hams still find it confusing as indicated by the continuing correspondence (and phone calls) received at Hq. Let's try once more, this time with a photograph, to see if a picture is really worth a thousand words.

Form 405-A may be secured from any FCC district office. It is used for straight renewal (no modification involved) of your combination operator-and-station license — and also to renew station-only or operator-only tickets in the few cases where those exist. If a change of address is involved, forget about 405-A and use the old, familiar Form 610.) According to regulation, you may apply for renewal any time within 120 days of expiration of your license; in the case of 405-A, however, FCC won't act on your application, no matter when received, until about 30 days before expiration, so there is no point in applying with this form more than about 60 days in advance of expiration.

Actually, the form isn't so bad if you bear in mind that it covers many radio services in addition to amateurs. The illustration, which shows the top third of the form, indicates how it should be filled out; the left sides of all three sections of the form are filled out identically. Note that (d), File No., is left blank in the case of an amateur applicant. Item (e) is the expiration date of your ticket being renewed. Of course the form should be notarized. On the reverse, be sure to check the space indicating that you meet minimum renewal requirements (at least 2 hours operating time in the last three months of the license term, or 5 hours in the last year, and ability to handle code at the speed required for class of license held). And address the third (bottom) section of the form to yourself. Send the application, when completed, to FCC in Washington, D. C. Do not include your present ticket. Note in your log the date of mailing application; this fulfills the requirement in Instruction 3 that the applicant must "post a statement" certifying that

(*Continued on page 160*)

FCC Form 405-A-1
February 1955

United States of America
FEDERAL COMMUNICATIONS COMMISSION
APPLICATION FOR RENEWAL OF RADIO LICENSE (SHORT FORM)
(Use only in accordance with instructions on reverse side)

Form Approved
Budget Bureau No. 52-R131.3

1. Name of licensee: John H. Doe

2. Mailing address (number, street, city, zone, and state): 135 Pleasant St. Podunk Hollow, Conn

3. Transmitter location: 135 Pleasant St Podunk Hollow, Conn.

4. (a) Nature of Service: Amateur Station-and-Operator
(b) Class of Station: General Class
(c) Call Sign: W1QRM
(d) File No.:
(e) License term ending: May 16, 1957

5. For renewal of Amateur license, see item 5a. on the reverse side.
6. Applicant certifies that there have been no changes in the station location or specified radio equipment, and that there have been no changes in ownership or control, either by transfer of stock ownership, changes in partnerships, or other changes of the licensee organization, as contained in the applicant's most recent application embodying this information.
7. Applicant waives any claim to the use of any particular frequency or of the ether as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests renewal of station license in accordance with this application.

John H. Doe
(APPLICANT MUST AGREE WITH NAME OF LICENSEE AS SHOWN IN ITEM 1)

BY — (DESIGNATE APPROPRIATE CLASSIFICATION BELOW)

☒ INDIVIDUAL APPLICANT
☐ OFFICER OF APPLICANT CORPORATION OR OFFICER AND MEMBER OF APPLICANT ASSOC.
☐ MEMBER OF APPLICANT PARTNERSHIP
☐ OFFICIAL OF GOVERNMENTAL ENTITY COMPETENT UNDER THE JURISDICTION TO SIGN FOR THE APPLICANT

SUBSCRIBED AND SWORN TO BEFORE ME THIS ..... DAY OF ..... 19 .....

NOTARY PUBLIC ..... SEAL
(OR NAME AND TITLE OF OTHER PERSON COMPETENT TO ADMINISTER OATHS)

MY COMMISSION EXPIRES .....

Strays

A reminder. The RSGB now charges a fee of $1.00 for issuance of the WBE award to non-members, 50¢ to members of the RSGB. ARRL Hq. continues to certify U. S. and Canadian applicants but please be sure to include the appropriate fee with your application and cards.

—•••—

W8WOJ sends in a newspaper headline reading "Long Range Ban Sought on Grid Bias"!

—•••—

The *N. Y. Times* recently reported that a Berk Kaufhold, call unknown, was given the job of pepping up attendance at the North Texas State College radio club. He made numerous phone calls and personal contacts, and the result was a large crowd. But when the club officers looked for Kaufhold in order to congratulate him, they discovered that he had slept through the meeting!

—•••—

W6CVW is rather proud of his QSLing record as a Novice. He sent a QSL to every one of his Novice contacts, and received a QSL from every one in return. Yessir, all three of 'em!

—•••—

Although W6FZA is only 34 years old now, he broke into ham radio just 25 years ago. When he received his amateur license at the age of nine in 1934, he was the youngest ham in the world. Postwar, he has been active on v.h.f. almost entirely. His father is W6GCA, his sister was W6MGP, and his wife is in the process of getting her ticket.

—•••—

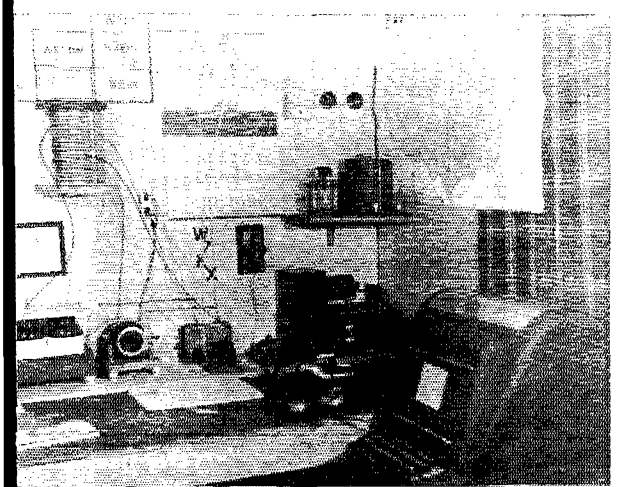
By pure coincidence, W4GSP and K4DWF worked each other on two occasions exactly one year apart — same date, time and frequency.

—•••—

You've heard of a fellow with a "big signal"? Well, K2DFP really has got it. He's a fireman on the Pennsylvania railroad, operating between N. Y. C. and Washington, D. C., and whenever he spots a beam he toots a "73" or "CQ" on the diesel horn. Daytimes only, of course.

—•••—

Again by pure coincidence. W8ALK had his first phone and first c.w. QSOs with the same station — W9KWC — a year and a half apart.



IGY Jobs

There are openings in connection with the IGY ionospheric research plans at a field station in northern Quebec. Necessary qualifications are as follows:

a) A good background in the practical techniques of maintaining transmitting and receiving equipment of conventional circuitry operating in the frequency range below 30 Mc.

b) Thorough knowledge of antenna impedance measurement and impedance matching practices.

c) An adventurous but stable personality for whom a period of 18 months in a small isolated community in a sub-Arctic climate would prove an interesting and challenging experience.

Those interested should contact Dr. Millet Morgan at Dartmouth College, Hanover, New Hampshire.

One night a stranger wandered into the meeting room of the Houston Amateur Radio Club in the Chamber of Commerce room and took a seat in the rear next to W5LI. A couple of 12-year-old amateurs were in the front of the room.

The stranger turned to W5LI (who assumed the visitor was a ham) and asked, "Are those young fellows members of your organization?"

"They sure are," replied W5LI.

"They start rather young in Houston, don't they," said the stranger.

Still thinking he was talking to a ham, W5LI replied, "We have several even younger than those two boys."

The stranger sat for a few minutes with a puzzled expression on his face and finally blurted out, "This *is* the Alcoholics Anonymous meeting, isn't it?"

W5LI directed him to the proper meeting room!

— Adapted from the HARC News

—•••—

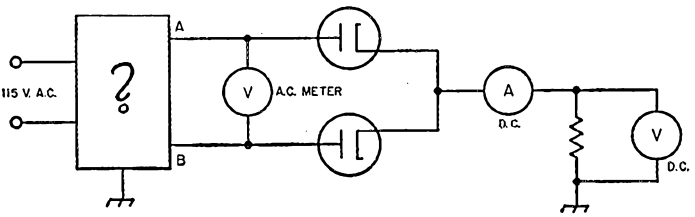
To the high claimed 1956 Sweepstakes scores (page 73, February *QST*), add these phone totals: K5EXZ—71,820-514-70; W4FGH—59,902-491-61.

«

W7KX writes to say he's got troubles. He just got himself a model 26 teletype machine, hooked it up to one of his transmitters, and can't seem to raise a soul. The equipment looks okay — perhaps he needs a compact all-band antenna.

Quist Quiz

The question this month was suggested by Clarke Redfield, K2DIG. The box in the sketch doesn't quite behave the way you would expect it to. Disconnected from the circuit, the resistance from A to ground and from B to ground are equal.



The resistance from A to B is twice this value. Connecting the box into the circuit and applying a.c. to the left-hand terminals, the d.c. ammeter and d.c. voltmeter give indications. "Aha!" you exclaim. "The box contains an ordinary center-tapped transformer." We hasten to point out that under these conditions the a.c. voltmeter reads 0. Problem: What is in the box?

LAST MONTH'S

If you answered "50 ohms" to last month's Quiz, as so many people do when they first look at the problem, you were wrong. It takes a 100-ohm resistor to give 25 ohms across the terminals, since the two halves are in parallel.

---

25 Years Ago this month

April, 1932

. . . Unless you were interested in "Fundamental Crystal Control for Ultra-High Frequencies," or "Stabilizing Superheterodyne Performance," or the records established in "The December Transcons," or "Simplified Remote Control for Amateur Transmitters," you might not have found much of interest in the April, 1932, issue of *QST*.

. . . On the other hand, you might have liked "Some Notes on Message Handling," by Paul Segal, or "The Old 'Peaked Audio' Receiver Rebuilt," or "The Economical Design of Smoothing Filters." Then again, you might have enjoyed the piece of fiction entitled "Here's How."

. . . However, if you are Capt. Basil Cutting, of the N. H. State Police, you might be interested in the description of W1APK in 1932, owned and operated by Basil Cutting.

. . . And by golly, here's a piece on "Traffic Handling" by W3NF — some fellow by the name of George Hart.

. . . The editorial twenty-five years ago dealt entirely with the five-meter band. K. B. W. pointed out that the average range of the gear was about 25 miles and thus again offered the incentive of developing a system of short-distance, high-speed relaying of messages. He further pointed out that the TV people were asking for frequencies between 30 and 80 Mc., and that it was high time we got some occupancy up there in the five-meter band. K. B. W.'s visions of the technical progress to come, plus the article on crystal control for the ultrahigh frequencies, plus the announcement of some special five-meter tests with airplanes, were indicative of the interest in that part of the spectrum.

. . . Incidentally, those December Transcons got quite a play in this twenty-five-years-ago issue. Ev Battey, then assistant communications manager and now W4IA, authored nine pages of text and charts which covered the subject in great detail.

Silent Keys

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

W1AZJ, George E. Martenis, Putney, Vt.
W1DJ, Arthur E. Ridley, Winthrop, Mass.
W1MUM, Joseph C. Botelho, New Bedford, Mass.
W1ZNO, George L. Fay, jr., Tewksbury, Mass.
K2GBV, Edward F. Sullivan, Livingston, N. J.
W2GNI/K2SYX, James B. Chupp, Smithtown, L. I., and Saint James, N. Y.
W2NA, Edward P. Kingsland, Herkimer, N. Y.
W2UIC, Robert C. Whitlock, Amsterdam, N. Y.
W3YRK, Melvin L. Gelow, Hagerstown, Md.
W4BZG, Hassell O. Phillips, Bessemer, Ala.
W4HRA, Harry I. Anderson, Ft. Myers, Fla.
W4LJE, William I. Browning, jr., Norfolk, Va.
W6PMS, Andrew Anderson, Artesia, Calif.
W7NGO, David L. Rempel, Dutton, Mont.
W7QEB, Louis Talen, Edmonds, Wash.
W7SJH, John C. Schabel, Dutton, Mont.
W7ZYV, Richard M. Hall, Ft. Huachuca, Ariz.
W8EDW, Ralph E. Armbruster, Blacklick, Ohio
W9HOG, Harry M. Wilson, DeSoto, Ind.
W9MDS, Daniel R. Zunker, Fifield, Wis.
W9UJR, Clarence A. Schroeder, Chicago, Ill.
WØFWU, Harold T. Gallaher, Kansas City, Mo.
KL7EKH, Harold W. Bales, Eielson, AFB, Alaska
VE4FU, R. F. Bonnett, East Kildonan, Manitoba, Canada

BE ON THE WATCH FOR!

Two National NC-183D receivers have been reported as stolen. One, serial number 11,416, was taken from the Endicott IBM ham shack on Feb. 22. Any info on this one should be given to the N.Y. State Police in Vestal. The other receiver bore serial number 202-0865 and was taken from K6HJN, Lawndale, Calif. A DX-100 was also stolen from K6HJN.

Hints and Kinks For the Experimenter

USING AUDIO FEEDBACK FOR CONELRAD WARNING

THE average a.c.-d.c. broadcast receiver can be quickly and inexpensively converted for audible conelrad monitoring by the addition of three small components. Modification of the receiver is not difficult, and the normal entertainment value of the set is not impaired by addition of a feed-back circuit that causes the receiver to "sound off" whenever the control signal — a broadcast carrier — leaves the air.

Fig. 1 shows the diagram of the 2nd-detector and 1st-audio stage of a typical a.c.-d.c. receiver.

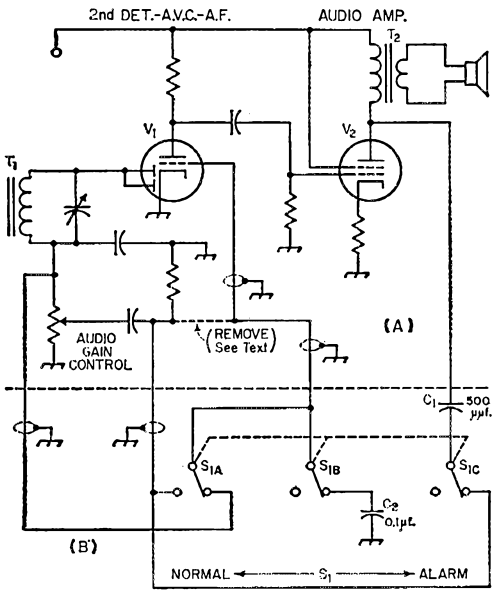


Fig. 1 — Circuit of the W6DCQ conelrad alarm system. Section A shows the 2nd-detector and 1st-audio circuit of a typical a.c.-d.c. type broadcast receiver. Section B shows the wiring of the *alarm* components.
C_1 — 500-μμf. 500-volt ceramic or mica.
C_2 — 0.1-μf. 400-volt paper.
S_1 — 3-pole 2-position selector switch (Centralab PA-1007 or PA-35 wafer mounted on PA-300 index).

Section B of the circuit shows how the *feed-back* components, C_1, C_2 and S_1, are wired into the main circuit. Notice that the original audio-input lead to V_1 is replaced with connections terminated at S_1. This permits feed-back voltage obtained from V_2 via C_1 and S_{1C} to be routed through the audio-gain control before being applied to the control grid of the 1st audio tube, thus providing a convenient means of controlling feedback in the circuit. C_2 is an a.f. bypass used in the "alarm" position of S_1. Using C_2 and the a.f. gain control as a separate a.v.c. filter resulted in more bias for V_1 than was obtained from the normal a.v.c. filter.

The converted receiver is made ready for alarm use by tuning clear of all broadcast signals and then adjusting the gain control for the desired feedback or output level. The receiver used here at W6DCQ exhibits the following three characteristics dependent upon input-signal strength.

1) A strong input signal creating approximately —3 volts a.v.c. provides complete silencing of the alarm tone and other audio output.

2) Moderate values of signal input silence the alarm, but allow some "muffled" broadcast modulation to leak through to the speaker. The muffled effect is caused by the a.f. filter capacitor, C_2. This mode of operation is desirable because it is not a fail-safe system.

3) Weak value of signal input silences the alarm tone, but permits considerable audio (broadcast programs) to ride through the receiver.

— *Louis Borne, W6DCQ*

THE audio-feedback principle may be easily applied to an a.c.-d.c. receiver for conelrad use by adding C_1, R_1 and S_1 to the detector-audio section as shown in Fig. 2. This modification does not provide for convenient control of the feedback voltage, but it does provide a cheap and effective means of monitoring conelrad without need for tearing out any of the original receiver wiring. Audio-circuit wiring not shown is to be left intact when installing the alarm components.

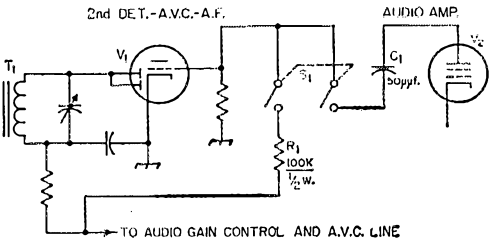


Fig. 2 — Circuit of the feed-back arrangement as applied to an a.c.-d.c. receiver by W3KKO. S_1 is shown in the normal-operation position. Closing the switch completes the feed-back circuit for alarm operation.
C_1 — 50-μμf. 500-volt ceramic or mica.
R_1 — 100K, ½ watt.
S_1 — D.p.s.t. selector or toggle switch.

One word of caution: To prevent hum pickup during normal use of the receiver, keep the new

(*Continued on page 158*)

Correspondence From Members-

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

HARMONIC ANTENNAS

660 West Polo Drive
Clayton 5, Missouri

Editor, *QST:*

W8YFJ stated (Feb. *QST*, p. 49) that he thought a good solution to the harmonic problem was the use of one-band antennas. Perhaps this is the most direct path of attack to the problem. But one must realize that the way contests and general operating are set up, most hams on the h.f. bands must be set up for multiband operation. And this means multiband antennas for the average ham, who has neither the space nor the money for an "antenna farm." I believe a better solution to the problem is harmonic traps and interference suppression within the transmitter. Concentrated effort in ridding the ether of harmonics is necessary, but let us not, in our zeal, handicap the ham of limited means.

— *Douglas Dodds, Jr., KNØHGZ*

715 South Pine Street
York, Pennsylvania

Editor, *QST:*

I agree with W8YFJ and I think ARRL can clear this up by doing just what he requests.

Have had lots of experience during my past 30 years as 3AQN, and I know it takes an antenna for the band you want to work.

The all-band antenna is just getting the gang into more hot water, and making more guys dull on getting the proper match.

— *Paul L. Stumpf, W3AQN*

Box 403
Lemon, South Dakota

Editor, *QST:*

The arguments against all-band antennas presented by W8YFJ show a complete lack of consideration for all the commonly-known antenna principles. It may interest him to know that his "good dipole or folded dipole" will radiate odd harmonics of the carrier frequency just as effectively as will any commercial all-band system. The reason his 40- or 80-meter dipole does not "radiate harmonics on other amateur frequencies" is that these frequencies are, with the exception of 15 meters, located at even harmonics instead of odd ones.

The recurring current loop at the center of an antenna fed at an odd harmonic allows the antenna to radiate quite well, until the harmonics become fairly high, when mismatch in the system will discriminate against them. It is on this principle that all multiband antennas are designed. The problem, then, lies mainly in our transmitters and antenna tuners; not the antenna.

— *Robert D. Dyson, W7TYC/Ø*

NOVICE HARMONICS

226 Linden Place
New Milford, N. J.

Editor, *QST:*

Re your February editorial on Novice Harmonics. Another common interference condition exists, namely, Novice sub-harmonics. Some Novice stations on the 21-Mc. band are radiating strong signals on the 14-Mc. band. In a few days of c.w. operating near 14,100 kc., I logged Novices from all U. S. call areas except the 6th and 7th. . . .

Incidentally, this spurious signal transmission is certainly not confined to Novices. The Novice call letters are readily recognized on frequencies like 14 Mc. where there is no Novice operation while General Class stations are not as readily noticed.

— *Philip J. Reich, W2HUG*

Berlin Rd.
Haddonfield, N. J.

Editor, *QST:*

I fully appreciate the wonderful job being done in *QST* to warn the newer Novices as to the dangers of excessive harmonic radiation. However, I feel one point is being neglected. This is the case of the Novice using an 80-meter crystal in the range 3575–3600 kc., and *not* getting his multiplication. During the past several weeks, I have noticed all too many Novices in this 80-meter range. . . .

— *Bob Weiman, K2EWR*

8ACF HEARD

Buckhannon, W. Va.

Editor, *QST:*

The December issue of *QST* was a nostalgic one. The article, *QST*, Volume V, and the first Transatlantic tests. How well I remember the morning we got the telegram that 8ACF had been heard by Godley! Not that we were so surprised! We blew out every condenser in the rig that night!

8ACF in Washington, Pa., was owned by Tom and Charlie McNary. Charlie is now dead. Other operators were Russ Hall, Hodge and Lot Alexander, and yours truly. Most of us were in college at the time and the gang broke up soon after. Wonder what has happened to the rest? I was 8LJ at the time. Hodge Alexander was 8JQ and he had some enviable records of his own in those days.

It would really be great to see and hear from any of that gang at 8ACF.

— *William A. Hallam, W8JKN*

TWO-HEADED OPS

Tulsa, Oklahoma

Editor, *QST:*

I was most interested in W9YLD's explanation of the two-headed, we/our type phone operator. (Feb. *QST*, p. 140) For all these many years I was under the impression that Yenudi or Kilroy was standing at his (their) right.

Do you suppose the "we/our" operator questions his (their) ability to face the air waves alone and is bolstering his (their) courage through the belief that in numbers there is strength?

Here's looking for more "I/my" operators with the courage to stand on their own feet.

—*Robert Rychel, W5PHN*

P. O. Box 283
Warrenton, Va.

Editor, *QST:*

The letter from W9YLD solves a long-standing mystery. Now I understand why phone operators say break break rather than just break. Each head must have its say.

— *Ev Battery, W4IA*

196 Lyons Avenue
Newark, N. J.

Editor, *QST:*

We (about seven of us) have done something about it. Through the leadership of K2PSW (Please Stop We), we (again plural) have established the "I" Net. For the past six months, we (still plural) have been holding a nightly roundtable in which the only qualification for membership is the proper use of the first person singular pronoun I, when referring to oneself or station. A member using "we" at the wrong time must pull his switch. It's a good habit of course and we (oops) find it to be good training. The net is in operation nightly at 28.624 Mc., from about 10:00 P.M. to ? A.M. If you are in our area, drop in. We (the net members) have an "I" certificate which we send to any ham who, when in QSO, avoids the "we's," and uses the "I's" in their proper places. . . .

— *Marty Feins, K2RXH*

(*Continued on page 164*)

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
GEORGE HART, W1NJM, Natl. Emerg. Coordinator
PHIL SIMMONS, W1ZDP, Asst. Comm. Mgr., C.W.

ROBERT L. WHITE, W1WPO, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., Phone

Getting Contest Know-How. In *Short Skip*, bulletin of the Manchester Radio Club (Conn.), W1AMY suggests the following: "Let's get into a few contests before the Field Day. The Novice Round-up (see Jan. '57 and June '56 *QST*) toughens an operator for work in any QRM; the DX competitions (whew) are for ops in the know and the dough; if you're an appointee there are CD Parties quarterly; the next one in April has both a phone *and* c.w. period. Was anybody locally besides me in the N-R? . . . Knowledge of contest operating can be obtained only by contest operating. Many fellows think the knack of good operating can be picked up in a few minutes, but I find it takes almost a year to learn what bands to operate at what time, what frequencies are best within a particular band, and other techniques that mean the difference between a poor and a spectacular score. Some say too that phone operating is easier than c.w. operating, but not so in a contest! Unless you're a real phone man with a sharp receiver you won't make half as many QSOs on phone as some make on c.w. I dare any 2-meter phone man in town who can do so to go down to 75 meters during a contest and make a sizeable number of contacts. You have to be really good. Anyone who wants to help our W1KKS Field Day score will be sharpening up his fist and code speed and getting some contest know-how in the best way by operating in each contest. Another way to get sharp: call into a traffic net such as CN, it's on 3640 every night at 6:45 P.M."

On Amateurism. This month let us quote an overseas item applicable to our own amateur purposes and operating behaviors. Broadly speaking, it's about getting the most from our Amateur Radio. We quote from a presentation by L. Aubry, F8TM, in a recent issue of the French society's *Radio REF:*

"The permanent Secretary of the Academy of Sciences has affirmed that *the Amateur has a fundamental and indispensable role in all activities*. From our point of view in radio, electronic theory has no meaning unless applied electronics follow. The experiments tried and the experiences considered exist only with the view of immediate application. The results obtained ought, in effect, to be put at the service of humanity as soon as possible. Whether he be aware of it or not, the individual lives by means of a continual exchange of services with this large family of humanity. If he attempts to isolate himself, he nevertheless profits from the work of others: if without giving anything in exchange, he becomes a parasite.

"The spectacular aid that the OM performs sometimes in the case of an emergency should not make us forget his permanent and modest utility. This resides in all of his activities to the extent that he makes them known. One does not expect a flood of brilliant results of him, but rather the gentle stream of news which comes from his patient daily experience. It is in this manner that techniques are perfected, and the frontiers of the unknown are slowly pushed back. It is pure egotism to hide in one's station and never communicate one's ideas, schemes, contacts or trials of things. It is also to deprive one's self of the light of that friendly cooperation which makes amateurism so charming.

"Thus, your work, experiments, and research should be made public at meetings, expositions and at national and international conferences. It is necessary to know the results obtained even if they are not brilliant. Another OM will know perhaps how to use them in a better manner. Do not be too personally occupied, and look at the results objectively. Whether you like the lower frequencies or UHF/

A.R.R.L. ACTIVITIES CALENDAR

Apr. 3rd: CP Qualifying Run — W6OWP
Apr. 13th-14th: CD QSO Party (c.w.)
Apr. 16th: CP Qualifying Run — W1AW
Apr. 20th-21st: CD QSO Party (phone)
May 2nd: CP Qualifying Run — W6OWP
May 15th: CP Qualifying Run — W1AW
June 5th: CP Qualifying Run — W6OWP
June 8th-9th: V.H.F. QSO Party
June 20th: CP Qualifying Run — W1AW
June 22nd-23rd: ARRL Field Day
July 3rd: CP Qualifying Run — W6OWP
July 19th: CP Qualifying Run — W1AW
July 20th-21st: CD QSO Party (c.w.)
July 27th-28th: CD QSO Party (phone)

OTHER ACTIVITIES

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

Apr. 6th-7th: 6th Vermont QSO Party, Tri-County Amateur Radio Club (p. 108, April, Station Activities).

Apr. 6th-7th: European WAE DX Contest (2nd c.w. week end), DARC (p. 86, December 1956, How's DX).

Apr. 13th-14th: 1957 French Contest (phone), REF (p. 67, March, How's DX).

Apr. 13th-14th: Belgian Contest (phone), UBA (p. 67, March, How's DX).

Apr. 13th-14th: Ohio Intrastate QSO Party, Ohio Council of Amateur Radio Clubs (p. 96, April, Station Activities).

Apr. 27th-28th: PACC Contest (c.w.), VERON (p. 63, April, How's DX).

May 4th-5th: PACC Contest (phone), VERON (p. 63, April, How's DX).

May 4th-5th: OZ Cross Country Contest, EDR (p. 63, April, How's DX).

May 18th: Armed Forces Day Receiving Competition (c.w. and RTTY), Dept. of Defense (next month's issue).

May 18th-19th: 1957 Helvetia-22 Contest, USKA (next month's issue).

NATIONAL CALLING AND EMERGENCY FREQUENCIES (kc.)

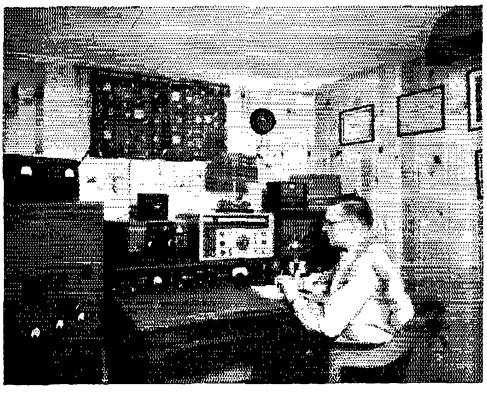
3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

VHF, remote control, antennas; whether you be young or not so young and more or less a slave of routine; avoid becoming a robot. Think, work and make your efforts known. It is only under these conditions that Amateurism will develop."

ARRL SCM appointees, net members especially will find the remarks on immediate application of our amateur radio to services to others refreshing — results *do* come from continuing efforts and patient daily experience. This is a challenge to take hold of our opportunities, whether through living up to appointment-recognition, an AREC-RACES registration or by collection and reporting of IGY-v.h.f. data, for a few examples. There is much for careful thought and for some to take to heart in this translated expression. The amateur who sticks by himself to a mere collecting of DX cards or casual contacting is enjoined not to live alone unto himself but to communicate his ideas freely in the companionship of other amateurs. Isolation deprives one of social and productive exchanges . . . a gentle hint that there is virtue and fraternalism perhaps in Affiliated Club Membership. Best of all the thought that greatness and true value are not the exclusive property of the brilliant, but lie within the capabilities of us all through sharing and personal activity in all the mechanisms of our amateur radio and our societies. — *F. E. H.*

RESULTS, JANUARY CD PARTIES

Here are the highest scores claimed by ARRL appointees and officials during the course of the CD Parties of January 12th-13th and 19th-20th. Figures indicate score, number of contacts, and number of different sections worked. Final and complete results are scheduled for the April CD Bulletin.



NNJ Official Bulletin Station W2VCZ rolled up the January CD Party's leading phone score at this well-appointed operating position. Gear includes a kw. final and modulator, Ranger, NC300, Viking I and v.f.o. These are intermittently tied to 10-11 and 15-meter rotaries, and to fixed arrays on 40 and 80.

C.W.

W6JVA	199,302-372-59	W8SVL	79,170-270-58
W1EOB	197,275-600-65	W4BZE	79,110-288-54
W6BIP	196,481-354-61	WØEEE[3]	78,100-279-55
W3VOS	*185,220-583-63*	*VE7AC*	*75,244-158-52*
W1TYQ	184,320-569-64	W8NOH	71,500-255-55
W4RQR	169,885-550-61	W0RNH	71,500-256-55
W6YHM	169,260-300-62	K6BBD	71,043-152-51
W3TMZ	164,920-532-62	K2OMT	70,635-274-51
W6WNI	160,303-298-59	W4LK	70,470-261-54
VE6NX	158,946-296-59	KØCNC	70,280-251-56
W6PZW	155,550-504-61	W4IA	69,915-230-59
W9KLD	152,220-474-63	W1CMH	69,600-290-48
W3JNQ	149,340-519-57	WØIA	69,310-232-58
W4PNK	144,270-458-63	W2MHE	65,800-235-56
W3MSR	142,435-460-61	WØBQJ	63,720-231-54
K4LPW	141,050-450-62	W2LRO	63,250-249-50
W1WEF	139,500-458-60	W4MI	62,910-233-54
W3KLA	138,900-463-60	W7JC	62,856-126-54
W2FEB	131,570-442-59	W4WKQ	62,250-249-50
W9SZR	129,890-414-62	W3ILD	62,100-230-54
W9MAK	123,300-405-60	W8SWZ	60,760-214-56
K4HOU	118,590-396-59	W3YOZ	60,750-238-50
W9YZA	118,560-410-57	W4RLG	59,890-221-53
W9WWT	116,100-380-60	W9LNQ	58,240-203-56
WØPHR	114,300-381-60	WØBDR	57,720-222-52
W1JYH	113,765-366-61	W7FRU	56,200-121-50
WØGXQ	110,715-358-61	W8PBO	56,000-224-50
W3NF	107,800-378-56	W1AQE	55,930-238-47
W4KFC	100,500-328-60	W4JUJ	55,890-200-54
W1AW[1]	100,035-344-57	K2KTK	55,440-224-48
W8TZO	99,750-343-57	W4BXV	54,590-202-53
K6HWD	97,898-192-56	W3UE	54,250-211-50
WØPBI	96,615-334-57	W7EMT	53,900-117-50
W2DMJ	94,875-338-55	K4GEZ	53,795-150-53
W3KUN	94,605-350-53	W6CMN	53,456-112-52
K4ANB	91,930-313-58	W2EMW	52,470-192-53
K2AFQ	91,690-340-53	W8HZA	51,510-196-51
W2DRV	91,260-331-54	VE2CP	51,220-190-52
WØDQL[2]	90,160-315-56	K2KNV	50,760-210-47
W1GVK	87,910-298-59	W3MCG	50,615-184-53
W9YYG	87,615-292-59	W2CVW	50,500-195-50
W4SNH	87,450-325-53	W9FNX	50,235-191-51
W2AYJ	86,520-302-56	W1BPW	50,105-253-39
K4KNP	86,125-325-53	K2EDH	50,050-176-55
W5DEJ	81,270-294-54		

PHONE

W2VCZ	35,875-172-41	W4ZM	9240- 77-24
W1JYH	26,040-161-31	K2KNV	9230- 65-26
W8NYH	17,985-109-33	W9KLD	8625- 63-25
W3KLA	17,150- 98-35	W1AQE	8510- 74-23
W3NF	16,250-118-26	W1SEO	7200- 60-24
W9KDV[4]	14,400- 90-32	K4IXG	7080- 54-24
K2OMT	13,200-107-24	W8PBX	7020- 54-26
W2LRO	12,905- 85-29	K4AOZ	6710- 61-22
W1GVK	12,350- 95-26	W1EOB	6650- 63-19
W2MHE	11,960- 92-26	W8VZ	6325- 55-23
W1TYQ	11,770-100-22	WØALW	6240- 49-24
K6HWD	10,746- 42-27	W3MSR	6160- 70-16
W4LK	10,560- 88-24	W4JUJ	5700- 50-20
W9NTA	10,250- 78-25	K2BHQ	5695- 62-17
W1FYF	10,010- 91-22	W3ADE	5605- 52-19
W2AEE[5]	10,005- 63-29		

[1] W1WPR, opr. [2] WØWDW, opr. [3] Multiple operator.
[4] W9VFY, opr. [5] W2AIP, opr.

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 on April 16th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7080, 14,100, 21,010, 50,900 and 145,600 kc. The next qualifying run from W6OWP only will be transmitted on April 3rd at 2100 PST on 3590 and 7128 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 will be made from W1AW each evening at 2130 EST through April 27th; after that date they will be at 2130 *EDST*. Approximately 10 minutes' practice is given at each speed. References 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 buzzer or audio oscillator and attempt to send along with W1AW.

Date	Subject of Practice Text from February *QST*
Apr. 2nd:	*The Snoop-Loop*, p. 11
Apr. 5th:	*A 7- to 30-Mc. Preselector*, p. 16
Apr. 8th:	*Ten Watts Mobile for Twenty Bucks*, p. 22
Apr. 11th:	*A Novice Three-Band Antenna System*, p. 25
Apr. 17th:	*Transistor Operating Characteristics*, p. 27
Apr. 23rd:	*Combined Keyer and Control Circuit*, p. 45
Apr. 25th:	*Handling Traffic by System*, p. 50
Apr. 29th:	*F.C.C.'s Amateur Service Group*, p. 54

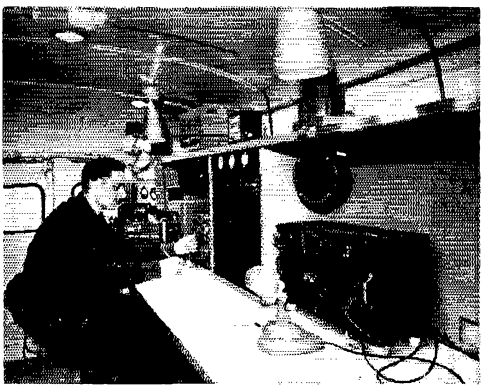
Two or three Section Emergency Coordinators have complained to us that they feel EC Annual Reports ought to be submitted through them rather than being sent directly to ARRL headquarters by the EC — that headquarters is bypassing them and therefore making it impossible for them to do the best possible job for their sections.

There is something to be said for this viewpoint. We wish we could do it that way. In fact, if SECs will take the responsibility for collecting these reports each year and see that they reach us, we would be glad to have them do so. There is no intention here of bypassing any SEC function; in fact, we would like to tend in the other direction — to decentralize more headquarters functions to the SECs. It would save us time, work, and a lot of headaches, and thus enable us to do our other innumerable jobs more efficiently and thoroughly.

But even more important than the work loaded on us and its consequences is the aspect of being assured that all EC reports submitted reach us. We know that many SECs can be trusted to forward these reports (or a detailed summary of them) to us in good season. We also know, from sad experience, that there are some SECs who do not perceive any value in "paper work" and would probably ignore annual report forms if sent them, or else delay forwarding them so long that they would not reach us in time to be of much value.

We do agree, most heartily, with the thought that SECs should be kept informed of AREC doings in their sections. On the first of each month, each EC should submit to his SEC a Form 5 monthly report, along with other information of interest, which the SEC can then summarize in his monthly report (Form 8) to headquarters. Now obviously, if all 1700 of our ECs sent in such a report each month, and if all 73 SECs reported their resultant summary information to headquarters each month, we would have a month-to-month picture of our AREC total strength and status. Ah, sweet dreams of Utopia! The fact is that if an SEC gets reports from 20% of his ECs in any single month he feels he is doing very well, and if we get reports from 20 of 73 SECs it well-nigh establishes a record.

The AREC member to EC to SEC to NEC relationship is not a "chain of command." They are simply levels of centralization. Your EC is not your "boss" in the AREC, he is the man who centralizes and coordinates your efforts (assuming you make some) for the best public service. In participating in Emergency Corps activities you are not working for or serving your EC, your SEC, or ARRL headquarters, but rather the opposite: *they* are working for and serving *you*. But they cannot do so if you volunteer nothing. They cannot serve you if you will not be served.



The Phil-Mont Mobile Radio Club of Philadelphia and environs remodeled a bookmobile into this completely-equipped communications van. W3VVS is shown at the 10-meter operating position. Console includes (l. to r.) 10-meter walkie-talkie, power control panel, 6-meter operating position, 10-meter remote control position, low frequency operating position. A 30-watt public address system is on the top shelf. Some setup, eh fellows?

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During a fire in Kankakee, Ill., on January 3rd, the power company was forced to shut off power in a certain section of the city due to snapping transmission lines. This left the police communications system without communications, so the Kankakee RACES-AREC group went into action. Mobile units were manned by W9GIQ, W9QAY, W9VQC and W9LCH (EC), with fixed stations operated by W9KLD, K9DDP, W9WZV and W9IBU. Communications were carried on until the situation was in hand. — *K9DDP.*

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The Oswego County, N. Y., RACES network was activated on January 15–16 when a gas line break precipitated an emergency condition in Fulton, Oswego, Watertown and all villages and towns in between, with the temperature from 10 to 25 degrees below zero. Communications points were established at the Mayor's office, at the state armory and at the gas co. pipeline pressure station. K2GEG, W2PDJ and K2BFH operated six hours. W2SPE served as relay station. — *W2ZHU, EC/RO Oswego Co., N. Y., & W2WLR.*

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As K6LRX was mobiling on 40 meters through Pacoima, Calif., in the San Fernando Valley, his attention was attracted to a severe air explosion ahead of him. Asking K6MYC, with whom he was in contact, to stand by, he investigated and found that a DC-7 had collided with an F89 Scorpion jet in mid-air. The crew of the former, which had landed in a school yard, were killed, as was the pilot of the jet, although a civilian radar observer in the jet had parachuted to safety. A network of amateur stations representing 17 cities quickly accumulated on the frequency to offer assistance, and K6LRX was able to handle emergency traffic for the Civil Air Patrol and the Mutual Broadcasting System. — *K6PTQ.*

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Hearing on the radio that his mother had been severely injured in an auto crash on Christmas day in Gary, Ind., an Army sergeant in Honolulu, finding telephone contact impossible due to Christmas traffic, appealed to MARS station KH6QU for assistance in getting further information. Contact was made with W4ELU in Florida, who tried to telephone Gary but also was unsuccessful due to the Christmas jam. However, the call was heard by W9GDM of Wheaton, Ill., who made contact with KH6QU and then called Wheaton police. Within seconds, a report on the lady's condition was obtained and relayed to KH6QU. K6DKI and KH6ABA also assisted in relaying for this successful emergency operation. — *W9GDM.*

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A hapless automobile thief picked the middle of a Pueblo, Colo., AREC drill to steal a car from in front of a local radio store. The drill, participated in by six mobiles and four fixed stations, was for the purpose of determining the reliability of 75 meters within the county, but right in the middle of it the net control station announced the stolen car and the hunt was on. WØNIT spotted the car some 30 miles west of Pueblo. W9MJR/Ø then joined him and they gave chase. The thief eluded W9MJR by turning into a dead end road, but was spotted again by WØNIT, who was following at a distance, as he emerged. Realizing he was hemmed in, the thief abandoned the car and fled to the hills on foot. The highway patrol was called and a search of the area began. All six mobiles met at the scene, were photographed for KCSJ-TV and interviewed by the local newspaper. The car was recovered in approximately one hour. — *WØNIT, SEC Colorado.*

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Without doing research, we are confident that the 24 SEC reports received for December activities is a new high. It is very gratifying to see this continued upward trend. Total AREC members represented was 6031. Comparable figures for 1955 are 17 and 5750 respectively. The only new section in the 24 reports was Arkansas. Other reports were received from the SECs of the following sections: Ala., Ga., San Joaquin Valley, Iowa, Los A., E. Fla., Santa Clara Valley, NYC-LI, Tenn., Wash., W. N. Y., N. Mex., Ky., Conn., Minn., E. Pa. S. N. J., Santa Barbara, Wis., Ore., Mont. Md.-Del.-D. C., Colo.

During the 1956 reporting year, we received reports from 36 different sections (33 in 1955), and a total of 230 reports (189 in 1955). We salute the SECs of the following sections, who did not miss a single report during the year: NYC-LI, W. N. Y., San Joaquin Valley, Ala., Wis., Santa Clara Valley, Md.-Del.-D. C., E. Fla. Special congratulations go to the Eastern Florida and Western New York sections whose SECs have reported 100% for *five straight years;* to Wisconsin, which has four consecutive years to its credit; and to NYC-LI, which has three.

Follows a breakdown of number of reports received from each section under 100%: *eleven* — Oregon; *ten* — Nebr., E. Pa.; *nine* — Mont.; *eight* — Minn., Santa Barbara, Wash.; *seven* — Mo., N. Mex.; *six* — Tenn., Ont.; *five* — Ga.; *four* — N. C.; *three* — S. Tex., Los A., Conn.; *two* — Ind., Vt., Ky., S. C., Iowa, S. N. J.; *one* — N. Dak., N. Tex., Ohio, Ark.

RACES News

A recent conference was held in Battle Creek between representatives of the United States Civil Defense Amateur Radio Alliance and FCDA to discuss several questions relative to RACES use, to wit: (1) ways and means of obtaining additional frequencies for RACES use; (2) reissue of the USCDARA Standard Operating Procedure manual (for the third time); (3) reissue and revision of the FCDA frequency allocations chart for RACES operation on 6 and 2 meters. FCDA and USCDARA work very closely together on all these matters, which will be of great interest to RACES amateurs.

The matter of frequencies has been an urgent one, particularly on the lower frequencies. Need for additional RACES frequencies for medium and long distance operation has been evident for a long time, but getting them is a continuing problem. It should be noted that it is not intended that such frequencies be taken away from general amateur usage prior to outbreak of war.

The USCDARA SOP has received widespread usage since its formulation several years ago. Your state civil defense should have copies available for distribution. The reissue is for the purpose of making additional copies available and revising it in a few minor respects.

The FCDA frequency allocation chart for 6 and 2 meters has long been in need of revision in view of changes in specifications to include a.m. gear and "utility portable" units on those bands. Both the USCDARA (NSCDARA) and FCDA plans were discussed in *QST* for May, 1953 (pp. 60–61).

TRAFFIC TOPICS

We think we should take note in this column that the 1956 Edison Award has been won again by a traffic operator — this time W3CUL, who has probably handled more traffic in her comparatively short tenure in this activity than any other operator alive. Mae first made BPL in August, 1949, and for 89 consecutive months never a month went by that she wasn't in that column. On 46 different months, she was tops in the field of single-operator stations. A truly remarkable achievement, and one deserving of the recognition that comes with the Edison Award presentation.

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Orchids are due the regional nets of the National Traffic System who supplied representatives from all ten U. S. regions to handle the replies to the Governors-to-President Relay messages (see details elsewhere in this issue). Unfortunately, the replies never materialized due to conditions beyond our control, but NTS was girded and ready to do the job promptly and efficiently, as usual, and deserves no less credit.

—•••—

We have been severely unbraided for neglecting to mention the work of Bertha, WØLGG, in the February *QST* list of YLs active in traffic work. Well, the item did conclude with the phrase ". . . just to name a few," which was meant to imply that there were many more; but we do agree that WØLGG has been one of the outstanding YL traffic handlers and should have been mentioned as manager of Iowa's Tall Corn Net and a member of the NTS Transcontinental Corps in the Central Area. Besides, *we* like cherry pie, too!

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Miscellaneous January net reports: Interstate Side Band net reports 345 messages, 23 stations participating. North Texas-Oklahoma Net had 31 sessions, 1230 check-ins, 239 messages. Early Bird Transcontinental Net handled 612 messages. Eastern States Net had 27 sessions, 65 stations, 413 messages. Dragnet had 15 sessions, 327 check-ins, 484 messages. Transcontinental Phone Net reports: First call area, 1076; second call area, 1170; fourth, ninth and tenth call areas, 367; total, 2614.

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National Traffic System. Time was when our traffic activities were built around the "iron man" traffic tradition. If a fellow couldn't be on deck every night to handle his schedules, he didn't amount to beans as a traffic man. Time and diversification of amateur interest have changed

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for January traffic:

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W3CUL	164	1026	892	123	2205
W2KEB	156	975	596	337	2064
W3WIQ	76	760	720	41	1597
WØBDR	56	777	708	4	1545
WØSCA	9	541	531	2	1083
W9NZZ	298	386	0	383	1067
W9DO	17	443	431	29	920
W7BA	28	441	415	21	905
WØLGG	36	427	403	5	871
W9CXY	8	410	380	30	828
WØLCX	35	401	383	8	827
W3ZSX	203	314	240	31	788
WØPZO	2	398	382	4	786
W4PL	12	384	347	26	769
WØCPI	7	376	348	28	759
W7PGY	34	353	310	37	734
W6DDE	10	351	346	5	712
W3PZW	10	334	267	67	678
W6GYH	515	52	83	10	660
W5UBW/5	10	319	301	18	648
KØBCQ	5	306	1	306	618
W6EOT	6	300	269	41	616
W2KFV	3	306	185	108	602
W8ELW	19	278	252	44	593
W9MAK	45	269	230	39	583
WØZWL	8	326	6	237	577
WØGAR	7	279	282	4	572
K6DYX	5	268	274	3	550
W7FRU	3	267	231	40	541
W7VAZ	23	256	233	21	538
W9TT	39	239	169	86	533
K7WAT	18	256	222	24	520
K2IYP	9	250	233	22	514
K9BBO	95	217	191	8	511
W3UE	13	256	205	29	503
Late Reports:					
K6SLB/6 (Dec.)	56	774	602	172	1604
W6EOT (Dec.)	29	485	466	68	1048
K9BBO (Dec.)	47	468	452	12	979
W3CVE (Dec.)	285	213	113	100	711
W1DYE (Dec.)	28	287	272	14	601

More-Than-One-Operator Stations

Call	*Orig.*	*Recd.*	*Rel.*	*Del.*	*Total*
W6IAB	45	796	1146	350	2337
K5WAB	24	824	800	24	1672
K7FBN	283	245	150	16	694
K7FEA	149	212	152	11	524
Late Reports:					
W6IAB (Dec.)	65	3531	2519	1012	7127
W6IAB (Nov.)	69	1078	1404	326	2877
W6YDK (Dec.)	35	563	459	104	1161

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

KH6BQS	199	W3RV	117	W7AHV	105
W9JYO	185	K6MON	115	K2DEM	101
W5BJR	171	WØGQY	112	K4BXV	101
W4BZE	166	KL7USA	110	Late Reports:	
KP6AK	121	W1BPW	108	W8WXO (Dec.)	147
W9SWD	118	W8GFE	107	K6CGA (Dec.)	112
WØNIY	118	WØKJZ	107	W1CRW (Dec.)	111

More-Than-One-Operator Stations

W5VTZ	150	W3YDX W1AW	144 134	K3WBJ	101

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: W3UE, W8PHA/Ø, W8UPH, W9YYG, WØCZ, WØKLG, KH6BQS.

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.

that somewhat, and NTS was built to accommodate the occasional traffic man as well as the every-day enthusiast. Few of us nowadays can get on the nets every night, but those few who do so are beginning to be annoyed by the constant changing of their counterpart stations with the resultant never-knowing whom they are keeping a schedule with, what his code speed is or whether his signal is going to be up to the mark.

NTS needs both the iron men and the occasionals, but sometimes it's hard to reconcile one with the other. We hope we never have to choose between them, because it would be an impossible choice to make. A daily traffic man naturally takes a big load of responsibility upon himself, and discharges it admirably as long as he is able. The nets in which he participates come to depend on him, *its members* look up to him, follow his example in their own operation, except that they can't maintain the daily grind. But NTS cannot put its administrative or operating reliance on any one single person. Each link must be not only one man, but several of them working together, because a one-man link that breaks can disrupt the entire system. And who is to say when our iron man will get across the high voltage, or break his arm, or have a heart attack, or just plain get fed up with knocking himself out and quit? Much as we admire them, and much as we need them in NTS, we drag our feet like the dickens when it comes to placing complete reliance for any one NTS function on one operator. The policy is to spread the load. As long as there are qualified operators available among whom the load can be spread, we'll keep trying to effectuate this policy. Where they aren't, we have no alternative but to rely on the iron men, and we do so with full appreciation of their worth to the system.

January reports:

Net	*Sessions*	*Traffic*	*Rate*	*Average*	*Representation*
EAN.....	26	979	....	37.6	96.1%
CAN.....	31	1192	1.22	38.0	100%
PAN.....	30	1017	0.49	33.9	100%
1RN.....	45	410	0.73	9.1	74.3%
2RN.....	53	335	0.73	6.3	97.5%
3RN.....	46	288	0.53	6.3	88.4%
4RN.....	23	220	0.25	9.6	64%[1]
RN5.....	52	747	0.85	14.4	67.5%
RN6.....	47	471	0.61	10.0	27.3%
8RN.....	51	297	....	5.9	88.2%
9RN.....	61	774	1.00	12.7	89.3%
TEN.....	93	1801	....	19.3	76.3%
ECN.....	20	92	0.40	4.5	85%[1]
Sections[2].....	576	4044		7.0	
TCC (East)	65[3]	655			
TCC (Central)	....	1865			
TCC (Pacific).	155[3]	823			
Summary.....	1154	16,010	CAN	11.0	....
Record.....	1154	16,010	1.22	12.1	100%
Late Reports:.					
4RN (Dec.)...	27	520	0.33	22.0	71.4%[1]

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

[2] Section nets reporting: MJN (Minn.); WSN (Wash.); CN (Conn.); QKS, QKS SS & QKN (Kans.); Tenn. C.W.; WVN (W.Va.); AENB, AENP & AENT (Ala.); NJN & NJN-AM (N. J.); KYN (Ky.); GSN (Ga.); OSN (Ont.); SCN (Calif.); 1LN (Ill.); TLCN (Iowa); S. Dak. 40 phone; S. Dak. 75 Emerg.; Minn. Phone.

[3] TCC schedules kept, not counted as net sessions.

The "summary" may be the total of the column, an overall average, or the highest net in that particular category, whichever is applicable. The "record" refers to the past highest record for the particular month in question, and when the "record" is the same as the "summary," it means that the present month equaled the past record or set a new one. Note that in recent months we have nearly always broken records as concerns number of net sessions and total traffic.

CAN Manager W9DO congratulates W9YYG for his fine work in conducting the Saturday and Sunday night CAN sessions; W9YYG and W9ZYK have earned their CAN certificates. W7APF has resigned as PAN manager; the Pacific Area NTS Staff will recommend his successor. W2ZRC says that "no news is good news" on 2RN. W3UE bemoans the inability of 3RN to get into Delaware, and the origination of amateur messages soliciting funds. 4RN will try an early session at 1830 EST. W8DSX says 8RN voted against the 1700 regional net session only because he could get no support for it in his region, not because they thought it was not a good idea. W4KKW recently sent us a copy of a very FB 9RN Bulletin outlining January activities and requesting opinions concerning the desirability of including Tennessee in 9RN. TEN Manager WØKJZ compliments KØCNC and WØSCT for their work in increasing the representation of North and South Dakota respectively; Manitoba is still missing.

Transcontinental Corps: W3WG reports a 100% increase over traffic and schedules from last month. Eastern Area TCC roster: W1AW, W1BDI, W1EMG, W1NJM, W2HDW, W2ZRC, W3COK, W3WG, W4ZDB, W8IBB, W9CXY, W9DO. WØSCA bawls us out for singling out the work of any one or two Central Area TCC stations, says they all deserve the same credit. Central Area TCC roster: W9CXY, W9DO, W9JUJ, WØBDR, WØDQL, WØKJZ, WØLGG. WØSCA. WØKQD says she is going to pin a rose on every one of the 19 different stations who kept the 155 schedules for the Pacific Area TCC in January. Pacific Area TCC roster: *W6s* ADB BPT EOT GJP HC IPW IZG PLG REF RFW VPC VZT YHM, *K6s* DYX GZ ORT, *W7s* APF DXV FRU GMC, WØKQD.

CURRENT FILM ADDITION

Our *Training Aids* section announces the addition of a 16-mm. film produced by the Phil-Mont Mobile Radio Club under the direction of William Bornmann, W3VXN. "Every Single Minute" (ARRL coded F-34) describes how a typical group of organized amateurs swing into action in time of disaster. Many types of amateur equipment are used, from fixed and mobile stations to walkie-talkies. Scenes from a recent Field Day are shown, explaining the amateurs constant preparedness, alertness and ability to use what equipment is available when tragedy, such as the flood of '55, strikes.

This is a black and white sound film which runs approximately 30 minutes. It is available to any ARRL-affiliated club. At least one month's notification should be given this office *prior* to a scheduled showing.

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 reason 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 *	Apr. 10, 1957	W. R. Williamson	Mar. 17, 1949
Hawaii	Apr. 10, 1957	Samuel H. Lewbel	Feb. 3, 1957
Oregon	Apr. 10, 1957	Edward F. Conyngham	Mar. 1, 1957
Manitoba *	Apr. 10, 1957	John Polmark	Mar. 2, 1957
Mississippi	Apr. 10, 1957	Julian G. Blakely	Mar. 8, 1957
Saskatchewan *	Apr. 10, 1957	Harold R. Horn	Apr. 15, 1957
Eastern Pennsylvania	Apr. 10, 1957	Clarence Snyder	June 15, 1957
North Dakota	Apr. 10, 1957	Elmer J. Gabel	June 15, 1957
San Joaquin Valley	Apr. 10, 1957	Ralph Saroyan	June 15, 1957
Connecticut	Apr. 10, 1957	Milton E. Chaffee	Resigned
South Dakota	May 10, 1957	Les Price	July 2, 1957
New York City Long Island	May 10, 1957	Harry J. Dannals	July 31, 1957
San Francisco	June 10, 1957	Walter A. Buckley	Aug. 14, 1957
Southern New Jersey	June 10, 1957	Herbert C. Brooks	Aug. 26, 1957
West Virginia	July 10, 1957	Albert H. Hix	Sept. 18, 1957

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

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.

Michigan	Thomas G. Mitchell, W8RAE	Feb. 17, 1957
Missouri	James W. Hoover, WØGEP	Mar. 1, 1957
British Columbia	Peter M. McIntyre, VE7JT	Mar. 13, 1957
Western Pennsylvania	John F. Wojtkiewicz, W3GJY	Mar. 17, 1957
Santa Barbara	Mrs. Dorothy E. Wilson, W6REF	Apr. 12, 1957
Los Angeles	Albert F. Hill, jr., W6JQB	Apr. 18, 1957

In the Eastern Florida Section of the Southeastern Division, Mr. John F. Porter, W4KGJ, Mr. Wesley E. Marriner, W4HSJ/W9AND, Mr. John W. Hollister, jr., W4FWZ, and Mr. Lloyd W. Warren, K4AZM, were nominated. Mr. Porter received 204 votes, Mr. Marriner received 126 votes, Mr. Hollister received 113 votes, and Mr. Warren received 84 votes. Mr. Porter's term of office began Feb. 21, 1957.

W1AW OPERATING NOTE

A complete new schedule of operation will become effective at W1AW on April 28th, with the start of Daylight Saving Time in some areas. This schedule will appear in detail in next month's *QST*. Until April 28th, W1AW will continue to operate on the schedule appearing on page 82, March *QST*.

DXCC NOTES

In view of the present status of Saarland and Trieste, effective as of April 1, 1957 these two countries will no longer be counted as separate for DXCC purposes. All confirmations dated April 1, 1957 and after, from Saarland and Trieste, will be considered as Germany and Italy respectively. Confirmations dated prior to April 1, 1957 will still count as separate credits.

DX CENTURY CLUB AWARDS

HONOR ROLL

W6AM....270
W1FH....269
W8HGW....268
W6ENV....267
W6MX....264
W6SYG....263
PY2CK....263
W3GHD....263
W9NDA....262
W8NBK....262
W8KIA....261
W6DZZ....261
W3BES....260
W5A8G....260
W6TT....260
ZL2GX....260
W2AGW....260
W8SN....260
W3JTC....260
W6VFR....259
W8BRA....259
W6MEK....259
W7AMX....259

Radiotelephone

PY2CK....257
VQ4ERR....251
W1FH....247
ZS6BW....244
W8GZ....239
CN8MM....238
W8HGW....237
W9RBI....237
W3JNN....236
W1NWO....233
W6AM....233
W9NDA....230

From January 15, to February 15, 1957, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

WØGDH....158
W1QMM....147
W8PWH....147
W9UNG....131
W3BYI....126
W6SUQ....124
WØDMA....124
ON4DM....124
W6FLT....114
W6TCQ....112
DL3AO....111
DL3BL....111
WØNWX....109
ET2US....109
W7QON....107
VE1NH....107
OH2RW....107
W1QM....106
K2EDH....106
K6EYT....106
WØBAU....106
OH3OE....106
W6EYY....105
W1TBY....104
W1YZG....103
W9EHW....103
OH1ST....103
IT1TAI....102
VE3BOR....102
VK4SS....102
W5JPC....101
W5OEN....101
W6DLX....101
W8ESR....101
F9AG....101
HP1EH....101
YU2DU....101
W3EH....100
W3GJY....100
W4VB....100
W6AGO....100
W6CBE....100
W9AMM....100
EA9DF....100
G3KAA....100
LA1RD....100
OY3ML....100
SM5BCE....100
VE5TK....100

Radiotelephone

W8PWH....141
W1LSZ....124
W5VU....122
W1RYJ....118
ON4DM....118
W7GUV....115
WØYMH....115
LU3FAQ....115
F8YE....106
EA7EU....104
I1ZJG....104
W2ESG....103
OE5CK....103
VE1NH....103
IT1TAI....102
W1PNR....101
W1YZG....101
WØQGI....101

ENDORSEMENTS

ZL1HY....250
W1BIH....241
CN8MM....241
W1HX....240
VK2ACX....240
W6BPD....235
W6GPB....231
W7HXG....231
W6UHA....229
W6PYH....222
W4HA....221
W5EB....214
W8TMA....214
W2BJ....211
W9AMU....211
W7KTN....210
W1LZE....204
W7ADS....204
W1WK....200
K2GFQ....200
W8VDJ....192
W6NGA....191
W7AC....191
W5DML....190
W6ALQ....190
W6CAE....190
W6ID....190
W6KSM....190
W7GXA....185
PY4ZS....185
W9JIP....181
LA6U....181
W9KNK....180
W4HVQ....180
W3AYS....176
W5VIR....175
W2CR....172
W6CG....172
W9UIG....172
W9VIN....171
W4IMI....170
W5CFG....170
CX1BZ....170
YV5BZ....170
W6EFR....169
K6EWL....164
W2HQL....162
W1OJR....162
WØFNN....161
W6SQP....160
DL1GU....160
W1ICP....153
W7IQI....152
DL6MK....152
W1RB....151
IS1FIC....151
W1JMI....150
W1LQ....150
W2FJH....150
W2LAX....150
W2NOY....150
W6GMF....150
W1WLW....149
WØDGH....149
W4AUL....147
W1NLM....145
JA1CR....145
W1FTJ....144
W9CPM....144
JA1CR....143
W3ZAL....142
K6EVR....142
W2MZB....140
W3MZE....140
W4JII....140
W7BGH....140
W8MRC....140
PY3QX....137
W4JAT....134
WØNGF....132
VK5LC....132
W1RYJ....131
W4HKJ....131
WØPGI....131
W1BRX....130
W1PFA....130
W3ILA....130
W9ROU....130
KH6WW....130
PAØFAB....130
VE7MD....130
VR2BZ....130
K6ENL....128
K9BVR....125
W9Y8X....125
WØYPQ....125
W2DEC....123
W3EOB....122
G4TM....122
W5RS....121
W9OTS....121
W1ICW....120
W1LQQ....119
W3TVB....116
K6EC....116
WØDSP....113
VE1DB....113
K2PIC....110
W3KFQ....110
W9ZTD....110
G3FKH....110

Radiotelephone

KH6OR....193
PY1NC....190
W5KBU....180
MP4KAC....179
W4ESP....172
W6CHV....171
TI2HP....171
W1PST....170
PY4ZS....170
W4NYN....161
PY4APE....161
ZS1DO....160
KZ5DG....159
W1HKK....151
W8NWO....151
W4ADY....142
WØCPM....141
W5TIZ....140
WØJYW....132
WØEHF....131
W4EBO....124
W2MFS....123
CE3DY....121
K4BVQ....120
W8TMA....120
F8PM....120
VK5LC....118
W4YHC....111
W9DSP....111
CO1AF....110
FB8BC....110

W/VE/VO Call Area and Continental Leaders

W4TM....249
WØYXO....250
VE1HG....164
VE2WW....189
VE3QD....210
VE4XO....118
VE5QZ....140
VE6VK....152
VE7GI....224
VE8AW....181
VO6EP....190
ZS6BW....249
4X4RE....222

Radiotelephone

W2BXA....207
W4HA....207
W5BGP....222
W7HIA....187
WØAIW....213
VE1CR....120
VE2GQ....118
VE3KF....163
VE6NX....101
VE7ZM....171
ZL2GX....223
OD5AB....180
EA2CQ....220

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, Clarence Snyder, W3PYF—SEC: NNT. PAM: TEJ. RM: YAZ. EPA nets: 3610, 3850 and 3997 kc. The sincerest congratulations are in order for CUL on her election as the winner of the General Electric Edison Award tor 1956. Mae, with her consistent traffic-handling, is definitely deserving of this great honor. LJA is conducting code classes at YDX. New officers of the Lehigh Valley ARC are KL7AZC, pres.; TEB, vice-pres.; ICQ, secy.; and EWN, treas. TDF has 21 states on 2 meters and 35 on 6 meters to lead both sections of the V.H.F. Contest sponsored by the North Penn ARC. ABT, the radio club of the U. of P., is playing around with RTTY, according to word received from UUA, secretary. The Philmont Mobile club presented certificates of merit to QZO, SAI, QQH and DSG for their work in club activities. SMA has a new QTH at Media. The Harrisburg Radio Amateurs Club is having a 6-meter transmitter hunt in April with the prize a complete mobile rig. There are 17 licensed amateurs employed at Harrisburg station WHP. CSP has repaired the club station at Harrisburg. BJG is now at the Navy Electronic school at Memphis, Tenn. JXQ worked G6UT on 10 meters on Dec. 18th for the second time. Their first contact was made Dec. 17, 1937. New officers of the Northeast RAC, PKV, are CLC, pres.; VOC, vice-pres.; DAO, secy.; DOB, treas.; DWR, DYL, HTR, BYX and TYX, board of directors. The Northeast Club has received TYU as the club call as a memorial to a former member. KØAWC has just moved to the Scranton Area from St. Louis., Mo. TEC is active in the Philadelphia Area with a Viking Ranger, a three-element Telrex beam, and an S-53A with a DB-23 preselector. AFF is a new ORS. FMU now has RCC. AYW has a new DX-100. Ten months of work on 10-meter phone (130 watts) netted BNU (Hatboro) 177 contacts with 50 countries. Oscar uses an NC-183 and a three-element beam. BUR has a new three-element tri-band beam. ZSX is manager of the Eastern States Net (ESN) which meets at 1730 EST on 7080 Mon. through Fri. JNQ won a new 4-400A at the Potomac Valley/Frankford RC joint dinner at Washington. VNM has raised his antenna. ZRQ has a new mobile under construction. New TARC officers are ZRQ, pres.; RZV, vice-pres.; ELJ, treas.; J. Latenzi, secy.; WN3LDV, act. mgr. BBS is now on s.s.b. New officers of the Carbon ARC are AMC, pres.; WJY, vice-pres.; AIW, secy.-treas.; COW, act. mgr. WQL has a new SX-100. Traffic: W3CUL 2205, ZSX 788, YDX 386, AFF 366, TEJ 129, BFF 115, ZRQ 95, NF 57, QLZ 48, BNR 46, OGD 41, PDJ 39, PYF 30, BUR 18, WQL 12, YVX 11, NQB 5, JNQ 4, ADE 3, EAN 2.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, John W. Gore, W3PRL—BWT, with AKB and CDQ, manned BWT continuously from Mon. evening until Tue. evening for the purpose of receiving messages sent to the President on the Governors-to-President Relay at the time of the President's Inauguration. BPE operated PZA. ECP and WV, working in several nets, also participated in the G.P.R. QDI was communications control for the Red Cross during the Inaugural celebration. He had a net of 15 stations at first-aid tents, ambulances and other strategic points. Ethel, K4LMB, ex-8MU, had a mobile unit on the plaza in front of the Capitol. RV, who had deactivated his station, is now back with a Valiant and plans to get a 75A-4. HWZ and PRL are on the air with a Pacemaker and PRL is feeding his Pacemaker into a Viking I KW. The area also wishes to welcome K4DKG/3, who is presently located in Rockville. The CARC held an election on Jan. 28th and LZZ was elected pres.; LZM, vice-pres.; FQQ, secy.; UYJ, treas.; and NQC, sgt. at arms. A number of stations in this area checked into emergency nets handling traffic for the Kentucky and West Virginia flood area the latter part of January. Those heard on the air were EOV, KDV, PRL, PKC, PZW, JNU, ECP and NNX. ZSR is building an electronic bug but he and ZME are presently planning to join the Marines. GNQ has passed his exam for General Class and now has a DX-100. The ARA has increased its membership, now approaching the 50 mark, and at its Dec. 18th meeting 8WZD/3 gave a most interesting talk on s.s.b. with a demonstration. The BARC, at its meeting on Jan. 11th, discussed the planning for the 1957 Field Day. The WTVI, at its meeting on Jan. 11th, heard Mr. Borzage, of PEPCO, give an interesting talk on the power companies' problems with respect to radio and T.V. interference. BWT has installed an emergency-power system as a back-up to his normal power supply. OQF is remodeling the shack. NL has been maintaining code practice transmissions week-day evenings from 2000 to 2100, also Sat. from 1000 to 1200 EST. It is planned to continue until April. Traffic: (Jan.) W3PZW 678, UE 503, K3WBJ 258, W3RV 141, UCR 97, WZL 71, BWT/AKB 65, ZGN 62, WV 58, TN 52, ECP 51, EOV 46, PQ 45, ZSR 44, ENU 26, COK 20, JZY 17, DNW 13, K4DKG/3 10, W3RUD 6, FAP 6, BKE 4. (Dec.) W3CVE 711, WZL 131, PKC 91, ZSR 36, K4DKG/3 10, W3OYX 9. (Nov.) W3WZL 182.,

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: YRW. PAM: ZI. Appointment of the month: YRW as RM. VDE, asst. manager of the N. J. Phone Net, has issued a very fine net bulletin. Another DVRA Old-Timers Nite is planned for April 12th at the Hotel Stacy-Trent, Trenton. Contact the chairman, ZI, for details. K2EWR is building a new rig which will be of considerable more power than the old one. Official Bulletins are heard several times weekly from JRO on 2 meters. K2CPR, K2ERC, TBD and K2BG attended the 8th annual meeting of the Potomac Valley-Frankford Radio Clubs, held in Washington. SVV, Mercer County EC and Radio Officer, has appointed the following assistants: HX, KVJ, RMJ, UAE and K2IIW. A very fine program of class instruction and regular drills is being held. Eleven new applications for AREC-RACES membership were received in the Mercer County Area. Hamilton Twp. Radio Club members are assisting with the White Horse c.d. effort, operating from the Township headquarters. K2KTS is conducting code classes at the Delaware Twp. High School. *Harmonics*, the SJRA paper, continues to grow in size, as does the club membership. VIS, Atlantic City, is back on the air after a layoff of five years. Johnny has a three-element beam on 15 meters. A new club has been organized in Maple Shade devoted to emergency communication. Officers are DBP, pres.; KHW, vice-pres.; DEE, treas.; K2KPF, secy.; and FQ. K2MJQ and K2MES, directors. ZI did a fine job handling the Governor-President Relay message. Traffic: W2YRW 315, RG 210, HDW 177, K2JGU 135, W2ZI 77, K2EWR 55, PTJ 33, W2BZJ 23, K2DSL 16, KN2THX 3.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: UTH/FRL. RMs: RUF and ZRC. PAMs: TEP and NAI. The NYS C.W. Net meets on 3615 kc. at 1900; ESS meets daily on 3590 kc. at 1800; NYS Phone on 3925 kc. at 1800; NYS C.D. on 3509.5 and 3993 kc. at 0900 Sun.; TCPN 2nd Call Area on 3970 kc. at 1900; SRPN on 3980 kc. at 1100; ISN on 3970 kc. at 1600. Congratulations to K2JYP, who has made BPL for the second month in a row. K2KNV received his WAS. The Ithaca Mike and Key Club is holding its annual hamfest Sat., April 6th, reports K2GQU. K2CUQ is adding an audio frequency meter to the shack for greater accuracy in OO work. ZHU reports that Oswego County RACES was activated Jan. 15th for emergency communications on account of a gas-line break. The net operated in sub-zero weather from 1145 to 1800. EMW is building a "Q" multiplier, 50-kc. i.f., and a product detector to improve his receiver. K2GWN received the A-1 Operator award. GBX has worked 101 countries, 96 on 10-meter phone, since April, '56. WDX is on 2-meter s.s.b. K2KXE has built a 2-meter pre-amp with two 6AJ4s to go in front of his S-102. BKC is putting up a 75-meter doublet and is building a monimatch. K2DCX finally received his

(Continued on page 88)

THEY ALWAYS COME BACK FOR MORE

THERE was a time in amateur radio when the great majority were teen-agers. Ham radio was regarded as a young man's game; we greybeards were few and far between, and it was generally assumed that when an amateur became old enough to go away to college, enter business, or get married he would drop out. A great many did exactly that and only a minority continued their interest into adult life.

OVER the years the picture has changed until today the age of the average amateur is around 35 and the youngsters are now in the minority. Probably one of the biggest factors contributing to this increased maturity is the gradual return to the amateur ranks of many who did drop out in earlier days. They have found that with increased leisure and the means to enjoy themselves, no other avocation offers the interest and challenge of amateur radio. To say this group of old timers is a welcome addition to our ranks is surely an understatement.

THE MEMORY of youthful achievements and good times undoubtedly impels many a former ham to investigate today's amateur radio. However, the tremendous improvements which have taken place, and the almost unlimited possibilities with modern equipment are no doubt the principal reasons they are becoming active once more. Today's single side band operation offers a type of reliable phone communications never even dreamed of in the early days; and if you want to hear patriarchs renewing their youth, just tune in to the high end of the 20 meter phone band any afternoon — two letter calls are practically "a dime a dozen."

IF YOU are among those who are now active in amateur radio, or contemplate returning to this wonderful hobby, please accept this advice. Whatever you do, don't ever throw out any of your log books, QSLs, or old licenses. You may feel that these items have no future value and probably won't be needed, but it isn't so. As an old greybeard, I can speak from experience in saying these records of your earlier activities may well prove invaluable time after time in the days ahead. And you can be sure that Hallicrafters will be ready for those future operations with new rigs better than anything you ever had before.

Vy 73,
CY READ, W9AA

Bud Hallgren Jr. W. J. Hallgren W9AC for hallicrafters

WAC and WAS after changing his QTH a couple of times. WZR has incorporated a 417A and a 404A in a new 2-meter receiver, especially for the IGY project; he also soon will be on 2-meter RTTY, along with K2JMI and FXT. UFI is back on 6 meters. UIT and K2DBS will have a 145.26 FM Net. K2TKJ mobile, running one watt to a 12BH7 on 6 meters, has worked two California, one Oregon, and one Alabama stations. K2SZM, also running one watt on 6 meters, has worked a W6. TBQ has a new beam on 6 and RHQ has returned to 6 meters. YIK is on 6 and 2 meters. The Syracuse V.H.F. Club had a fine Roundup and members plan a DXpedition to Vermont. The Greene ARC participated in a recent c.d. exercise, providing emergency power and communications. JVZ received his DXCC; he now has 110 countries. K2GEK is active again with his p.p. 807 old faithful. JZG is back at sea as a marine operator and can be heard on 15 meters. K2HWW uses a pair of 807s on 80 and 40 meters. KN2TLQ has worked 26 states. K2PLT has a new AF-67 and an SX-43 and has worked 35 states. RAWNY has sponsored K2YCU, a club station in the Buffalo Veterans Hospital. The V.A. has purchased a KWS-1 and a 75A-4. ICZ fathered the project. RAGS is receiving nationwide publicity for its excellent job of maintaining communications with Operation Deepfreeze in Antarctica. The Noontimers' picnic is scheduled for June 30th at the QTH of K2ISO. Glad to hear RUF on the bands again. Traffic: (Jan.) K2IYP 514, W2ZRC 129, K2KIR 112, W2OE 73, K2KNV 62, GWN 56, W2BKC 43, K2DSR 37, W2QHH 36, K2GQU 26, W2EMW 25, DEX 18, K2DG 15, W2FEB 15, COU 13, GBX 10, K2PJU 10, W2BLO 4, ZHU 4. (Dec.) K2KNV 130, GWN 38.

WESTERN PENNSYLVANIA—SCM, R. M. Heck, W3NCD—Asst. SCM: Anthony J. Mroczka, 3UHN, SEC: GEG, RMs: NUG, NRE and GEG, PAM: AER. The McKean County Amateur Radio Club has a training program under way, meeting in the public library with code classes followed by theory. At a special meeting the Allegheny Kiski Amateur Radio Association drew up an activities plan for the first half of the year. In conjunction with regular meetings there will be a sale of surplus club gear, movies, guest speakers, transistor equipment displays, a family picnic and Field Day. UHN attended a fine ATA meeting in Pittsburgh at which the main discussion was s.s.b., then went to the Westmoreland County c.d. meeting held by Radio Officer UVD. UHN says he hears the Uniontown Radio Club on 10 meters with its new WRL 500B with a good signal. The Bellowers and Chirpers Society went to VKD's shack for the first week end of the DX Contest. The Breeze Shooters Net, via UJP, announces that its Annual Hamfest will be held May 12th. UJP, in a QSO on 160 meters, was questioned about BSN. SHF has a new beam and is getting a new all-band antenna. TWT and LVU are the latest NCSs. SHT is on 6 meters for variety. Seventeen netters checked in on Christmas Eve and ten on New Year's Eve. SIR was the first NCS of '57. HEA has a new beam. TVW's XYL recently was in the hospital. UEM, the new editor of the Washington County Amateur Radio Club *Bulletin*, says club meeting attendance is good. In the club contest just completed the YL-XYL phone winner was KHY, with HWU and GYZ tied on c.w. The c.d. is to operate on 80, 10 and 6 meters. At a recent meeting the Cumberland Valley Amateur Radio Club announced the formation of code classes to be conducted every Tue. at 7 P.M. in the Recreation Center. These classes are open to all interested in amateur radio or the communications fields. The key stations in the RACES plan were given forms to complete. The club also formed an interference committee. The CVARC is planning another mobile test with a fixed control station in Chambersburg. LZK, from Kane, reports that the area is active mostly on 20 meters. Active thereabouts are LZK, NQ, RZN, BRJ, PWN, PMY and JGV. P6MN, the Pittsburgh 6-Meter Net, has been in operation for six months and meets every Mon. at 7 P.M. The club issues a nice certificate to any amateur station working any six-member stations. Contact Frank A. Mihm, 1409 Jefferson Heights Road, Pittsburgh 35, Pa., for more information. The Radio Association of Erie, via QN and FIQ, received honorable mention in the Edison Award. MMJ, ZWK, NNZ and RHJ are newcomers on 10 meters. Also to be found there are MS, NMP, MED, OIH, LKJ, NXK and mobiles BOW, TLA, TMK, BVM, AQY, MMI and BFB. KVB works 20-meter DX. PIY, MMI, TXZ, QMY and QN are on 40 meters. Traffic: W3WIQ 1597, EPM 111, YUL 82, BZR 62, KUN 48, YA 27, LSS 14, UHN 12, KNQ 11.

CENTRAL DIVISION

ILLINOIS—SCM, George T. Schreiber, W9YIX—SEC: HOA. RMs: STZ and MAK. Cook County EC: HPG. Section nets: ILN, 3515 kc. Mon. through Fri.; IEN, 3940 kc. The National Convention scheduled for Chicago next Labor Day week end is past the organization stage and is taking solid shape, reports QKE, general manager. Some of the committee chairmen are FUJ, finance manager; QCR, hotel arrangements; HPG, program; LOY, YLRL; K9AXK, food functions; K9APQ and JGL, publicity; and VTV, legal. Other committee chairmen will be named from time to time. GDI, one of our most active OOs, writes, "Something must be done to clean up this second harmonic thing, 7400 to 7500 kc." FDI expects to be out of the service and back on 40 meters about the time you read this. OCB plans a new 7-over-7 beam on 2 meters in the near future. New officers of the Chicago Suburban Radio Assn. are DWD, BPW, FBP and IDO. SWANI (Southern Wisconsin and Northern Illinois Radio Club) now is conducting a code and theory class in Harvard. Members teaching are NZ, TPA and YUN. The club meets the last Mon. of each month. CNT has fun with his QRP 6146 and works 160 through 40 meters. JGL has been appointed the new editor of *The Beam*, official newspaper of the Midwest V.H.F. Club, and he does a fine job. GOB does the printing. Officers of the club are K9APQ, SEK and BOZ. Congrats to BRD and his XYL, Carol, on the birth of Elizabeth Carol on Jan. 14th. MAK has qualified for a Traffickers 5,000 Club certificate. VHD reports he is the victim of a bootlegger who gets him QSL cards from bands he never works. GSB writes he likes his new GPR-90 receiver. A new General Class licensee in the section is K9CSP. New officers of the Greenville College Radio Club are KN9-DWM, KN9DNZ, KN9BTS and K9EWB. The North Central Phone Net handled 155 messages in January, reports CSW. The St. Clair Amateur Radio Club's new call is K9GXU. The club will be active in c.d. work. GME has been appointed to act as trustee for YL-WAS and issued certificate No. 17 to KA. The LARK celebrated its fifth anniversary Jan. 26th and entertained a great crowd. The Tri-Town Club celebrated its 25th anniversary Feb. 15. Illness kept your SCM away so we can't give you a personal report, but IBC filled us in. DSO has returned from a two-week air trip to the Caribbean, where he visited a lot of the DX he has worked. LNQ reports that after 20 years of hamming he finally worked his first DX on 80 meters. K9ACS writes that a radio club for teen-agers interested in becoming hams is being organized in Carlinville. The Kankakee Radio club is starting its code and theory classes with teachers QAY and EWQ/9, writes OUI. Those of you interested in AREC registration, please send your applications to your local Emergency Coordinator, not to the Section Communications Manager. If you don't know who he is drop us a card for the information, giving your county, and we will tell you. This cuts down on the paper work and expedites your card. Traffic: (Jan.) W9DO 920, MAK 583, YYG 384, IDA 169, YRH 132, CTZ 82, YIX 79, OYL 57, BUK 53, STZ 52, VHD 42, OCB 39, SXL 22, K9AXL 10, W9MHC 9, HPG 8, EDH 7, YFO 6, BQC 3, YGG 3. (Dec.) W9PHE 8, YGG 5.

INDIANA—SCM, Seth Lew Baker, W9NTA—Asst. SCM: George H. Graue, 9BKJ. SEC: QYQ. RMs: DGA, TQC and TT. PAMs: CMT, KOY, SWD and UXK. New appointments: FJR as OO; CTF, FVI, UBF, K9AQP, BEH and GGC as OESs. CLF, DGA and SWD have received appointments as Asst. Dir. for the Central Div. SVL was reelected vice-chairman of TCPN. TQC has an A-1 Operator certificate. KTX resigned as State MARS director and ZHL is the new director. DGA received a Trafficker 10,000 certificate. DPT, MVZ and K9GGC have new DX-100s. DOK won the Muncie contest with 565 points and DED was second with 526. JYO is making a wonderful record in MARS. New calls: KN9s, GXJ, GOC, GVW, EEM, DXO, DXP, ECV, CQS, ETR and DZR. K9GPQ is a new call in Peru. 9LBD/9 now is located at Laporte. Seymour has an emergency net on 3750 kc. at 1500 CST Sun. Club elections: Clark Co. ARC—EAO, pres.; LSG, vice-pres.; DKC, secy.; and ANV, treas. Duneland ARA—LEF, pres.; LXZ, vice-pres.; PQQ, secy.; and VAY, treas. Indianapolis RC—SWD, pres.; K9-BKA, vice-pres.; JZV, secy.; SUN, treas.; CJT, chief op.; DNQ and JJC, dir. Western Elec. ARC—EIV, pres.; HUB, vice-pres.; Al Larson, secy.; and Bob Spannuth, treas. Circle City RC—UTL, pres.; LWN, vice-pres.; Don Stephanoff, secy.; and VPN, treas. VZF is on s.s.b. ZVS is mobile on 2 and 10 meters. KN9CQS has a DX-35 and an NC-98. PFO has resigned as editor of the *Bison* and Mrs. Doris (Butch) Singer is the new editor. Send all items for the paper to her at R.R. 2, Box 185, Indianapolis. All IRCC clubs are asked to send delegates to the April meeting in Indianapolis. Visitors from other clubs not yet affiliated with IRCC are always welcome. Traffic from the Governor to the President was handled by SWD and TQC. UXK is getting a Valiant. The Evansville MS drive was assisted by FJI, YZO, SWN, MZE, KEP, ABW, VSD, OG, NYK, K9AYH, WØWQQ and SWL/9. Don. SWD reported IFN morning traffic as 175 and evening 325, total 500. TQC gives QIN as 442. RFN had 106, as reported by TT. EHZ gives CAEN traffic as 64. Those making BPL were NZZ, TT, K9BBO, W9JYO and

(Continued on page 92)

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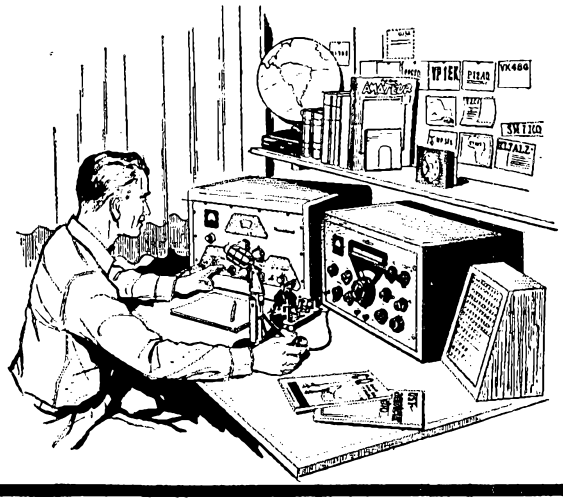


Top quality ham equipment in kit form . . . designed especially to meet your requirements!

Heath amateur radio gear is designed *by* hams—*for* hams, to insure maximum "on the air" enjoyment. Good design and top-quality components guarantee reliability. Heathkits are easy to build and are easy on your budget! You save by dealing direct, and you may use the Heath Time Payment Plan on orders totaling $90.00 or more. Write for complete details.

HEATHKIT

DX-100

TRANSMITTER KIT

PHONE AND CW

- *Phone or CW—160 through 10 meters.*
- *100 watts RF on phone—120 watts CW —parallel 6146 final.*
- *Built-in VFO—pi network output circuit.*
- *Easy to build—TVI suppressed*

MODEL DX-100

$189.50

$18.95 dwn., $15.92 mo.

Shpg. Wt. 107 Lbs.

Shipped motor freight unless otherwise specified. $50.00 deposit required on c.o.d. orders.

The Heathkit DX-100 phone-CW transmitter offers features far beyond those normally received at this price level. It has a built-in VFO, built-in modulator, and built-in power supplies. It is TVI suppressed, and uses pi network interstage coupling and output coupling. Matches antenna impedances from approximately 50 to 600 ohms. Provides a clean strong signal on either phone or CW, with RF output in excess of 100 watts on phone, and 120 watts on CW. Completely bandswitching from 160 through 10 meters. A pair of 1625 tubes are used in push-pull for the modulator, and the final consists of a pair of 6146 tubes in parallel. VFO dial and meter face are illuminated. High-quality components throughout! The DX-100 is very easy to build, even for a beginner, and is a proven, trouble-free rig that will insure many hours of enjoyment in your ham shack.

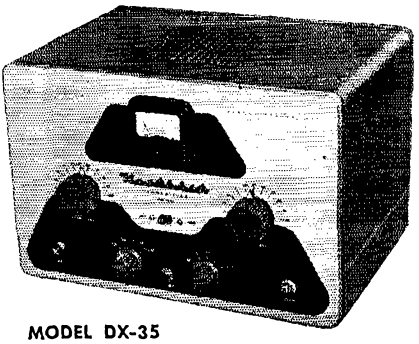
HEATH COMPANY BENTON HARBOR 9, MICHIGAN

A Subsidiary of Daystrom, Inc.

HEATHKIT DX-35
TRANSMITTER KIT

PHONE AND CW

This transmitter features a 6146 final amplifier to provide 65 watt plate power input on CW, with controlled-carrier modulation peaks up to 50 watts on phone. Modulater and power supplies are built in, and the rig covers 80, 40, 20, 15, 11 and 10 meters with a single band-change switch. Pi network output coupling provides for matching various antenna impedances. Employs 12BY7 oscillator, 12BY7 buffer and 6146 final. Speech amplifier is a 12AX7, and a 12AU7 is employed as modulater. Panel control provides switch selection of three different crystals, reached through access door at rear. Panel meter indicates final grid current or final plate current. A perfect low-power transmitter both for the novice or the more experienced amateur. A remarkable power package for the price. The price includes tubes, and all other parts necessary for construction. Comprehensive instruction manual insures successful assembly.



MODEL DX-35

$56.95

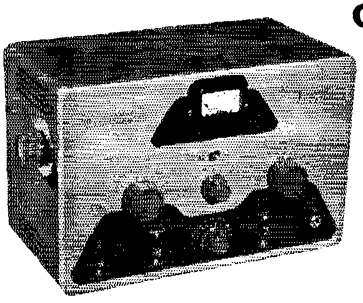
Shpg. Wt. 24 Lbs.

$5.70 dwn., $4.78 mo.

- *Phone or CW—80 through 10 meters.*
- *65 watts CW—50 watts peak on phone—6146 final amplifier.*
- *Pi network output to match various antenna impedances.*
- *Tremendous dollar value—easy to build.*

BRAND NEW

HEATHKIT DX-20
CW TRANSMITTER KIT



MODEL DX-20

$35.95

$3.60 dwn., $3.02 mo.

Shpg. Wt. 18 Lbs.

- *Designed exclusively for CW work.*
- *50 watts plate power input—80 through 10 meters.*
- *Pi network output circuit to match various antenna impedances.*
- *Attractive and functional styling—easy to build.*

Here is a straight-CW transmitter that is one of the most efficient rigs available today. It is ideal for the novice, and even for the advanced-class CW operator. This 50 watt transmitter employs a 6DQ6A final amplifier, a 6CL6 oscillator, a 5U4GB rectifier and features one-knob bandswitching to cover 80, 40, 20, 15, 11 and 10 meters. It is designed for crystal excitation, but may be excited by an external VFO. A pi network output circuit is employed to match antenna impedances between 50 and 1000 ohms. Employs top-quality parts throughout, including "potted" transformers, etc. If you appreciate a good signal on the CW bands, this is the transmitter for you!

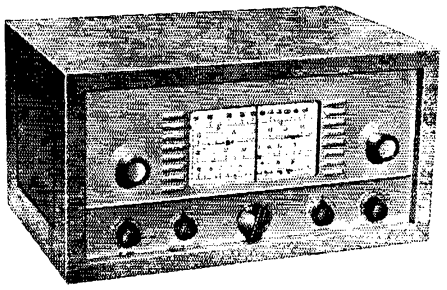
HEATH COMPANY BENTON HARBOR 9, MICHIGAN

A Subsidiary of Daystrom, Inc.

HEATHKIT

COMMUNICATIONS-TYPE, ALL BAND

RECEIVER KIT



This receiver covers 550 kc to 30 mc in four bands, and is ideal for the short wave listener or beginning amateur. It provides good sensitivity and selectivity, combined with fine image rejection. Amateur bands are clearly marked on the illuminated dial scale. Features transformer-type power supply—electrical band spread—antenna trimmer—separate RF and AF gain controls—noise limiter—headphone jack—and AGC. Has built-in BFO for CW reception. Shpg. Wt. 12 Lbs.

MODEL AR-3

$29.95

incl. excise tax (less cabinet)

$3.00 dwn., $2.52 mo.

CABINET: Fabric covered cabinet with aluminum panel as shown. Part 91-15A. Shipping Wt. 5 Lbs. $.50 dwn., $.42 mo. $4.95

Ⓐ HEATHKIT VFO KIT MODEL VF-1

Covers 160, 80, 40, 20, 15, 11 and 10 meters with three basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Requires 250 VDC at 15 to 20 ma, and 6.3 VAC at 0.45A. Incorporates regulator tube for stability and illuminated frequency dial. Shpg. wt. 7 lbs. $1.95 dwn., $1.64 mo. **$19.50**

Ⓑ HEATHKIT GRID DIP METER KIT MODEL GD-1B

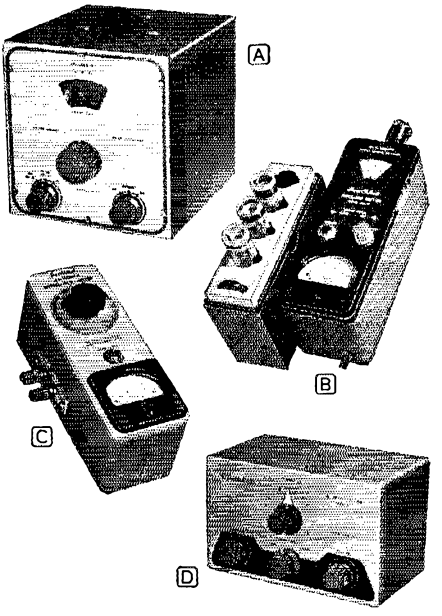
Continuous coverage from 2 mc to 250 mc with prewound coils. 500 ua panel meter for indication. Use to locate parasitics, for neutralizing, determining resonant frequencies, etc. Will double as absorption-type wavemeter. Shpg. wt. 4 lbs. $2.00 dwn., $1.68 mo. **$19.95**

Ⓒ HEATHKIT ANTENNA IMPEDANCE METER KIT MODEL AM-1

The AM-1 covers 0 to 600 ohms for RF tests. Functions up to 150 mc. Used in conjunction with a signal source, will determine antenna resistance and resonance, match transmission lines for minimum SWR, determine input impedance, etc. Shpg. wt. 2 lbs. $1.45 dwn., $1.22 mo. **$14.50**

Ⓓ HEATHKIT "Q" MULTIPLIER KIT MODEL QF-1

Functions with any receiver having IF frequency between 450 and 460 kc that is not AC DC type. Operates from receiver power supply, requiring only 6.3 volts AC at 300 ma (or 12.6 vac at 150 ma), and 150 to 250 vdc at 2 ma. Simple to connect with cable and plugs supplied. Provides extra selectivity for separating signals, or will reject one signal to eliminate heterodyne. Effective Q of approximately 4000. Shpg. wt. 3 lbs. $1.00 dwn., $.84 mo. **$9.95**



HOW TO ORDER...

It's simple—just identify the kit you desire by its model number and send your order to the address listed below. Or, if you would rather budget your purchase, send for details of the Heath Time Payment Plan for orders totaling $90.00 or more.

HEATH COMPANY BENTON HARBOR 9, MICHIGAN

A Subsidiary of Daystrom, Inc.

SWD. K9BBO also made BPL in December. Certificates must be sent to the SCM for endorsement on the due date. Traffic: (Jan.) W9NZZ 1067, TT 533, K9BBO 511, W9JYO 431, EQO 372, ZYK 365, EHZ 302, SWD 261, TQC 185, AB 150, NTA 118, LDB 84, WUH 81, DGA 77, DHJ 76, SVL 75, EJW 64, CMT 55, BKJ 46, DOK 39, KOY 30, OFW 27, ZSW 27, RTH 23, VNV 21, VPJ 21, AZF 18, EJC 16, BDP 15, BUQ 14, SVZ 14, WHL 14, DZC 13, WAU 11, CDW 10, CYZ 10, EZW 10, PQZ 10, UXK 10, YVS 10, YYX 10, CLY 9, EHY 9, HRW 9, HST 8, NTR 7, LGD 6, NH 6, STC 6, K9AOM 5, W9URQ 5, CTF 4, FJI 4, HUF 4, KLR 4, PLB 4, QR 2, QYQ 2, OWZ 1. (Dec.) K9BBO 979, W9CLY 10, HUF 3.

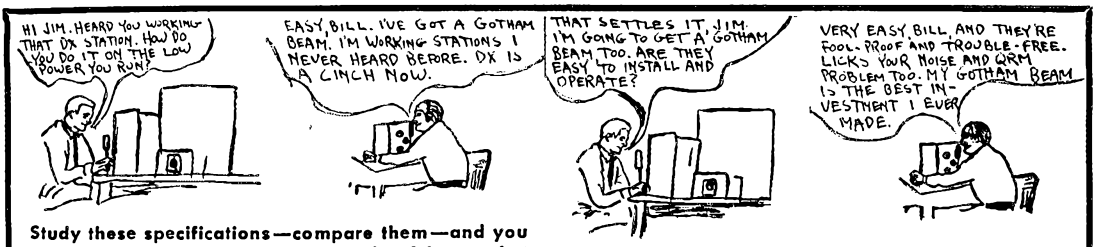
WISCONSIN—SCM, Reno W. Goetsch, W9RQM—SEC: OVO. PAMs: NRP and AJU. RMs: KQB and KJJ. Nets: WIN, 3535 kc. 7:15 P.M. daily; BEN, 3950 kc. 6 P.M. daily; WPN 1215 Mon.-Sat., 0930 Sun. Wisconsin mobile and c.d. frequency: 29,620 kc. KQB says the new WRL VFO is working FB. KJJ is in the market for a 100-watt all-band rig. K9AEQ has WAS and 25-w.p.m. certificates and a new Vibroplex. Net certificates (WIN) were issued to SZR and DKH. FZC is working on a T-R switch. K9AQT has a new BC-342N receiver, and added ORS and CP-20 certificates. SZR has returned to U. of W. at Madison. ODC is enjoying a new mobile. RUJ and RNH are new ECs in Waukesha and Outagamie Counties, respectively. SQM has added a phone patch. JEF added a combination antenna sw., balun, r.f. voltmeter, audio monitor and LP filter to his station. K9ASH now has 120 watts to a pair of 1625s. New officers of the Waukesha Club are HAT, pres.; CWK, vice-pres.; MMA, treas., HIF's XYL, secy. IKY is back at WFRV-TV and having FB results with tri-band beam and G66 mobile receiver. New officers of the Racine Megacycle Club are KZZ, pres.; TAD, vice-pres.; NVK, secy.-treas. New officers of the FLARC club are LJR, pres.; FMI, vice-pres.; RUB, secy.; HCR, treas.; and MBF, KN9ELK and LAA, directors. FLARC members provided communication for the "percheree" on Lake Mendota. WIN had a busy night with FZC as NCS with 53 messages offered and 46 cleared in a 2-hour session. JWK is sporting a new Volkswagon, a KWS-1, and a 75A-4! KLJ authored an article on the DX-35 in *CQ*. Results of the Wisconsin QSO Party: (Composite) 1st RQM, 2nd LGR, 3rd SZR. (Phone) 1st GYA, 2nd SAA, 3rd FMI. (C.W.) 1st DIK, 2nd K9AEQ, 3rd RKP. (Novice) KN9DKW. We regret to report AZN as a Silent Key. TCJ is discontinuing his RTTY OBS schedules until further notice. DPN has gone DX-minded with such stuff as SP9, G, ZS, PAØ and DL. CIZ has a new KWS-1 and 75A-4. A new NC-300 adorns the shack of VWX. UJ8KAA makes No. 194 for KXK. EIZ has the RACES plan approved for Langlade County, and has been responsible for 4 new licensees in Antigo. The M & M Club held its charter party Feb. 9th at Marinette. MIN is getting equipment ready for RTTY. Traffic: W9CXY 828, KQB 209, SAA 155, KJJ 76, K9AEQ 75, W9DKH 39, FZC 24, K9AQT 17, W9SZR 15, OVO 14, SQM 12, EIZ 11, RQM 10, MCK 9, FFC 8, JEF 7, YOS 7, KWJ 4, YZA 4, GIL 3, K9ASH 2.

DAKOTA DIVISION

NORTH DAKOTA—SCM, Elmer J. Gabel, WØKTZ—SEC: CAQ. PAM: HVA. RM: KØCNC. The Jamestown Radio Club elected the following officers: KØCNC, pres.; WØEOZ, vice-pres.; and KØCMX, secy.-treas. WIQ has a new tri-band beam. How's DX, Jack? SWB/7 contacted 21 North Dakota stations on 10 meters from Tucson, Ariz. GJJ has moved to Williston. DNJ is looking for more fellows to join the Screw Ball Net. So you fellows within 75 miles or so from Fargo, fire up the rigs on 1992 kc. each day except Sun. at 1230. Minnesota stations may check in on 1820 kc. Appointments: KØCNC as RM, FVG as ORS and YCL as EC. Traffic: (Jan.) KØCNC 106, WØFVG 18, KØHLT 12, WØPHC 12, HVA 11, KØAPX 8, WØYCL 4. (Dec.) WØDNJ 20, FVG 17.

SOUTH DAKOTA—SCM, Les Price, WØFLP—Asst. SCM: Gerald F. Lee, ØYKY. SCM assistants: HOH, FKE, APL, GQH, NEO, TI, MZJ and GDE. SECs: YOB and GDE. PAM: ULV. RM: SMV. The S.D. C.W. Net had 13 sessions, QNI 75, high 7, low 3, average 5.7; QTC 37, high 10, low 0, average 3.1. SMV, the NCS, is now active on 2 meters. The S.D. Weather Net had 26 sessions, QNI 449, high 22, low 12, average 17; QTC 389, high 22, low 8, average 15. ZWL, the NCS, was very happy with her special award. The S.D. 160-Meter Net, FKE as NCS, had 30 sessions, QNI 480, average 15 check-ins, 12 formals, 22 informals. The S.D. 75-Meter Evening Net, GDE and UVL as NCSs, had 26 sessions QNI 449, high 22, low 12, average 17; QTC 389, high 22, low 8, average 15. The S.D. 40-Meter Noon Net, EXX as NCS, reports QNI 376, high 23, low 8, average 14.5; QTC 19, high 3, low 0, average .6. RSP reports 2-meter activity good because of aurora

(Continued on page 94)



Study these specifications—compare them—and you too will agree, along with thousands of hams, that GOTHAM beams are best!

TYPE OF BEAM. All Gotham beams are of the full half-wave plumber's delight type; i.e., all metal and grounded at the center. No wood, tuning stubs, baluns, coils, or any other devices are used.

MORE DX CONTACTS

GAIN. Gotham beams give the maximum gain obtainable. Our 2-element beams give a power gain of four (equivalent to 6 db.); our 3-element beams give a power gain of seven (8.1 db.); and our 4-element beams give a power gain of nine (9.6 db.)

THE DESIGN IS PROVEN

FRONT-TO-BACK RATIO. We guarantee a minimum F/B Ratio of 19 db. for any of our 2-element beams; 29 db. for any of our 3-element beams; 35 db. for 4-element beams.

THOUSANDS IN DAILY USE

MATCHING. Matching of the transmission line to the beam is extremely simple and quick. Everything is furnished and the matching is automatic. No electronic equipment or measuring devices are required.

ALCOA QUALITY ALUMINUM

ASSEMBLY AND INSTALLATION. No special tools are required for assembly and installation. Entire job can be done by one man in less than an hour. Full instructions are included with each beam.

CONSISTENT PERFORMANCE

MAST. Any Gotham beam can be mounted on a simple pipe mast. Diameter of the pipe should be between ¾" and 1⅝".

QUICK INSURED DELIVERY

STANDING WAVE RATIO. A very low SWR of approximately 1.5 to 1 will result from following the instruction sheet, depending on the height above ground and the surrounding area. If an SWR indicator is available, Gotham beams can be quickly and easily adjusted to 1.1.

YOU WILL WORK THE WORLD

STANDARD AND DELUXE BEAMS. Standard beams in the 6, 10 and 15 meter bands use ⅝" and ¾" tubing elements; the deluxe models for these bands use ⅞" and 1". In 20 meter beams, the standard has a single boom, while the deluxe uses twin booms.

AND THE PRICE IS RIGHT!

HOW TO ORDER FROM GOTHAM

Send check or money order to GOTHAM — we ship immediately by Railway Express, charges collect.

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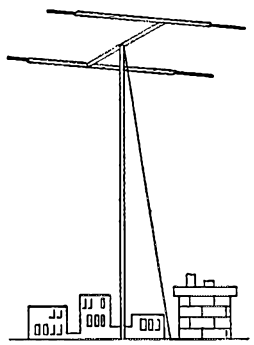
ANY electronic distributor can order a Gotham antenna for you. Here are some of the leading distributors who sell Gotham beams: Atronic Corp., Alltronics, Amateur Radio Supply, Lew Bonn Co., Burghardt Radio, Capitol, Curle, Crabtree's, Dixie, Duffy, Evans, Electronic Distributors, Emco Electronics, Electronic Supply, Miami, Emrich, W. H. Edwards, Fargo, Ft. Wayne Electronics, Graham Electronics, Henry of Missouri and Calif., Harris, Johannesen, Kinkade, Mytronic, Melrose Sales, Nidisco, Offenbach & Reimus, Purchase, Rome Electronics, Radio Electric Service, Radio Equipment Co., Radio Parts Co., Radio Supply Co., E. A. Ross, Sacramento Amateur Radio, Specialty Distributing, Swan Distributing, Srepco Inc., Selectronic Supplies, Thurow Distributors, Tel-rad, Thrifty TV Supply, Universal, World Radio.



This Full Size Gotham Cost Only $21.95 And Brought In 87 Foreign Countries, All Continents And 30 Zones On 35 Watts!

Airmail Order Today — We Ship Tomorrow

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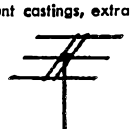
Enclosed find check or money-order for:

2 METER BEAMS			
☐ Deluxe 6-Element	$9.95	☐ 12-El	$16.95
6 METER BEAMS			
☐ 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			
☐ 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
15 METER BEAMS			
☐ 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			
☐ 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.)

NEW! RUGGEDIZED HI-GAIN 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

Name.....

Address.....

City.....Zone....State.....

conditions. The Signal Hill Amateur Radio Club met Jan. 7th and elected APL, pres.; EQV, vice-pres.; DVB, secy.; LBO, treas.; Henry Allen, activity; and Mary Frances Fredrickson, publicity. On Dec. 14th, George and Dorotha Adams went to Rapid City to attend a special meeting of the BHARC. Al Gowan was the guest speaker. The Prairie Dog ARC met for its Jan. meeting in the north dining room of the Evergreen Cafe in Vermillion, Jan. 8th. MMQ and his XYL Helen, received their No. 2 son on Jan. 6th. Additional Sioux Falls 2-meter news: SIR, DIY, HON, and KØHRR, ex-K4GEU, are on 144.9 Mc. and KNØDKV is on 145.33 Mc. CJS retired from the mail route as of Dec. 1, 1956. Four of the five Turner Co. hams, EUJEC, KNØGDS, KØEWH, and SCT, met Jan. 31st, with the county c.d. director. The GDE's third child, a girl, was born Jan. 22nd. KØAZD is active at Garden City, KDLO-TV, with a Viking Ranger and an HQ-129X. 2-meter operators on 144.9 Mc. at 12-12:30 P.M., 7 and 10 P.M. in Sioux Falls include KNØDKV, KØHRR, WØs SIR, SMV, DIY, HON and soon BLZ. The Mitchell Nat. Guard station, KØWBW, operated by WCN and GCP, has been supplying hospital reports to Bob McMullin. Traffic: WØZWL 577, SCT 213, ARF 144, DVB 50, NEO 28, RTD 22, CTZ 21, FLP 18, NNX 18, SMV 18, GWS 14, YKY 14, BQS 8, DKJ 8, EXX 8, AZD 7, DIY 7, GDE 6, KØBMQ 4, ARC 3, WØOFP 3, NPV 2, WKM 2, BQR 1, KØHSW 1, WØNIK 1, RSP 1.

MINNESOTA—SCM, Charles M. Bove, WØMXC—Asst. SCM: Vince Smythe, ØGGQ. SEC: GTX. RMs: RLQ, DQL and KLG. PAMs: J1E and LUX. PEV has a new KW S1 s.s.b. rig on the air. IRM has been appointed Official Observer, so watch your sigs, fellows. 7EJZ, of Missoula, Mont., visited the Twin Cities and is on his way to Superior, Wis., to take the job as City Manager. He formerly was City Manager of Hopkins, Minn. Twenty-two members of the St. Paul Mobile Amateur Radio Corps have ordered new uniform jackets with their insignia sewn on them. The local single sidebanders have been working Arthur Godfrey, K4LIB, on 15 and 20 meters. WDY has a new 10-meter beam and has worked all continents on 10-meter phone. KNØDUQ passed his Technician Class exam. TQQ is on another one of her jaunts around the country. My term as SCM for Minnesota is at an end and all records have been turned over to Bob Nelson, KLG, at Dassel, Minn., who has been elected as your new SCM. All appointment reports, renewals and traffic reports should be mailed to him. I want to thank everyone for the wonderful cooperation I have received. I also want to thank GTX, your SEC, for the swell job he has done in building up the AREC in this section. We now have a larger AREC organization than at any time in the past. I, too, want to thank the RMs and PAMs for their excellent work in keeping our traffic and emergency nets in such fine shape. WMA is bragging again. He says he has worked 94 countries to date. Traffic: WØKJZ 392, RVO 156, KLG 131, UNG 110, KFN 47, WMA 46, RLQ 38, QVR 34, VJS 34, IRJ 31, ALW 29, BUO 29, OJG 29, UMX 29, LUX 16, QVQ 15, ADI 13, BUD 12, ECZ 12, CWB 11, CVD 10, EMZ 10, TQQ 9, AEE 8, MXC 8, PBI 7, QDZ 5, IEA 4, EUD 2, EKR 1, GLU 1.

DELTA DIVISION

ARKANSAS—SCM, Ulman M. Goings, W5ZZY—We want to commend all amateurs who participated in the emergency communication during the ice storm in Northeast Arkansas. Communications were carried on very nicely. We want to thank the amateurs from all sections who helped us to handle the traffic. A new ham in Van Buren is KN5IMI. FPA assisted in handling the traffic from Gans, Okla., after the storm. KRO is now on the air single sideband driving a pair of 813s with a 20-A. VKE gradually is getting ECs set up throughout the State. The Arkansas Emergency Net meets on 3885 kc. each Mon. The Arkansas EC Net meets on 3885 kc. each Tue. All amateurs in the Arkansas section are invited to the EC Net. Be sure to send in your appointment certificates for endorsements. DAG, South Miss. County EC, has started a local county net each Sun. on 3850 kc. at 1400 as an AREC preparedness program. RACES finally has been approved for Arkansas. TIE is working very hard to put it into operation in the State. WSM/5 gladly handles traffic for students at Arkansas Tech. College. He is on 7290 kc. at 1300 and 3960 kc. at 1730 daily. Traffic: W5VTZ 300, BJR 276, K5EED 235, W5DZK 83, EMN 83, KRO 60, HEE 39, WZN 38, DAG 34, WSM 15, ZZY 6, FMF 5, VZL 4, FPA 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—K5BES, our SEC, held a special meeting at the Greater New Orleans ARC with C.D. Coordinator Lt. Col. Numa Avedano, C.D. Deputy Director Maj. John H. Bush, both with the Louisiana National Guard, C.D. Communications Officer Maj. Wilbur Golson, Louisiana State Police and Training and Education Director John Dunn. Also attending were BUK from the Westside ARC and amateurs from the Greater New Orleans Area. K5BES outlined plans for AREC, c.d. and RACES programs showing the state divided into 7 sectors with Radio Officers who also are ARRL Emergency Coordinators in charge of each. Special plaques were presented to Col. Avedano and Maj. Bush for the help and cooperation they have given the amateurs. New ECs include AZM, K5ALK, K5CWQ, K5EAY and VAR. K5BWZ is active on 40 meters running 35 watts to an AT-1 and a Super-Pro receiver. K5DMA, active with an all-band doublet, has 35 states. UXE is trying to build up code speed while converting surplus gear. K5AGJ reports Jefferson ARC's recently-elected officers are EPC, pres.; EKL, vice-pres.; K5GGK, rec. secy.; and K5HEK, treas. CWC is pounding away at AF MARS, Delta 75, Ark. Emer. Net and Nucklehed Net. EA got the BC-669 going as well as an RAL-7 receiver. FMO gave his RAL-7 away to a deserving ham. MXQ may have difficulty with the new equipment but still handles lots of traffic. K5DDH now has an SX-99, a DX-100 and a Q Multiplier on 40 and 15 meters. SIW now has a two-letter call, TL. NYC is up to 11 w.p.m. trying to renew his expired license. Get in touch with your SCM if you wish an ARRL CD appointment. Traffic: W5MXQ 154, EA 23, UXE 19, CWC 4.

TENNESSEE—SCM, Harry C. Simpson, W4SCF—Asst. SCM: Richard A. Crowell, 4WQW. SEC: RRV. PAM: PQP. RM: IV. K4LPW is now trying for DXCC from his new QTH. UWA is converting his Adventurer to 6 meters. His XYL is now Technician K4JNI. WQT, busy with construction for his many friends, has finished a Valiant, and now is working on a 20A. K4DNU writes about the many activities of the outstanding Whitehaven ARC. The club station is HZB, under the trusteeship of LRO. WQW tersely reports, "Antenna iced and fell . . . power failed . . . emergency generator took over . . . antenna fell again . . . jolly good show . . ." The usual fine BPL report was received from PL. PFP is busy installing an Elmac in the new Ford. HHK, our 2- and 6-meter wizard, reports on auroral propagation during January and says that 18 Memphis stations now are on 6 meters, with 15 mobiles expected before summer. The Feb. 1st 6-meter statewide test was not able to bridge the gap between Nashville and Memphis via Dresden, but ZZ expects better results on the next attempt. DMU, who has done such a fine job with the Davidson County 10-meter Emergency Net for the past two years, has turned the reins over to SWU. K4DIZ, who occasionally lends out her microphone, is now 4th Call Area TCPN Director. IRI has a new 35-w.p.m. certificate and uses a BC-696. K4ADX, from Dalton, Ga., now a student at McCallie, Chattanooga, uses a DX-100. Very nice bulletins are being received from the Athens ARC. The editor is UVU, also president. K4DSI, K4BMC, HSX and others demonstrated various Conelrad systems at the recent Memphis ARC meeting. GFV, an E.E. student at Vanderbilt, reports working 15 UA, UB UC and UD stations on 20 meters using a DX-100. He is now building a cubical quad for 10 and 15 meters. Traffic: W4PL 769, K4DIZ 128, W4OGG 90, UVS 77, VJ 64, PQP 62, SCF 42, IV 34, WQT 31, K4GFL 29, W4EWC 26, UVL 26, IRI 23, PFP 23, UIO 22, SZI 20, K4BMC 17, W4GFV 17, ZZ 14, K4ADX 9, W4WQW 7, DMU 6, K4LPW 6, W4HUT 4, HSX 3, K4DNU 1, W4HHK 1, PVD 1, RRV 1, UWA 1, YRM 1.

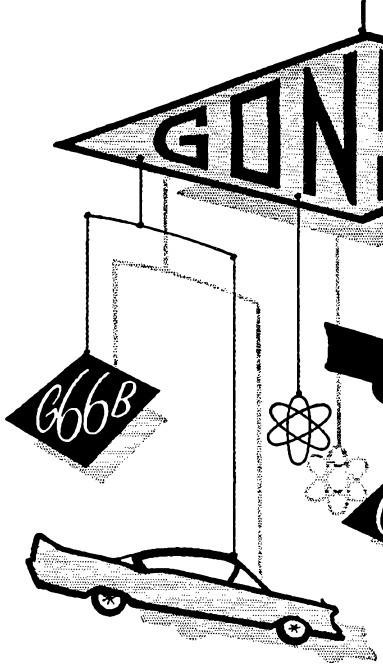
GREAT LAKES DIVISION

KENTUCKY—SCM, Albert M. Barnes, W4KKW—SEC: JSH. PAMs: VJV and SUD. RM: QCD. The Kentucky Flood Disaster will be covered in a future *QST*. I want to thank every amateur who helped during this emergency and I am recommending that a Public Service certificate be issued to those whose work is reported, after so noted in *QST*. I hope the public officials of Kentucky, from the Governor on down, will realize the need for better emergency and civil defense communications than we now have. K4AIS heads the top of the list with the highest traffic total. MWR did an excellent job during the flood. VJV and SUD are doing a wonderful job as PAMs. QCD, our RM, kept the c.w. nets going and turned in a fine report. ZDA and ZDB were on long hours during the flood on both phone and c.w. SBI, our former SCM, did wonderful work with KPN. 5GOH/4, at Ft. Campbell, received his 35-w.p.m. certificate. YZE and HJI are new OPSs and did fine work on the Governor to President Inaugural Message Relay. DAF is carrying on interesting experiments in radio astronomy. CDA printed an excellent report of flood amateur activities in the *KPN-KPN Bulletin* and completed a report to ARRL, JSH, the SEC, and the ECs of Kentucky were on the job where needed. K4JGN has a new all-band doublet. KKG would like to swap 35-mm. color slides of beam arrays. JUI says s.s.b. is the only way to work through QRM on 75 meters. K4CHK got his fingers frozen to the beam while adjusting. KZF experimented with folded

(Continued on page 98)

GONSET

mobile twins

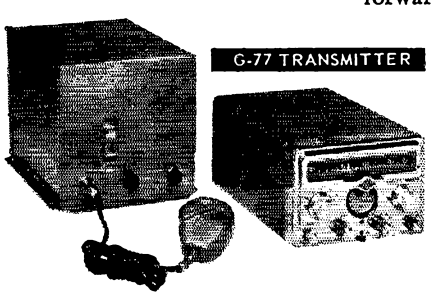


Each by itself . . .
or together as a
team . . . unexcelled!

G66B, compact, conveniently accessible, is widely used and acclaimed for mobile reception . . . . . performs in an equally outstanding manner as a multi-band communications receiver for fixed stations. Separate power supply/speaker combination unit operates from 6 and 12 volts DC (specify) and 115 volts AC, makes either operating mode possible.

G77 typifies the finest in modern mobile transmitter design, offers multi-band operational flexibility.

Operated together as Mobile Twins, G66B and G77 point up the effectiveness of GONSET forward thinking, coordinated designs.



G-77 TRANSMITTER

FREQUENCY RANGE: 80-40-20-15-10 meters. VFO or xtal, switchable. Highly stable VFO, each band spread over most of slide rule dial.

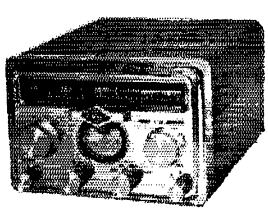
FULL BANDSWITCHING: Exciter ganged with VFO, pi network output.

POWER INPUT: 50-60 watts, modulated. CW provisions, 6146 tube in output. New modulator has integral speech clipping. High gain speech for PA-type dynamic, reluctance or xtl mikes.

POWER SUPPLY: Heavy-duty, vibrator, 6 and 12V DC. Output voltage 500-600V full load, Selenium rectifier, low drain both on standby and transmit. Power supply is a separate compact unit.

G77 with power supply...(less microphone and crystal)..... 279.50

G-66 RECEIVER



6 BANDS: 540-2000 kcs. 3500-4000 kcs. 7000-7300 kcs. 14,000-14,350 kcs. 21,000-21,450 kcs. 28,000-29,700 kcs.

STEEP SKIRT SELECTIVITY: 265 kc 2nd I.F. 8 high Q tuned circuits. 3.5 kc I.F. bandwidth at 6 db down.

AM, CW, SSB RECEPTION. Highly stabilized HF and BF oscillators and xtl controlled 2nd conversion oscillator.

DOUBLE CONVERSION ALL BANDS: 2050 kc 1st I.F. Double input tuning (3 tuned circuits) on high bands for high image rejection.

AVC—Noise limiter—Panel S meter—antenna trimmer—BFO pitch—Audio-RF gain control—slide rule dial—3 watts audio.

G66 RECEIVER...(less power supply).....(#3046).....net 189.50

"3 way" (6V-12V-115V AC) Universal power supply/speaker....net 44.50

GONSET DIVISION OF L. A. YOUNG SPRING & WIRE CORP. . . . . Burbank, Calif.

dipoles. W4WNH operated with the Kentucky. CAP during the flood from Louisville and Vine Grove. Traffic: K4AIS 332, W4MWR 219, ZDB 170, QCD 166, SUD 164, KKW 145, NBY 106, W5GOH/4 87, W4HSI 82, RPF 78, VJV 76, K4DTI 63, BVT 59, HOE 58, W4CDA 54, JSH 53, ZDA 51, KQU 49, K4JGN 42, W4KKG 32, TQD 30, K4HBF 17, W4SZB 17, JCN 14, HJI 11, OMW 10, K4DLI 5, AGY 3, CHK 2, JUI 2, K4KIN 2, W4NGZ 2, KZF 1.

MICHIGAN—SCM, Thomas G. Mitchell, W8RAE—Asst. SCM (phone) Bob Cooper, 8AQA; Asst. SCM (c.w.) Joe Beljan 8SCW. SEC: GJH. BPL certificates were issued this month to ELW for January traffic and to WXO for December traffic. Under the heading of "Story of the Month" we might well report the 50-Mc. QSO between TIN and KL7VT, which took place on Jan. 3rd. It was a "first" for both. TIN used a Gonset Communicator with a four-element beam and the KL7 used an 829-B with 150 watts input. This ought to be some sort of a record, at least for our section, and should provide the inspiration for more of us to delve into the fascinations of v.h.f. activities. Visitors to Lansing will be glad to know that they may see FX's old wireless gear nicely displayed in the Michigan Historical Museum. Tate says that more may be added later. Cos (HSG) has introduced an amendment to the Public Acts of 1931 which will legalize the installation of FCC-licensed radio receiving equipment in automobiles. When adopted, situations as reported in this report in January 1957 QST will be eliminated. Appreciation for this action also is extended to LKM for his part in preparing the legislative work. Several of the Oakland County amateurs have completed basic c.d. and RACES training courses conducted by the Area EC and RACES Radio Officer. EGI is busy revamping his 20-year-old SX-11, which is probably older than many of the persons reading this report. FGB is operating 144 Mc. with a Gonset Communicator II and BPY is working on pedestrian mobile units with the Blossomland gang in Benton Harbor and St. Joseph. OCU is active again on 7 Mc. and hopes to return to QMN as soon as a suitable antenna can be rigged. The Holland Area Radio Club has been assigned the call K8DAA for the club station, which boasts an AT-1 with modulator, a Viking Valiant, and an RME-4300 with a preselector. Traffic: (Jan.) W8ELW 593, GKT 163, ILP 97, NOH 90, YAN 82, FX 81, ZLK 80, K8NAW 77, NUL 63, FGB 54, DAP 48, NTC 39, FWQ 34, SCW 29, TBP 25, OGY 23, RAE 22, WXO 21, QIX 20, HKT 18, RVZ 17, AUD 16, DSE 14, OCC 14, TIN 9, LIM 8, K8NRD 8, W8SJF 6, UCN 3, TIC 2, HSG 1. (Dec.) W8WXO 163, GKT 122, RTN 88, TBP 31, IUJ 30, OCC 18, TQP 17, OGY 16, TIN 9.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCMs: J. C. Erickson, 8DAE, and E. F. Bonnet, 8OVG. SEC: 8UPB. RMs: DAE and FYO. PAMs: HPP and HUX. GRG has his General Class license. 1957 officers of Ohio U. RC are UMH, pres.; ODS, vice-pres.; SES, secy.; LLY, treas.; and MSL, engineer. This club has a new DX-20 for its Novices. Santa brought MXO a multiphase r.f. analyzer. MYV moved to Rochester, N. Y. New appointments are K8BXG as OO, RLR, SVL and K8BEW as ORSs, SDZ and K8CSI as OBSs and HZJ as OPS. PLQ runs 100 watts on 2 and 6 meters with a new Viking 6N2 and worked Florida, Texas and Oklahoma. The Quaker Radio Assn. of Salem's officers are CJG, pres.; FAU, vice-pres.; and OZW, act. chairman, with K8BTP as the club call and new Novices KN8s AZZ, BAB and BAC. SPF marched in the Inaugural Parade as a trombone tooter. CJG has a new Morrow mobile rig. OZW has a new DX-100 and a cubical quad on 10 meters. PWH has 165 countries confirmed. The Massillon ARC showed three films. KJE has a 20A exciter preparing to go on s.s.b. OKC has WAS. TWO is mobile on 10, 6 and 2 meters. FBE has a new NC-300. AQW has a DX-35 and K8BML has a new DX-100. KN8s AZW and BMM have new SX-99s. KN8BMO is on 15 meters using a DX-35. The Six Meter Nomad group of the 5th Corps Area of the Ohio Civil Defense Corps has been activated as the official roving communication group and has over forty members. Columbus ARA's 1957 officers are RFE, pres.; ZCQ, vice-pres.; AAU, secy.; GKQ, treas.; DWP, editor; and THU, printer. ABM broke about all the records in the book while operating as a Novice—WAC, WAS and top-scorer in the SS and Novice Roundup. AER has a new home and 10-meter beam. ZCQ spent a couple of weeks in Florida. GGG and MOX have new Viking 6N2s. AAU has a new Valiant. DWP made WAS and WAC. K8BVB received his General Class license. BUQ is the new c.d. Radio Officer for Cuyahoga County. HXB relayed messages for President Eisenhower from the Governors of California, Oregon and Washington. SVL is working some DX. GFE has a 15-meter quad. BN, an old-timer, is Toledo's ham of the month. It is with regret I report the passing on of CVZ. SQX has a new Viking Ranger. KN8GJS has a new baby son. HWX received certificate No. 2 for working 1000 OMs. DN runs six watts on 6 meters. The stork brought a baby girl to JEX and a baby son to VEK. HNY has a new three-element 20-meter beam, Viking II, VFO, 75A-3 and V.H.F. 152A. The Springfield ARC bought a panel truck to convert into a mobile communication center. IXA is mobile exclusively. TCT has a vertical ground plane for 6 meters. HZJ put an 89U and product detector in his HRO-60. PLQ's 6N2 is working fine. SWT, in Madison County, answered our plea for ECs. GFE made BPL in January. The Hocking Valley RC's picnic and hamfest will be held on July 14th at Lake Burr Oak, so mark your calendar and make plans to attend. More later on this event. K8BBI received his General Class license. PAU runs phone patches daily for KL7FAR. HQK has an s.s.b. rig. Traffic: (Jan.) W8UPH 491, VIP 320, UPB 189, GFE 173, DAE 153, SZU 140, HXB 133, AL 79, QLJ 64, SVL 60, VYU 52, W9VBV/8 21, W8PLQ 18, HZJ 14, ARO 8, RO 6, EEQ 5, LZE 5, QIE 4, BEW 2, LMB 2. (Dec.) W8SZU 210, ZAU 63, LZE 37, WAV 27, PLQ 26, MXO 15, PBX 14, UMH 6. (Nov.) W8PZS 10.

FIFTH ANNUAL
OHIO INTRASTATE QSO PARTY
APRIL 13TH AND 14TH

The Ohio Council of Amateur Radio Clubs will sponsor a QSO Party, open to all Ohio amateurs, which will be held from 6:00 P.M. EST Saturday, April 13th, until 6:00 P.M. EST Sunday, April 14th. All Ohio amateurs may take part. In one county, ten contacts *only*, phone or c.w., may be counted.

Any and all amateur bands and any mode of emission may be used. There will be no power restrictions. *Scoring:* multiply the number of Ohio stations worked by the number of Ohio counties contacted. Each station may be worked but once regardless of band or mode of emission used. Logs should include calls of stations worked, time, date, and the county in which the station is located. Operation near the following frequencies is recommended: 3550, 3740, 3860, 7100 and 7250 kc. On the other bands, take your pick. The call "CQ Ohio" should be used on both phone and c.w. A cup and four appropriate certificates will be awarded to the highest scoring stations. Certificates will also be awarded to Novices, the number of certificates being contingent upon the degree of activity.

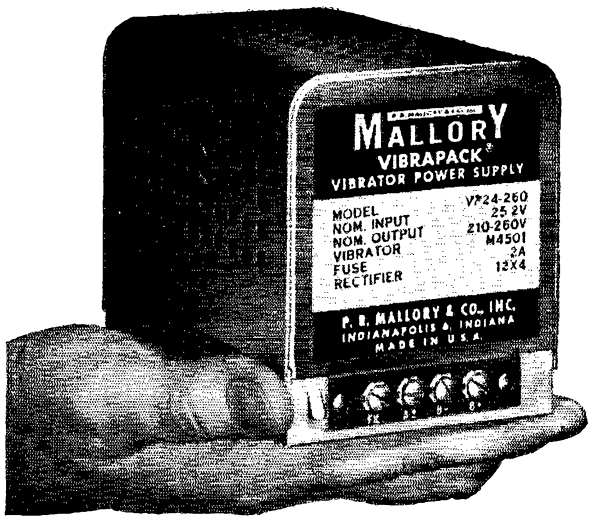
All contest logs must be postmarked no later than May 1, 1957, and should be sent to the contest manager, Hamlin King, W8EQN, 353 S. Arlington Ave., Springfield, Ohio.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George K. Tracey, W2EFU—SEC: KGC. RM: BXP. PAMs: GDD, IJG and NOC. Section nets: NYS on 3615 kc. at 1900, NYSPTEN on 3925 kc. at 1800, SRPN on 3980 kc. at 1130, IPN on 3980 kc. at 1530, MHT on 3716 kc. Sat. at 1300. K2HPQ is the new asst. mgr. of Second Call Area TCPN. K2PIC made DXCC and got a new KWS1 in December. HF reports 2-meter activity on week ends from Putnam Co. using a Gonset linear and four-over-four beam. K2EST spoke on antennas Jan. 17th at the Ulster County Mike and Key Club. K2BCU is conducting a theory class for the Ulster Club. While working 80-meter c.w. and 2-meter phone, K2PRB is becoming interested in traffic. ZHI spoke on receiver sensitivity at the February meeting of the Schenectady Club. Printed circuits was the February subject at the Harmonic Hill Radio League. WAC in two hours and fifteen minutes on 20-meter c.w. is reported by FBS. K2RUU is now running 150 watts on 6 meters. To reduce RTTY drift, K2DRN had to shock-mount the receiver, with much better results. We apologize to EWO and VDX; they will not leave Poughkeepsie for Owego until October. ZBY and JZK represented G.E. during the Edison Award judging in Washington, D. C., Jan. 24th. We are proud of the winner, 3CUL. Ex-member of NYSPTEN, KUD, is now signing 7KUD from Phoenix, Ariz. Endorsement: AAO as EC. Also transferred to Phoenix is new OO FZW. K2RDI is feeding his Gonset into a twenty-element beam on 2 meters. Several clubs recently have incorporated. We suggest you have an attorney describe the advantages and procedures to your group. SZ, at R.P.I., is heard with a new linear amplifier using low-level modulation. Traffic: (Jan.) W2BXP 391, EFU 166, NOC 117, PHX 90, K2HPQ

(Continued on page 98)

New, Compact Vibrapacks® to Power Your Mobile Rigs...



Before you start working over your battery-powered gear for the outdoor radio activity that will soon be in full swing, stop in and see your Mallory distributor. He is prepared to introduce you to a new Mallory Vibrapack vibrator power supply that you can fit into almost any type of mobile equipment.

So small that it fits into the palm of your hand, this new power supply puts out plenty of wattage. It embodies design principles that Mallory engineers have learned in 25 years' experience in building vibrator operated power supplies for communications equipment. You'll find that our designers have used techniques formerly reserved exclusively for commercial mobile equipment.

Here are some highlights. The same communication-duty, series drive vibrator found in taxi, police and utility two-way transmitters and receivers is used. High stability ceramic capacitors are used in critical parts of the circuit. Heavy gauge steel protective cover and bottom plate snap on and off in an instant, to make replacement of vibrator and rectifier tube a few seconds' work even on field location. When you remove the bottom plate, all wiring is exposed and accessible for trouble-shooting.

Special attention has been given to hash filtering in the "A" and "B" power leads. A separate external connection to the rectifier heater saves your battery during standby, and provides instant return to operation.

The Vibrapack has been designed to let you provide whatever low frequency filtering is necessary for your particular equipment . . . without paying for parts and wiring that you may not need. You can connect the output "as is" to a transmitter or receiver that already has its own filter system. Or, if you want to add a filter to the Vibrapack, the chassis has been punched and space allowed for the installation of a Mallory multi-section FP electrolytic capacitor.

Power ratings are conservative, to assure you of higher efficiency, peak conservation of battery power and long operation between charges.

Ask your Mallory distributor to show you the new Mallory VP (6), (12) and (24) Series Vibrapacks, and to give you their electrical characteristics. Or, just drop us a letter and we'll send you complete details.

Heart of the New Vibrapack...

is the new Mallory 1700 series vibrator, using a new design that eliminates contact buttons. New leaf spring contacts give far greater area, much longer life, and end sticking and slow starting. The 1700's are available separately, as replacements, or to build your own supply.

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73. EDH 56, W2ATA 47, K2LKI 32, HNW 22, QIX 12, BE4, PRB 1, W2TYC 1. (Dec.) K2CXP 42, W2MHE 11, TYC 4.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: ADO. PAM: OBW. RM: WFL. Section Nets: NLI, 3630 kc. nightly at 1930 EST and Sat. at 1915 EST. NYC-LIPN, 3908 kc. Mon. through Sat. from 1730 to 1830 EST. NYC-LI AREC, 3908 kc. Sun. at 1400 EST. Our section traffic nets are handling many messages but much of the traffic travels its last legs by mail because inadequate coverage exists in Brooklyn, Queens and the Bronx. Our net managers request your assistance—a few minutes each evening will help very much. OBW announces the beginning of a regular weekly AREC Net on 3908 kc. Sun. at 1400 EST. KEB has been reelected national secy. of TCPN and KFV has been returned to office as 2nd call area director of TCPN. DEM passed his radiotelephone 2nd-class exam. KN2VNI is a new Novice at AEE. K2s JYD, RCG, STF and MAU dropped the "N." After active duty with the Army, KH6BPZ returns to the station at AEE. K2LTI runs a Viking II and has worked 47 states and 69 countries. K2LUM received his WAS certificate. K2KXZ worked 17 stations in 7 countries on 40 meters one evening before his antenna came down! It's a new daughter at K2RJO and a new son at UXY. A new KWS-1 has added the modern touch at PF's station. Mobiles caught in snowstorm traffic jams made use of their rigs to notify families of their delay. KGN has a "Match-stik" vertical. K2UOY made WAS. K2CUI is hoping that his newly-acquired 75A-3 will help him find Utah for that elusive 48th state. K2JQO has a new mobile rig on 10 meters. K2BTT added a new two-element 10-meter beam. An s.s.b. rig is under construction at DID. HQL received his DXCC-160 sticker. EBZ is copying FSK RTTY on 3620 kc. with an FRA converter. SMX has a new DX-100 and is equipped for RTTY. K2AED has a new AF-67 ready for mobile work. The latest total at K2BSM is 143 countries. K2DDK is preparing for 220-Mc. operation. A Globe King, HRO-60 and three-element 10-meter beam have accounted for 25 new countries at K2RCO. New officers at the AMPS RC are K2RBS, pres.; K2GXL, secy.; and JUN, treas. K2TTA is working on a 435-Mc. transceiver. 1957 officers of the Babylon RC are K2KES, pres.; K2KHU, vice-pres.; K2IQA, secy.; and K2AAN, treas. The Stuyvesant HSRC, CLE, with K2LTI, pres.; K2IBY, vice-pres.; and K2LWT, secy.; is on the air with an HT-9 and an NC-98. VVZ moved to Oceanside. KN2s YAL and YAK are father and son. The L.I. 6-Meter Emergency Net, on 50.25 Mc., boasts 40 active members. Hidden transmitter hunts are held on the 1st Fri. of each month. Higher power is the watchword on 6 meters as the band openings provide more DX. K2s ACD, AZT, QNY and RKL are in the 100-watt class, while K2s MBY, MXT and PWH run Communicators and linear amplifiers and AZA, JZT and K2IEJ run Johnson 6N2s. New members of the 6-Meter Net are K2s LXM, OTO, VIX and YEA. K2JHK now signs K4LPP. K2ODE joined the Marines. New officers of the Levittown ARC are K2HZC, pres.; HQD, vice-pres.; MZN, secy.; and K2LUR, treas. New officers of the V.H.F. Institute are AOC, pres.; K2JLR, vice-pres.; AUF, treas.; K2DDK, corr. secy.; and K2UHF, rec. secy. K2UQX has now worked 35 states. The Amateur Radio Association of Flatbush, K2VSS, is now running 500 watts with K2s PZH, RCO, TRJ and UAQ operating the rig. New members of the NYRC are CAT, JZX, NNC, K2s ISK, QOT and KN2s UZG and VDS. Our Official Observers are reporting many cases of out-of-band operation. Check your receiver calibration and watch out for drift in your v.f.o. Traffic: (Jan.) W2KEB 2064, KFV 602, K2AMP 261, DEM 232, W2WFL 205, K2PHF 104, GHS 75, W2AEE 62, K2QZS 59, W2TUK 52, GP 50, K2LTI 49, W2DRD 44, K2KSP 41, W2UGF 39, K2BH 38, W2HAC 37, JOA 37, K2LUM 34, RKL 31, W2JGV 30, K2CRK 26, W2OBW 25, K2KXZ 23, PSE 18, RJO 18, ECY 16, GLP 16, W2PF 15, LGK 14, KGN 12, EC 9, K2UOY 9, JZR 8, CUI 7, UQX 4, CMV 3, W2DUS 3, JBQ 3, K2OBO 3, AAW 2, W2YBT 2. (Dec.) W2PEQ 22, K2BH 18, W2PDU 16.

NORTHERN NEW JERSEY—SCM, Lloyd H. Manamon, W2VQR—SEC: IIN. PAM: VDE. RMs: BRC, CGG and NKD. Section Net certificates were issued to the following stations during January: AGD, PIG, FIK, VC and KAK and K2GVB, OAM, HHU and GIF. New ORS appointments went to K2MMM and CSC. VDE is doing a fine job on NJFN in getting member stations to apply for OPS appointment. NJN report for January is as follows: Evening net—27 sessions, attendance 469, traffic 262. Morning net—26 sessions, attendance 97, traffic 52. In addition to daily morning and night sessions. NJN is running Sun. night sessions on 3695 kc. at 1930. New stations on NJN during January were QND, QLF, ISZ and K2RRH. The NJN RM has a goodly supply of Section Net certificates and will issue them to all stations earning them. BRC has a new DX-35 and a new v.f.o. The GSARA has just issued volume 1, issue 1 of *The Scope*, the new club paper. The first issue contains a message from the club president, CQB, outlining a very interesting program for the year ahead. The club meets on the 2nd Wed. of each month at 2000 in the Red Cross Bldg., Broad Street, Shrewsbury. The 4th Wed. meetings are held at McGuires Grove, Middletown. JTJ was visited by an XE during the holidays. VCZ is building a crystal s.s.b. rig. Bob worked 41 sections in the last CD party. New officers of the Ridgewood Amateur Radio Club are CGJ, pres.; VCZ, vice-pres.; MQF, treas.; LAN, secy. The Club net meets every Wed. at 2100 on 29.254 Mc. except on the club meeting night, which is the 2nd Wed. of the month. GNQ is net control. Our thanks to LAN, club secretary, for keeping us so well informed on club doings. The RBRA officers are K2BEV, pres.; K2DDM, vice-pres.; K2DSW, treas.; K2KFE, act. mgr. LRO is active in OO work again. All new hams in Teaneck are requested to contact HXU so that delivery of QSL cards will reach owners when the street address is not given. CVW is on 2 meters. Ed had his highest score yet in the recent CD Party, all because of the new Valiant. A card has just been received from DXD, who is in Mexico on a trip. He has visited XE1A and XE1RE. K2SKK is chasing TVI. K2EQD is on 2 meters with an s.s.b. rig. K2RJD is building an 826 linear for 2 meters. K2POH has a new 75A-4. K2LBN has a new DX-100. K2DSW will graduate from RCA Institute soon. K2RGS is active in the Interstate and 2nd. Reg. Phone Nets. ZEP got a good break-in system working. K2KHZ changed his QTH to E. Orange. Dave has been active with the mobile rig, working a total of 24 states on 15-meter phone while traveling to and from work. K2EMJ is a new OPS. K2IBF is doing fine with his v.f.o. hooked to the antenna in the absence of a high-power rig. VMX has been promoted to Class I OO. He has been working with transistors and reports very favorable results. K2BHQ is revamping the rig for 15-meter operation. K2JGU has been appointed treasurer of the NJFN. K2OYJ is a new member of the high-power class with a new 250-watt linear final. YLS and BTG have a new 40-ft. tower in the back yard complete with 10-over-20 beams. WSN and MWW are heard on 2 meters. K2TLI is on 2 meters with a pair of 4-125A tubes. K2DHE was host to the state RACES Tech. Committee at the County Control Center. Freehold. Traffic: W2MLW 381, K2EB 185, W2VDE 149, K2EQP 123, BHQ 73, W2BRC 65, RXL 59, FIK 46, FNT 46, VMX 30, ZVW 23, K2MFF 20, MMM 17, W2OXL 16, K2RGS 16, W2DRV 14, K2GIQ 12, EMJ 7, SKK 6, BWQ 5, OYJ 5, W2CJX 4, ZEP 4. (Dec.) K2HHU 80, W2DRV 24.

MIDWEST DIVISION

IOWA—SCM, Russell B. Marquis, WØBDR—New appointments: MJH, LBK, ZPM and CZC as ECs. Endorsements: HWU, LAC and QVA as ECs; KVJ as ORS; and CZ as OPS. New officers of the Des Moines Club are ULV, pres.; YEH, vice-pres.; QNO, secy.-treas. Sioux City Club officers are WWM, pres.; KØAAU, vice-pres.; GXQ, secy.; TNX, treas.; and JKT, sgt. at arms. Fort Dodge Club officers: QVZ, pres.; KØARA, vice-pres. and treas.; WØNGS, secy.; ZCN, BTX and ZPM, directors. GQ was appointed RACES Radio Officer for the Cedar Rapids Area, with GIM as alternate. LGG got a new 75A-4. SCA has a NC-300. Doc is getting longer ears these days. Paul Hamilton, FCC examiner, was guest speaker at the Des Moines Club meeting. KVJ has a 10-meter cubical quad. DO, EHH, CSP and SMW vacationed in the Southland. EEJ has a KWS-1. KØKTG received a KWS-1, 75A-4 and a beam from the XYL as a Christmas present. ARN has gone to Alaska and hopes to get on from KL7-Land. NWX passed traffic directly to Iowa by 80-meter c.w. mobile while on the Pennsylvania Turnpike. KØCLX received a WAS certificate. WHE is a new member of TUCN. Traffic: (Jan.) WØBDR 1545, SCA 1083, LGG 871, LCX 827, PZO 786, BJP 287, KVJ 222, CZ 216, BLH 152, UTD 149, GXQ 141, LJW 54, WHE 45, KØAAH 42, WØQVA 42, BTX 28, NGS 25, VWF 24, KØCLS 23, WØYI 22, KØDZX 20, BEC 16, WAD 13, WØZPM 11, ATA 10, GQ 10, RQW 10, BQJ 8, EHH 8, MG 8, YUA 8, KJN 7, KBRE 6, EXN 6, WØFMZ 6, KØAHZ 5, WØCGL 5, FDM 5, HNE 5, UTX 5, EEG 4, KØDBW 3, DYJ 3, WØDJY 2, KØGOQ 2, PTL 2. (Dec.) WTIU 13, KDHQ 6.

KANSAS—SCM, Earl N. Johnston, WØICV—SEC: PAH. RM: QGG. PAM: FNS. Salutations to newly-formed Mike and Key Amateur Radio Club of Parsons. Officers are KØIII, pres.; EYD, vice-pres.; (also Radio Officer for local c.d.); KØESF, secy.-treas.; KØGZP, publicity; and George Murphy, USNR training supervisor. The Air Capital ARA of Wichita elected the following officers: KØAQJ, pres.; CRN, vice-pres. & treas.; KNØGIA, secy. According to *Ground Wave*, the club paper, the 2-meter project is completed. This should increase 2-meter activity in Wichita. The N.W.

(Continued on page 100)

What's New With The Electron...1957

Eimac unveils new ceramic tubes at 1957 I.R.E. Show in New York City

One of the highlights on last month's I.R.E. Show was Eimac's display of tubes that can take it... they range from a giant klystron, taller than any man, to receiving tubes barely larger than grapes...

tetrode prize package

Among the Eimac tubes on display was the new Eimac ceramic 4CX5000A... a ceramic and metal all-purpose forced air-cooled tetrode, only 4½ by 9 inches in size... it delivers 16 kw of Class B audio power... is highly recommended for CLASS AB_1 SSB where its output is a conservative 10 kw...

Eimac turns on heat

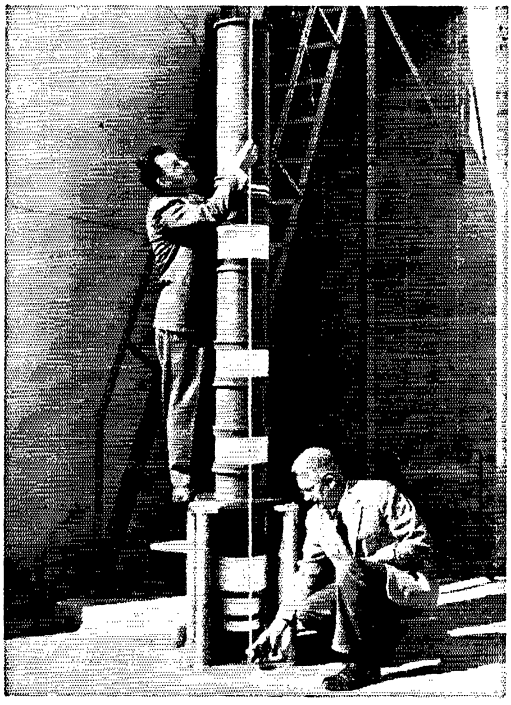
Further proving the claim that Eimac tubes can take it was the display featuring a small transmitting tube overloaded to more than three times its normal rated input... this is the 4CX300A, a ceramic prize package that has almost incredible ratings up to 500mc... two 4CX300A's will take a kilowatt in SSB... another tube featured was the 4X250B... with a ceramic plate-grid seal... a tube useful for amateur application in all services...

the long fellows

Serious-minded engineers looked over the display of new ceramic klystrons... some designed for industrial application... powers range from a few watts to a megawatt in UHF/microwave service.

add footnote

Interested persons may obtain a copy of "What's New With The Electron... 1957" by writing our Amateur Service Bureau.



Bill Eitel, W6UF, and Jack McCullough, W6CHE, measure the world's largest electron tube, the Eimac X626 UHF klystron, which delivers 1,250,000 watts peak power and 100,000 watts average power.

EITEL-McCULLOUGH, INC.
SAN BRUNO · CALIFORNIA
Eimac First with Ceramic Tubes that can take it

Eimac

Emergency Net (in Northwest Kansas) held an AREC drill with 14 of the 17 stations reporting. EC LOW says drills will be held each month. I would like to hear of more AREC or c.d. activities, fellows! ZUX, of Scott City, reports of an ideal TVI committee composed of a TV-set owner, a TV service man, and an amateur, MI (chairman). KØDIP's nephew, KNØIFI, a newcomer, has a new DX-35 and AR-3 receiver. The High Plains Club held an FB Christmas Party at 5PHM's Dec. 16th. KL7AN received high praise for his portrayal of Santa Claus. PAH, our SEC, and I had a wonderful time at the CKRC Banquet Jan. 13th. TWU, of McPherson, has started a code, theory and study course scheduled each Tue. at 1930. IFR, of Topeka, really is giving his Elmac a workout keeping skeds on KPN and QKS. KØGQP, of Topeka, received his General Class ticket and has a DX-100 completed. Traffic: (Jan.) WØBLI 387, OHJ 315, FNS 233, NIY 194, QGG 155, TOL 131, SAF 81, UOL 37, KNØHSF 35, WØABJ 34, KØBXF 34, WØFDJ 25, QQQ 17, IHN 15, TSR 15. KØBIX 14, WØONF 14, ICV 12, KØAHW 11, WØDEL 9, LIX 8, WWR 7, DHR 6, VZM 6, WFD 6, FHU 3, HL 3. KØHVR 3, WØTNA 3, KØIGF 2, WØASY 1, KØGZP 1, WØLOW 1, LQX 1, UAT 1. (Dec.) KNØHSF 11, WØIFR 11.

MISSOURI—SCM, James W. Hoover, WØGEP—OUD reports that DE is improving slowly after an eye operation. KIK has received a Traffikers 5000 certificate, and ECE received a 1000 certificate. MHS has received WAS and TEN Net certificates. Two stations who recently moved from Arkansas have received their Ø call—KØIHY, Joplin, and KØIIC, Branson. Traffic activity was hampered at WYJ by receiver trouble. KØDEX has worked both coasts with 4 watts on 40 meters. LLU and NXG have a reliable schedule on 6 meters between Rolla and Salem. The Rolla Amateur Radio Association has a net on 29 Mc. each Wed. at 8:30 P.M. A Civil Defense Net has been established in Cass County and meets Mon. through Fri. on 3504 kc. at 7:30 P.M. All interested Missouri stations are invited to report. HVW is hospitalized with a broken leg. New officers of the Southwest Missouri Amateur Radio Club are KØCCL, pres.; SPU, vice-pres.; QWS, secy.; BHC, treas.; SZT, act. mgr. The club bulletin for February lists the following stations on 2 meters at 8 P.M. daily: KØEET and MMZ, Slater; BQV, Columbia; JUR, Warrensburg; INI, Pleasant Hill. IBL has 27 states confirmed on 6 meters. The Midwest V.H.F. Club installed the following new officers at a dinner meeting with 38 in attendance; KØABA, pres.; KØEXG, vice-pres.; KØDGG, secy.; KØDCQ, treas. Traffic: (Jan.) WØCPI 759, GAR 572, GBJ 176, UXT 166, VPQ 160, OUD 134, BVL 123, KØDEX 93, WØKIK 71, MHS 66, CKQ 55, EEE 53, WAP 47, RTW 40, KØAQO 35, WØKA 29, WØLQC 22, WFF 18, HUI 17, EBE 12, KØIHY 12, WØEPI 11, WYJ 8, OVV 4, GEP 3. (Dec.) WØVPQ 248, KØFCT 220, WØIJS 191, EBE 12, EPI 3. (Nov.) WØIJS 4. (Oct.) WØIJS 3.

NEBRASKA—SCM, Floyd B. Campbell, WØCBH—SEC: JDJ, PAM: MAO. RNH is back on the air with a DX-35, an NC-98, and a quad antenna and worked 37 countries with 85,000 points in the SS and 50,000 in the CD Party. KØIDFO has a wonder-bar beam. The Scottsbluff Club is on 28,560 or 29,000 kc. Thurs. after 8 P.M. MST. NIK has joined Air Force MARS. The Dawes County Amateur Radio Club (Chadron) is setting aside the first Sun. of June each year for its annual picnic. It will be held at Chadron State Park 10 miles south of Chadron on Highway 19. Join them for an eye-ball QSO. New officers of the Soo Radio Club at Sidney are QKR, pres.; UOB, vice-pres.; DQN, secy-treas. The club meets on the 4th Wed. of each month at 7:30 P.M. New officers of the North Platte Club are CVC, pres.; ERM, vice-pres.; EVY, secy.-treas. The Ak-Sar-Ben Club has a 10-meter, 6-meter, and 2-meter net operating under the Nebraska RACES program Mon. on 29,500 kc., 51 Mc., and 144.3 Mc. at 9 P.M. Western Nebraska net reports QNIs 355, average 13.1, traffic handled 23. The Phone Net: QNIs 799, average 25.8, QTCs 76, average 2.5. The NSS Net: QNIs 267, average 8.6, QTCs 24, average 0.8. Traffic: (Jan.) WØZJF 170, MAO 111, KØDGW 97, WØPQP 45, UJK 40, SPK 36, BOQ 33, KDW 26, KØCDG 25, WØZOU 25, DQN 22, NIK 20, ERM 18, FTQ 18, KØBRQ 17, BRS 13, ELQ 13, KNØHUF 12, WØAIN 11, KØDFO 11, WØOCU 10, KØBDF 8, WØFXH 8, HOP 7, LJO 7, RNH 5, AQQ 4, EGQ 4, IAY 4, NHT 4, BTG 2, KØCYN 2, WØFBY 2, IXR 2, KLB 2, LEF 2, OOX 2, REØL/Ø 2, UJM 2. (Dec.) WØORW 1.

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(Continued on page 102)

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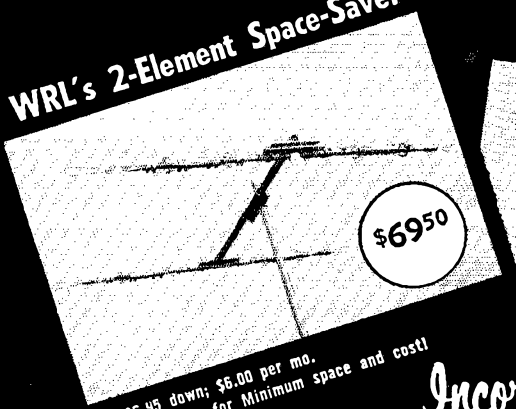

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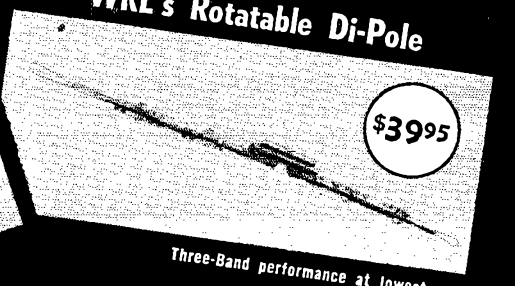

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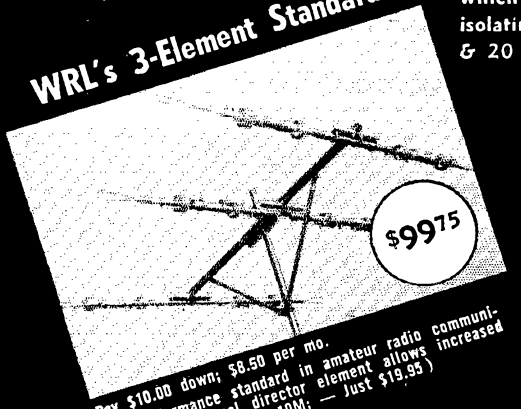

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for an outstanding job as SCM during the past 3 years. In January MCN handled 69 messages in 20 sessions with high QNI going to RFJ (18), BVB (17), IBE and EFW (15) each. YBH advises CPN met 31 times and handled 221 messages for an average of 7.1 per session. High QNI honors go to DHP (31), VIY (30), EVH, TVU and VQH (29), HID and YBH (28) and FYF (27). KYQ reports each session of CN met 27 times. The early session handled 316 messages for an average of 11.7 per session. Attendance averaged 7.7. The late session handled 111 messages for an average of 4.1 per session. Attendance was 5.1 per meeting. Why not originate some traffic to a friend and check in the late session of CN? New officers of the Stratford Radio Club are WAV, pres.; RFJ, vice-pres.; WAP, treas.; EWS, secy.; TCW, comm. officer. UFV and UFW (father and son) have a new p.p. 813 rig on c.w. FVX is using a new 3-band beam on s.s.b. Are there any other s.s.b. men in Connecticut? The Hamden Amateur Radio Assn. elected WHL, pres.; UKX, vice-pres.; FKQ, treas.; QXT, secy.; GTG, JIK and FCE, activities. GIX is maintaining his OBS schedule. RWS added 3 new countries after raising the power to 350 watts. AW made BPL again. In addition to RM duties, KYQ made a fine traffic total. APA landed a JA on 7-Mc. phone. FDO is enjoying the new Viking Valiant. EKJ has a new p.p. 813 final and 100TH modulator. EOR finished the new all-band final using a pair of 4-125As and 100TH modulator. New appointments: GEA and HID as OPSs, FDJ and OS as ECs; DHP as OO; SUZ as OES. Renewals: ABZ, RDV, RLN and WX as ECs; RWS and TD as ORSs; GIX as OPS, OO and OBS. BVB, AMY and GIX sent in OO reports. OES reports were received from FVV and SUZ. Traffic: WIKYQ 371, AW 342, FYF 295, EFW 259, YBH 225, TYQ 166, GVK 138, IUC 126, HID 114, BDI 109, NJM 103, LV 95, CUH 92, DHP 70, RGB 49, AVS 44, BVB 40, RFJ 40, AMY 29, EBW 23, ULY 21, VIY 21, GEA 19, RRE 16, YU 16, YOG 13, FHP 12, HYF 12, GIX 9, GVJ 6, WN1MDB 6.

MAINE—SCM, Allan D. Duntley, W1BPI/VYA—SEC: TVB, PAM: FNY, RM: EFR. The Barn Yard Net meets Mon. through Sat. at 0800-0930 on 3960 kc.; the Sea Gull Net Mon. through Sat. at 1700-1800 on 3940 kc.; the Pine Tree Net Mon. through Sat. at 1900-1930 on 3596 kc.; the Horse Traders Net Sun. at 1600-1700 on 3940 kc.; and the State C.D. Net Sun. at 1100-1200 on 3993 kc. ZNL has a new Globe Champion. TVB has burnt up the big rig so is only on mobile. NXX moved to larger quarters and will be on all bands soon. Calls we sure miss on frequency are EBJ, NIQ, QJA, WSV, WIN, WTQ, RHA and LBJ. VYA still maintains a sked with 7HUV in Tucson, Ariz. You old-timers will remember "Skipper" as 1HUV. Thanks to FNT for the hard work on the number plate deal. Hats off to the boys and gals in the Granite State on getting their plates. SRW needs another crystal on 10 meters. Glad to hear COM back on the airwaves. We hear there is to be a super-duper hamfest in Augusta soon. See you there. YYW is back mobile and finally had to drill holes in the new black one. WRZ is operating with 9 watts. We sure had a good hamfest in Casco when the boys and gals from "The County" were down this way. The PAWA treasurer is not at present a ham. The Barn Yard Net now is under the very able leadership of ZEN. We are looking for JIS to get back home. Traffic: W1LKP 174, CEV 78, EFR 55, BCD 29, BDP 24, UDD 24, FLV 17, EPN 14, BX 10, HZZ 10, OTQ 6, RJE 4.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, jr., W1ALP—New appointments: BNS as OO; KO Hanover, PO Norwell, COL Cambridge, KTG R.O. Sector 1D, as ECs. Appointments endorsed: ADM Canton, MME Hull, IPZ Shirley, IBE Rockport, VAN Norwood, PYT Ipswich, KWD Weymouth, SH Dedham, OSS Townsend, VYS Weston, MF Salem, ZDN Medford, as ECs; BL as SEC; MME, AAR, TZ, VMD and KBS as OBSs; MME, AAR, BB and CZW as OPSs; AAR, CAM, LM, USA, BB, AUQ and CZW as ORSs; GDJ, TZ and UIR as OOs. Sorry to have to report the death of DJ, of Winthrop, the husband of OIR. Heard on 2 meters: KN1s AQM, AGH and AAJ, and CBA, YNL, WCX, CEI, JHU and SNR. Heard on 10 meters: VMU, KYE, SNK and FNN. On 6 meters: CSH, UIQ and DYQ. DTU now is in Holliston. DTM moved to Wisconsin. KN1AVS is new in Quincy. KN1ADB is on 15-40 meters. K1AXB is TZ's XYL. DNF is on at Pocasset. THO, 6-meter PAM, reports that K1AFT and ALF and W1s AAI, AR, DLY, DRY, EZQ, EZZ, GAP, GEF, GLD, GQQ, IME, IAQ, IOD, JHJ, MB, MER, MPX, MR, MTT, OZ, VCJ, VSU, WAF and JVG are on. PX GRT and MEG have 6N2s. GEI is on with a Gonset. HOM and IME have halo mobile antennas. PF is on again. HHC is on several bands. A Sector 1B meeting was held in Stoughton with many R.O.s and Alternate R.O.s present. Mr. Langston, the new communications chief of the Mass.

(Continued on page 104)

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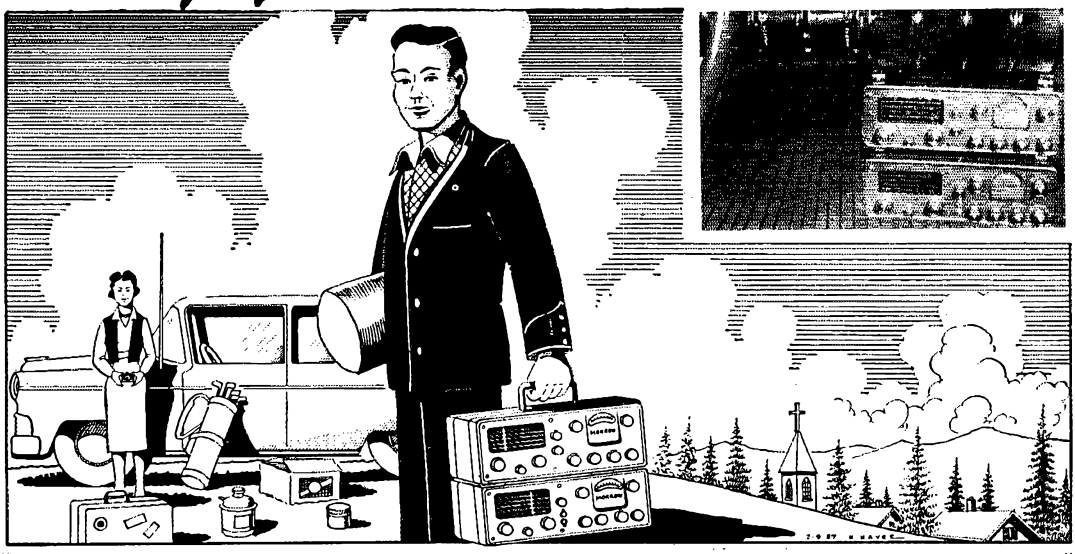

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C.D. Agency, was present. The Dedham c.d. group has a Gonset for 6 meters. BB handled the Governor-to-President message for Massachusetts. QEY is Alternate R.O. for Acton. AWO reports that they have 4 new Gonsets in Wenham. MSP is Asst. EC. KN1AWI is new in Newton. KZW has a new Valiant transmitter. The North Shore Chow Hounds, JBA, HLF, ZBE, JVG, NRY and EZZ, meet on 6 meters each night. Bill Galebach, Braintree, has his General Class ticket. MEG and ZEN have WAM certificates. Area 1 Radio Comm. held a meeting with ZYX, AR, KTG, LLY and ALP present. PIW has a baby YL. SXD has a 6146 final. NEM is teaching a transistor class. LMU is on 160 meters. LVN is going to California. EK is working on his house. ARU, AF and 3FCS will be on 6 meters. BW's 60-ft. mast came down in a storm. AYG is on s.s.b. on 10 meters. OOP gave a talk on Simple Improvements in Low Priced Communication Receivers at the GBARS. The Bedford Radio Club will hold an auction and get-together at the American Legion Hall, Bedford, on Apr. 18th at 8 P.M., reports KJO. NF has a new L-1000-A final, worked 5 countries in 45 minutes with a dipole and made Conelrad out of a Heathkit BR-2. BPW has WAS and 68 countries. RSE is in West Bridgewater. New officers of the QRA: VKF, pres.; PPK, vice-pres.; OG, treas.; VRK, secy.; OKB, CTW. KTJ, KI, DNW and EYZ directors. JSM worked 8SFG on Aurora skip on 2 meters. NCT is putting up a 60-ft. tower. AGA has 75A-3 and 32V-3 with super minibeam. VRK got a VS60Y card. DWY is on 10 meters with a DX-100. The 2200 Club meets daily at 2200 on 28,056 kc. A meeting of the new Federation of Eastern Mass. Amateur Radio Associations was held at the G.E. place in Lynn. JLN is acting chairman and VRK secy.-treas. AVY has been sick. TZ has a new REM 2-11 receiver and 2-meter rig and a six-element beam. BB is busy on 160 meters. BCN, GRC and MKW are working DX on 80-meter c.w. LYV is DXing on 160 meters. CMT has a new 829 on 2 meters. YHQ is back home. MQG, BCN and WHC are on 6 meters. MFI moved. BNC applied for OBS appointment. NPR is the new EC for Barnstable. BPW and KLQ are in the Eastern Mass. Net on 3660 kc. at 7 P.M., daily except Sat. and Sun. MON writes from New Hampshire that he is on 15 and 20 meters. The South Shore Club and the Braintree Radio Club are holding regular meetings. The Winthrop group still is holding drills. KN1AOT is new. QVK made a ground plane for 2 meters. RCJ and ZEN had Open House on New Year's. SQY is on the Cape. AHE spoke on 2 and MHC spoke on 6 meters at the Framingham Club. EXH worked 2CFW again after a 22-year lapse. IBE has the RACES plan in for Rockport. AAR handled a message from Honolulu to Quincy Hospital and back again for a fellow whose father had a heart attack. ETH is DXing and looking for Delaware. AKN is trying to work his son in Los Angeles, but has been sick. MRQ/CHA has renewed his EC, ORS and OPS appointments. NBS has renewed ORS appointment. AVY has renewed OO and OBS appointments. TQQ has been in the hospital. ABC suggests that we make the Humdinger Fone Net a habit for efficient traffic-handling every Sat. at 1200 on 7.220 Mc. The net manager is 2PEQ. Traffic: (Jan.) W1EPE 252, BPW 242, EMG 235, MME 86, GNX 71, EAE 43, AVY 42, IBE 32, TY 30, KLQ 16, BY 14, ATX 12, AHP 8, TZ 8, AUQ 7, AKN 5, BB 5, SMO 4, MKW 3, CAM 2, LM 2. (Dec.) W1IBE 379, MME 99, KBS 12, AAR 8, NUP 8, RCQ 8, HHC 6, CZW 4, ETH 3, AKN 2. (Nov.) W1MME 150. (Oct.) W1MME 151.

WESTERN MASSACHUSETTS—SCM, Osborne R. McKeraghan, W1HRV—SEC: RRX. RM: BVR. PAM: MNG. The WMCW Net meets on 3560 kc. Mon. through Sat. at 1900 and 2200 EST and has several new members. The Western Mass. Phone Net on 3870 kc. Wed. at 1800 EST needs your support to become an active and solid net. Comments have been heard from some Novices about forming a get-acquainted net on their frequencies. How about some more ideas from you Novices? DLS has been appointed an OPS. TAY has been elected a vice-director of TCPN. The Hampden County v.h.f. group topped the Hartford County boys this year in the January V.H.F. Contest to even the score at two wins each. Sgt. Joe Dunning, a W5 of Westover AFB, and several of his crew, all hams, put on a very fine demonstration of amateur TV on 420 Mc., using surplus gear, at the February meeting of the Hampden County Club. A move is on to secure call letter automobile plates for hams in Massachusetts. KUL is coordinating this activity for the Hampden County Assn. and seeks the support of other groups and individuals. The Greater Worcester Emergency Phone Net had a nice write-up in the *Worcester Telegram* on Jan. 21st. The Pioneer Valley Club in Holyoke is becoming very popular in the area and the boys put out an FB monthly rag called *The Pioneer Valley Indian*. Members of the Pittsfield Radio Club sent out

(Continued on page 106)

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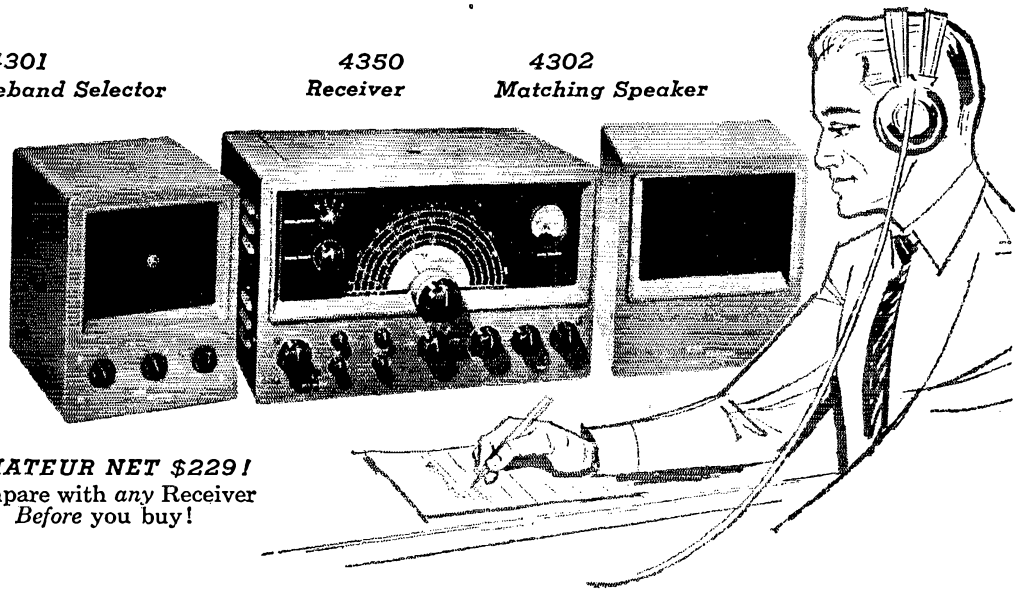

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seven mobiles and four walkie-talkies to assist in the sled dog races held at the Winter Carnival at Pontoosuc Lake Jan. 13th. These included BKG, LKO, UIS, UUJ, HPA, WF and CJG. New Novices are AQJ in Lenox and AHI in Peru. EOB got back from Florida in time for the DX Contest. He reports a countries total of 171 going into the contest. BVR has a Johnson Matchbox and can now be heard on 20, 15 and 10 meters, c.w. of course. 4NNW recently moved to Adams. JKD has 167 countries confirmed. NPL made WAC. ZER has a new cubicle quad up and working. BYH and ZXM have acquired phone patches. AGM is a regular on 11 meters and reports many fine contacts there. CPN is working 50-Mc. DX quite regularly from the Berkshire Hills. Traffic: (Jan.) W1LDE 414, BVR 118, EOB 66, FZY 53, DZV 51, DVW 20, MNG 20, DGL 9, AGM 8, KGJ 2. (Dec.) W1UKR 301, EOB 88, AGM 15.

NEW HAMPSHIRE—SCM, John A. Knapp, W1AIJ—SEC: BXU. RMs: CRW and COC. PAM: CDX. The Granite State Phone Net's meeting time is now 1900, Mon. through Fri., with an informal session at 0900 Sun. on 3842 kc. The New Hampshire C.W. Net is on 3685 kc. at 1900. The New Hampshire Emergency Net meeting time is Sun. at 1300 on 3850 kc., tying in with RACES test runs on 2 and 6 meters. Please contact the following RACES officers for information on the New Hampshire RACES plan: For Belknap County, HZN; Carroll Co., IIQ; Cheshire Co., VZS; Coos Co., VEG; Grafton Co., RXA; Hillsboro Co., GDE; Merrimack Co., COC; Rockingham Co., CDX; Strafford Co., WBM; Sullivan Co., PTB. Congrats to BPL-winner DYE, with a December total of 601. The Port City Amateur Radio Club is back on the air with a DX-100. GVL reports on RACES tests between Proctor Academy and Concord. Best of luck to Dover High School's new radio club, the Dover Mike and Key Club, KKT trustee. Welcome to new General Class licensees K1AHE, K1AXQ and GIB. Please check your certificates for expiration dates and send them in. Traffic: (Jan.) W1DYE 206, AIJ 7, FZ 7, NBD 3. (Dec.) W1DYE 601, CRW 402, GJM 26.

RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ. PAM: YNE. RMs: BBN and BTV. VWR is a new OBS. Endorsements: BTV and YNE as ORSs. Results of recent club elections—NCRC: 2LHB/1, pres.; JBB, vice-pres.; JFF, rec. secy.; Temperence Semich, corr. secy.; and WN1IAG, treas. PRA: KKR, pres.; TQW, vice-pres.; VZP, rec. secy.; HIK, corr. secy.; KKE, treas.; SGA, CPC and VSZ, directors. BCR has been awarded the Navy's Distinguished Public Service Award and an Edison Citation. Newt has been regularly providing a link for many Rhode Island families with their relatives at Operation Deepfreeze. The NCRC held its annual banquet Jan. 19th. UHE is getting good reports with a new s.s.b. exciter running 4 watts on 50 Mc. Some of the other Rhode Island amateurs now operating s.s.b. on various bands are AOJ, BTV, CCN, CPI, KGC, GPE, GR, GTS, HXS and ZPG. QR and VAY have been awarded the Clam Digger's certificate. YNE has a new phone patch in operation. We are very sorry to learn of UTA's hospitalization and wish him a speedy recovery. WN1OTI and KN1AAK, two busy YLs, have been making very fine contacts on 15-meter c.w. KCS, who recently worked Florida for his 19th state on 144 Mc., is looking for skeds on this band with other stations interested in meteor work. Traffic: (Jan.) W1JJW 89, VXC 63, YKQ 63, BTV 56, BBN 52, KDS 38, ZXA 25, HLY 23, YNE 17, CCN 16, TGD 16, YRC 15. (Dec.) W1YKQ 110, VWR 13, DZI 9.

VERMONT—SCM, Mrs. Ann L. Chandler, W1OAK—SEC: SIO. RM: BNV. PAM: SEO. Traffic nets: VTN, Mon.-Sat. at 6:30 P.M. on 3520 kc.; VTPN, Sun. mornings at 9 on 3860 kc.; GMN, Mon.-Sat. at 12 Noon on 3860 kc. VTN held 27 sessions during January with 89 messages handled. Top QNI were ELJ 23, JLZ 19, BNV 15, KRV 11, ZNM 9. On VTPN 44 different Vermont stations reported in during January with HOA and ETV as new members. A new OPS is VZE. Appointments endorsed: MEP as OES; CGW, OAK and VSA as ECs; IT, TXY and VZE as ORSs. Brattleboro's 6-meter, 6-o'clock emergency net has developed into a daily net called the "6 x 6"! The Rutland Radio Club held a chicken dinner at Lindholm's Diner Feb. 3rd. Meetings now are held every Sat. at 7 P.M. ELR again is active on 14-Mc. c.w. chasing DX, some of the latest being AP2AD, ST2NG, VQ2RG, CR6CZ and LU2ZS (Antarctica), running 100 watts to a home-brew rig with an HQ-150. From Bennington, MEP has a new home on top of a hill with a new sixteen-element beam on 2 meters, three elements on 6 and NH has a 60-element 2-meter beam up again. KRV boosted power to 80 watts on 3.5 Mc., and also finished the new band-switching exciter on 80, 40 and 20 meters. PZX, is now K6TSM operating on 20 meters. KKM is working the night shift and is missed on VTN. Stationed at Pep-

(Continued on page 108)

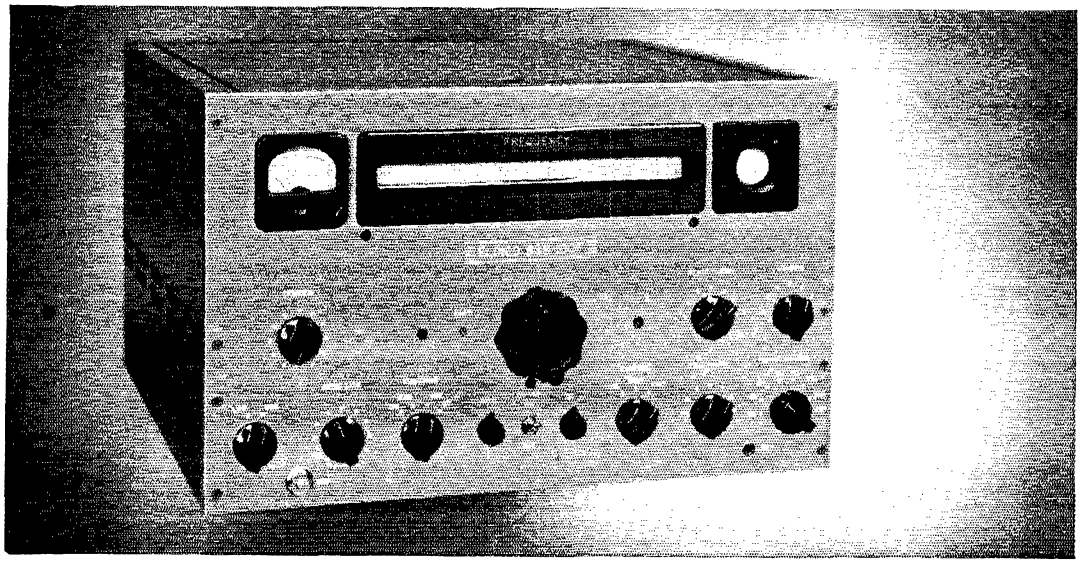
For Peak Performance

one name stands out

ELDICO *New* SSB-100F

featuring
CRYSTAL LATTICE FILTER

100 WATT P.E.P. OUTPUT*
EXCITER/TRANSMITTER



There's no compromise with power and performance when you choose ELDICO'S New 100 Watt Exciter-Transmitter. You'll enjoy every minute of operation with this luxury-class equipment. And best of all ELDICO'S popular price puts this superior equipment within reach of every ham's pocketbook.

Compare the features of the SSB-100F with any equipment and you'll know why ELDICO'S "Years Ahead" equipment is your best buy!

CHECK WITH YOUR DEALER FOR HIS "LOW DOWN PAYMENT—EASY TERMS" PLAN ON ALL ELDICO EQUIPMENT.

- **BAND COVERAGE:** 80, 40, 20, 15, 11-10 Meter Bands.
- **TYPE OF EMISSION:** CW - AM LSB - HSB
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***144 P.E.P. INPUT**

HARMONICS AND SPURIOUS RESPONSES: Spurious mixer products — 40 db or more down. Third order distortion products — 35 db or more down. TV interference suppression — 40 db or more second harmonic, 60 db or more higher harmonics.

UNWANTED SIDEBAND AND CARRIER SUPPRESSION: 50 db or more down, THROUGH LOW FREQUENCY CRYSTAL — LATTICE FILTER.

FREQUENCY STABILITY: Control Oscillator — (800 to 1300 kc) — ± 100 cycles after two minute warm up period. Output frequency — within 300 cycles after five minute warm up period. Dial accuracy — ± 2 kc after calibration.

- **CABINET:** Receiver type table model with hinged cover.
- **FINISH:** Flat gray.
- **SIZE:** 17¼" long by 10¾" high by 15" deep.
- **WEIGHT:** 58 lbs.
- **SHIPPING WEIGHT:** 65 lbs.

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SIXTH VERMONT QSO PARTY

The Tri-County Amateur Radio Club of Brattleboro, Vermont, announces the 6th Vermont QSO Party and invites all radio amateurs to participate. Vermonters are urged to work as many out-of-state stations as possible, to help them toward WAS, WANE and W-VT awards. Here are the details:

(1) Time: 24-hour week-end period from 6 P.M. EST Saturday, April 6th, to 6 P.M. EST Sunday, April 7th.

(2) No time limit and no power restrictions.

(3) Bands: work any band or bands you wish. The following schedule is suggested. 1800-2000 — 10, 15 and 20; 2000-2200 — 40; 2200-0600 — 75, 80 and 160; 0600-0930 — 40; 0930-1200 — 75 and 80; 1200-1500 — 10, 15 and 20. Fight it out anywhere from 1500 to 1800 EST.

(4) Outside stations call "CQ Vermont." Vermont stations call "CQ (call) de VT" or "CQ (call) in Vermont."

(5) Scoring: *Vermont stations:* 1 point per contact and multiply by number of states, U. S. Possessions, Canadian Provinces and foreign countries worked during the contest period. *Outside stations:* 5 points for each Vermont QSO and multiply total by the number of Vermont counties worked. Contacts with the same station on any other band will count towards total.

(6) Contact information required: Vermont stations send number of QSO, RST or RS report, and county. All others send QSO number, RST or RS, and state, possession, province or foreign country.

(7) Awards: A certificate will be awarded to the highest-scoring station in each state, U. S. Possession, Canadian Province and foreign country, and to the highest-scoring station in each Vermont county. In addition, a W-VT certificate will be sent to any station working 13 of Vermont's 14 counties, provided the station has not previously been issued this award. Party logs showing required date will be accepted in lieu of QSLs. Separate awards are not given for phone or c.w.

(8) Logs and scores must be postmarked not later than June 1, 1957, and should be sent to Ray N. Flood, W1FPS, 2 Marlboro Ave., Brattleboro, Vermont.

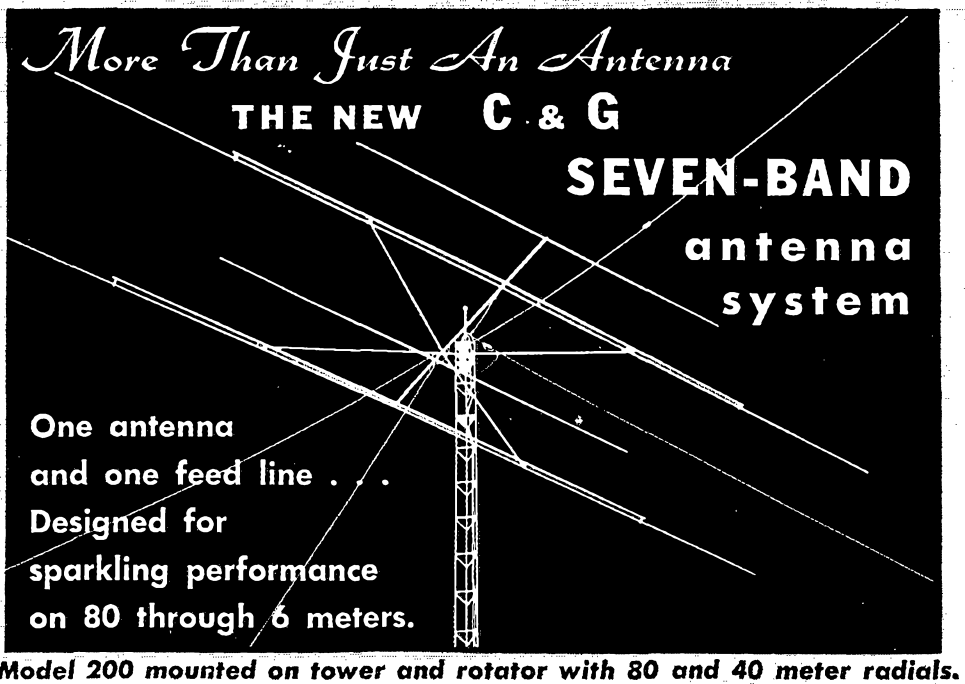
Mark your calendars *now* so you won't forget the 1957 Vermont QSO Party!

perill AFB in YO-Land is newly-licensed WN1AKU, from Barre. WN1IVT advises another new Novice in East Calais is KN1AUE. New Novices are KN1ADQ, St. Johnsbury and WN1NXB, Poultney. WN1LTD dropped the "N" and is operating an AT-1, now grid-modulated, with an SX-99 receiver. HGZ also dropped the "N." ØSGI/1 from Purdy, Mo., now lives in University Heights, Burlington, and is technical representative at Ethan Allen AFB. WOA is working on a roster booklet of Vermont c.w. and phone net members which will carry pictures and write-ups. VVP and VZE are assembling a DX-100 for a prospective ham—VVP's father-in-law! TBG, VSA and WPY are enjoying 2-meter activity. EIB has a dandy signal on 75-meter phone. Lee Warner, jr., reported on the CAP set-up at the Mike and Key Club at its January meeting held in the Middlebury Fire House. ZEW is sporting a new four-element beam on 10 meters. A 6-inch telescope mirror will be FPS's new telescope for counting outer space objects very soon. VZE held open house around Christmas time with many ham friends and XYLs present. Heard on during the January CD Party were ELJ, KRV, OAK, SEO and VZE. Traffic: W1BNV 102, OAK 78, AVP 60, ZYZ 45, KRV 43, BXT 30, ZEW 22, ELJ 20, JLZ 19, ZNM 18, VVP 12, VZE 9.

NORTHWESTERN DIVISION

ALASKA—SCM, Dave A. Fulton, KL7AGU—Our thanks to BZC, BPK and USA, whose contributions made this month's column possible. BPK and family were on a trip to W-Land and just recently returned. Don is putting up a new vertical which he hopes will help him to snare those hard-to-get East Coast stations for his WAS. BCZ writes that the Bering Amateur Radio Club would like to enter in some of the coming contests as a club station. The problem is to get the information in time to enter. Well, Joe, that is also a problem here, too, as our mail is always late. Dog team is awfully slow for mail delivery. There might be one way to beat it, though. How about an OBS appointment out that way? USA rolled up quite a traffic count this month. USA is a single-operator station,

(Continued on page 110)



Model 200 mounted on tower and rotator with 80 and 40 meter radials.

The new C & G Seven-band antenna System is ideal for those with limited space who want optimum coverage on 80 through 6 meters. All Systems are pre-tuned and color-coded to simplify installation. Assembly is simple and fast. A standard heavy-duty TV rotor operates the beam.

Because the array is fed by coxial cable, the TVI problem will be reduced on every band. The specification chart below shows that here is a complete antenna system to give the radio amateur maximum performance at minimum cost.

ELECTRICAL SPECIFICATIONS AND CHARACTERISTICS CHART

	6 Meters	10 Meters	11 Meters	15 Meters	20 Meters	40 Meters	80 Meters
Model 100 Amateur Net...$ 99.95							
FORWARD GAIN	4.7db	7.6db	6.7db	5.9db	0 db	(c) 1.5db	(c) 1.5db
FRONT TO BACK RATIO	12.6db	26db	21db	17db	(a)	(a)	(b)
STANDING WAVE RATIO	1.2-2.1	1.1-1.8	1.1-1.5	1.1-1.6	1.1-1.3	1.1-2.1	1.1-2.1
NUMBER OF ELEMENTS	2	3	3	2	1	1	(b)
HORIZONTAL BEAM ANGLE	32 deg.	30 deg.	34 deg.	37 deg.	(a)	(a)	(b)
Model 200 Amateur Net...$ 149.95							
FORWARD GAIN	4.7db	7.6db	6.7db	5.9db	5.6db	(c) 1.5db	(c) 1.5db
FRONT TO BACK RATIO	12.6db	26db	21db	17db	14db	(a)	(b)
STANDING WAVE RATIO	1.2-2.1	1.1-1.8	1.1-1.5	1.1-1.6	1.1-1.6	1.1-2.1	1.1-2.1
NUMBER OF ELEMENTS	2	3	3	2	2	1	(b)
HORIZONTAL BEAM ANGLE	22 deg.	30 deg.	34 deg.	37 deg.	39 deg.	(a)	(b)
Model 300 Amateur Net...$ 199.95							
FORWARD GAIN	5.2db	8.8db	7.9db	7.8db	7.6db	(c) 2.6db	(c) 1.5db
FRONT TO BACK RATIO	12.6db	29db	26db	23db	21db	9db	(b)
STANDING WAVE RATIO	1.2-2.1	1.1-1.8	1.1-1.7	1.1-1.6	1.1-1.6	1.1-2.1	1.1-2.1
NUMBER OF ELEMENTS	3	4	4	3	3	2	(b)
HORIZONTAL BEAM ANGLE	22 deg.	22 deg.	26 deg.	30 deg.	32 deg.	39 deg.	(b)

Footnotes: (a) Standard figure 8 dipole pattern rotary
(b) Vertical cone radiator with top loading
(c) With radial guy wires

Order direct from C & G or your local distributor. Write for complete specifications.

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operated by KL7CAB. Nice going, Lee. Another nice job by USA is the running of the 75-meter Intra-Alaska Net. Traffic: KL7USA 167.

IDAHO—SCM, Rev. Francis A. Peterson, W7RKI—The Idaho amateur license plate bill finally was passed with almost no opposition. Congratulations and thanks to all who helped with it. Now we should all thank our c.d. director for his help by joining up with RACES. The Boise Club has started a fine new paper, *Ham Hill News*. Four new OBSs will give better coverage to Idaho. W7ABK and RKI blew up their modulation transformers with their big words. GMC is the new manager of the RN7 Net. YBA is working out with his transistor transmitter. QIS and WNR made the papers by handling traffic to disaster areas. The Pocatello and Boise Clubs are running code classes. IY is now transmitting code practice on 7162 kc. Fri. 9 P.M. 2-meter activity is growing in the Boise-Nampa Area with regular nets and continuous monitoring on 145.44 (f.m.) and 145.8 (a.m.) Mc. The Boise Club's simulated search was a success. Traffic: W7GMC 270, IY 10, RSP 4.

MONTANA—SCM, Vernon L. Phillips, W7NPV/-WXI—SEC: KUH. Governor Aronson signed the Montana Amateur License Plate Bill into law Feb. 1st. The Bill went into Committee as House Bill #20 on Jan. 15th. It passed the House 89-3 on Jan. 24th and passed the Senate 49-3 on Jan. 28th. Montana amateurs now will be able to purchase a single call letter plate for $1.50 and display it above one of the regular numeral plates. SJH, of Dutton, joined Silent Keys, Jan. 24th. New officers of the Great Falls Radio Club are YIO, pres.; ZOL, vice-pres.; JGG, secy.-treas.; TSM, act. mgr.; KUH, FDH and JGG, directors. The club is affiliated with ARRL, is incorporated and the club station is affiliated with MARS. KUH is on s.s.b. with 250 watts. FUM is a new ham in Glasgow. GCY has a new Globe Scout. OOY and NPV have a jr. operator born Jan. 20th. Recent appointments: TPE as EC and OBS. Traffic: W7SFK 46, NPV 35, YPN 22, OOG 15, TPE 15, TNJ 12, UPR 12, NCS 8, ZCG 8, ED 6, TYN 5, FIS 4, YCQ 4, YHS 4, YQZ 3, EEO 2, EUQ 2.

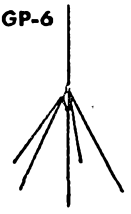
OREGON—SCM, Edward F. Conyngham, W7ESJ—The OARS Net has some new officers, QWE, manager; JCJ, assistant manager; YQJ, net director; DJX, assistant net director. QWE is giving bulletins on the OARS Net. OLU is building a new double-conversion receiver with variable crystal filter to replace the old BC-312M. Using a Collins PTO and a Viking II, Bob worked ZL1AAX on 3854 kc. UJL has been playing basketball and his traffic score suffered. UGE has been hospitalized for the past two months. QFY is on his way to VK-Land for a vacation. WHE completed the c.w. section of a 300-watt rig. SMR finished modification on the ARC-5 VHF and now is working on a receiver. LT is working MATN and the ham band with traffic. UZU has been busy trying to improve c.w. using a mill to copy. BEG, VIL, ULR, VPH and ISP have 2 meters jumping around Medford, in addition to working the lower frequencies. ALG, AXK, CEU, BJI, DTS, LI, MTT, NGW, OTV, RET, VZZ, WSP, WTQ, ZHF, DFK and YUN are keeping 2 meters hot around Portland. CMB, in Seattle, also works into Portland on 2 meters. In the Pendleton Area we find ADX, AYT, BKD, DDP, PL, PON, TAK, TUC and WXB active. Around Portland we hear LI, PFA, QBO, WGB, WHE, ZND, MTW, SMR, VLE, WAA, WJZ, RCL, FPD, FQI, 6NBE/7, GWV, BVH, QF, SQR, TYT, VBF, VMX, VUY, WHD, ZBP, DFK, AYW, DXV, EUG, PDR, QEI, SRK, TMT, UJY, VKA, WVI, WNW, NPF, NTI, VNS and ZKH. Traffic: (Jan.) W7LT 49, HDN 41, HJU 29, OLU 20, BVH 11. (Dec.) W7OLU 112.

WASHINGTON—SCM, Victor S. Gish, W7FIX—The Valley Amateur Radio Club (Puyallup) held its annual banquet Feb. 15th. Guest speakers were FIX and OEB. Plans are being laid by PUA for the June V.H.F. Party with operation on 6, 2, 1¼ and ¾ meters and on 1296 and 10,000 Mc. VARC's code and theory classes average 20 students twice weekly. The Apple City Radio Club (Wenatchee) reports the following officers: WN7DZX, pres.; ZGH, vice-pres.; ETO, secy.-treas. Theory classes conducted by HQO and code classes by ETO are well attended. OVE trained about 20 women operators for c.d. operation. CUZ is leaving Fairchild AFB for KG1-Land. FWD now is Radio Officer for the State C.D. The Walla Walla Club is showing ARRL films at its meetings. Word from the ex-SCM of Indiana, 9BKJ, says he has joined the "rocking chair" brigade. Welcome to the fold, George. So far there has been no response to the SCM's appeal for each club to appoint an Emergency Coordinator. WAH still is QRL school, WSN, RN7 and PAN and is waiting for relief from the RN7 Mgr. job. OE is on the road again and has dropped all nets except WSN and the "3550" C&E Plan. AIB is getting gear together for a 3DZZ 5-band antenna. EHH is keeping a second receiver on 3875 kc. (C&E Plan).

(Continued on page 112)

GROUND PLANE
(Drooping Type)
FOR 6 METERS

No. MGP-6



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$14.95

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TENAHOLD
Protects antenna, prevents whipping. Easily attaches to car.

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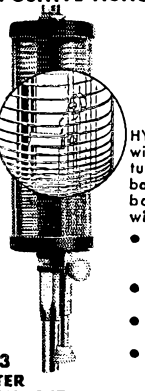
NEW! **. . SILVER-PLATED ROLLER WITH POSITIVE ACTION, STAY-PUT CONTACT**



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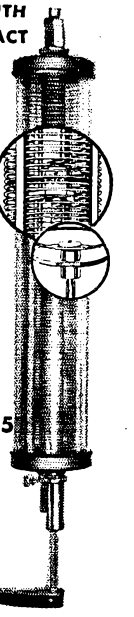
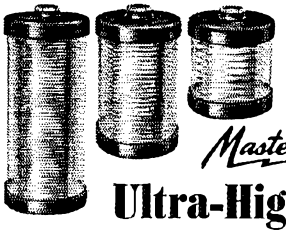
MASTER DELUXE ALL-BANDER
No. 750

HY "Q" construction with wider spacing of turns for high frequency bands. Use as center or base loaded antenna with 60" whip.

- Covers 10 thru 75 and all intermediate frequencies.
- Silverplated single turn contact, positive spring.
- Eccentric cam contact, easy selection of turn.
- Automatic lock prevents damage to coil.

Amateur net **$14.95**





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- Greater efficiency
- Precision made
- 2¼" Diameter

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Ultra-High "Q" COILS

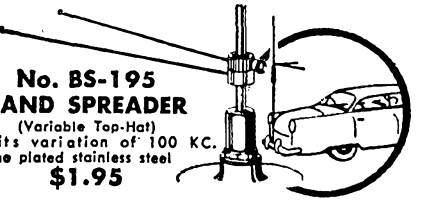
For 80-40-20 & 15 Meters

After many years of experimentation, here is the coil with the highest "Q" ever obtained. Tested and found to have a "Q" of well over 515. Use with 36" base section, 60" whip.

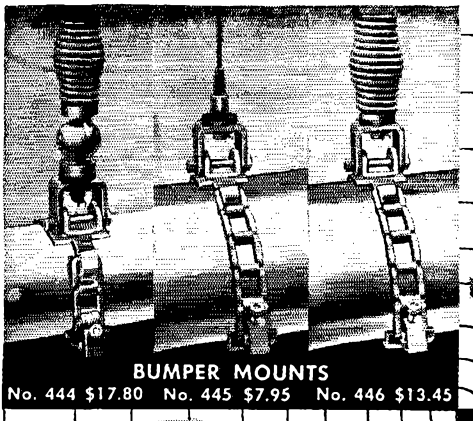
$5.25 Each

No. 333
MASTER MIGHTY MIDGET

. . . engineered to provide the highest "Q" consistent with good design. Compact, extremely rugged, yet lightweight, its operation assures precision tuning with the new adjustable silver-plated roller that stays put! Perfect for 40-20-15-11-10 meters. "Get 5 Bands Plus on 1 Coil." **$9.95**



No. BS-195
BAND SPREADER
(Variable Top-Hat)
Permits variation of 100 KC.
Chrome plated stainless steel
$1.95



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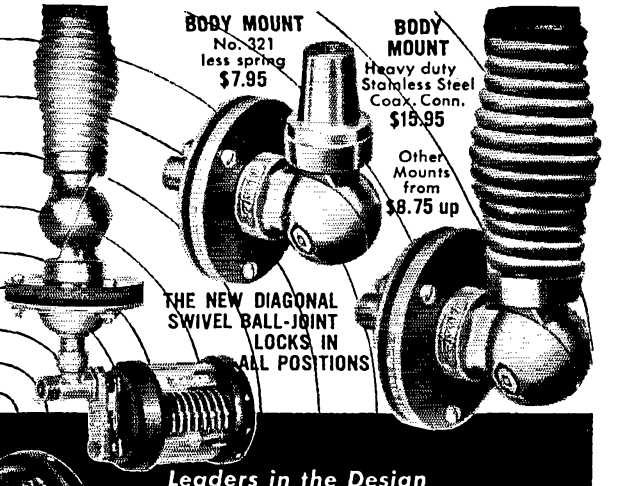

BODY MOUNT
No. 321
less spring
$7.95

BODY MOUNT
Heavy duty
Stainless Steel
Coax. Conn.
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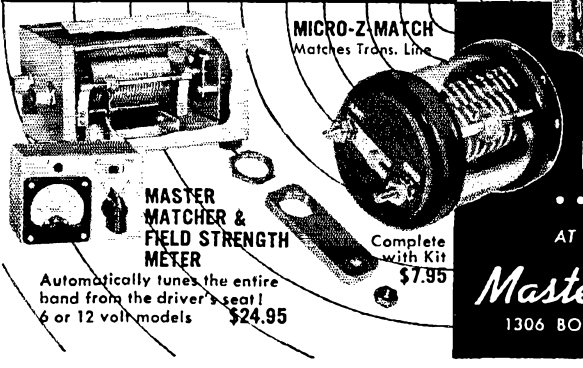
Other Mounts from $8.75 up

THE NEW DIAGONAL SWIVEL BALL-JOINT LOCKS IN ALL POSITIONS



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Complete with Kit **$7.95**

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AT LEADING RADIO JOBBERS EVERYWHERE

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ER says flu kept his traffic down. USO says Clark County C.D. now has 2-meter contact to nine outlying stations, each with one operator and two alternates, with drills each Tue. at 1930 PST. GAT's antenna came down and he now is working WSN with one end of the Zepp on the ground. HDT is the only station in Asotin County on the air—the rest are repairing or rebuilding. UQY and family have been plagued with illness but things seem to be on the upgrade now. AVM demonstrated 2-meter work to the Lions Club by having a brother Lion talk to the meeting from his bed in the hospital. WQD and DDY are working on RTTY rigs. "3550" is getting to be quite a "calling" frequency in off-net times. GVV installed a differential kever to keep AIB happy. Traffic: W7BA 905, PGY 734, K7FBN 694, W7FRU 541, VAZ 538, K7FEA 524, WAT 520, W7WAH 169, OE 167, AHV 114, APS 70, JC 49, AIB 42, EHH 41, AMC 35, ER 34, JEY 30, USO 30, BXH 16, FZB 13, GAT 10, WQD 7, HDT 6, EVW 5, NWP 5, GVV 4.

PACIFIC DIVISION

HAWAII—SCM, Samuel H. Lewbel, KH6AED—IJ is the latest convert to 2 meters. He is on now using a new 6N2 transmitter and worked Honolulu from Lihue. He still is after DX and contest scores, too. Maui hams held a contest for the most countries worked during 1956. The winner was ER, with 186. PM was second with 184 and MG third with 183. The Territorial Ham Convention will be held in Honolulu, July 6th and 7th. The Honolulu Amateur Radio Club will be the host this year. The SCM still needs news. Maui has pitched in, now how about Hilo and Kona? Traffic: KH6BQS 329, KP6AK 125.

SANTA CLARA VALLEY—SCM, G. Donald Eberlein, W6YHM—Asst. SCM: Roy E. Pinkham, 6BPT. SEC: NVO. RMs: ZRJ and K6GID. PAMs: OFJ and WGO. New appointees: VZT and K6GZ as ORSs; ZLO, OII and K6CGA as OPSs. The Monterey Bay Radio Club presented a 30-minute TV program on Feb. 3rd demonstrating the operation of a simulated emergency network. K6ILM acted as NCS, with the following stations working as mobile: K6RWJ, K6BDP, UJA and RJA. Although there was no remote pickup of the mobiles in action still pictures of the installations were flashed on TV as each station transmitted in the test. The following attended the joint meeting of the NCTA and SCT held at Fresno Feb. 2nd and 3rd: K6CGA, OFJ, HC, UTV, ZRJ, PLG, VZT, K6DYX, RFW, ZLO and YHM. Problems concerning the traffic nets in California were discussed. A talk on key clicks was given by K6DYX. CBX participated in the F.M.T. KN6RUO has changed QTH to South Carolina. VZT is trying to clean up a chirpy signal. PLG is building a power supply to run 4-400A. K6BBD was active in the last C.D. Party. YBV is working on a new tube-keying system. K6QCI is building a transistor rig. K6GZ holds stand-by watch on 3620 kc. Mon. through Fri. for any RTTY boys with traffic. Bob also will take anything on c.w. K6DYX makes BPL. HJP reports from Santa Cruz. ART has been heard from KR6RX recently and says he has twelve months of overseas duty yet. K6PWD is a new station in Gilroy. Traffic: (Jan.) K6DYX 550, W6PLG 353, BPT 247, YHM 210, K6GZ 153, W6YBV 112, VZT 110, K6CGA 75, W6ZLO 68, NW 55, AIT 32, FON 25, K6BBD 22, QCI 15, KN6RUO2. (Dec.) K6CGA 224, W6ZLO 63.

EAST BAY—SCM, Roger L. Wixson—As promised, from time to time this column will be devoted to paying our respects to the old-timers who helped make amateur radio what it is today. How many have ever worked ZX? Percy W. Dann, better known as Pop, was born in Oakland on Dec. 1, 1889. Percy spent some of his "teen" years in Reno, Nev., where he attended Reno High. He first become interested in amateur radio in 1910 while living in Portland, Ore. His first license, 7DP, was issued to him by the Department of Commerce in Seattle, Wash. Later Pop held the calls 6BFL and 6KR. His present call was issued to him in 1920. Pop's first rig was a spark coil transmitter and crystal and slide-wire receiver. Pop says DX in those days was two to three blocks. After the spark-coil days Pop went 1st-class with a rotary and de Forrest audion detector. Operating frequencies up to 30,000 kc. were common in those days and plug-in coils were on hand for quick band changes. After returning to Oakland in 1920 Pop Dann went high power with a pair of 811s. At present he is running low power on 20 and 40 meters. Pop keeps daily skeds with CSD in Grover City on 40 meters (7125 kc.). GRT gets in on the sked now and then, too. Percy W. Dann is past president of the Oakland Radio Club, which office he held in 1927. He lives with his wife at 1246 Marin Street, San Pablo, Calif. Around the clubs in the East Bay section: The East Bay Club toured the Berkeley Division of Beckman Instruments for its Jan. meeting. MXQ was

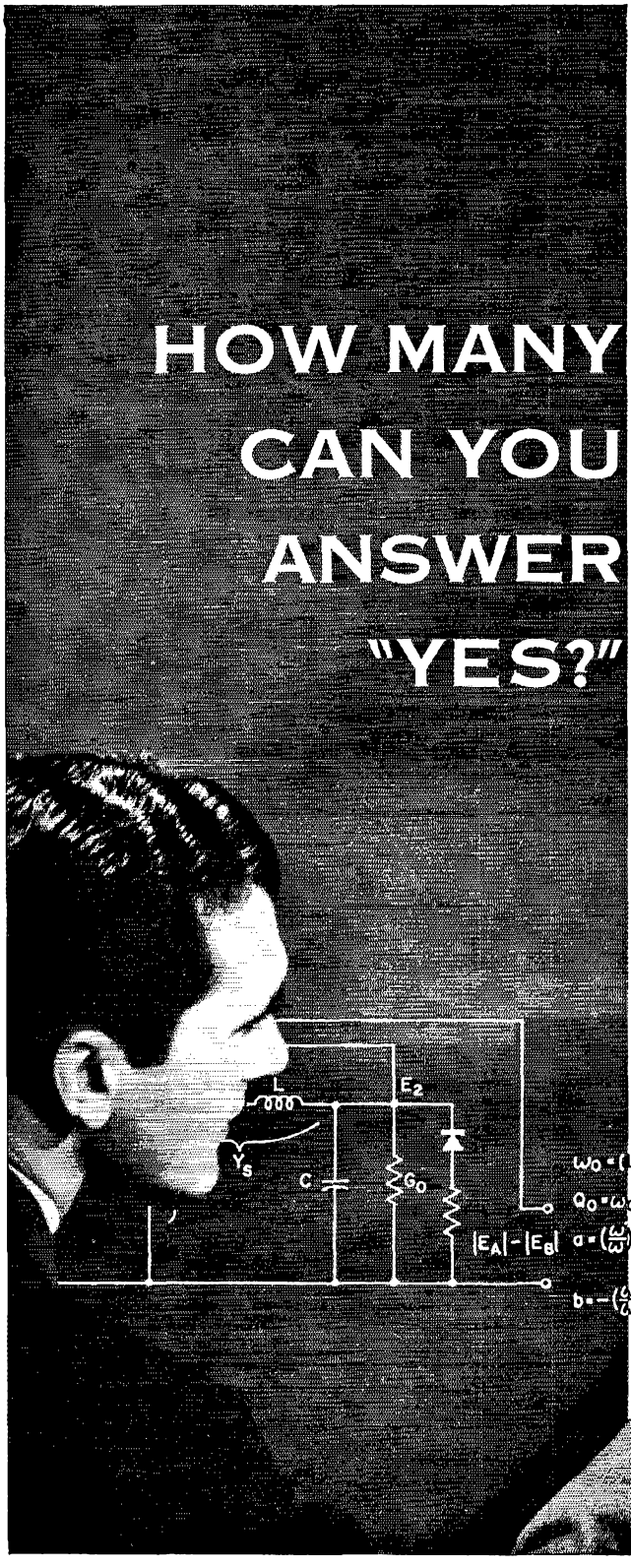
(Continued on page 114)

host of the affair. The members saw many items of interest such as electronic counters, control equipment and developments in the field of magnetics. The Oakland Club had its semi-annual auction and drew a good crowd. GK gave an account of the TVI committee and the problems connected with getting help to support that activity. The Mt. Diablo Club had a "radio quiz" program similar to a spelling bee. Questions were taken from FCC laws, regulations, theory, procedures and history. K6BYQ was down from Napa way the other night and showed me the new 6-meter rigs the Silverado Six Shooters are using. The boys are doing a real fine job with local c.d. work using these rigs. Incidentally, the rigs work on 6 volts d.c. or 110 a.c. by merely changing the power plug. We have two more OBSs now, K6GK and K6KFF. GK is putting out Official Bulletins on UTL, Army MARS and Air Force MARS. KFF is doing the same on 6-meter RTTY. Reports have been received from all parts of the country commenting on the RTTY bulletins which are put out on 75, 40, 20 and 2 meters. VPC has teletype machines for anyone interested. Call Higate 4-5410. RTTY activities are really moving and regular skeds are being kept from coast to coast. K6GZ, ØBP and 1BDI have been quite successful with traffic between Hartford, Minneapolis and San Francisco. Traffic: K6WAY 447, GK 231, W6VPC 50.

SAN FRANCISCO—SCM, Walter A. Buckley, W6GGC—VE7AMM, of the Canadian Air Force, visited the Humboldt Amateur Radio Club when his plane had a stop-over at Eureka. K6OBX now is stationed on a fleet tug at Pearl Harbor. ZSE worked ES on 40-meter c.w. ES, in San Francisco, was using transistors only in his rig with a power of 60 milliwatts and it was solid copy to Eureka. The 10th Annual Dinner of the San Francisco Naval Shipyard and HAMS was held at Veneto's Restaurant with a good turnout. After dinner the gang played bingo. Ninety-seven members of the 6-meter club held their monthly luncheon at San Francisco on Jan. 27th. Most of these fellows are in the 6-Meter C.D. Net ready for any emergency. Sixty-one members of the Tamalpais Radio Club enjoyed an Installation of Officers Dinner held on Jan. 26th. The Red Cross advised the Marin Amateur Radio Club that they would waive the previous charge of $2.50 per meeting night for use of the R.C. Hall by the amateurs. Nomination of officers was held at the MARC at this meeting. The speaker was UVB at the Marin Club meeting held in January. CBE finally has achieved DXCC and now has 126 worked with 108 confirmed. IS started working as of Feb. 1st at the Standard Research Institute in the antenna labs. AHH was net control for the hidden transmitter hunt on 10 meters held by the 29ers Club. WJF and FEA are settled in their new QTH at San Anselmo and Clare has accepted an appointment as OPS. GQY is back in the swing again with a traffic report. QMO is enjoying being a lady of leisure now and is very active on the c.w. nets again. The San Francisco Radio Club lost its regular meeting place at the Lakeshore Plaza Auditorium but the committee got busy and found a new hall up on Forest Hills which met with the club members' full approval. URA is rebuilding again and has the new rig half done, which calls for 400 watts to an 814 on 40-meter c.w. The Ladies Radio Club of San Francisco held its election of officers and celebrated its 3rd anniversary with a dinner at Veneto's Restaurant with BYB as guest speaker for the evening. About thirty of the local mobileers took a snow trip up to Yosemite in January and although the valley was free from snow on arrival there we were treated to a real thrill when we woke up the second day to find the trees and ground a white winterland. A wonderful time was had by all. Many of the fellows were busy on the nets handling traffic for the Reno Disaster when some of the buildings were demolished by gas explosion. Traffic: (Jan.) W6GQY 244, QMO 196, FEA 62, WJF 52, BIP 33, GGC 30, CXO 21, GHI 12. (Dec.) W6FEA 296, WJF 120.

SACRAMENTO VALLEY—SCM, Harold L. Lucero, W6JDN—With the election results awaited at this writing I wish to take this opportunity to thank everyone for the wonderful support given me during the past term. I truly hope that I pleased more than offended. It has been fun and I have enjoyed every second, fellows and gals. The traffic has been on the upswing with more reporting. This is fine and I hope it keeps up. ZF is preparing a vertical with ground radials, 45-ft. aluminum tubing mast 2½ inch in diameter fed with 52-ohm coax. He also is making a multi-band tuner for the grid circuit of his 813s. It was wonderful that HQF and K6EHT attended to the Governor's message, but since the Governor was in Washington, D. C., and with the President, the message sent was signed by Lt. Governor Harold Powers. Thanks, fellows, and I am sure that it arrived at its destination in time. JEQ gave a talk on RACES and c.d. and it was re-

(Continued on page 116)



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ported to be very fine and to the point. ZF gave a run down on frequencies. Of course these were given during the Sacramento Amateur Club meeting. The meeting held in Fresno on the 2nd and 3rd of February was not attended by JDN because of the snow conditions in this area. Well, 73, for this time and again thanks for past cooperation. Traffic: W6MWR 86, K6IYC 60, W6RXX 19, JDN 12, ZF 2.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—The Northern California and Southern California DX Clubs held their annual get-together in Fresno Jan. 19th and 20th. It was well attended and the talks were very interesting. Danny Weil, skipper of the *Yasme*, was a guest speaker. The Northern California and Southern California Traffic Association held a meeting at the Hacienda, Feb. 2nd. It seems that traffic men have their problems, too! K6KYW is on 40-meter mobile. BAN is building a modulator using a pair of 811s. JXY is back on 75-meter mobile. K6AHQ is a new call heard on 75-meter mobile. WME is on 75-meter mobile. CZO is new to Fresno from Stockton. K6VQE is another new call heard around town. FA8III reports he is hearing several W6 stations on 6 meters. K6JGH is running 120 watts mobile. K6LRQ has a new 6-meter Communicator. DBU is building a new QTH. K6BGO reports and has proof of lots of snow on his beam in Coalinga. FGJ has been awarded the boner trophy by the Stockton Radio Club. TV, Fresno City Civil Defense station, now is handling the check-ins on 3995 kc. every Monday night at 8 o'clock. K6JQN is now a function of Region 3C. The Coalinga Radio Club officers are JJV, pres.; CET, vice-pres.; NPP, secy. K6HTM is going s.s.b. with one kw. Keep up the reports. Check into your local c.d. nets. It takes only five minutes. Traffic: W6ADB 62, EBL 8, GCS 5.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: ZG. PAM: DRC. Alamance County has organized a radio club with LXH, pres.; AEH, vice-pres.; K4DNY, secy. The club in Kinston is doing something about c.d. ESB, EC for District 22, appointed NRG Asst. EC for the Kinston Area. District 10 is busy registering AREC members. Thanks to YQX. KN4IEX has received WAS in ten months with a Globe Scout. The Winston-Salem group is building a remote transmitter on 2 meters. This will give state coverage on 2 meters. DKO informs me that the Wake County RACES plan was approved Jan. 23, 1957. K4CEB, NCS of the NCN, reports openings for c.w. operators on 3700 kc. from 7:00 to 8:00 P.M. daily. BCE, BUW and TMO are acting as liaison to the Fourth Regional Net. All Emergency Coordinators except Districts 9 and 15 returned their certification forms for the Command and Information Net (RACES) for a State Net. This is an excellent record. SGD has received WAS on phone, eight endorsement stickers and has WAC/YL all confirmed except a YL in Africa. EJQ has received her YLCC certificate. The Morganton Club is busy building 6-meter gear for c.d. The Raleigh and Greensboro Clubs assisted in the March of Dimes with their mobile units. Traffic: K4BUJ 437, W4GXR 108, RRH 78, DSO 74, DRC 46, QC 13, K4FFR 7, W4EYZ 6, RQR 6, SGD 4.

SOUTH CAROLINA—SCM, Bryson L. McGraw, W4HMG—K4GLV reports new officers of the Edisto Radio Club are K4GLT, pres.; K4GLV, secy.-treas.; KN4MHK, act. mgr.; K4HQK, reporter. Members of the club are visiting high schools with two-way communications and report much interest by students. EGI, of the Columbia Club, finished the Novice Class and all 7 passed their exams. BPD is back on 75 meters after a long absence and is being welcomed by the old-timers. ZRH has been appointed State Radio Officer for c.d. and is visiting clubs to urge participation. TWW is doing a fine job on 20 meters with Polar Expedition traffic. We regret to learn of the death of BBL's brother. FFH is back with us after having been under the weather for several weeks. GQE is now s.s.b. via 2 meters with fine results. AKC is rolling up the DX with a new 3-band vertical plus the old kw. K4EAR is burning up antenna coils here with a new custom 500-watter. The *Rock Hill Bulletin* requests clubs in North Carolina, South Carolina and Georgia to list hamfests, etc., with them in an attempt to avoid the conflicting dates as in the past. Address P.O. Box 447, Rock Hill, S. C. What's happened to ANK? Too much MARS? K4ADZ's new 150-watter sounds great. ECU is on 75 meters with a new DX-100 that's putting out a nice signal to all points. Shaw-Sumter is having a WAS contest with K4EJR getting 25 states the first week end. GIF has a new 813 on 40 meters with good results. BHS/4 is NCS for the 10-Meter Net Thurs. at 2000 on 29.626 Mc. All in the Sumter Area are invited to join. Sorry to hear we are losing TNO/4, who has completed his military tour. The Charleston Club has

(Continued on page 118)

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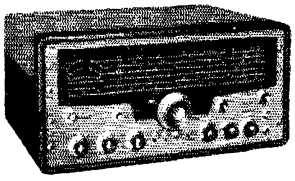

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FEATURES:

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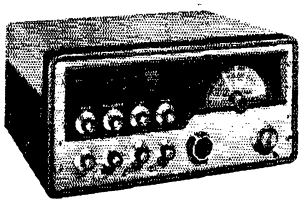

HT-32 TRANSMITTER

Hallicrafters new HT-32 is a complete table top, high efficiency amateur band transmitter providing S.S.B. AM or CW output on 80, 40, 20, 15, 11 and 10 meter bands. This unit incorporates two new exclusive features in S.S.B. generation techniques.

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FEATURES:

- 144 watts plate input (P.E.P. two-tone).
- Six band output (80, 40, 20, 15, 11-10 meters)
- All modes of transmission—S.S.B., AM, CW
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- Both sidebands transmitted on AM.
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- 52 ohm pi network output for harmonic suppression.
- Logarithmic meter for accuracy tuning and carrier level adjustment
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TUBES AND FUNCTIONS:

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- 6CB6 Variable frequency oscillator
- 12BY7 R.F. driver
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- 6AH6 3rd Mixer
- 6AB4 Crystal oscillator
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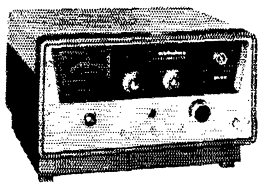

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SPECIFICATIONS*

Power Input.....1000 watts S.S.B. and C.W. 700 watts A.M.
Power Output S.S.B....625 watts P.E.P.
Power Output C.W.....575 Watts
Power Output A.M.....285 carrier with D.S.B.
Drive Power S.S.B.....8 watts P.E.P.
Drive Power C.W.....6.5 watts
Drive Power A.M.....6.0 watts

*These are production performance data not just taken from tube manuals, but actual measured values.

FEATURES:

- Six Ham Bands—80, 40, 20, 15, 11-10 meters
- Pi-network output system for high harmonic suppression
- All control leads filtered
- Full metering of all important circuits
- Relay rack panel mounting if desired
- Built-in power supply
- 52 Ohm coaxial output
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"graduated 4 to the Novice ranks." HHO makes 4 OBS skeds daily, Mon. through Sat. (75-meter phone). Congrats to Lois, K4CXJ, who placed 3rd in the YLRL Anniversary Party. K4EYV needs Nevada for WAS. Traffic: K4BVX 237, DFR 18, W4CAL 5.

VIRGINIA—SCM, John Carl Morgan, W4KX—SEC: PAK (Route 1, Box 7H, Fentress, Va.). Please note the new SEC, succeeding RTV, now resigned. Get behind Hack and help him make AREC a going concern. K4EAS, the new South Boston EC, is getting AREC rolling, and RACES is about ready to roll in that area. Fairfax Co. EC/RO TNQ reports much interest in 6-meter pack sets, with K4EWW working on technical details. ZZV reports manning the Roanoke Club station, CA, and his own rig during the January flood emergency. Incidentally, all Virginians are urged to send the SCM reports of emergency operation. If YOU don't report such activity, it's probable no one will. Also see that the local press and radio/TV know about such things. Thanks to FJ, BZE and the Richmond gang, Virginia was represented with the Governor's message during the G.P.R. FLX reports UDX is heading the Bedford gang's set-up at the NG Armory, anticipating MARS gear. A fine time was had by all at the Annual PVRC/Frankford RC meeting held in Washington. BGP, now in Germany as DL4SK, reports working plenty of DX and mobiling. K4ELG, who reports receiving his CP25, is working DX on 80-meter c.w., as is GF. K4ERY, now General Class, is asst. commandant at FUMA, Fork Union. 8JQS, formerly of West Virginia, is awaiting a K4 call in Alexandria. Former CZB now is K8DDG in Ohio. FZG is active on nets again after a long hiatus. OO BIJ opines that bad signals are becoming more plentiful. Most appear to be recently upgraded Novices fighting r.f. feedback, parasitics, clicks, etc., with their first VFO. JUJ reports the first VA-JF certificate went to YL K4CZP, with six issued in January. K4DKA gives advance notice of the Roanoke Hamfest to be held on Sun., May 12th. IA received QSL No. 100 for YLCC. KX has had several pleasant visits from hams passing through Fredericksburg on Rt. 1. The welcome mat at WFVA is always out. Traffic: (Jan.) W4IA 420, K4KNP 268, W4QDY 224, BZE 190, KX 81, K4DBC 77, DKA 30, W4FLX 24, JUJ 22, LW 22, PVA 20, K4ELG 12, W4CV 11, K4BUI 10, EAQ 9, JLO 7, BYS 4, IKF 4. (Dec.) W4MWH 56, K4ASU 13, EAQ 7.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQQ—ORD is building a new kw. all-band rig for s.s.b. and a.m. 4VAN now has his call 8VAN back and will have an s.s.b. rig on from Charleston. The hams who helped during the flood are to be highly praised for their splendid work and cooperation. HZA/8 is operating quite a lot from the e.d. headquarters. IRN's XYL has taken her ham exam. MLX has a new Ranger and is working lots of DX. NLT is very active now and is to be congratulated on his fine work in pushing the auto license plate legislation. SNP also is quite active now. We hope to see a lot of you at the Dayton Hamvention on April 6th. Thirty-eight stations were active during the Kanawha Valley emergency demonstration. This demonstration was witnessed by industrialists from all over the U.S. RKV did a bang-up job in planning the radio activities of this affair. ELJ assisted 4SBI during the flood. CSG is working lots of DX. PQQ QSOed ZC3AC on phone and c.w. for a new one. PBO sure is handling a large traffic load. The C.W. Net needs outlets in the eastern part of the State. If any hams would care to help out from this area it sure will be appreciated. DDB also is working lots of good DX. Traffic: W8PBO 214, HZA 76, BWK 36, DFC 26, NYH 20, SNP 19, PJI 15, ELJ 14, PZT 12, UYR 10, CSG 1, PQQ 1.

ROCKY MOUNTAIN DIVISION

COLORADO—Acting SCM, William R. Haskin, KØCEN—SEC: NIT. RM: KQD. PAM: IUF. INT wants more company on the 40-meter phone net on Sun. mornings. The State's first shortwave chess meet between Denver and Pueblo was held Jan. 30th. KØDCC made the 5th Army MARS Honor Roll in November with 40 hours. New officers of the Montrose County Ham Club are UIB, pres.; KØBWI, vice-pres.; KNØEGJ, secy.-treas.; KØEGU, communications manager. The Larimer County Amateur Radio Club's new officers are KØDTK, pres.; Jim Sandoz, vice-pres.; KØHFB, secy.-treas. The club project is 6-meter work, so you Denver guys look for them. K6SHG now is KØILX. The Boulder Amateur Club reports new officers are CHM, pres.; IA, vice-pres.; RRV, secy.-treas.; KØCEZ, act. mgr. Bill Clyne from the FCC was the guest speaker and was assisted by BOW and Mel Rogers from the Denver Club. DMC reports ACA, TVV, UHD, VSN, MLH, KN6QJV/Ø and KNØDSW are active on 2 meters and looking for contacts in Wyoming and Southern Colorado. The Informal Net is held at 7 P.M.

(Continued on page 120)

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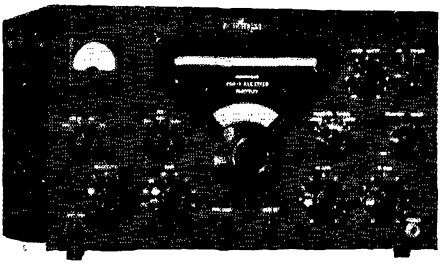

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TMC GPR-90	495.00
Gonset G66B	189.50
Gonset G-77	279.50
Gonset Communicators	229.50
Elmac PMR7	159.00
Elmac AF-67	177.00
Morrow MB-560A	214.50
B & W 5100B	475.00
B & W 51SB-B	265.00
RME 4350 RECEIVER	229.00

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Thurs. on 146.25 Mc. Two new 1st-class phone ticket holders are PTR and PGN. UNM has had his for some time now. KØBCQ made BPL. Traffic: KØBCQ 618, WØKQD 496, NVU 131, KØDXF 118, WBB 87, DCC 74, WØYQ 50, W4ZIW 19, WØJHI 12, KØCEN 8, WØSGG 6.

UTAH—SCM, James L. Dixon, W7LQE—OCX says that he will QSO and QSL any needing Utah for WAS. He has joined the PAN Net. The Ogden Radio Club held its Annual Banquet Jan. 19th. Attendance was 179, with John Reinartz, K6BJ, of Eimac, as the main speaker, and HWQ, Clyne of the Denver FCC, and IC, Rocky Mountain Division Director, as honored guests. The first prize, an NC-300, was won by Steed of Tri-State Electronics. QDS has added Ireland to his DX skeds. FYE has a new NC-300 and s.s.b. with 150 watts on 80 and 20 meters with a Windom antenna and is converting an ARC-5 and a 522 for use on 2 meters with a ground-plane antenna. RPY completed a Conelrad alarm and killed 10-meter parasitics in his kilowatt. New calls: GXB as Novice with a Globe Chief and SX-28 and three antennas; BCN as Technician on 6 meters with 75 watts to a 4E27 and a ground plane with an NC-57 and a Gonset converter. Traffic: W7FYE 4.

WYOMING—SCM, James A. Masterson, W7PSO—The Pony Express Net meets Sun. at 0830 on 3920 kc., PSO and MWS alternating as NCS. The YO C.W. Net meets on Mon., Wed. and Fri. at 1830 on 3610 k.c., BHH, DXV and NMW alternating as NCS. BHH has been appointed RM. YO Net certificates have been issued to AEC, AXG, BHH, DXV, HRM, HX and NMW. YSS and YJG are now mobile in Cheyenne. ØHJR/7 is now 7HEB. LHW has a new 75A-3. MWS has his new s.s.b. exciter on the air. ORM has a new trap antenna for all bands. GS, RJP and RJQ are back on the air after a three-year absence. TZK has moved to Gillette. N7HAL is a new Novice in Worland. YKU and his XYL, COY, have a new daughter. DXV is active in MARS. MNW is State RACES Officer. PSO visited the Cheyenne Club. The YO Net urgently needs more check-ins. Traffic: W7DXV 89, BHH 27, TZK 18, YKU 13, DTD 12, YSS 12, AXG 10, UZR 9, COY 8, MWS 6, AMU 4, CQL 4, PMA 2, PSO 2, AEC 1, LHW 1.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Joe A. Shannon, W4MI—KN4KJE has 41 states for WAS on 40 meters. In Tuscaloosa the following have graduated from the Novice Class: K4s IPQ, HNJ and HQS. KN4KID, age eleven, is working 40 and 15 meters with 50 watts. K4BTO has installed the new operating position built by K4BWR. New club officers—Auburn: K4ANV, pres.; GZM, vice-pres.; K4GOM, secy.-treas. Tuscaloosa: JLU, pres.; K4HNJ, vice-pres.; K4BWH, secy.; CHO, treas. Mobile Club: WHW, pres.; NU, vice-pres.; K4HNL, secy.; YZR, treas. The Mobile "Mobileers" helped make collections during the Cerebral Palsy Drive. K4EEH is the new EC for the Mobile Area and K4BTO is EC for the Gadsden Area. A correction on the frequency of AENO, the 6-meter net: It is now 50.05 Mc. AZC reports that the AENO was called into emergency session with eleven stations checking in—all without resorting to telephone! The Mobile Club auxiliary's new officers are Dot Karcher, pres.; Betty Kennedy, vice-pres.; and Juanita Rudd, secy.-treas. AENJ, in Birmingham, is considering 6 meters. CNU has been exercising his bug. HHG is sporting a new multi-band wire and worked NY with low-power 6-meter mobile during the recent opening. How about more LO and CD Party participation? Traffic: (Jan.) K4AOZ 227, W4RLG 188, KIX 151, K4BRS 134, EOG 80, ANB 67, W4HON 65, DTT 63, ZSQ 46, BFX 42, K4BTO 32, W4MI 31, CIU 29, K4DDC 27, W4YRO 24, ZSN 24, CNU/4 22, WHW 21, WOG 21, K4BWR 17, W4HHG 15, UJJ 14, K4BFL 12, W4CRY 11, RTQ 11, TKL 10, YFN 9, K4EEH 8, W4TOI 7, DGH 6, SXS 5, K4BFF 4, KJD 4, APF 2, W4NIQ 1, UHA 1. (Dec.) W4EJZ 17, GUY 14, K4HAL 12, W4HGF 11.

EASTERN FLORIDA—Acting SCM, Andrew C. Clark, W4IYT—Asst. SCM: John F. Porter, 4KGJ. SEC: IYT. RM: LAP. PAM 75 meters: JQ. PAM 40 meters: TAS. We are very sorry to report the passing of HRA, Ft. Myers. Jacksonville: ZJ is "The Poet" of the Old Goats Net on 3910 kc. 8-9 P.M. Attention Netters: The Florida Mid-day Traffic Net (FMTN) operates Mon.-Sat. on 7225 kc. from noon to 1 P.M. All interested may check in with NCSs DTV, HGO or K4BNE. TAS has been appointed PAM for 40-meter phone and is acting net mgr. for FMTN. Another all-Florida c.w. net is now in operation, the Florida Slow-speed Net (FSN). Maximum speed is 15 w.p.m. The net was set up by RM LAP. DVR is net mgr. of FSN, Mon.-Fri. on 3675 kc. 1830-1900. Fellows, we need more c.w. participation in our section nets in Florida.

(Continued on page 122)

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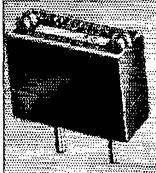
Give LAP and DVR a chance to teach you how to work traffic on c.w., please! All NCSs will work you at your speed and no faster! Regular FN now begins at 1900 on the same frequency. Miami Area: The Hialeah Radio Club's new officers are PBS, pres.; AYJ, vice-pres.; EKZ, secy.; Marvin Hill, treas. PBS sound-proofed the ham shack. The South Miami and Miami Springs Radio Clubs are now ARRL affiliated. K4AEE has daily skeds on 15 meters with son KZ5RM for U. S. traffic. K4BLM has a new 50-ft. heavy-duty tower. K4DRO was top man in the YL/OM Contest. GGQ, IYT and WWJ are on 2 meters. ZXK has a new 20-meter beam. BQW worked 42 countries in 36 days with a new two-element 20-meter beam. DEN was shifted to 29.520 kc. AHW participated in Operation Crackdown. The Flamingo Net is going great each Fri. on 29,044 kc. at 1930 EST. The West Palm Beach Radio Club reorganized with the following new officers: SJK, pres.; K4AWG, vice-pres.; DWK, secy.; TH, treas. Sarasota: WHF has a new 10-meter handy-talkie. LMT is looking for more 145.6-Mc. contacts. St. Petersburg: SPARC's new president is WME. The club now has about 60 members. K4BNE has a new Q multiplier. New Port Richey: 9ZAK, of Quincy, is visiting 9FRP/4 until spring. Melbourne: The Melbourne Radio Club has grown from 2 to 30 members and now has a code class going. Miscellaneous: SMK and LUK have new DX-100s. New officers of the Miami Springs Radio Club are K4CEJ, pres.; HQW, vice-pres.; GGQ, secy.-treas. Please see page 6 of *QST* and get your reports off to your new SCM by the first of each month. Traffic: W4FPC 385, PJU 217, WS 142, PZT 138, DVR 135, LAP 132, ZIR 130, EHW 123, IYT 86, K4BNE 81, KDN 80, ABV 57, W4LMT 53, HNV 46, HFT 37, W9FRP/4 32, W4KGJ 18, HGO 14, K4JOX 10, W4TAS 7, K4AHW 4, W4BJI 3.

WESTERN FLORIDA—SCM, Edward J. Collins, W4MS/RE—SEC: HIZ. RMs: AXP Escambia, BVE Okaloosa. EQR received a heard card from KL7VT on 6 meters. FHQ is resting up after a trip to the hospital. QK is becoming interested in ham TV. K4KIF is debugging the 6-meter transmitter. UUF promises higher power on 2 and 6 meters. GMS is giving DX a fit with the new Valiant. CCY is getting the tower up at the new QTH. AXP has transistor fever. ACB is pushing c.d. work over Tallahassee way. K4IYQ has 6-meter gear underway. K4ECP/4 goes over into Alabama with mobile gear on 6 meters to give locals another state. K4AGM has 23 states on 6 meters with 35 watts. MUX is home from Europe. PAA still CQs DX. ZPN stays with 7 Mc. VR is there with him. UCY is rebuilding 6-meter gear. WKQ ran up 62,250 points in the CD Contest. New hams over Tallahassee way are DKT, K4MNE and K4MCL. K4LQC has an FB quad perking. Other new hams to the section are KN4LQE and KN4LQU over Ft. Walton way. RKH has added another monitor receiver for 27,994 kc. CPE, UXW, 5BJZ and 7QNN are working on monitor receivers for 27,560 kc. in the Eglin Field Area. 8BOQ operates aeronautical mobile on cross-country trips. MFY and RKH enjoyed the use of 75-meter mobile gear during Christmas holiday trips. K4LBN's new jr. operator was the first baby born in 1957 in the Ft. Walton Area. SRX, the Eglin Club station, has an FB Conelrad monitor operating. SNV gave an FB talk to the EARS group. CKP is the proud owner of a Simpson 260. PTK has been under the weather but is getting along FB now. TTM looks after him. JLW is after bigger antennas. CSS is on 6 meters over Eglin way. MS/RE worked Mississippi for his 41st state on 6 meters. The Pensacola Amateur Radio Club is conducting code and theory classes for beginners. PQW is the guiding light. DAO/DEF has moved into his FB new shielded shack. HBK has a new vertical antenna up. ODO put in an appearance on 6 meters. EQR now has 44 states on 6 meters after working Alabama, Hi. Word has it that UW is becoming interested again. ZFL has the mobile set-up in the car about ready to go. BGG is having modulation trouble. K4ADY wants to get on 6 meters when not QRL with the civil defense program. Fellows, look at your license and see if it is due for renewal. Traffic: W4BVE 152.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: K4AUM. PAMs: LXE and ACH. RM: PIM. GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs. and at 0800 EST Sun. ATLCW meets on 7150 kc. at 2100 EST Sun. GSN meets Mon. through Fri. at 1900 EST on 3595 kc. PIM is NC. The 75-Meter Phone Mobile Net meets each Sun. at 1330 EST on 3995 kc. UUH is NC. The Atlanta Ten-Meter Phone Net meets each Sun. at 2200 EST on 29.6 Mc. VHW is NC. The Atlanta Radio Club will hold its hamfest Sun., June 2nd, at American Legion Post 216 in Atlanta. Dinner will be served at 12:30. K4GGN is NCS for GSN on Tue. night. BXV made BPL. K4CZQ is NCS for GSN on Fri. night. K4CSL cleared up all his TVI. PBK is doing fine work with the Boy Scouts in his spare time. 4RN

(Continued on page 124)

BLILEY NOVICE BAND CRYSTALS



BAND	MULTIPLIER	CRYSTAL FREQ. RANGE	TYPE	PRICE
80 Meters	1	3700.0 to 3750.0 kc's	AX2	$2.95
40 Meters	2	3587.5 to 3600.0 kc's	AX2	2.95
40 Meters	1	7175.0 to 7200.0 kc's	AX2	2.95
15 Meters	1	21,100 to 21,250.0 kc's	SR10	8.50
15 Meters	3	7033.33 to 7083.33 kc's	AX2	2.95
15 Meters	6	3516.66 to 3541.66 kc's	AX2	2.95
2 Meters	6	24,166.66 to 24,500.0 kc's	SR10	8.50

AX2

SR10

Bliley CRYSTALS

BLILEY CRYSTALS FOR SPOT FREQUENCIES IN NET OPERATIONS

MC9

TYPE	APPLICATION	TOLERANCE	PRICE
MC9	3 mc-12 mc experimental frequencies	± .03%	$6.50
SR10	12 mc-27.5 mc experimental frequencies	± .03%	8.50

SR10

Bliley CRYSTALS

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KV3 SR10 CF6 AX2 MC9

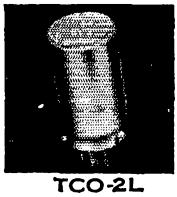
TYPE	APPLICATION	TOLERANCE	PRICE
KV3	Reference Frequency 100 kc	± .005%	$8.50
MC9	Marker Frequency 1000 kc	± .05%	8.00
MC9	13.6275 mc (Multiplier to 27.255 mc) CITIZEN'S RADIO SERVICE (CLASS "C")	± .04%	5.50
SR10	27.255 mc (3rd Overtone Crystal) CITIZEN'S RADIO SERVICE (CLASS "C")	± .04%	5.50
CF6	455 kc — 456 kc — 465 kc Single Signal Filters	± 5 kc	4.50
AX2	1800-1825 kc; 1875-1900 kc; 1900-1925 kc; 1975-2000 kc	See Note A	3.75
AX2	3500-4000 kc; 7000-7425 kc; 8000-9000 kc	See Note A	2.95
AX2	14-14.5 mc	± 10 kc	3.95

Note A: We will supply to integral spot frequencies (no fractions) as ordered; calibration ± 500 cycles in factory test oscillator.

NEW HIGH STABILITY PACKAGE WITH 100 kc AND 1000 kc CRYSTALS

This compact temperature controlled package provides a high stability reference source at both 100 kc and 1000 kc. Precision reference for general amateur use.

TYPE	DESCRIPTION	STABILITY	PRICE
TCO-2L	6.3V Oven	75°C ± 5°C	$ 9.00
BH6A Crystal	1000 kc	± .0002%	12.50
BH9A Crystal	100 kc	± .0005%	11.00



TCO-2L

Crystal units described are calibrated in recommended oscillator circuit—adjustable to zero beat (at 75°C) in this circuit.

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has gone back to 3547 kc. K4HOU racked up 394 QSOs in the last CD Party. The Valdosta Radio Club's new officers are K4INN, pres.; KN4MEH, secy.; ZLS, act. mgr.; RTN, ZLS and TSU, TVI comm. LNG was married Jan. 12th and hasn't been on the air since. K4CFO passed his 1st-class phone exam. The South Georgia Rag Chewers will hold their big picnic in Thomasville, Ga., on Sun., May 5th. Everyone is welcome. Tifton has three new Novices, KN4MGP, KN4MGL, and KN4MSA. Fine information is sent in each month by K4HAV. The Warner Robbins amateurs did a fine job in finding a lost man this month. Also Atlanta hams did a good job in helping to find a lost three-year-old child. Check your Emergency Corps cards for renewal with your EC. All ECs, be sure to send in your monthly reports to your SEC, K4AUM. Traffic: W4PIM 203, K4BXV 145, CZQ 118, W4DDY 76, PBK 63, K4GGN 58, CSL 35, W4ZDP 33, K4HOU 10, INN 8, W4PDP 7, K4CFN 6, W4CFJ 5.

WEST INDIES—SCM, William Werner, KP4DJ—SEC: KP4HZ. DV is interim-president of the PRARC because of the resignation of HZ. SZ replaces MV as vice-president. The PRARC is installing a 400-watt station in the USWB airport office and a 400-watt station in the Telco Bldg. in San Juan for hurricane net liaison. The 3559-kc. AREC C.W. Net shows increased activity with DJ and ABA alternating as NCS on Mon. at 8 P.M. The 3925-kc. Net continues active every evening with the Wed. roll call bringing out 10 to 15 stations. ABW is a new member of the AREC in Santurce. FJ, back on 3925 kc. after a five-year absence, is building a tri-band beam. AED uses a Globe King 500A on 10 and 15 meters but is satisfied to use an AT-1 and a modulator on 75 meters for Island ragchews. CAP hams are installing a BC-610 at their headquarters station, KP4QS. EK is on 3925 kc. using an Elmac 67A and an HRO. HZ built 10-meter mobile as per a *QST* article. ACF replaced the Globe Scout with Viking II and a VFO. AFL, at Mayaguez, is on 3925 kc. since becoming General Class. AFS is DL4CD/DL4MM and wants to QSO KP4s on 15 meters. RK is heard occasionally on 3925 kc. Visitors to KP4-Land who attended the PRARC meeting were W2SKE and W2EXE. QR moved his ham station from the WMDD transmitter site to his home QTH and is active on the 3559- and 3925-kc. nets. LK built an all-band vertical antenna. PZ/KP4, attending Polytech at San German, skeds his father, ZK, on 75 meters every afternoon. MV received a certificate for working ten stations in Malaga, Spain. New hams at USWB are AHV and AIN. AIA is CAA Communicator. KD built a Conelrad monitor alarm. W4QEB is now KP4QEB at Pamey AFB. AAM is on 75 meters with an AT-1. URO reports to the 3925-kc. Net. KV 4BD's XYL is now KV4BU. ZK says his call was 2BS in 1912! AEF has a new Valiant transmitter. BI celebrates his 20th anniversary as a licensed radio amateur. ABA improved antenna performance by changing from a "V" to straight wire. ABA is the first official member in P.R. of the Graveyard Net on 3885 kc. at 5 A.M. EE advises the Philmont Net on 29,493 kc. provides phone patches in the Philadelphia Area every Sun. 11 A.M. to noon. W2JXE is visiting KP4-Land. QR makes printed circuit modules with resistors and condensers at Modular Systems, Inc., at Fajardo. VD is another new station on 3925 kc. from Puerto Nuevo. AED skeds Ponce every morning at 7:45 A.M. on 3850 kc. AAA has an extra receiver now, an old HRO-W. ABD uses GS66 and GS77 mobile equipment on 3.9 Mc. Other mobiles are AAA, CZ and MS in the San Juan Area. MS is using a 20A s.s.b. barefooted on 20 meters when the kw. a.m. can't get through. RC also is using a 20A barefooted. AZ is on s.s.b. using a commercially-built kw. s.s.b. amplifier and a 100A exciter. RD is on 14-Mc. s.s.b. using a 20A and a 700-watt linear. RD uses a 32V-3 for c.w. operation and put a Collins vernier knob on 75A-3. The Governor's message congratulating the President on his inauguration was obtained by RM and sent by DJ on 14-Mc. c.w. Traffic: KP4WT 112, DJ 1.

CANAL ZONE—SCM, P. A. White, KZ5WA—KZ5DG, keeps weekly schedules on 15-meter phone between civil defense units in the Canal Zone and Region III of the Federal Civil Defense Administration in Thomasville, Ga. She and her OM, KZ5GD, recently made a 2-week visit by air to La Feria, Tex. The CZARA has appointed a TVI committee for every townsite in the Canal Zone. At the February meeting of the CZARA, Col. Les Gross lectured on the Earth Satellite, its launching, and how to track it by radio. The Crossroads Radio Club, on the Atlantic side of the Isthmus, has a new president in the person of KZ5TG. KZ5NM fired up a brand-new B&W 5100 and s.s.b. generator using a 105-foot trapped antenna, all-band. KZ5KA has a sticker for 120 countries confirmed. KZ5VR will take traffic any day before 11 A.M. for delivery into the TCN Florida Net at noon via K4AEE. KZ5RM will take traffic up to 5:30 P.M. any

(Continued on page 126)

New 'Skillman' Speed-Master semi-automatic key special

Superior to $20 'bugs elsewhere

The first truly professional semi-automatic key priced below $20.00. Has all of the deluxe features wanted by professional operators as well as amateur CW men. Easily adjusts from 10 WPM to any speed you desire. Has 8 separate tension and speed adjustment knobs to personalize it for your own "fist". All operating parts are precision-tooled brass with oil-tempered steel springs. Base is heavily weighted and has plastic suction cups. Transparent plastic dustcover. Imported! With cord, and alligator clips. Ship. 5½ lbs. *Order No. Q-7902.*

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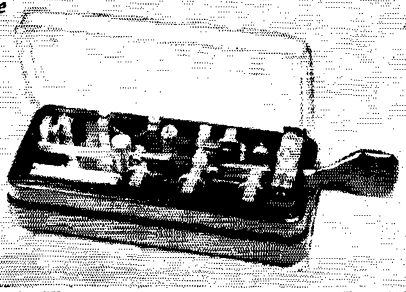
- As fast as you want



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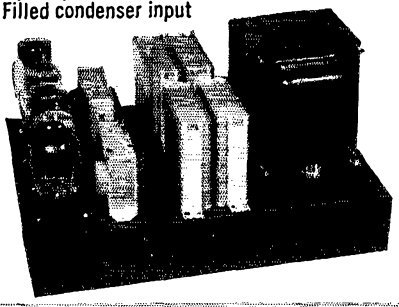
- Dual push-pull 5U4G's
- Oil Filled condenser input

The magnificent shielded transformer alone nets for over $20! It is rated to deliver 426 VDC @ 265 mils DC and simultaneously will deliver 326 VDC @ 340 mils DC. The filament windings will deliver 6.4 V. @ 11 amps, 5.0 V. @ 6.0 amps and 6.4 V. @ .6 amps. Each section of the dual-high voltage power supply utilizes parallel 5U4G's, 2,-8 *mmf. @ 600 volt oil-filled* condensers and a 3 henry @ 300 mil. choke. A 20K 100W bleeder resistor is also used. All components mount on a heavy gauge 10" x 14" x 3" black ripple finish chassis with adequate "breathing room" for each component. Complete with all necessary parts. Money back guarantee. Ship. 40 lbs. *Order No. Q-10016.*



400 VDC @ 250 Ma.
350 VDC @ 150 Ma.
6.3 V. @ 11 Amps.
6.3 V. @ .6 Amps.

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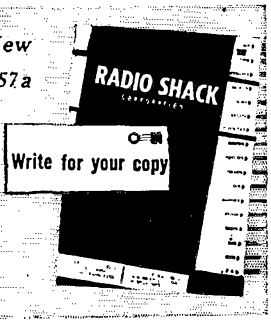

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day for the same net for delivery the next day. There were 160 licensed KZ5s on Feb. 1, 1957. Traffic: KZ5JS 120, VR 91, WA 21, RM 12.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, William J. Schuch, W6CMN —Asst. SCM: Albert F. Hill, jr., 6JQB. SEC: LIP. RMs: BHG and GJP. PAMs: PIB and K6BWD. LIP is QRL reorganizing the AREC. K6DDO busy as OO and is working DX. K6LMW now is on 220 Mc. K6BEQ is s.s.b. mobile. K6BWD has a new beam. WPF is back in traffic again. K6ICS is trying for WAVE and needs VE1. K6GTG has a new 200-watt rig. K6PLW is DXing these days. K6UYK is a new ORS. ORS will handle the April traffickers meeting. CK is having trouble with ice on his beams. K6CSR reports into SCN. USY now has emergency power. K6OZJ is active on the 51-Mc. Net. K6GUZ is QRL three nets. BHG is crying for NCSs for SCN. GYH is skedding Pacific MARS for traffic. K6LVL is Asst. EC of Barstow. HJY is busy with three nets and makes a nice traffic count. K6MON makes BPL the second month in a row. GYH made BPL for the twelfth consecutive month. NJU has a new 75-A4. K6EXO is putting a kw. on the air. K6KJN is back from the service. K6OQD writes that the Glendora c.d. gang has formed a club. K6ICS is QRL college. K6COP is doing a fine job as OO and ORS. K6EA is building new gear. K6TAN is a new General Class licensee. There was little news from the gang this month. Traffic: (Jan.) W6DDE 712, GYH 660, BHG 226, K6MON 221, W6HJY 156, K6COP 92, LVL 82, EA 68, GUZ 66, HOV 56, W6LIP 52, CMN 46, K6OZJ 43, W6GJP 36, VSH 27, USY 24, K6CSR 21, W6CK 20, ORS 19, BUK 16, K6UYK 13, PLW 11, GTG 8, ICS 6, OQD 6, WPF 6, BEQ 4, BWD 4, DDO 3, LMW 3. (Dec.) K6DQA 127, W6LIP 34, K6DDO 3.

ARIZONA—SCM, Cameron A. Allen, W7OIF—SEC: YWF. PAM Grand Canyon Net 7210 kc.: LUJ. It meets Sun. at 9 A.M. MST. PAM Arizona Emergency Net 3865 kc.: ASI. The AEN now meets Mon. through Fri., inclusive, at 7:30 P.M. MST. It will take all traffic coming into the State. Members who check in on other nets will take traffic going out of the State. The Little Fatty Net meets every Wed. at 9:00 A.M. MST on 3885 kc. All YLs and XYLs are welcome to check in. The Montezuma Well Hamfest has been set for June 1st and 2nd. Tickets are one dollar per call from George Olson, W7OAS, 210 E. Moreland, Phoenix. Pre-registration must be in by May 15th. The Phoenix V.H.F. Club gives code practice each Tue. and Sat. from 8 to 9 P.M. on 11 meters. KYE and his XYL, YWD, are in charge of it. LED received a letter of thanks from the Elks for service he rendered in taking traffic for them. WN7FMZ is building a DX-100. The Arizona Amateur Radio Club is getting its station, LO, set up at Boy Scout Hq. Sixty-foot poles, courtesy of the phone company, have been set with antennas on them. The transmitter and receiver are being installed. Traffic: W7NFL 41, OIF 19, OUE 6, WN7FMZ 2.

SAN DIEGO—SCM, Don Stansifer, W6LRU—New officers of the Clairemont Club are K6KIJ, pres.; K6UKG, vice-pres.; INI, secy.; and ZBE, treas. Guest speaker at the Convair Club's January meeting was OH2SF. K6JYQ is a new member of the Helix Club. K6ITF is the proud father of a jr. operator. K6HLQ is in Oklahoma with the Navy attending school. New officers of the Upper-Ten Club are JKM, pres.; WCH, vice-pres.; K6AFO, secy.-treas. Eighteen stations are now active on 420 Mc. in San Diego: W6s BLK, BYE, GTZ, JKM, KRV, KUG, LWT, MVV, OSA, UFI and YWM and K6s BCG, BTO, HXK, LQR, OLS, OWV, and PFP. It is with regret we note the loss of KVB to this section. Paul has accepted a position in the East. His work in the AREC as the EC for the northern part of the country will long be remembered. K6LXL lost his antennas, but is now back in business handling traffic. EOT has made BPL two months in a row. RAN is a new member of the San Diego DX Club. The Aztec Club at State College is on the air with a BC-610. The activity on the part of the San Diego DX Club in the ARRL c.w. portion of the contest sounded like old times with more than 20 stations in this section participating. K6EC has moved to a new and better DX location. Special congratulations this month go to the mobile boys on 10 and 75 meters who for many years have participated in many civic parades and events by offering their facilities for communications. K6BHM and JVA are nearing the 100 mark on countries worked. K6BHM was the last 1956 QSO for 9S4AX as a separate country. BGX is back in town looking for a good DX location. We are glad to report the recovery from an illness and the recent marriage of OAJ. Traffic: (Jan.) W6IAB 2337, EOT 616, LYF 28. (Dec.) W6IAB 7127, K6SLB/6 1604, W6YDK 1161, EOT 1048. (Nov.) W6IAB 2877.

SANTA BARBARA—SCM, William B. Farwell,

(Continued on page 128)

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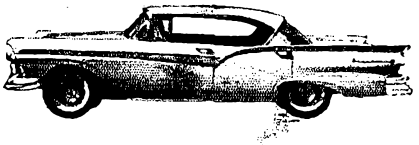

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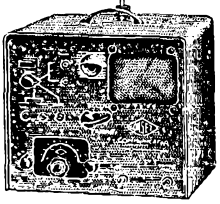

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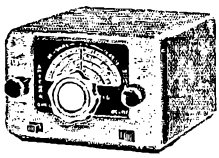

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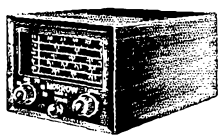

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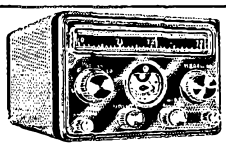

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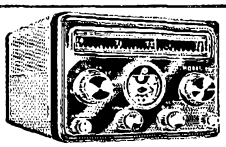

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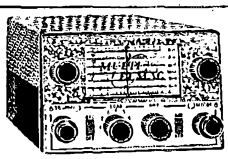

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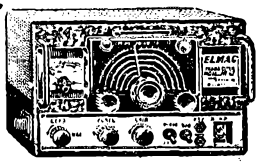

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W6QIW—The Paso Robles Radio Club auction was a huge success, with 17 visiting hams from out of town. ENR, RED and K6EEJ are sporting new mobile rigs on 75-meter phone. The AREC was active during the Ventura and Lake Sherwood fires handling spot newscasts for radio station KVEN. Among the Novices: KN6UUX, now K6UUX, worked New York on 40 meters with 15 watts with a 589 report. KN6QIL and QIM built a transistorized code monitor. KN6VHB is building a new shack in back of his house. The Ventura Ham Club paper really gets around, last month's paper going to KL7BKZ, Ketchikan, Alaska, 6MMP, in New Mexico, and KV4AA in the Virgin Islands. LQ reports his son John has received his Novice Class ticket and is KN6VKI. NTF has his windmill fixed up with a 15-inside-20-meter cubical quad antenna. Traffic: W6QIW 182, K6ELR 12, W6ENR 10, K6KPU 6, W6FYW 4.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, Ray A. Thacker, W5TFP—SEC: PYI. PAMs: YKT and IWQ .RM: KPB. KPB reports NTX had 27 sessions in January with 118 stations handling 122 QTC. FCX invites more c.w. devotees to check in on the net. AHC is sporting a new 813 final! YIJ has been elected NCS of CTEN. KN5IRB is new to the Novice bands from Tahoka. Teen-agers, there is a new Teenage Net on 3940 kc. K5IAB is manager and I hope he will advise the time the net meets. K5DXJ is responsible for getting the entire 6-Meter Net in Dallas to join the AREC "en masse." PCN advises that Amarillo Area hams are activating the Panhandle Storm Warning Net and 3950 kc. will be monitored daily at 1730. Should bad conditions exist in your area get on and report it to the Acting NCS. BWV reports a very successful March of Dimes program jointly handled by the Midland and Odessa ARCs. Dallas ARC's new officers are PED, pres.; CNI, vice-pres.; TUU, secy-treas. We certainly enjoyed visiting with the Central Texas ARC recently and was most surprised and grateful for the nice turnout in spite of bad WX! The boys in Waco are DOING things. My thanks to BOO and AYX for their hospitality. Stop in and visit the club when you are near Waco. Thanks for the many reports, folks. Traffic: K5WAB 1672, W5UBW/5 648, K5FFB 340, W5KPB 232, DTA/5 110, K5EMR 103, W5FCX 72, AHC 52, K5BKH 51, W5ASA 41, BKH 28, TFP 24, CF 23, K5EUV 23, BBM/5 15, IGY 11, W5OCV 10, K5AIB 5, W5DFB 3.

OKLAHOMA—SCM, Ewing Canaday, W5GIQ—Asst. SCM: James R. Booker, 5ADC. SEC: LXH. PAM: MFX. RM: JXM. A big thank you to EJK for his fine work in handling emergency communications at Gans, Okla., following the recent tornado which killed 8 persons. Another note of thanks for the fine job done by the boys in Enid, Lawton and surrounding areas who relayed donation reports during the March of Dimes telethons held by TV stations in the two cities. EHC originated the Governor-to-President-Relay message. New officers of the North Fork Amateur Radio Club are LZ, pres.; FRB, vice-pres.; and K5DUX, secy.-treas. Congrats to WEI, RRU and LTD upon the arrival of new harmonics, all boys. VNC is in the hospital at Rochester, Minn. MMD is back on the air after a long absence with a DX-100. RRM, former Northern Texas SCM, is operating portable from his new home in Bartlesville. K5DUJ is back on the air with a new 250-watt rig. ZOW has a new Globe Champ 300. KN5IBZ worked 40 states in 30 days with his new DX-100. KN5ERK also has a new DX-100. KN5EUD and ERI have new DX-35s. KN5ICC, recently named Duncan's outstanding young man of 1956 by the Junior Chamber of Commerce, has a new Globe Chief and HQ-140. K5BAR, K5EVN and K5DWO have new General Class tickets in Duncan, Bartlesville and Cushing. Traffic: W5KS 432, DRZ 258, K5CAY 252, W5GIQ 153, FEC 128, EJK 121, CBY 83, ESB 76, K5HZF 75, AOV 58, W5MFX 43, K5CVU 36, W5ZAJ 35, ADC 34, K5AUX 34, W5CCK 30, MRK 29, K5DJA 20, W5MGK 19, K5CBA 18, W5QAC 18, PNG 15, SVR 11, EHC 9, RST 7, WEI 7, MQI 6, IER 2.

SOUTHERN TEXAS—SCM, Roy K. Eggleston, W5QEM—2NEW is in Houston attending Houston University. The Houston Amateur Radio Club has code classes under ITA, FYW and HKE. VWT and K5BVH are s.s.b. mobile. KN5EYZ is a new Novice at Angleton. He is 70 years young. Houston Mobile Dragnet officers for 1957 are DNJ, NCS; TIJ, ACS; BRM, secy. CVQ handled the Governor-to-President message and it was in Washington seven minutes from the official starting time. YJB now has an XYL. KN5IUR is a new Novice in Austin. OBA has a new beam on 20 meters. IAN has a new 20A s.s.b. exciter. The Houston and Galveston County Amateur Radio Clubs participated in the March of Dimes Telethon. URU contacted a VE station whose operator had been a victim of

(Continued on page 130)

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polio. He was patched into the television station, where the Master of Ceremonies was televised talking to him. DKK is the OPS in San Antonio. DTJ is trying to work all Texas counties. He has 193 out of the 253 total. The El Paso Amateur Radio Club sponsors code and theory classes. Attendance is about 40, including 6 YLs. This class is held Thurs. at 7:30 P.M. MST. ES is the OBS for the El Paso Area. The schedule is Mon. 7:15 P.M. on 29.640 kc., and Fri. 7:45 P.M. on 3828 kc. All time is MST. Traffic: W5PXZ 25. DTJ 18.

NEW MEXICO—SCM, Einar H. Morterud, W5FPB—SEC: DAA. PAM: DVA. RM: RKS. The NMEPN meets on 3838 kc. Tue. and Thurs. at 1800 MST. Sun. at 0730; the NM Breakfast Club meets on 3838 kc. daily except Sun. at 0700. POI has his 1st-class phone license. ZLF was home on a 30-day furlough before leaving for JA-Land. GVB moved to El Paso. DAO has been on a business trip to Washington, D. C. BNJ is on 20-meter c.w. FED received a safety award from the Texas Company. Members of the Totah Radio Club assisted the Mother's March on Polio. TBP is the new EC for Chaves Co. WNU is the new EC for the Albuquerque Mutual Aid Area, with UWA Asst. EC for mobiles and K5GLJ Asst. EC for 144 Mc. The other ECs are FHL, Santa Fe Mutual Aid Area; K5CEV, Eddy Co.; NQG, Lea Co.; SUY, McKinley Co.; CIN, San Juan Co. There are no ECs for the following counties: Catron, Colfax, Curry, De Baca, Grant, Guadalupe, Harding, Hidalgo, Lincoln, Luna, Mora, Otero, Quay, Roosevelt, San Miguel, Sierra, Union. How about an EC in the counties where there are amateurs? Traffic: K5DAA 63, W5UAR 19, FGZ 15, DVA 14, ZU 9, K5CEV 7. W5RKS 1.

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VE1WB—Asst. SCM: Aaron Solomon, 1OC. SEC: FH. PZ reports the formation of a new club at Sydney, N. S. The Dartmouth Club has a new DX-35 transmitter. Newly-elected officers of the Fredericton Club are LS, pres.; OQ, vice-pres.; VU, secy.-treas. NQ is a new call from Charlottetown. The Cape Breton Emergency Net members recently presented what is believed to be the first all-amateur TV show in North America over CJCB-TV, Sydney. QY worked Argentina on 6 meters to establish what is believed to be a DX record for this band. FQ has been handling traffic from VEØND (HMCS *Magnificent*). TT has a DX-100 transmitter. LY keeps regular skeds with brother 7AKN on 10 meters while OC works 7HV and 7ARB daily. Other regular occupants of this band are ACP, XY and ZT. IY now is VE8AD at Whitehorse. HJ is active on 20- and 75-meter phone. DB, EK, LY and OM have new Q multipliers. KM (ex-7AJV with DXCC) needs only one more country to make the Century Club from the East Coast also. SI and LZ have joined the s.s.b. ranks. Traffic: (Jan.) VE1FQ 172, AV 43, FH 18, OM 17, DB 14, ME 14, LY 13, UT 13, ADH 11, QM 10. ABT 8, BY 5, VU 5, WK 5. (Dec.) VE1OM 17.

ONTARIO—SCM, Richard W. Roberts, VE3NG—SEC: KM. The start of the new year saw the HMCS *Magnificent*, aircraft carrier, en route to the East. AML, Sarnia, took many messages from the crew to their loved ones. BUK and DVY were heard from again and will be returning to their navigating duties soon. VE8MF was a visitor to the Sault Area. The Ottawa Radio Club has a drive on for new members. IU and NN are active again on 75 meters. The Muskeg Net is on 3755 kc., while the Ontario Phone Net is on 3770 kc. AA has a new DX-35. AVS is ORS. DAR, RU, ARF, ADA, AKC and RW are all new OPSs. TX is an OO. BJV is an OBS on 7-Mc. c.w. CD and LO Parties brought out a lot of VE3 officials. RH is now an OPS. HK is feeling better, as is GG. AMB is in the Civil Air Patrol in Toronto. HB is working good DX on 14 Mc. UY has a new mobile on 10 meters and skeds his brother in Germany. The Ottawa Club Dinner will be held May 4th. The Northshore Radio Club of Oshawa also will hold its Dinner on May 4th. AJR was active in the YL/OM Contest. DZA is working 28-Mc. DX. AREC in the Toronto Area worked the ARRL booth at the Sportsman Show held in Toronto in March. Three clubs operated a rig each, Nortown, Metro and Westsides. Your SCM was the coordinator, with HE as assistant. Our thanks to all concerned; it was a good show. AML worked VE4, 5, 6 and 7, all in one week on 75-meter phone. DMU, Dr. Spooner, is a newcomer to 75 meters. Doc is taking off on a banana boat for points south on vacation. BUT has recovered from a broken arm. CMP will depart for VO-Land soon. NO, AML and AJR act as liaison to c.w. nets for the Phone Net. Traffic: (Jan.) VE3BUR 141, NG 95, AML 87, COY 69, AUU 43, DEX 43, BOY 40, NO 33, TX 23, DPO 22, DH 21, CO 16, IU 13, BJV 11, DSM 9, VI 8, CJM 7, EAU 7, RW 5, APL 4, AVS 4. (Dec.) VE3GI 191, BOY 44.

(Continued on page 132)

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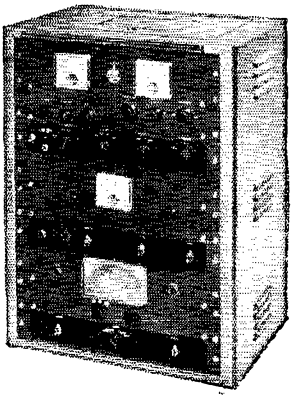

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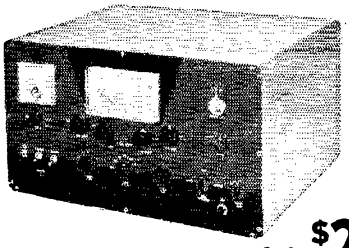

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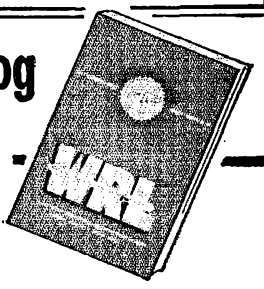

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CITY & STATE: _____

QUEBEC—SCM, Gordon A. Lynn, VE2GL—The activities report in Feb. *QST*, line 11 of the Quebec section, should have read "EC is celebrating 25 years skeds with AEM, etc." The MARC at its annual meeting had as a nominating committee old-timers QQ, CO, DR and BK. Election results were BB, pres.; AKT, 1st vice-pres.; TA, 2nd vice-pres.; HI, secy.; AKY, treas.; VV, XX, MB, MW and SU, directors; with BK as auditor. Plans are being discussed for the ARRL Convention to be held in Montreal in autumn. BB is Radio Officer of the Lachine Disaster Control Unit, which is equipped with a Collins 32V-2 and a 75A-1. OR and DY are taking a c.d. course at Arnprior. AOL and GI are mobile and ready for emergency work. AIZ, TI and AJD are active on 20 meters. PV, ZG and VE are experimenting with u.h.f. CP was on 15 meters for the first time on New Year's Day and worked 29 countries. KG has completed a 5-over-5-element 2-meter beam and reports it is really hot. The South Shore Amateur Club, now incorporated, elected the following officers: AJI, pres.; ATT, vice-pres.; KG, secy.; AY, treas.; AVC, act. mgr.; GD, social mgr. Traffic: VE3DR 100, CP 48, EC 41, GL 9.

ALBERTA—SCM, Sydney T. Jones, VE6MJ—PAM: OD. The reference made to LZ in this column in December *QST* was an error. It should have read "LQ." Sorry for the mistake, Al. I'm sorry to report the resignation of XG as Route Manager. If any of the c.w. gang would like to apply for this important post, please contact your SCM. MM has been appointed EC for the Red Deer and Lacombe Area. DZ and KM are working over some surplus 144-Mc. gear. QR is working 28 Mc. GS is chasing DX on 28 Mc. and is active on 144 Mc. MJ is conducting a c.d. course in communications. WL reports the annual CARA Banquet held recently was most successful. OB took a 144-Mc. expedition thirty miles west of Calgary. SX is working on the modulation problem with varying degrees of success. OE is back in the land of the living after several months of inactivity. HM reports his usual skeds with the northern gang and leads the section with traffic. NX reports well over 200 countries worked on 14 Mc. Traffic: VE6HM 159, YE 22, OD 18, MJ 9, TT 2.

SASKATCHEWAN—SCM, Harold R. Horn, VE5HR—LU visited the Saskatoon Club, giving a run-down on AREC for the district and the section as a whole. TH reports his new QTH is much better for activities. EH has accepted a position in CN Telegraph's installation department and will not be heard so frequently chasing DX. GT has built an FB all-band with a 6146 final. BZ reports the Rosetown AREC Net is doing fine and has a new frequency of 3740 kc. for Sun. skeds at 1300. He also is getting in some 10- and 20-meter activities. EQ is rebuilding an all-band mobile for summer work. AT has a new Heathkit Q5-er, and is building a low-pass filter. EX is building a VFO exciter. LM has a new 3-band beam to go up as soon as the weather permits. LT has built an a.m. modulator and now has a very nice signal on the bands. Traffic: (Jan.) VE5LM 28, DS 16, RE 14, CT 10, BI 6, LE 6, BZ 5, BF 4, EQ 4, PJ 4, QL 3, HF 2, JK 2, VL 2. (Dec.) VE5BZ 30, DS 26, RE 22, GO 10, QL 9, SL 8, HF 7, CB 5, PQ 5, EQ 4.

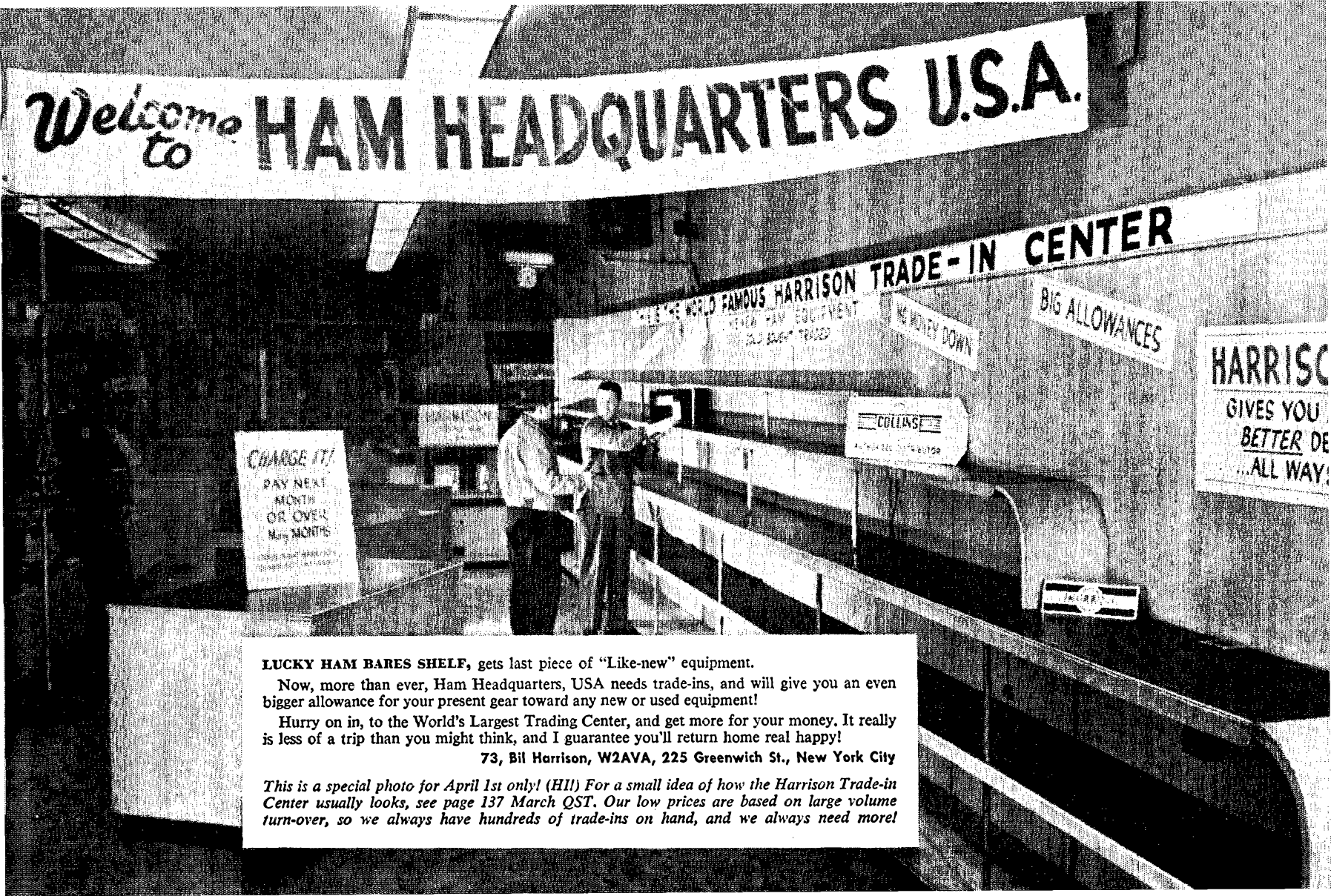
PRP Project

(Continued from page 70)

their use for practical communication by radio amateurs. Now, perhaps, hams can make equally important contributions toward their more detailed explanation. It goes without saying that if something pops up which can't seem to be explained at all, we're interested in that, too.

The reporting job of our observers is simplified by the use of special report forms. These are something of a cross between contest forms and the ARRL log, and provide space for all the required information. This brings us to PRP "Phase B." We wanted to make sure that the reporting form decided upon not only provided the wanted data but also would meet the needs of the observers. (After all, they would be the ones using the forms.) About the middle of November, therefore, we sent out samples to be used in a trial run before actual reporting got under way. Observers were asked to comment on

(Continued on page 134)



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This is a special photo for April 1st only! (HI!) For a small idea of how the Harrison Trade-in Center usually looks, see page 137 March QST. Our low prices are based on large volume turn-over, so we always have hundreds of trade-ins on hand, and we always need more!

the form, and several changes were made in it as a result. In December a shipment of modified reporting forms went out to all PRP observers.

News Bulletin

Along with the December shipment of forms went the Number One issue of a brand-new publication, *The PRP News:* The Project has its own monthly bulletin, available only to registered observers.

The first issue, primarily instructional, brought our observers up to date on the project, and went into some detail about what we wanted reported and how to present the reports. It described the results of our November trial, and contained a made-out sample report and a list of the fellows so far registered. Our second bulletin, which came out about the first of February, was a bit more newsy. It dealt primarily with some of our foreign observers, and included information on v.h.f. abroad as well as tidbits from more local sources.

Future issues will draw more heavily on the actual reports sent in. These have been arriving at a very satisfying rate. All of the propagation modes mentioned above, including transequatorial scatter, have been spotted at least a few times.

By the end of January, PRP reports and other correspondence were threatening to burst out of the ARRL Technical Department corner where the writer has been working. Fortunately, our new PRP Headquarters office (we had to have a separate office, since there was no space available for us at 38 LaSalle Road) was ready for occupancy just about this time. So it is that we're now operating from a pleasant and airy room in a modern office building at 530 Silas Deane Highway in Wethersfield. It is a few miles from ARRL Headquarters in West Hartford, which makes for problems now and then, but they're rapidly getting ironed out.

Incidentally, the writer's editorial "we" actually means something now. The PRP staff includes Mrs. Constance Campbell, XYL of the ARRL Technical Department's W1CUT and formerly of *QST*'s Advertising Department. She will help screen and evaluate the reports sent in by observers.

Data Handling

Actual observing began January 1st. Although this was six months before the beginning of the IGY, an early start was considered essential so the program could be in full swing by July 1st. Also, with propagation conditions improving every day much valuable information is accumulating during this advance period.

Individual and personal inspection of all reports is the first operation to be performed when a batch of them is received. It is also, perhaps, the most important operation. Following evaluation, additional information such as station latitudes and longitudes will be added and the reports will go to an operator who will prepare punched cards containing all pertinent

(Continued on page 136)

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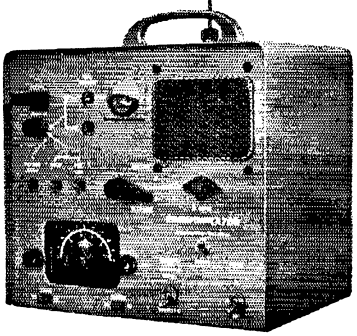

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information. This process will put all data received in a form suitable for high-speed automatic sorting, collating, and summary preparation, later on.

It is important to note that this system is a flexible one. Our data, like all data collected during IGY, will be available for study by scientists the world over for years to come. That's the main purpose of the IGY — to build up a vast stockpile of information for future investigation. In PRP, with your help, we can provide a record of essentially all ionospheric v.h.f. DX which will be worked during 1957 and 1958. This record will be in such a form that future scientists with ideas yet undreamed of can easily refer to it to check their theories against practice. It is a fine chance for today's hams to equal or surpass the contributions of their forerunners.

Welcome to PRP!

Though this discussion began as a progress report, it seems to be ending on a note of prediction. You can help make this prediction come true. PRP needs more observers in more parts of the world in order best to paint the propagation picture as it really is. If you're interested in v.h.f., write in and tell us. If you're not interested in v.h.f. you should be, because you're missing some of the most fascinating aspects of our hobby.

Lastly, if you're visiting the Hartford area and ARRL, don't forget you will also be welcomed at PRP Headquarters.

All Band Antenna

(Continued from page 29)

excellent results over a period of several months. It was found that moving the antenna to the lower altitude of 30 feet gave poorer signal reports, indicating that the height of the antenna was a controlling factor in its performance.

The Image Principle

While pondering over the problem of the amateur who isn't blessed with a 50-foot flagpole in front of his terrace, the principle of the antenna "image" was recalled. This is explained in any good textbook on antennas; briefly it means that every antenna has an "image" directly beneath it in the ground, and it is the combination of the effect of the antenna plus the effect of the image that gives the antenna most of its directional properties. Conjecture as to the location of the image when the antenna proper was buried under the ground resulted in taking down the ferrite antenna from the flagpole and burying it 5 feet under the ground. It loaded the transmitter in the same way, and the s.w.r. checked out to be nearly the same as before. Examining the space above where the antenna was buried disclosed that the maximum field intensity existed 5 feet above the ground, indicating that the buried antenna did indeed have an image above the ground! Inspired by

(Continued on page 138)

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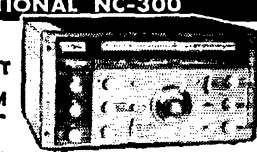

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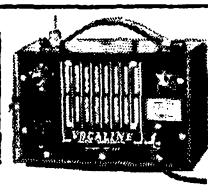

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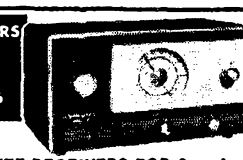

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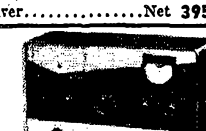

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this discovery, the antenna was buried 30 feet below the ground. Raising and lowering the field-strength meter by means of the flagpole rope, the area of maximum intensity was found at 30 feet above the ground, further confirming the earlier finding. At 50 feet below the ground a very hard rock formation was encountered that prevented further experimentation at this location, but the signal reports continued upward and the performance was every bit as good, if not slightly better, than the performance had been when the antenna had been 50 feet above the ground.

Using the antenna for receiving for the first time, it was noticed that all c.w. signals came in on the *other* side of zero beat to what was usual for the receiver. After a little cerebration the reason became apparent: one should expect image signals with an image antenna. This works no real hardship on the operator, once he has realigned his receiver to cope with these slightly different signals.

This sketchy report is offered to the amateur fraternity in the hope that some of the remaining parameters of this antenna will be determined. For example, it is predicted that if the antenna is buried under a house that uses radiant heating the efficiency of radiation will be improved, since a good low-resistance ground system is always desirable. Operators interested in using the antenna as a vertical should, of course, raise a radial system a foot or so above the surface of the ground, although in some localities this may present a problem for pedestrians. If the antenna is buried deep into the side of a cliff, the radiation angle will be lowered and a measure of directivity will be obtained in the direction perpendicular to the cliff face. The radiation angle is then equal to 90° − A, where A is the vertical angle of the cliff face. An ideal location would be a shallow salt-water marsh directly over dry sand, since the marsh acts as a ground plane and the dry sand is a low-loss insulator.

It is known that the antenna does not work at all if it is merely hung in an abandoned (or working) well or mine shaft; the antenna has to be *buried*. As mentioned earlier the performance increases with the depth of burial, and depths of less than 25 feet are not recommended, just as heights of less than 25 feet are not generally recommended for the old-fashioned eyesore-type antenna.

Strays

The Mars Air Force Eastern Technical Net will broadcast technical talks on 7635 kc. on Sunday afternoons at 2:00 P.M. EST, beginning April 7th. The first four talks (April 7th, 14th, 21st and 28th) will feature W2CRR on Double Side Band, W2CSY on Product Detectors, W2AMJ on V.H.F. Techniques, and W. Kaufman on Control Theory. A similar technical net covers the southwestern states Sundays at 1:00 P.M. CST on 7305 kc., and a Western Technical Net will soon be activated on 7832.5 kc.

Famous "final words" in radio!

In 1877, Emile Berliner of the U.S.A. had the "final word" when he invented the microphone. The discovery of the telephone had been made the year before.

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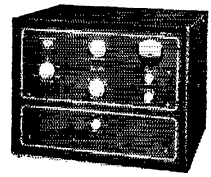

New! B&W L1000—A LINEAR AMPL. 1 KW PEP SSB • CW • AM.
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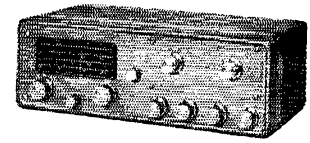

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Grounded-Grid Kw.

(Continued from page 15)

850 volts is possible without the necessity for changing the series resistor. A 50,000-ohm bleeder is used as well, and the VR string remains across the supply in c.w. operation for improved regulation.

Cooling

Some form of blower should be used to keep the tube seals within temperature ratings in order to obtain full life from the tubes. Originally, a smaller, higher-speed unit was contemplated so it could be mounted on the chassis or at the rear of it. However, blowers do not seem to be too readily available even in the larger cities, and they are not low in cost. In the interests of getting on the air, a surplus unit was purchased which was physically too large to be placed in the chassis. It is mounted on the bottom plate by means of a piece of ¾ × ¾-inch aluminum angle and a piece of ⅛-inch thick aluminum, and must be removed before the amplifier can be withdrawn from the rack. If the amplifier were to be used in a table-top cabinet, the smaller variety of blower would be the best solution; it could easily be accommodated below or on top of the chassis.

Eimac Air-System sockets were used because of their mechanical excellence and the fact that air is channeled exactly where it is needed. For those who might find the cost prohibitive, a number of good designs using less expensive sockets have appeared in *QST* in recent months. As for pressurizing the chassis, no special pains need be taken other than to cover any large unused holes, such as those punched in the ends of many chassis for rack panel brackets.

V.H.F. Meteor Scatter

(Continued from page 24)

breaking, with calls for about 5 seconds and breaks about 2 seconds. Station B does the same for the second 5 minutes, etc.

2) Station A calls for the first 15 seconds of each minute. Station B calls for the second 15 seconds, A for the third, B for the fourth, etc. This is varied by some to make the periods 30 seconds or a full minute's duration.

The advantage of the first method is that it does not require precise timing. It will catch a long overdense burst easily, and enable a rapid exchange of information. For the short underdense bursts, where information must be exchanged bit by bit, it is not so desirable. The 2-second break results in neither station being on the air for 30 per cent of the total time!

The second method is almost 100 per cent efficient for the more common underdense bursts, but it requires precise timing, with WWV synchronization and sweep-second hand clock faces. Also, it tends to make less-effective use of the long bursts. The majority of meteor DX

(Continued on page 142)

work is done with underdense bursts, so the second method seems more valid. An exception would be with low-power stations, where insufficient underdense bursts are found to make contacts. They will make out better by concentrating on the good showers and gambling on sustained strong bursts.

The shortness of most bursts has led meteor enthusiasts to ever higher keying speeds. (You should hear my tape of W3TDF!) The only limitation on keying speed, after we have dispensed with human operators and gone to teletype, is band width. Present receiving setups allow minimum band width around 100 to 500 cycles, which is adequate for speeds up to 100 w.p.m., so it seems logical to use all the selectivity we can get, and go to the highest practical keying speed. Obviously, it is useless to try to get information across on half-second bursts if individual characters are 0.25 second long!

Speculation

Here we are not asking you to agree. All comments are welcome! During the 1956 Geminids contact between W9GAB and W4LTU, Mose noted (and recorded on tape) that our signal had some characteristics of ionospheric scattering. For 4 or 5 consecutive calling periods by W4LTU the signal in Wisconsin was weak but steady, with no sign of underdense bursts.[3] If it was a single long overdense (5 *minutes?*) why was there no such signal at this end? All overdense bursts heard here to date (5 of them) have obeyed reciprocity, giving signals both ways. It may be possible that there is some ionospheric phenomenon that is not reciprocal, differing from the usual overdense bursts. Nonreciprocity can be brought about by effects of the earth's magnetic field, (Faraday rotation of polarization.)

There is such a fine line of division between meteor scatter and ionospheric scatter that some say they are the same. Perhaps the high level of underdense meteor activity at the time (12 per minute) resulted in sufficient turbulent ionization to give signals of a continuous character, as in ionospheric scatter. It is interesting to note that normal ionospheric scatter signals on 144 Mc. would be expected to be 35 db. below those on 50 Mc. Perhaps an abnormal increase in background ionization brings 144-Mc. signals up to a usable level on rare occasions.

During nightly skeds with W3GKP, Smitty has noted apparent increases in duration of bursts when there is an aurora present. Not enough auroras were experienced up to the time this article was written to double check this, but more will come.

More definite effects which may have a bearing on the subject resulted from checks with W2ORI and W3GKP during shower periods. During the

(Continued on page 144)

[3] On one occasion during nearly two years of daily tests on 144 Mc., W4HHK recorded 5 minutes of weak steady signal from W2UK. There were only about two or three meteor bursts in this entire period, and their level was only a few db. above the residual signal. This was in January, when tropospheric bending would not be expected to produce signals over a 940-mile path on 144 Mc. — Ed.

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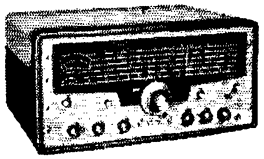

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1956 Orionids, nightly tests with W2ORI showed up to nearly four times the normal burst rate of about 0.5 per minute for nonshower periods. This does not seem unusual until we note that the tests were from 2030 to 2100, while the meteor radiant does not rise until 2230! The actual shower meteors were striking the opposite side of the earth, and the only effect that could be laid to them is residual ionization remaining on our side of the earth from the previous night's shower meteors. Were the increased bursts merely from sporadic meteors which found it easier to ionize where there was initial ionization? W3GKP found a similar effect during the 1957 Quadrantids. Increased burst rate was noted on schedules running up to 2145, when the meteor radiant did not rise until 2300.

A check on this effect would be to run schedules during a very short shower, perhaps the Giacobinids, Oct. 9th, and see if the enhancement exists just before the shower, as well as just after. More tests which should prove interesting would be the comparison of normal burst rates with those obtained during intense sporadic-*E*. If the presence of high residual ionization does enhance meteor scatter, then E_s might well permit meteor-scatter contacts under non-shower conditions.

Or perhaps we are putting the cart before the horse! Note the very intense daylight showers in June and July. Their peak rates rival the Perseids, and the total number of meteors received during them is immense. Perhaps the presence of intense E_s during this period is due to the integrated ionizing effect of these recently discovered daytime showers.

Know the Regulations?

(Continued from page 31)

Answers

1. (b) A photocopy is valid only for the station authorization; you must carry your original operator license.

2. (c) Of course he must also have his operator license of the proper class.

3. (c) His name must be written in the log, but not necessarily by himself.

4. (c).

5. (c) The call sign of the station transmitting must follow, not precede, the call sign of the station being worked.

6. (c) For the code test (b) would be correct.

7. (b).

8. (b).

9. (c) The "maritime mobile" designation is used for operation outside the continental limits of the U. S.

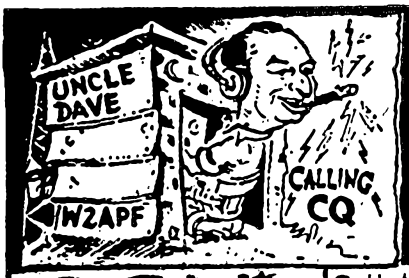
10. (c) While (b) is not incorrect, (c) is recommended.

11. (c).

12. (c).

13. (b) Novice and Technician license holders

(Continued on page 146)



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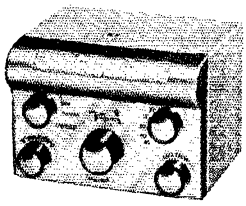

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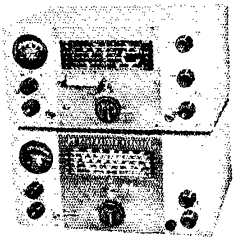

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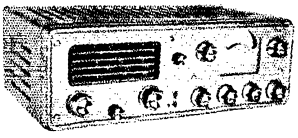

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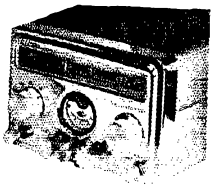

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have no mutual frequency assignments and therefore cannot operate in each other's bands.

14. (c) Before granting authorization, FCC will clear the application with aviation agencies.

15. (c).

16. (c) On c.w., geographical position is required only for mobile operation outside the U. S.

17. (c).

18. (b) This procedure is to avoid multiple issuance of licenses for temporary moves.

19. (c).

20. (b), since all of Lake Michigan is within the U. S. For operation outside the U. S., (a) would be correct.

Scoring

Correct Answers	*Rating*
20	You must be an FCC examiner!
19	Oh come, you peeked at the answers.
18	Pretty good; you are eligible to give legal advice to other 75-meter phone men.
17	Excellent.
16	You pass.
15	You pass, but it is getting marginal.
14	Better brush up.
13	You can come back and take the exam in 30 days.
8 to 12	How many tickets have you collected?
4 to 7	Who did you say took the exam for you?
0 to 4	Aren't you ashamed?

Cubical Quad

(Continued from page 19)

selector switch. In this way, my receiver and transmitter are switched from one antenna to another simultaneously.

Well, boys, there it is. Of course, you can't figure in the cost of the mast and coax cable or rotating mechanism, but the three-band cubical quad itself cost me approximately $10.00. However, I did my own welding.

If you who build this antenna get as much pleasure out of it as I have had, it will be well worth its cost to you. I have worked more DX with 10-over-9 reports than ever before, and my transmitter is a Viking II. In checking the front-to-back ratio with an Australian station, I received a 10 over 9 on the front, nothing on the sides and a 3 on the back, and I have never changed the original tuning of the driven elements or the reflector. Maybe I could improve it, but I am afraid to try for fear I will ruin what I have!

Strays

K2ANN simplifies his log-keeping by using various colored inks for phone contacts, c.w., DX, etc. He has also used different colors for work on different bands. Says it makes it fun looking back through the log.

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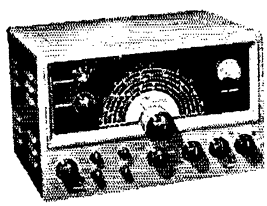

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Results

(*Continued from page 51*)

W8RGZ....84- 21- 2-B
KN8AHA...84- 21- 2-B
W8PFP....82- 41- 1-B
W8EQV....80- 20- 2-B
W8TDY....80- 40- 1-B
W8RLA....70- 35- 1-B
W8CSA....68- 34- 1-B
KN8CTM...68- 17- 2-B
W8RLY....62- 31- 1-B
W8WAU....62- 31- 1-B
W8WYU....60- 60- 1-B
K8BOX....60- 30- 1-B
W8UZB....58- 29- 1-A
W8KW8....50- 25- 1-B
W8VZE....44- 22- 1-B
W8KOT....42- 21- 1-B
KN8ABL...40- 10- 2-B
W8YCP....26- 13- 1-B
K8DKE....20- 5- 2-A
W8IFZ/8...20- 10- 1-AB
W8OLH....16- 8- 1-A
KN8AJF...16- 8- 1-B
W8SFC (W8s BVJ SFC SRW)..1908-106- 9-AB
W8BTK (W8s BTK BTQ) 1408- 88- 8-AB
W8RKX/8 (W8s HTD RKX) 76- 38- 1-A

HUDSON DIVISION

Eastern New York

K2GCH...2568-107-12-AB
K2HPN...2280-114-10-ABC
K2JQV...1296- 81- 8-A
W2MHE...960- 10-12-AB
W2HBC...790- 79- 5-ABCD
W2LWI...500- 25-10-B
W2HF/2...392- 28- 7-B
K2JYR....300- 30- 5-B
W2CTH...240- 30- 4-B
K2BFU....180- 18- 5-B
W2FEN....102- 17- 3-B

N. Y. C.-L. I.

K2IEJ/2..2880-120-12-AB
K2JLR...2484-138- 9-B
K2JWT...1818-101- 9-B
K2DDK...1652-118- 7-B
W2YHP...1416-118- 6-AB
W2AOC...1368- 76- 9-BC
W2GLU...1200-100- 6-B
W2AOD...1120- 80- 7-BD
K2KRC[1]...960- 80- 6-A
W2KDC...900- 75- 6-B
W2JBQ....868- 62- 7-B
W2TUK....828- 69- 6-B
W2SJX....756- 63- 6-B
K2MYS....690- 69- 5-B
K2MBY....550- 55- 5-A
W2ENW....540- 45- 6-B
K2MQV....528- 44- 6-B
K2GCU....516- 43- 6-A
K2LDK....500- 50- 5-A
W2IN.....470- 47- 5-AB
K2AZT....470- 47- 5-A
KN2VWZ...470- 47- 5-B
W2LKP....462- 33- 7-BCD
K2RKL....460- 46- 5-A
W2MZY....448- 56- 4-B
K2OIL....335- 35- 5-A
W2QAN....312- 52- 3-B
W2BNX/2..306- 51- 3-B
K2CMV....256- 32- 4-B
W2EEN....216- 27- 4-B
W2DVK....152- 19- 4-B
W2KTF....136- 34- 2-B
W2QPQ....135- 23- 3-A
W2AUF....108- 18- 3-B
W2YIG.....92- 23- 2-B
W2CLG.....80- 20- 2-B
K2JXD.....72- 9- 4-A
W2ELT.....62- 31- 1-B
W2TNI.....56- 28- 1-B
W2QBR.....38- 12- 2-B
W2WCR[3]...48- 12- 2-B
W2SOB.....40- 20- 1-B
K2SFS.....30- 15- 1-B
W2EC......28- 14- 1-B
K2MUA....28- 7- 2-A
W2MFP....26- 13- 1-B
W2DQN....12- 6- 1-B
K/KN2VIX (K2s IOL VIX) 1155-116- 5-AB
KN2VDR (K2s UOY VDR) 549- 92- 3-B

Northern New Jersey

W2CBB...3124-142-11-B
W2IDZ...2676-112-12-A
K2LXI...2420-123-10-A
W2MEU...2380- 85-14-A
K2PCG...1700- 85-10-A
W2ZKE...1536- 96- 8-AB
K2GQP...1200- 60-10-A
W2IDZ/A...1148- 82- 7-ABC
W2SYR...1090- 55-10-A
K2BI.....938- 67- 7-AB
K2KIB....924- 77- 6-B
K2SUW....840- 60- 7-A
K2GLS....510- 51- 5-B
K2DIG....290- 29- 5-AC
K2BO.....224- 28- 4-B
KN2VPV...216- 36- 3-B
W2WKL...212- 28- 4-B
KN2UYH..180- 30- 3-B
W2QCY....48- 8- 3-A
K2GLQ/2...40- 20- 2-B
W2WCM....20- 10- 1-A
K2AWY/2 (K2s AWY GLQ) 5082-231-11-AB
W2ONV (multiopr) 4018-287-14-B

MIDWEST DIVISION

Iowa

W0SMJ...1133- 52-11-AB
K0EMQ....210- 21- 5-B
W0USQ....200- 25- 4-AB
W0NWX....40- 10- 2-A

Missouri

K0BVL[1]...268- 67- 2-A
W0IHD....200- 50- 2-AB
W0GEP....116- 29- 2-A
K0AHD....112- 28- 2-A
W0WKG...100- 25- 2-A
W0NUE....96- 24- 2-A
W0LTT.....36- 18- 1-A
W0FIN.....34- 17- 1-A
W0EXN....22- 11- 1-A
W0TPB.....20- 10- 1-A
K0DGG....18- 9- 1-A
W0HQI.....16- 8- 1-A
W0JNK....16- 8- 1-A
K0DOK (K0s DOK DTO DUV W0TGC) 704- 88- 4-AB

Nebraska

KN0ICK....26- 13- 1-B
W0WRT....24- 12- 1-B
K0CHK (3 oprs) 1240- 62-10-AB

NEW ENGLAND DIVISION

Connecticut

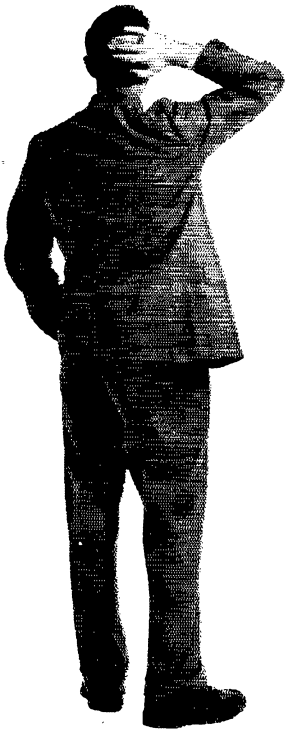
W1HDQ[6]11,920-301-20-AB
W1PHR...4092-171-12-AB
W1DXE...3509-160-11-B
W1BYX[1]..3108-114-14-A
W1FTX...3089-141-11-AB
W1YDM...2739-125-11-AB
W1YOB...2000-125- 8-AB
W1LGE...1529- 70-11-A
W1LBF...1512- 63-12-A
W1COT...1260- 70- 9-B
W1DFA...1148- 82- 7-B
KN1ACG[2]..928-116- 4-B
W1AWV...850- 85- 5-B
W1AW[6,7]...820- 82- 5-AB
W1HXD...816-102- 4-AB
W1VLH/1..676- 85- 4-AB
W1VSI....676- 85- 4-B
W1FVV....658- 47- 7-A
W1SUZ....648- 36- 9-A
W1BDI[6]...600- 60- 5-B
W1VNO....600- 50- 6-A
W1DEW....546- 46- 6-A
WN1MQQ..540- 90- 3-B
W1WRQ....512- 64- 4-B
KN1AOX...510- 85- 3-B
W1OIT....480- 60- 4-AB
W1VLL....450- 38- 6-B
W1WOQ....450- 75- 3-B
W1VLK....420- 70- 3-AB
W1TXI....396- 66- 3-B
W1KQV/1..312- 26- 6-A
W1ZDP[6]...300- 50- 3-B
W1RFJ....270- 27- 5-B
W1HDF....256- 32- 4-ABC
W1TXM...220- 55- 2-B
W1FPF....208- 26- 4-A
W1SRH....168- 42- 2-B
W1KHM...140- 35- 2-AB
W1IKL....128- 32- 2-B
KN1AOY...128- 32- 2-B
W1VWP/1..120- 30- 2-B
W1GVK....114- 19- 3-B
W1EJV....104- 26- 2-B
W1GFE....104- 26- 2-B
WN1NWE..100- 25- 2-B
W1UYP....84- 21- 2-B
W1TCJ....40- 10- 2-B
W1GHI....26- 13- 1-B
W1IYR/1...16- 8- 1-B
W1JZA.....6- 3- 1-B
W1WRV/1 (W1s WRV ZYS) 704- 88- 4-AB
W1ORS (W1s RFJ TCW ORC)....400- 40- 5-B
W1YNT (W1s KYV YNT) 204- 51- 2-B

Maine

W1TAM..1340- 67-10-AB

(*Continued on page 150*)

MAKING THE BIG DECISION?



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W1AQE...3542-161-11-AB
W1J8M...1520- 76-10-B
W1ABE...1470-105- 7-AB
W1UIQ...1064- 67- 8-A
W1MEG...1032- 86- 6-AB
W1QMN...896- 56- 8-A
W1FRR...850- 85- 5-AB
W1LUW...630- 63- 5-AB
W1EZZ...612- 51- 6-A
WN1NMI/1...528- 66- 4-B
W1RCJ...400- 50- 4-AB
WN1NQQ...342- 57- 3-B
W1LHV...328- 41- 4-B
W1KCC...288- 36- 4-B
W1ZEN...280- 35- 4-AB
W1NXY...264- 33- 4-B
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W1ZWL/1...2640-120-11-A
W1UBD...2340-130- 9-AB
W1BXB...2072-148- 7-AB
W1STR...2025-113- 9-AB
W1MNG...1936-121- 8-AB
W1NY...1638-117- 7-AB
W1HDM...1452-121- 6-B
W/WN1JJO[2] 1220-122- 5-AB
W1OBQ...1040-104- 5-AB
W1EVZ...890- 89- 5-B
W1RRX...840- 84- 5-B
W1RQY...830- 83- 5-AB
W1ALL...800- 80- 5-B
W1FAB...768- 96- 4-AB
WN1JIZ/1...760- 76- 5-B
W1CJK...720- 72- 5-B
W1HUN/1...540- 45- 6-A
W1WLE...540- 90- 3-B
W1HYO...468- 39- 6-A
W1CSF/1...456- 57- 4-B
W1DGA...450- 75- 3-B
W1TTL...448- 32- 7-A
W1OY...440-110- 2-AB
W1BCI...432- 36- 6-A
W1WFL...432- 72- 3-B
W1NLE...426- 71- 3-B
W1ESA...420- 70- 3-B
W1SWJ...402- 67- 3-B
W1VNE...378- 63- 3-B
W1UKR...372- 62- 3-B
W1KUE...360- 60- 3-B
WN1NRK...354- 59- 3-B
W1KUL...348- 58- 3-B
KN1ANF...336- 42- 4-B
W1DRZ...330- 33- 5-A
W1JWV...270- 45- 3-B
W1RVW...270- 27- 5-AB
W1UWX...258- 43- 3-B
W1IOL...228- 57- 2-B
W1JYH...220- 55- 2-B
W1BH...180- 45- 2-B
W1WDW...156- 39- 2-B
W/WN1IDJ 132- 33- 2-AB
W1QWJ...120- 30- 2-B
W1GLD...78- 13- 3-A
W1DHA (2 oprs) 800- 80- 5-B
W1HRV/1 (3 oprs) 504- 63- 4-AB

New Hampshire

W1AZK...3562-137-13-AB
W1ULU...805- 58- 7-A
W1AXW...180- 15- 6-B

Rhode Island

W1KCS...3936-164-12-ABC
W2BVU/1 3430-172-10-AB
W1UHE...2068- 94-11-AC

Vermont

W1FTF...792- 34-12-A
K2OTO/1...736- 46- 8-A
W1MMN...192- 16- 6-B
W1MEP...176- 22- 4-B

NORTHWESTERN DIVISION

Alaska

KL7VT...110- 11- 5-A

Oregon

W7HBH...420- 42- 5-AB
W7VZZ...400- 40- 5-AB
W7INX...372- 31- 6-A
W7NGW...344- 43- 4-AB
W7VJV...200- 25- 4-A
W7FVN...96- 24- 2-A
W7QND...18- 9- 1-A

Washington

W7VOQ...1177- 54-11-A
W7DMN...342- 29- 6-A
W7DYD...230- 23- 5-A

PACIFIC DIVISION

Hawaii

KH6OS...28- 14- 1-B
KH6DQ...26- 13- 1-B
KH6AED...24- 12- 1-B
KH6EE...22- 11- 1-B
KH6KC...22- 11- 1-B
KH6AWG...18- 9- 1-B
KH6EZ...8- 4- 1-B

Nevada

W7JLV/7...6- 3- 1-AB

Santa Clara Valley

W6RLB...1932-161- 6-AB
W6TPZ...1590-159- 5-AB
K6OBN...640- 64- 5-A
K6HAM...258- 43- 3-B
K6HYX...40- 10- 2-B
W6YHL/6...27- 5- 3-B

East Bay

W6ASH...1550-155- 5-AB
K6RNQ...1120-112- 5-A
K6APB...246- 41- 3-A
W6FAR...160- 20- 4-B
K6CCQ/6...132- 22- 3-B

San Francisco

W6AJF...1340-134-5-ABCD
K6EOW...1140-114- 5-A
K6GOW...1070-107- 5-A
K6OTF...84- 14- 3-A

Sacramento Valley

W6PIV...350- 35- 5-AB

San Joaquin Valley

K6KLR/6...400- 40- 5-A
W6ERE...340- 34- 5-B
K6GOX...176- 22- 4-A
W6HAB...44- 11- 2-B

ROANOKE DIVISION

North Carolina

W4ACY...30- 15- 1-B
W4NHW...30- 15- 1-B
K4EUD...16- 8- 1-B

South Carolina

W2BHS/4...16- 8- 1-AB
W1TNO/4...10- 5- 1-B

Virginia

W4JCJ...1440- 90- 8-B
W4UCH...1035-115- 9-A
W4TNQ...340- 34- 5-B
KN4LLL/4 (W4WSF KN4LLL) 420- 42- 5-B

West Virginia

W3PZK/8...444- 74- 3-AB
W8BKI...8- 4- 1-B

ROCKY MOUNTAIN DIVISION

Colorado

WØTII...14- 7- 1-A
KØGKR...14- 7- 1-A
KØCLJ...12- 6- 1-A
WØRWD...8- 4- 1-A

Utah

W7QDJ...14- 7- 1-AB

SOUTHEASTERN DIVISION

Alabama

W4AZC...102- 17- 3-A
W4LSQ...30- 5- 3-B

Eastern Florida

W4LTU...32- 8- 2-B
W4TKE...16- 4- 2-B

Georgia

W4IKK...329- 24- 7-A
W4FWH...192- 24- 4-AB
W4LNG...160- 17- 5-AB
W4VZR...72- 13- 3-AB
W4GIS...68- 17- 2-AB

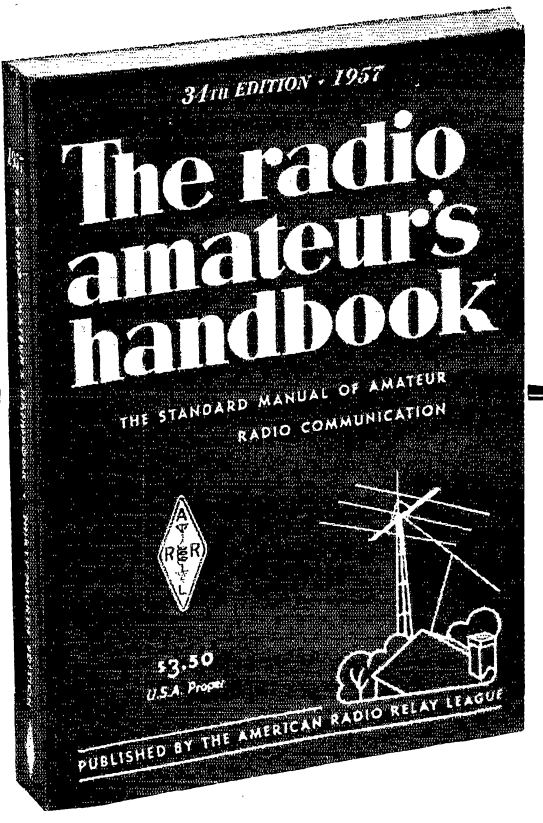
SOUTHWESTERN DIVISION

Los Angeles

W6NLZ...710- 71- 5-ABD
K6QIP...114- 19- 3-B
K6QLG...105- 27- 3-A
W6BWG...66- 11- 3-A
W6SDW/6 (5 oprs) 1182-297- 2-AB
K6KJY (3 oprs) 597-105- 3-AB

(*Continued on page 152*)

1957 EDITION



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WEST HARTFORD 7, CONN.

San Diego

K6COE/6	552	92	3-A
K6HLQ	10	5	1-A
K6LJS	8	4	1-A
K6CUZ	2	1	1-A

WEST GULF DIVISION

Northern Texas

W5QMA	404	51	4-AB
K5AON[1]	92	46	1-A
W5FEG	74	37	1-AB
K5BDI	58	29	1-A
K5CHF	52	26	1-A
K5ADV	28	15	1-A
K5DCQ	16	8	1-A

Southern Texas

W5HFF	52	26	1-AB
W5GHL	36	18	1-A

CANADIAN DIVISION

Maritime

VE1EF	855	48	9-A

Ontario

VE3DIR	1162	83	7-B
VE3DSU	998	83	6-AB
VE3AIB	496	62	4-B
VE3DUU	432	54	4-B
VE3BHQ	210	35	3-A
VE3BOW	120	30	2-B
VE3KM	114	19	3-B
VE3DFT	72	18	2-B
VE3DSP	72	18	2-B
VE3OJ	54	9	3-A
VE3AET	28	7	2-A
VE3DLS	14	7	1-B
VE3DQU	12	6	1-B

British Columbia

VE7ND	174	16	6-A
VE7NM	120	12	5-A
VE7AFB	80	8	5-AB
VE7ACV	56	7	4-A
VE7AOD	6	3	1-A

[1] Technician award winner. [2] Novice award winner. [3] W1YRZ, opr. [4] W2YLM, opr. [5] W2AUF, opr. [6] Hq. Staff, not eligible for award. [7] W1QIS, opr. [8] W1HOY, opr.

Hints & Kinks

(Continued from page 78)

audio leads as short as possible and away from the existing a.c. wiring.

— *William J. Engle, jr., W3KKO*

(*QST* wishes to thank Vernon Beck, W5DNY, for submitting a conelrad "Feedback" circuit similar to the one received previously from W3KKO. And Walter Bruun, W2DGP, also sent us his version of the arrangement. Walt, however, picks up feed-back voltage from the speaker side of the output transformer instead of tapping on to the plate of the output tube.)

YL News and Views

(Continued from page 87)

which appeared in the January 1957 column. The net will issue the YL-OM Certificate to any amateur, YL or OM, who sends confirmation of contact with twenty-five full members of the Texas YL Round-Up Net to certificate custodian Helen Douglas, W5LGY, 1501 Monroe Street, Commerce, Texas. Write W5LGY for the complete rules. The certificate has already been issued to K5s BNH, BNG, BWM, and W5s KEC, LGY, and WXY.

MISCELLANY:

OM W2QHH has a six hundred endorsement sticker for his YL Century Certificate! . . . OM W4JUJ relays that K4CZP, Mattie, received the No. 1 Jamestown Award VA-JF, a certificate offered in connection with the 1957

The new President of the South African Women's Radio Club is Pat Woodland, ZS1MU, of Cape Province. One of the best known of some ninety ZS YLs, Pat has served the SAWRC before in various offices. Using twenty phone and c.w., Pat has close to 100 countries confirmed.

Jamestown, Virginia, Festival. (Write the Richmond ARC, Box 1985, Richmond 16, Va., for details.) . . . W3s AKB and CDQ helped with operation in the Governors to President Relay on Inauguration Day. . . . W6PCA, Opal,

(Continued on page 164)

Brazilian YL Olga Oliveira, PY4DU, reigned as Queen of Radio Amateurs at the LABRE convention in Sao Paulo. When about her more mundane duties at home, Olga can be heard on forty meters. *Photo via W2BVS and W9BRD.*

holds the Texas YL Round-Up Net 10CC Certificate #1 and W8HWX, Lillian, has #2 (1000 OM QSLs required). . . . W1UZR lists some of Maine's more active YLs: K1ADY, W1s BBY, GWF, VVT, YTE, ZLT, and ZOL. Rita is happy about her own good mobile reports from European DX on ten. . . . In just eight months W4VCB/3, Ev, has worked some 100 countries. . . . YLRL Veep W3YTM/5 is back on 40 c.w. from her new Pasadena, Texas, QTH. . . . KZ5VR, Virginia, is another YL who has worked KC4s USA and USB. . . . Though her four little harmonics provided plenty of interruption, KN6PQG of El Granada, Calif., made 1030 contacts during her novice year. Babs has persevered on to her General Class (this item from OM KN6TNU). . . . For working ten maritime mobile stations W8MBI, Marie, swept up her Witch Certificate, awarded to YLs only. . . . Best wishes to W1ZID, who graced our YL page last December. On February 2nd Anne became Mrs. William Hopke. She has resigned from *QST* headquarters staff and will continue ham operations from her new QTH in upper New York.

How's DX

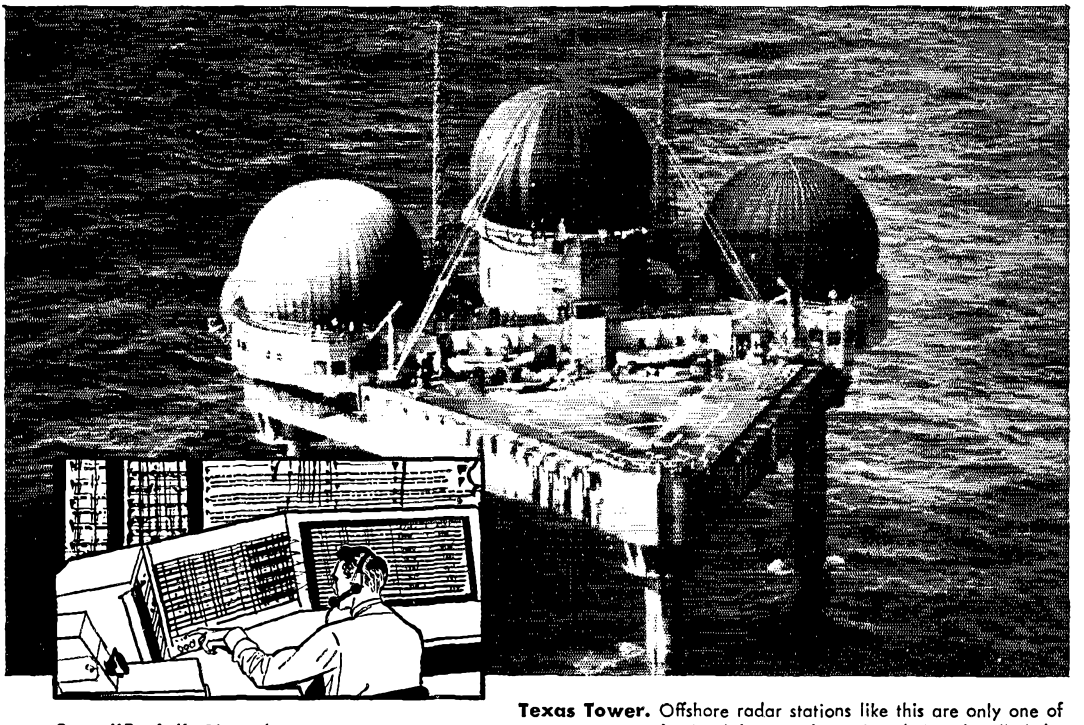
(*Continued from page 64*)

NCDXC-SCDXC parley in Fresno was a lively testimonial to the effective planning of chairman W6TI and assistants. VP8AP (ex-GM3EYP) attended a February SCDXC meeting, edifying W6AM and other members with much Dependency and antarctic info . _ . _ . _ After years of frustration listening to rare DX calling CQ NEV, CQ VT, CQ NO WK, CQ this, and CQ that, W8NOH declares he'll drop stone dead if he ever hears a juicy one calling CQ MICH . _ . _ . _ W4CYY fights the Battle of Belmont, N. C., a running skirmish between himself and a neighbor's leaky fence-charger. J. B. figures that darned popcorn-popper must be double-DXCC by now . _ . _ . _ W0QGI nominates Rosa, YL at HR2GH, as a candidate for your YL-DXCC collection . _ . _ . _ W9RJV/VE8, through W9KJ, credits K2EOR, Ws 3TKQ 8HAI 9RUO 9TGB, VE1FQ and others for key assistance in keeping northern Canada outposts in touch with the home folks . _ . _ . _ As W2GVZ so aptly put it, they *always* come back. Ws 6CIS 8YGR and 0FWW report into the "How's" net after DX layoffs caused by a traveling job, house-building and hospitalization, respectively. One of W8YGR's first comeback encounters on 15 featured OB3KA "on the moon." Imaginative maniac, what? . _ . _ . _ VE1PQ warns that old VE1ZL has the itch again and is preparing a 4-element spinner for the 20-meter wars . _ . _ . _ Help! K2ENO wants the present address of op Kruse of SV0WO ('56); K5IIX needs QTH scoop on the current CN8FV; VE3AAZ hungers for the whereabouts of FF3CN ('48); and VE3PK will settle for data on old KJ6AR, SU1MT and ZD9AA ('52-'53) . _ . _ . _ OVARA's *Ether Waves*, with W4KVX handily punching out

(*Continued on page 166*)

Help test SAGE

— the new Air Defense System



Sage "Brain". Giant electronic computers store defense data . . . furnish correct picture to commanders at earliest possible moment.

Texas Tower. Offshore radar stations like this are only one of many sources of air defense information being handled by Sage (semi-automatic ground environment).

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* * *

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FOR FURTHER INFORMATION CONTACT: D. P. Wilkes, W2LNC, Superintendent, Systems Testing; Western Electric Company, 220 Church Street, New York 13, New York. Or, if you prefer, telephone collect to: WOrth 4-0277.

Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

its DX column, reports W8FGX lurking in the Caribbean. New OVARA officers: W4JBQ, pres.; W8ELB, v.p.; W8CGY, treas.; W4KVX, sec.; W4OMW, ed.; and W8IFX, v.h.f. ed. . . . . Out where those pasteboards *really* roll in, we note that W6TI has been handling your ARRL W6/K6 QSL Bureau for over twenty twine-snapping, card-sorting, pigeonhole-digging years.

Ten Years Ago in "How's DX?" — Moderator W1CH acknowledges assistance from W1s GKA GKK KMY LQO, W2s CYS MPA PNB QUJ RDK, W3s HH JKK LNE, W4LAC, W5IWY, W6s SAI SN TI, W7s BED JHB RT, W8s NBK RDZ ZBK, W9s AWO ENQ RBI, VEs 1EP and 3ACS in turning out his second "How's" effort following the retirement of W1DX from DXdom's fourth estate . . . . . Forty-meter resurgence is noted in our April 1947 column. CR9AD, HA8F, J2AAM, KA1s EA ZU, KP6AB, LX1AS, TR1P, UA3s AF DQ KA, UG6AB, W6NQG/KM6, W6VSO/J9, XU6GRL and YR5M are reported worked, and our West Coast gang avers that 7-Mc. European signals now roll through as never before . . . . . Twenty c.w. captivates its growing audience with EP3D, FF8WN, HA4EA, HZ1AB, I6USA, J3AAD, LX1AO, PI1L, PKs 1RX 4IP, PZ1s AL MY, SP1KWK, ST2AM, SV1RX, TA1DB, TF3A, UAs 6BC 9DP, UN1AO, VP8AD, VQ5TWJ, VS7ES, W@MCF/C1, YO5WZ, ZC1AN, ZD2G and ZK1AH. On 20 phone the smart set mingle with C7AA EK1MB, Js 2UVW 3IDN 9AAW, KA1SS KP6AB, PK1AW, UA1AB, VQ8AB and Basutoland's ZS4P . . . . . Ten phone gets a good going-over because of FK8VB, Js 2AMA 9AGT, SU1BD, W4HUR/C7, W9URU/C7 and XU6GRL, while the 28-Mc. c.w. gang dote on CRs 4AA 9AG, GC4LI, HA7AD, OE1AX, UA9CF, UB5KAE, VQ5FCA, VR2AB, YI2AT, ZB1AB and ZC6FP.

World Above 50 Mc.

(*Continued from page 67*)

to tune the sigs in readably. Results were not related to signal level, as signals were strong during the January session. Aurora veterans are familiar with the variation in distortion of signals, even during one event. Distortion usually tapers off gradually toward the end of the opening. In the closing minutes of an aurora session s.s.b. should get through often when a.m. will not. The quality of the c.w. notes should provide a clue.

W2EWL has done it again! Tony now comes up with a modification of the system he described in March, 1956, *QST*, to give a simple approach to v.h.f. s.s.b. The signal is generated at 7150 kc., in a manner similar to the original unit. The trick is that some of the crystal oscillator output on 7150 kc. is fed into frequency multipliers with output on 42,900 kc. This is then mixed with the s.s.b. energy on 7150, to give a sum frequency of 50.05 Mc. Thus only one stable oscillator is required — and it uses readily-available ham-band crystals, or a *good* v.f.o. already in use on lower bands can be pressed into service. The rig is in use at K2KSW, Denville, N. J.

The first two-way s.s.b. on 50 Mc. for K2KSW was with W2HBC, Mt. Vernon, N. Y., who reports that the life of a v.h.f. s.s.b. enthusiast is not all a string of successful extended-range work. Out of Bill's first 14 stations worked, only 5 could copy his s.s.b. well enough to make a QSO of it. W2HBC uses a B & W rig on 14 Mc., a high-level 6146 mixer with 36-Mc. injection, and a 4D32 amplifier.

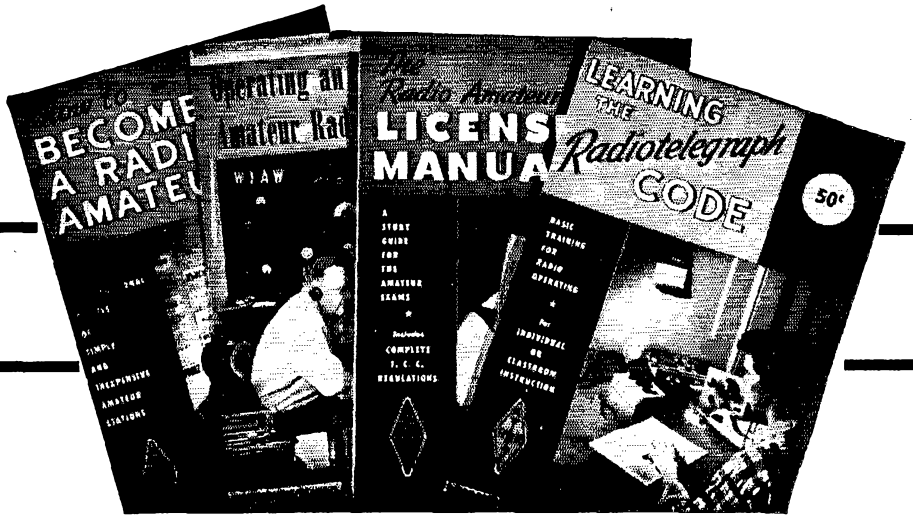
K6GFI, Sacramento, passes along some hints that may be helpful to budding sidebanders on the v.h.f. bands. He built a phasing exciter for 14 Mc. and then heterodyned this to 144 Mc. in a manner similar to that shown in *QST* for November, 1956, page 74. His injection unit uses a 43.33-Mc. crystal oscillator and a tripler to 130 Mc. It was found that a regulated 150-volt supply was necessary to maintain adequate stability in the crystal oscillator.

The first attempt at a mixer for 130 and 14 Mc. was an 832A, but output was too low to drive a pair of 4X150As as a final stage. Thinking that part of the trouble with this arrangement, which involves injecting the 14-Mc. energy into the screen circuit, was the high screen-to-ground capacitance of the 832A, K6GFI next tried a 6524. This required more inductance in the 14-Mc. tuned circuit in the screen lead, but it netted output to burn.

The 6524 is driven on 130 Mc. to the point where it shows 3 ma. through a 12,000-ohm grid leak. The plate circuit is a conventional 144-Mc. tuned line. Screen voltage, fed through the 14-Mc. tuned circuit, is taken from an adjustable tap on a bleeder across the 300-volt plate supply. Screen voltage is adjusted for maximum output, but metering is advised, to prevent exceeding the tube's ratings. The 14-Mc. s.s.b. signal is fed to the 6524 screen, of course.

(*Continued on page 158*)

Gateway



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To keep unwanted mixer products out of the final grid circuit, K6GFI runs the 6524 output through a 144-Mc. re-entrant coaxial tank circuit. This is made of copper, 1⅜ inches square and 10 inches long, with a ¼-inch inner conductor, tuned with a 50-$\mu\mu$f. trimmer.

OES Notes

W1KCS, Providence, R. I. — Worked W4LTU, Orlando, Fla., via meteor scatter during Geminid shower. Would like skeds for other meteor work.

W1SUZ, Colebrook, Conn. — Receiver especially designed for v.h.f. use now nearing completion. Front ends are converters for the various bands. These work into a 6BA7 mixer and 6SJ7 local oscillator, covering 30 Mc. to 500 kc. Two stabilized tuning ranges for converters are provided at 7 to 11 Mc. and 1.5 to 2 Mc. i.f. system at 465 kc. includes crystal-lattice filter, either product detector or infinite-impedance detector, and *Q* multiplier. Audio and power supply with Selecto-ject is separate unit used with previous receivers.

W1UHE, Tiverton, R. I. — Working W1VNH, Agawam, Mass., regularly on 220 Mc. Signals usually weak. Path is about 75 miles with rough terrain and hills up to 1000 feet in between. Both locations near sea level. 50-Mc. s.s.b. exciter completed; good reports being obtained with 4 watts. 829B linear under construction.

K2DDK, Flushing, N. Y. — Can't figure out why some fellows with otherwise well-equipped v.h.f. stations do not make provision for c.w. operation. In a contest they can't possibly compete with the c.w.-equipped station, and they automatically leave themselves out of much of the interesting v.h.f. DX work.

K2ITP, Riverton, N. J. — Half-watt mobile on 50 Mc. doing better than expected. Normal solid range with home station is 10 to 15 miles, and the signal has been reported out to 50 miles. Worked 157 stations on 6 alone in V.H.F. SS from home station, including W4IKK, by ionospheric scatter.

K2RKL, New York City — Two Long Island 50-Mc. nets: Tuesday and Thursday, 50.25 Mc.; Sunday, 0730, 50.1 Mc.

W4HKK, Collierville, Tenn. — Converter for 432 Mc. now completed. Includes 416B r.f. stage built by W7LHL, 6AJ4 cascode i.f. at 50 Mc. with output at 7 to 11 Mc. for working into HRO-50. Will be on shortly with 4X150A doubler, running 50 watts input. Presently working W5RCI, Marks, Miss., crossband, 432-144. W4RFR, Nashville, nearly 200 miles, is worked crossband 6–2, making for fine duplex QSOs.

W4IKK, Rome, Ga. — Fine response of 6-meter men in Ga., Ala., Tenn., and S. C., made this year's V.H.F. SS more fun than ever before. Ionospheric scatter and back-scatter contacts helped, too.

W6LWT, El Cajon, Cal. — Now working 420-Mc. mobile. Notice fast flutter in working fixed stations, but mobile-to-mobile sigs seem steady.

W7QDJ, Clearfield, Utah — Newcomers to 6 include W7s RPY, Sunset, and BCN, Ogden. Stations on 144 Mc. in Salt Lake Valley now changing to horizontal polarization in attempt to extend working range.

W8TIN, Clio, Mich. — Biggest surprise of ham career came on Jan. 3rd, when KL7VT, Summit, Alaska, responded to a 50-Mc. CQ at 1801 EST! KL7VT reported it his first stateside contact on 6.

W9PUD, Anderson, Ind. — Would like to stir up interest in RTTY on 50 Mc. Any takers?

WØUSQ, Davenport, Iowa — Expect to be RTTY on 2 and 6 by middle of March. Heard several East Coast 2-meter stations during Jan. 21st aurora, but could not raise them on c.w., 144.043 Mc. Suggestion from W1HDQ — Try moving higher in the band and calling some good long CQs. The first 100 kc. is a solid mass of strong signals here during a good aurora.

MEMBERSHIP CHANGES OF ADDRESS

Four weeks' 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.

GPR

(*Continued from page 46*)

These relays are customarily one-way traffic exercises. We almost had an unexpected chapter to report in this relay. Government officials apprised of the relay in progress hinted the strong possibility there might be radio acknowledgments filed by the White House. The Washington gang advised ARRL; the Regional Net Control Stations that are key points in the ARRL National Traffic System (see Feb. *QST*, page 50) were alerted to this possibility. We *were* ready with our best service. But on Jan. 24th word was distributed by W1AW and W3WV that no reply would be filed. So another relay becomes history.

There was no fully satisfactory answer to the question why all states didn't send messages. We do know that at least one SCM or his designated man failed to contact the governor. W9KQL reported the Illinois gubernatorial stand that sending a message was superfluous, since their governor was going to Washington in person to extend felicitations. We'll conclude with a state-by-state message routing from data reported here:

Calif.	K6EHT W3WV W3ECP	No. Dak.	WØHVA WØSCT WØCZ K4USA W3ECP
Colo.	WØCDX W3CVE *	Okla.	W5EHC W5GIQ W3WV *
Ga.	W4CFJ W3CVE *	Ore.	W7USA W3WV *
Ind.	W9SWD W9TQC (QIN UTL) W3PZW	Pa.	W3DJZ W3OMN *
Iowa	WØLCX W8ELW W3LYQ W3MCG *	So. Dak.	WØUVL W9GWK W3PZW
Ky.	K4HOE W3PQ *	Tenn.	W4IV W4PIM W4BVE
Maine	W1WRZ W1TOP W2OLV K4DOR W3TCN	Tex.	W5CVQ W3EIX
Mass.	W1BB (W3PZA) (W2AAO) W3MCG *	Va.	W4BZE K4KNP W3PQ *
Mich.	W8MEX W3AKB	Wash'n	W7FWD W7FRU W3WV W3ECP *
Mo.	KØCTG W3WV *	W. Va.	W8HZA/8 W3PZW *
N. J.	W2ZI W3ECP *	Wis.	W9GWK W3CVE
N. M.	K5HYX W4FB	Wyo.	W7MNW W4ZZA *
N. Y.	W2AAO W3PZA	C. Z.	KZ5VR W4ZZA *

— *F.E.H.*

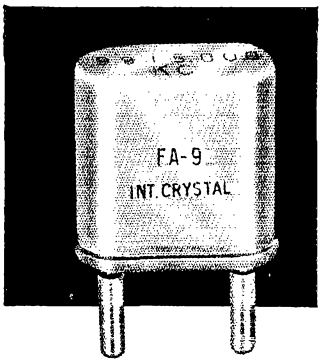
Happenings

(*Continued from page 75*)

such application has been made in advance of expiration, in instances where the renewal certificate is not returned by expiration date and operation is continued, as provided in the rules, past such date.

Don't use 405-A for renewal if at the same time you want to ask for a duplicate license to replace one lost or mutilated; again, use Form 610 in such cases.

Bear in mind that the application does not bring a new document to replace your present license; instead, the bottom portion, "Certificate of Renewal of Radio License," is authenticated, stamped with the new expiration date, and returned to you. Your present license is merely extended by the Certificate of Renewal; neither is any use without the other.



ONE DAY Processing!

FOR AMATEURS — EXPERIMENTERS 1500 KC to 50 MC

Wire mounted, plated crystals for use by amateurs and experimenters where tolerances of .01% are permissible and wide range temperatures are not encountered.

CIRCUIT: Designed to operate into a load capacitance of 32 mmf on the fundamental between 1500 KC and 15 MC. Designed to operate at anti-resonance on 3rd overtone modes into grid circuit without additional capacitance load. 5th overtone crystals designed to operate at series resonance. *(Write for recommended circuits.)*

Prices

Pin Diameter .093
Pin Spacing .486 (FA-9 Fits Same Socket as FT-243)

Frequency Range	Tolerance	Price
1500-1799 KC	.01%	$4.50
1800-1999 KC	.01%	4.00
2000-9999 KC	.01%	3.00
10000-15000 KC	.01%	4.00

Frequency Range	Tolerance	Price
Overtone Crystals — 3rd Overtone Operation		
15 MC-29.99 MC	.01%	$3.00
30 MC-54 MC	.01%	4.00
Overtone Crystals — 5th Overtone Operation		
55 MC-75	.01%	4.50
76 MC-90 MC	.01%	6.50

ONE DAY SERVICE! Crystals are sold direct, for fastest possible service. When cash accompanies order, International prepays Airmail postage; otherwise, shipment made C.O.D. Specify exact frequency and crystal will be calibrated to .01% or better of this frequency.

COMMERCIAL Precision Crystals F-6 Series 1500 KC - 50 MC

NOTE: The FA units will not necessarily have the correct correlation for Commercial use.

For Commercial applications, the F-6 type unit should be used. Write for details!

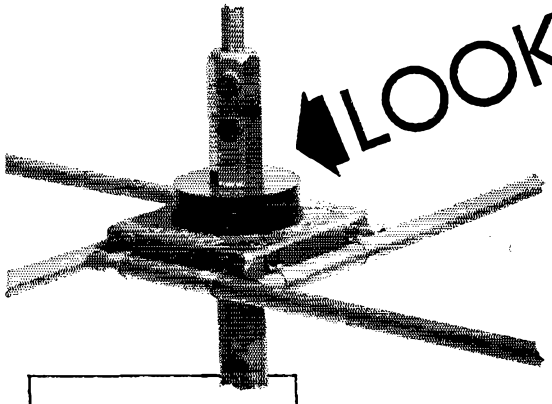
FREE CATALOG!

Ask for your copy of New 1957 Catalog showing the International complete line. Crystals available from 100 KC to 100 MC.

International CRYSTAL MFG. CO., INC.

18 N. LEE PHONE FO 5-1165 OKLAHOMA CITY, OKLAHOMA

NO MORE VERTICALS LOST IN THE WIND



LOOK — SEE how this one is secured

Only THE CARLSON has this feature and LOW PRICE TOO!

10M—$17.95
6M—$14.95
2M—$12.95

LIBERAL TRADE-INS
LOW DOWN PAYMENT —EASY TERMS.
Send for LIST of used Equipment Values!

DeMambro RADIO SUPPLY COMPANY, INC.

SIX STORES TO SERVE YOU

Worcester, Mass. Providence, R. I. Manchester, N. H.
Keene, N. H. Brockton, Mass.

All with TELETYPE CONNECTION to MAIN STORE

1095 Commonwealth Avenue, Boston 15, Mass.

Write, wire or phone ERNIE BONO (W1QBP) for immediate service

BETTER STILL, COME IN — PLENTY OF PARKING SPACE

Edison Award

(*Continued from page 69*)

for each conference, and that exclusive space be provided for the radio amateurs both internationally and nationally. For example in 1943, during the work of the Craven Subcommittee in preparing the proposals of the Interdepartment Radio Advisory Committee for the revision of the Cairo Allocation Table, the Navy submitted and strongly justified detailed recommendations for the provision of amateur bands in the spectrum above 27 Mcs. These bands may be found today in either the Worldwide or Atlantic City Allocation Tables, almost without change.

"The United States was successful in obtaining exclusive space for amateurs at the Washington Conference of 1927, and at the succeeding Conferences at Madrid, Cairo and Atlantic City. At the Cairo Conference, the advocates of high frequency broadcasting brought considerable pressure to bear upon the amateur service, and ultimately succeeded in breaching the 7000–7300 kc. band insofar as the European region was concerned. Similarly, at the Atlantic City Conference, proposals and counter-proposals regarding amateur allocations in the high frequency spectrum caused such a serious deadlock that the success of the radio conference was for a time in jeopardy. The United States delegation, again with the strong support of the Navy members, was successful in bringing about an ultimate compromise which, though not providing what we would have liked, was instrumental in making available to the amateur service the maximum amount of spectrum space obtainable under the circumstances.

"The increased use of the radio frequency spectrum, brought about by technological developments since the end of World War II, demonstrates the wisdom of the foregoing, and dictates that for the future, firm action must continue to be exercised in the preservation and provision of spectrum space for the radio amateur. I might add that the Joint Communication-Electronics Committee of the Joint Chiefs of Staff organization is well aware of this important consideration.

"No discussion of amateur radio is complete without mention of the American Radio Relay League, or ARRL, which is virtually synonymous with amateur radio itself in this country. Established in 1914 and continuing with increasing growth and influence (except for the short period of World War I), the ARRL and its leaders are responsible primarily for the progress and development of amateur radio as it exists today. The ARRL today is not only the spokesman for amateur radio in this country, but it is also by far the largest amateur organization in the world. It is pledged to promote interest in amateur communications and experimentation. It is interested in relaying messages by amateur radio, and is concerned with the advancement of the radio art. It stands for the maintenance of fraternalism and high standards of conduct, a cooperative loyalty to the traditions of amateur radio, a dedication to its ideals and principles, so that the institution of amateur radio may continue to operate in the best public interest. The radio amateur code, drafted many years ago by Paul M. Segal, now General Counsel for the ARRL, still stands as a shining guide to the amateur in his activity and in his relationships with others. The amateur is gentlemanly; the amateur is loyal; the amateur is progressive; the amateur is friendly; the amateur is balanced, and the amateur is patriotic. By virtue of this exemplary code, the ARRL has established a standard of conduct unexcelled in any similar field.

"Through the years, the ARRL has had as its presidents four distinguished Americans. The beloved and well-known Hiram Percy Maxim, ARRL's first president, served for 22 years, until his death in 1936. Dr. Eugene C. Woodruff, then professor of electrical engineering at Pennsylvania State College, succeeded Mr. Maxim, and served ably and well from 1936 to 1940. George W. Bailey, now executive secretary of the world-renowned Institute of Radio Engineers, and formerly president of the Armed Forces Communications and Electronics Association, served with distinction as ARRL president for 12 years, from 1940 to 1952. Goodwin L. Dosland, whom I am proud to call a brother officer in the Naval Service, and who also served as one of the illustrious members of the 1956 Edison Radio Amateur Award judging panel, is currently president of the ARRL. The official organ of the ARRL is *QST* magazine, a respected and valuable journal not only to radio amateurs

(*Continued on page 164*)

but also to many others in the field of communications and electronics, world-wide.

"It has been a pleasure, this evening, to address this receptive audience who shares with me a common interest in the past, present and future of amateur radio. I consider it a privilege, as I know you do, to have a part in these ceremonies honoring the 1956 radio amateur of the year, Mrs. Mae Burke."

Correspondence

(Continued from page 39)

CQ DX

1340 Giddings S. E.
Grand Rapids 6, Mich.

Editor, *QST*:

In contrast to those who condemn the use of "CQ DX" as standard procedure, I would like to thank all those who do use it and offer the following for consideration of those who say it brands us as lids.

I use it because I want to save time for other W stations who might be hearing me. It tells them I'd rather not get hit with an S9 signal when I am only interested in searching out a weaker foreign signal. Conversely, when I hear a "CQ DX" on the air, I immediately know enough to let him alone — and I can search the band for another contact. I'd no more think of calling him than I would if he were calling "CQ California," or for that matter actually calling another station.

The operators who use "CQ DX" provide me with a valuable service. It not only saves me time, but, if I have just turned on the receiver and am waiting for the rig to warm up, it gives me a known spot to monitor the band and to see who comes back to him and what conditions are. If he answers a VS1 I didn't even hear and my beam is pointed NE, it tells me I'd be wise to swing it around and see if I can pick up a new country. If it is a G or some other European station and he is only an S5 in my receiver, but I hear a W7 give him an S8, I can be pretty sure skip isn't favoring the midwest. The "CQ DX" boys instantly identify themselves as excellent monitoring spots up and down the bands.

And so I'd like to thank every one of them who uses this so-called lid procedure, and with the kind permission of those who condemn it, I think I'll continue to furnish the same service for those who wish to avail themselves of it. I don't wish to start an argument, but I think there are two sides to this matter.

— *Norman C. MacPhail, W8DLZ*

HAM Q

P. O. Box 207
Winnebago, Ill.

Editor, *QST*:

I fully agree with W6MUR's letter in February *QST*, p. 49. The boys who spend a lot do get an unfair break. A way to cure this follows. It's so simple, it is almost stupid.

1) All of us have spent something on ham radio.

2) None of us has spent as much on ham radio as we would have liked to spend.

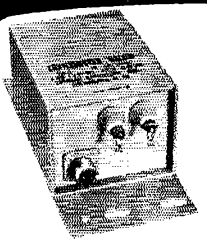
3) The true merit could be found for any ham by simply dividing what he would have liked to spend by what we did spend.

$$\text{"Ham Q"} = \frac{\text{What a ham wanted to spend}}{\text{What he spent}}$$

The "Ham Q" would then be a multiplier in all award or contest rules. This would take into account the rich

(Continued on page 166)

FOR YOUR TRANSMITTER —



ONE BALUN FOR 1.5 to 30 mc

Full Kilowatt Rating When SWR is 2 to 1 or Better

One balun for 1.5 to 30 mc. True broadband operation. No switching or complicated circuitry. Full kilowatt when SWR is 2 to 1 or better. Three types are available.

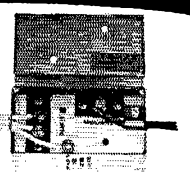
Type TB-2 Matches between 75 ohms unbalanced, and 300 ohms balanced...Price $16.95
Type TB-3 Matches between 50 ohms unbalanced, and 200 ohms balanced...Price $17.50
Type TB-4 Matches between 75 ohms unbalanced, and 75 ohms balanced....Price $17.50

These baluns are a natural for feeding dipoles, beams, trap antennas, twinlead, etc., etc. They allow transmitters designed for coaxial cable output, to drive balanced circuits without any strain or pain. Completely weather-proofed, they may be mounted on a pole, suspended by a rope, or mounted in your shack.

Specifications: 3½" wide, 3" deep, 4½" long (less mounting bracket), 8" long (with bracket). Weight 2½ lb.

FOR YOUR RECEIVER —

A MATCHING BALUN FOR 1.5 mc to 150 mc



Of course, a transmitting balun may also be used for receiving but it is certainly uneconomical. The Lynmar type RB-1 Receiving balun is designed to match between 75 ohms unbalanced and 300 ohms balanced from 1.5 mc to 150 mc. It may be used between unbalanced circuits of 50 to 100 ohms and balanced circuits of 200 to 600 ohms when the upper frequency limit is restricted to 30 mc.

Some communication receivers have a high impedance input. In such cases, use of the RB-1 balun between a coaxial feed line and the receiver may result in a definite increase in signal and a better signal to noise ratio. Similarly, it can be used to efficiently feed twinlead into receivers designed for coax input. It may be used for transforming from twinlead to coax to decrease noise pickup and then back to twinlead if necessary. It is a flexible piece of gear with a variety of uses.

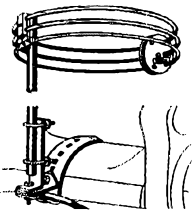
Type RB-1 $2.95
Specifications: 3½" long, 2" wide, 1" deep. Weight 3 oz.
Also Available: Type RB-2 Matches between 75 ohms unbalanced and 300 ohms balanced . . . 50 mc to 1000 mc .....Price $2.95

LYNMAR ENGINEERS, INC.

1432 N. CARLISLE STREET • PHILADELPHIA 21, PA.

Consultants and Manufacturers

ELECTRICAL - MECHANICAL - ELECTRONIC



"SATURN 6"

MOBILEER

- Horizontally polarized
- Minimizes flutter and noise
- Adjusts to your frequency in 6 meter band
- Feeds with 50-ohm cable
- Fits standard mounts
- Ruggedly constructed
- Weighs under 2 lbs.

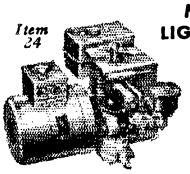
MODEL S-1
"Saturn 6" Antenna

2-pc. adjustable aluminum mast, bracket, universal bumper bitch. No holes to drill. Co-ax feed line not inc. Net.....$16.95

HI-PAR PRODUCTS CO. • **Fitchburg, Mass.**

BUY DIRECT FROM-FACTORY — SAVE MIDDLEMAN PROFITS

MASTER MECHANIC PORTABLE LIGHT PLANTS, PUSH BUTTON START



Item 24

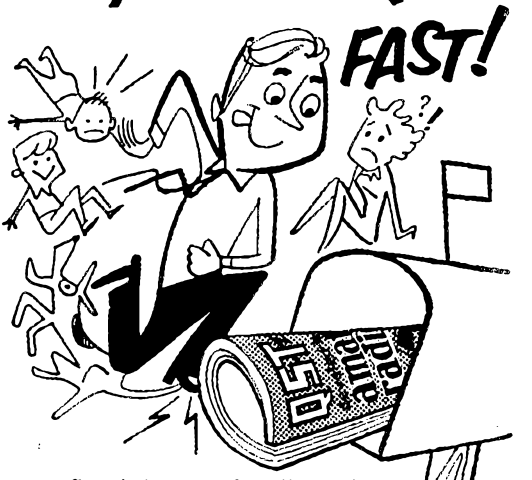
AC Plant 700 Watts — 115 v. 60 cyc. Powered by a rugged 2.2 hp. easy starting Briggs gas engine. No wiring necessary; just plug in and operate. Plenty of current for receivers, transmitters, antenna motors, emergency lights, etc. which require up to 700 Watts. Ideal for radio amateurs, Civil Defense, trailers and camps. Complete with Voltmeter and built-in winding to charge 6 v. auto batteries.

Item 24. Wt. 75 lbs. Be prepared if war or storms knock out power lines..... **$143.50**
800 Watt Plant (Item 44) same as above but with larger engine and greater capacity..... **$169.95**
1200 Watt Plant (Item 45) same as Item 24 but with larger generator and engine — 50% greater output **$199.50**

We make all sizes up to 25,000 Watts. Write for information.
Send 10¢ for big 1957 Catalog. Free with order.
Prices f.o.b. factory. Money back guarantee. Send check or M.O.

Master Mechanic Mfg. Co., Dept. 30-Q, Burlington, Wis.

Be sure to get your May Issue of QST



There's **big news** from Hammarlund — not just reworks of present products, but brand-new, from scratch, designs.

HAMMARLUND
HAMMARLUND MANUFACTURING CO., INC.,
Since 1910 **460 W. 34th ST., N. Y. 1, N. Y.**

fellow who spent all he cared to and give a break to the fellow who only had a few pennies but was nuts enough to want a good rig.

Frankly, I feel persecuted as I feel sure my lousy rig, my poor fist, my skippy copy, and my disinterest have kept awards from me and my mother always said I was as good as the next fellow. In fact, I'm boiling mad at those millionaires. Maybe only hams who have stolen all their equipment should be allowed to compete. (These would have a "Ham Q of infinity"; i.e., something divided by nothing equals infinity.)

— *Conrad R. Hilpert, K9DJG*

WAIT ONE

Antioch College
Yellow Springs, Ohio

Editor, *QST:*

It occurred to me recently that we are more or less in need of a new Q signal. Something to the effect of "Wait, I am checking my Conelrad monitor." Many of the monitors either involve a brief pause in checking, or will indicate "alert" under conditions of malfunction, sign off of station monitored, or temporary cessation of modulation on the monitored signal. There should be something short and brief indicating that a check is necessary before further transmission is necessary — a Q signal? Haven't a complete list to check but QNL, QCD, or some such seem logical.

— *Jim Pullman, W8EXZ*

STRONG WORDS

76 Highland Road
Glen Cove, L. I., N. Y.

Editor, *QST:*

February *QST*, p. 49, carries a note from W6MUR, expressing his personal opinion of sponsored DX-peditions and voluntary contributions to those who spend their time and money to visit out-of-the-way places.

Personally, I appreciate the efforts of these venturesome amateurs and feel that if I can cover the airmail and printing cost on my QSL and maybe chip in a few cents for some other ham who can't afford it or who won't, I'm glad to be able to help.

Certainly one fellow's idea of "morality" and "depths of degradation" are awfully strong words to throw around — even as transient opinions. . . .

— *Al. Stobbe, W2WZ*

125-MILE LIMIT

1685 Lincoln Hwy. E.
Lancaster, Pa.

Editor, *QST:*

I wish to register my opposition to the recent ARRL proposal to the FCC requesting a return to the 125-mile limit for license examinations. I believe that the liberalized rules on mail examinations have been a great contribution to the growth of amateur radio. (It saves us a few tax dollars, too.) . . .

Many of the new amateurs that I have talked to are under 20 years of age. These younger amateurs are doing us all a service by increasing our numbers and using our bands. . . . Many of the younger applicants could not manage a long trip to obtain a license. We should not ask for rules which would tend to exclude them.

— *George S. Gadbois, W3FEY/W1UIZ*

R. F. INDICATOR

Orange, New Jersey

Editor, *QST:*

Conelrad monitors, CD monitors, fancy gadgets, and so forth — all very fine. The law says you have to, so I did.

I built the little gimmick as described on page 49 of January *QST* (Conel-Band Aid) and attached it to my trusty old broadcast a.c.-d.c. portable radio and fired it up. It works fine with practically any B.C. station in the area. I'm using WOR.

Now, can anyone tell me how I keep the neon bulbs from blinking when my 110-watt transmitter is on? Some warning device! When I go on the air, it tells me I'm on and to hoot with Conelrad! . . .

— *Paul Boivin, Jr., W1ZXA/K2SKK*

NEW BOOKS

Reference Data for Radio Engineers, fourth edition, published by International Telephone and Telegraph Corporation, 67 Broad St., New York 4, N. Y. 1121 pages, plus index, 6 by 8¾ inches, cloth cover. Price, $6.00.

Users of the preceding (third) edition of this well-known handbook are invited to note that the fourth edition is just about 500 pages larger. In fact, each new edition gives the impression of being twice as thick as its predecessor — a process that for physical reasons alone obviously cannot continue indefinitely!

Part of the expansion in this new edition of the popular "*Federal Handbook*" is in additional subjects not previously covered. New chapters have been added on magnetic amplifiers, semiconductors and transistors, transistor circuits, scattering matrixes, digital computors, nuclear physics, information theory, and probability and statistics. Earlier material has been enlarged and in some cases rechaptered — for example, there are now three chapters on filters: one on design by the image-parameter method, one on the use of modern network theory, and a band-pass design chapter that includes material formerly under the title "Selective Circuits." Servomechanisms are now treated under "Feedback Control Systems," the material on this subject being largely new. The mathematical sections also have been considerably expanded.

The compact and economical method of presentation characteristic of preceding editions is continued in this one. Truly a book that anyone professionally engaged in radio or electronics can't afford not to have.

Electronic Technology Series (formerly Rider Review Series), edited by Alexander Schure. Published by John F. Rider Publisher, Inc., 480 Canal St., New York 13, N. Y.; 5½ by 8½ inches, paper covers. No. 13, *L-C Oscillators*, 72 pages, $1.25; No. 16, Resonant Circuits, 72 pages, $1.25.

Earlier volumes in this series were reviewed in the October and November, 1956, issues of *QST*. No. 13 appears to be on a more advanced level, at least from the standpoint of the amount of mathematics employed, than the other books so far published in the series; the mathematical design material is carried a bit deeper than is customary in elementary texts. Most of the book is devoted to conventional tube oscillator circuits, but there is a short closing section on special types of u.h.f. oscillators. No. 16 discusses reactance, resonance in series and parallel circuits, coupled resonant circuits, and transmission-line resonant circuits, with a brief outline of their principal applications.

Servicing TV AFC Systems, by John Russell, jr., published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. 119 pages, including index, 5½ by 8½ inches, paper cover. Price, $2.70.

A general text describing the operation of a.f.c. systems for horizontal sync in television receivers, with methods for trouble-shooting.

SOS at Midnight, by Walker A. Tompkins, published by Macrae Smith Company, Philadelphia 2, Pa., 223 pages, 5½ by 8¼ inches, cloth cover. Price, $2.75.

K6ATX has done a remarkable job of sugar-coating an introduction to amateur radio, wrapping it in a fast-moving adventure story involving 17-year-old Tommy Rockford and his friends with a gang of smugglers. Before the boys are finally rescued after a dramatic SOS at Midnight, Tommy has explained many things about amateur radio, including TVI, ham language, cost of getting started, DX chasing, rag-chewing, and the League — all without slowing down the plot. This may make an ideal gift for that junior op, nephew, or friend you have been trying to interest in radio.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters, be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type copy be signed solely with amateur call letters.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) **Remittance in full must accompany copy, since Ham-Ads are not carried on our books. No cash or contract discount or agency commission will be allowed.**

(5) Closing date for Ham-Ads is the 20th of the second month preceding publication date.

(6) **A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature.** Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) **Because error is more easily avoided, it is requested signature and address be printed plainly. Typewritten copy preferred but handwritten signature must accompany all authorized insertions.**

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used FM communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9VIV, Troy, Ill.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8KP, Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. NOrmandy 8-8262.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara Calif.

WANTED: All types aircraft & ground transmitters, receivers ART-13, RT18/ARC1, R5/ARN7, BC610E, ARN6, BC788C, ARC3, BC342. Highest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system alternator, regulator & rectifier, $45.00. Also Leece-Neville 12-volt 100 amp. system, alternator, regulator & rectifier, $85.00 Good condition. H. A. Zimmermann Jr., K2PAT, 115 Willow St., Brooklyn 1, N. Y. Ulster 2 3472.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gonset, Hallicrafters, Hammarlund, Johnson, Lysco Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

URGENTLY need AN/APR-4 items particularly tuning units for important defense contracts. New high prices. Engineering Associates, 434 Patterson Rd., Dayton 9, Ohio.

WANTED: Receiver R5/ARN-7, MN-62A transceivers, RT18/ARC-1, AN/ARC-3, BC-788C, 1-152C, Collins, Bendix equipment, test sets, dynamotors, inverters. We pay highest prices. Advise quantity, condition, price in first letter. Aircraft Radio Industries, Inc., 15 East 40th St., New York City. Tel. LExington 2-6254.

DX'ERS Notice! Save money? Save Time? Free info. DX QSL Coop, Box 5938, Kansas City 11, Mo.

PANORAMIC Adapter ID-60/APA-10 Tech. Manuals $2.75 postpaid in U. S. A. Electronicraft, 27 Milburn St., Bronxville 8, N. Y.

MULTI-BAND Antenna. 80-40-20-15-10, $19.95. Patented. Send stamp for information. Lattin Radio Laboratories, Owensboro, Ky.

SAN FRANCISCO and vicinity. Communication receivers repaired and realigned. Guaranteed work. Factory methods. Special problems invited any equipment. Associated Electronics, 167 So. Livermore, Livermore, Calif. W6KF, Skipper.

WANTED: 2-way FM equipment. Phillips, 1312 McGee St., Kansas City, Mo.

WANTED: Highest prices paid for ARC-3, ARC-1, BC788, BC610, BC348, ART13, BC312, BC342 and other military or aeronautical surplus. Name your price. We pay freight and c.o.d. James S. Spivey, Inc., 4908 Hampden Lane, Bethesda, Md.

WANTED: Used receivers and transmitters: Will pay cash or trade, 10% down with up to 24 months to pay. In stock: New 75A4's, KWSI's (Collins equipment shipped out of our Cedar Rapids store). Demonstrator Johnson KW amplifier with desk; Johnson 6N2, Valiant, Pacemaker, B&W, National, Hallicrafters, Elmac, Hammarlund, Gonset, Central Electronics; 10-15-20 meter Hi-Gain beams, $99.75; 10 meter, $18.95, also Mosley & Gotham. Write for Bargains in used receivers and transmitters. Ken, W0ZCN, or Glen, W0ZKD, at Ken-Els Radio Supply Co., 428 Central Ave., Ft. Dodge, Iowa.

QSLS? SWLS? Finest and largest variety samples 25¢. (refunded). Callbooks (Spring Callbooks), $4.50. "Rus" Sakkers, W8DED, P.O. Box 218, Holland, Mich.

C. Fritz for better QSLS-SWLs! Top quality! Samples 10¢. 1213 Briargate, Joliet, Ill.

QSLS-SWLS. Meade W0KXL, 1507 Central Avenue, Kansas City, Kans.

QSLS-SWLS. 100, $2.85 up. Samples 10¢. Griffeth, W3FSW, 1042 Pine Heights Ave., Baltimore, Md.

QSLS. Nice designs, Samples, Besesparis, W3QCC, 207 S. Balliet St., Frackville, Pa.

DELUXE QSLS — Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

QSLS-SWLS. Samples free. Bartinoski, W2CVE Press, Williamstown, N. J.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

QSLS-SWLS. Samples 10¢. Malgo Press, 1937 Glendale Ave., Toledo 14, Ohio.

QSLS. Western states only. Fast delivery. Samples 10¢. Dauphinee, K6JCN, Box 66009, Mar Vista 66, Calif.

QSLS, sharp, 200 one color, three bucks. Multi-color samples dime, refunded. Edward Green & Sons, 4422 Marquette Drive, Ft. Wayne, Ind.

QSLS. Samples 10¢. Bob Morris, W2IHM, 230 Rose St., Metuchen, N. J.

QSLS. Twenty exclusive designs in 3 colors. Rush $3 for 100 or $5 for 200 and get surprise of your life. 48 hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLS — All kinds and prices, samples 10¢ fast service. DX Card Co., Kulik St., Clifton, N. J. GR 3-4779.

QSL Samples. Dime, refundable. Roy Gale, W1BD, Box 154, Waterford, Conn.

QSLS. Lower prices, faster delivery. Catalog, 10¢. Dick, K6GJM, 10558 E. Olive, Temple City, Calif.

QSLS-SWLS. Samples free. Bolles, W5OWC, Box 9007, Austin 17, Texas. (We regret p.o. box error in last ad.)

LIVELY! Original! QSLS! Catalog, stamp. WAT, Box 128, Breckville, Ohio.

QSLS. Neat, Attractive. Samples 10¢. Woody's. Box 164, Asher Sta., Little Rock, Ark.

QSL Special. Free sample. Nat Stinnette, W4AYV, P. O. Box 155, Umatilla, Fla.

QSLS, Taprint, Union, Miss.

RUBBER Stamps for QSLS: sample imprints. C. W. Hamm, W9UNY, 542 North 93rd, Milwaukee, Wis.

QSLS. Samples, 10¢. H. J. Snyder, 398 Washington, Peru, Ind.

NEW! QTH cards! Proud of your call? QTH? Large call in color, QTH, Land Line. Business card quality, size. Must for Ham Gatherings. Samples 10¢. Country Print Shop, Route 2, Chesterton, Ind.

QSLS. Samples, dime. Printer, Corwith, Iowa.

NOVICES! Generals! QSLS, SWLS, YL-OMs (Samples approximately 9¾¢.) Reasonably priced "tacked-up-kind," different, comic, sedate, diversified, attractive, prototypal, unparagoned, infrequent, unprecedented, extraordinary, dissimilar (whew!). Rogers, K0AAB, 737 Lincoln Ave., Saint Paul 5, Minn.

QSLS, Cartons, colors. Samples 15¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

QSLS, SWLS. Samples dime. Backus, 703 Cumberland St., Richmond, Va.

QSLS. Glossy. Samples 10¢. W1OLU Press, 30 Magoun, Medford, Mass.

RUSPRINT Special: QSLS-SWLS, .01¢ each, samples 10¢. Rusprint, Box 7507, Kansas City 16, Mo.

QSLS Ham's "Super-Speed Specials" are the best darned wallpaper you've ever seen. Gil Cartoons, Maps, XYL-OM, Mobiles. Samples dime. Robinson, W9AYH, 12811 Sacramento, Blue Island 11, Ill.

NEED Information: wish to meet hams operating fur farm, letter or radio. Work all bands. Schedules possible week-ends and evenings except Monday. W8WUN.

FOR Sale: Collins 32V2, in new condx, $375. W2JXP, J. Erickson, 10 Woodbury Way, Syosset, L. I., N. Y.

CASH for BC-312, BC-342, R5A/ARN7, BC-788, BC-610E, BC-939, BC-614, BC-221 and late type test equipment, receivers, etc. Amber Industrial Corporation, 75 Varick St., New York 13, N. Y. We pay freight charges. Write.

SELL: 32V3, $475; 75A3 with speaker, $350. Guaranteed in excellent condx. Fred Stein, W9KPL, 203 S. Harrison St., Warsaw, Ind.

SEND for this month's standout listings of Reconditioned Equipment. Also request our new "1957" Amateur Catalog. We feature all leading brands and promise you an attractive deal always regardless of your needs or budget. Check our offer first. We deal quickly, easily and always on a personal basis. Stan Burghardt, W0BJV, Burghardt Radio Supply, Watertown, S. Dak.

RECEIVERS: Repaired and aligned by competent engineers, using factory standard instruments. Authorized Factory Service Station for Collins, Hallicrafters, Hammarlund, National. Our twenty-first year. Douglas Instrument Laboratory, 176 Norfolk Ave., Boston 19, Mass.

VACATIONS. Ham with my equipment, modern housekeeping cabins, American plan. Big McKenzie Lake, Spooner, Wis. Tony Martorano, W9HZC.

UNUSED BC-429 receivers, complete w/6 tubes; 2500-47 k.c. coil and 201-398, 4150-7700 k.c. 2 band coil. Shipping weight app. 18 lbs. $2.95, C.O.D. only. George Salyers, 112 Neal Ave., Dayton, Ohio.

WANTED: ARC-3, ARC-1, ART-13, BC-312, BC-342, BC-610, BC-788, O-17/ART13 LFO and other surplus. Advise what you have and price. Ritter, W4VHG, Box 5878, Bethesda, Md.

SCHEMATIC diagrams ARC-5 80-40 meter rcvrs and xmitters, 25¢ each or trade. S. Consalvo, 4905 Roanne Drive, Washington 21, D. C.

RADIO magazines. Buy, sell or trade. Bob Farmer, Plainview, Texas.

COLLINS KWS-1. Purchased new, delivered late November 1956. Late series and never uncrated. $1895 cash or consider trade on retail price of $2095. WØFMK, Barnett. Telephone TE 7-3491, St. Louis, Mo.

BEAUTIFUL Nickel-plated self-inking pocket rubber stamp. Name, address and call, $1.40. For sale: back issues of *QST*. Howard Rapple, WØVRB, 401 N. 2nd St., Humboldt, Iowa.

CASH Paid! Sell your surplus electronic tubes. Want unused, clean transmitting, special purpose, receiving, TV types, magnetrons, klystrons, broadcast, etc. Also want military, and commercial lab test and communications gear. We swap, too, for tubes or choice equipment. Send specific details in first letter. For a fair deal write, wire, or telephone: Harry Electronics, 512 Broadway, New York 12, N. Y. Tel. WAlker 5-7000.

FOR Sale: One NC-98 rcvr, $100, plus shipping cost. Arden Henry, Canisteo, N. Y.

WANTED: BC-221, BC-348, BC-312, BC-342, BC-610-E, ARN-7, BC-788, ARN-6, APR-4, ARC-1, ARC-3, ART-13. All types surplus or amateur transmitters, receivers, test equipment taken in trade for New Johnson Viking Ranger, Pacemaker, Valiant, Hallicrafters, Hammarlund, National B&W, Gonset, Elmac, Telrex, Fisher Hi-Fi, etc. Write Tom, W1AFN, Alltronics, Box 19, Boston 1, Mass. Tel. Richmond 2-0048.

COLLINS 32V2 xmitter LN condx, best offer over $350. Blum, 396 E. Whittier St., Columbus 6, Ohio.

FOR Sale: Best offer or swap for mobile rig: 4 transformers 1600 volts 300 Ma., HV filament transformer for 866's; 3 transformers 12 volts 11 amp, 24 μfd 4000 v. and 2 3μfd, 2000 volt condensers; 3-10 Hy. 250 Ma. choke and one 300 Ma. swinging choke, 6-866 and 1-813 tubes. All unused Govt. surplus from storage. W6HOJ, 2006 Hamner Ave., Corona, Calif.

KW $300; complete; VFO, 813, 250TH's, Class B 304TL's, speech amplifier, all power supplies, rack-mounted; spare tubes and coils. Presently on the air. Final adapted for C or AB1 operation. K6DUE, North Hollywood, Calif.

FOR Sale: Ham station with less than 300 air contacts. B&W 5100, excellent condition, $350; HRO-60 with speaker and 7 coils A, B, C, D, E, F and AD: $475. Both for $795. K6PGE.

FOR Sale: HQ-140X with speaker, not yet a year old, $220; 40 watt modulator, $35; Adventurer, $40. K5CDD, 2400 Long, Beaumont, Texas.

FOR Sale: Hart c.w. xmittr, 75 watts; 80 thru 10, $45; Knight VFO, $20. Information on modulator furnished on request. K2MFB, Bill Valky, Stella Rd., Binghamton, N. Y.

SELL: QST 1930-40 inclusive run. Good condition, no dog-eared, torn, missing, discolored pages, covers, etc. $25 or $2.50 year. Want BC-221 with calibration chart. VE7DY, 1610 Pinewood Ave., Victoria, B. C., Can.

10 Mtr. lo W. mobile xmittr, $12.50; 10 mtr. converterette, $8.50; 10 or 15 mtr. Preselector, $4.50. F.o.b. W6RET, 862 Elm, Chula Vista, Calif.

TRADE: Voigtlander Vito B camera for DX-35 Globe Chief, Adventurer, or the equivalent. 100% QSL. Hugh Shoemaker, New Haven, Kentucky.

SELL: Gonset G-66, 12 volt, excellent condx, used 5 months, hot on all bands. Complete with all hardware, manual, accessories, $195. Allan Murphey, W4JAG, Princeton, Kentucky.

HRO-60T in top condition and appearance, coils cover all bands from 50 Kcs to 30 Mcs. and 50-54 Mcs., complete with crystal calibrator and NBFM adapter, $425. W3QVK, 327 Roberts Ave., Glenside, Pa.

A54H with 40 and 15 added, Gonset Super Six converter, 400 at 250 mil dynamotor. All six volts, and all in exc. condx: $100 F.o.b. Peekskill, N. Y. Dick Walker, Adams Rush St., RJ, Peekskill, N. Y.

SELL Hallicrafters receiver S-40B. Complete with Q multiplier. Both in brand new condition physically and mechanically. Used less than 50 hours, $75. G. Townsend, 234 Charles St., So. Meriden, Conn.

WANTED: Novice transmitters And Receivers for underprivileged Boy Scout troop trying to get ham license: Heath AR-3, AT-1, S-38D, SW-54, Adventurers, Homebrews, etc. Must be cheap. Need code course. Charles D. Cobb, 206 Pitt St., Greenville, N. C.

FOR Sale: BC906C freq. meter, excellent condx, and GE Sideband Slicer mod. A. Write for price and details. Peter Unchur, W2URM, RFD #5, Amsterdam, N. Y.

FOR SALE: Complete Elmac mobile outfit including AF-67 transmitter, PMR 48A receiver, PSR 12 power supply, dynamotor, mike, Vaaro whip antenna and mount. All relays, etc. $250.00. Wm. S. Warner, 7930 SW 54th Ct., Miami, Fla.

SELL: New Elmac 4-400A, B&W KW inductor #850, National MB-40SL. Any reasonable offer considered. Send check. W1GKK, 109 Gallup St., North Adams, Mass.

SELL: Heath AR-3 receiver; highest offer over $20. QF-1 Q-Multiplier, $11.50; both are one month old. Mike Hoodes, 219 Beach, 135th St., Rockaway Beach 94, L. I., N. Y.

OPPORTUNITY of a lifetime. Someone between the ages of 16 to 19 will be needed to operate complete Johnson Kilowatt Station at brand new boys' camp in New Hampshire. Free travel expenses, room and board, salary dependent upon qualifications of amateur. Needed for end of June 1957 through middle of August. Come and get it! Contact W3THI.

FOR Sale: Collins 32V1 improved with shielding, leads by-passed, etc.: $275. Collins 75A1 receiver with speaker, $250. HROS-TA1 receiver with speaker and power supply, $150. VHF152, $35. Gonset Commander trans. w/coils, 160 thru 10 meters, $75. All items are in excellent shape. Jim Adamson, W9THB, 2422 Grand Ave., Granite City, Ill.

SWAP or Sell: Have HRO60, like new condx; Collins 32V1 TV1 suppressed, with antenna coupler and co-ax relays, also 1951 Johnson 5 H.P. outboard; want good outboard runabout with motor and trailer. All inquiries answered. W1WQN, Bill Mueller, 10 Dover St., Pittsfield, Mass.

LOOKING for good condx copy DeSoto's "Two Hundred Meters & Down". Reasonable price. K. Komuro, JA9AB, 1-6 Ikedamachi, Box 73, Kanazawa, Japan.

FOR Sale: Gonset 6 meters Communicator, 6/115 VTS with xtal and mike and mobile whip ($125) or will trade for Ranger, etc., with cash. Thomas Dalton, K2QCP, 18 Broad St., Newark, N. J.

HAM Register soon goes to press!

TWO Vacuum variable capacitors 18-80 μμfd at 7000 volts, ?-1000 μμfd at 3000 volts. Need Communications receiver or what have you? Ken, W7ROM/4, 336 W. Blvd., Charlotte, N. C.

WANTED: Collins 75A4 with filters, $1000 in tubes, power supply units, test equipment, meters, miscellaneous parts for trading. W6OOB, 4254 Niagara Ave., San Diego, Calif.

GLOBE KING 400B, TVI suppressed. In excellent condx: $275; Phasemaster Jr., 50 watt SSB exciter with voice control and receiver anti-trip, excellent, $70. Robert Hanson, 5509 Highland Road, Minneapolis 24, Minn.

HAMMARLUND PRO-310 for sale: Ser. No. 686, purchased new June 1956. Used very little: $375. Subject to prior sale. S. B. Bailey, 896 Ridgewood Rd., Millburn, N. J.

FOR Sale: 1.4 KW (California Kilowatt) D.C. power supply on casters. Powerstat control to 3.5 KV, 400 Ma., 115/230 input. F.O.B. Berkeley, Calif. Robert L. Ellsworth, 2637 Dana St., Berkeley 4, Calif.

SELL: AT1 — $22; S-38, $25; AC1 — $8 or 50 takes all. K6RLX, Rt. 1, Box 264, Le Grand, Calif.

WE Plan to add several members to our staff of 55 state police radio operators. We prefer men with commercial licenses but will consider amateurs who are high school graduates, not older than thirty-two, some typing ability, code speed of at least 15 WPM and interested in servicing equipment. Permanent positions with retirement. Write: Director, Radio Division, Highway Patrol, Jefferson City, Mo.

SELL: DX-100, $185, excellent condx; Heath 0-8 5" 'scope, $25. All letters will be answered. W3BMF, 1120 Mac Dade Blvd., Woodlyn, Pa.

FOR Sale: Hickok microvolt signal generator Mod. 19XD, perf. condx, no reasonable offer refused; BC-221 complete with original charts and A.C. power supply, $50, perf. condx; Gonset Super Six converter, used 3 months, with steering column bracket, perf. condx, $35. Sid Tritsch, W2NFU, 97-10 62nd Dr., Rego Park, N. Y.

TRADE: Will trade my cameras for ham gear. W3VZL, Baltimore 4, Md. 801 Weatherbee Rd.

DX100, in excellent condx, with improved grid blocked keying, $185; nearly new Matchbox, $40. Moving to area where station is forbidden. Lt. Col. B. M. Senn, Watervliet Arsenal, Watervliet, N. Y.

WANTED: 20/meter 5/element SC20M5 Hy-Lite Skycaster beam or what have you? Russ Garlin, W3BCZ, 211 Berry St., West Pittston, Penna.

WANTED: Two HK24 transmitting tubes. State price. David Porter, W7WEE/6, 515 So. Kingsley Dr., Los Angeles 5, Calif.

MIKE/Line to grid xfrmrs, UTC AI (4); CRT xfrmr P8151240O V at 5 Ma.; Haydon timer 0-60 Sec. Want: 3-el. 20 mtr. Shortbeam and 4 wire rotor for same. Howard E. Leyland, W3UDM, 19 Rainbow Lane, Levittown, Pa.

NEW SX-96, never used, $200, also beautiful 3000 v dc @ 1 amp. power supply. W1YFX, 34 Highland Ave., Somerville, Mass.

BROADCAST Transmitter and equipment wanted. Advise model, age, condition, price. Need vibrators, Mallory 525, 534C, Radiart 5805. Sell ART-13, including A.C. supply. $175. B. C. Higley, W2OEA, 82 Lower Main St., Matawan, N. J.

COLLINS 32V2 with spare RK 4D32 tube. Low pass filter. Antenna relay, 110-volt co-ax type only $325. M. Levy, W6WGT, 1615 N. Mesa, El Paso, Texas.

BEST Offer over $50 takes a Knight 50 watt rig and Knight VFO. Postpaid within 150 miles. Vic Abell, St. Bede College, Peru, Ill.

VIKING Ranger: Latest model with grid block keying. Used less than 2 months. Brand new condition. Will deliver 30 mile radius. $200. C. R. Avery, W3ARB, 129 Hopkins Rd., Balto 12, Md.

SELL: Two husky Westinghouse selsyns, gud condx, 120 volts, 60 cycles, type ADS, $10 pair. Baldwin type E headset, excellent, $10. W2TB, BA 9-3260. Chas. Gardiner, 39-20 220th St., Bayside 61, L. I., N. Y.

WANTED: Commercial 450 Mc. FM 2-way equipment; Lampkin freq. meter and deviation meter, HQ100 or HQ140 and DX100 fixmitter. Cash. W9DSV, Webster, Wisc.

FOR Sale: Five complete custom-built phone transmitters ranging in power from 50 watts to 1000 watts. All units are complete with high level modulators, well metered, built-in 'scope circuits, band-switching 20-40-80-160. Includes xtals, tubes and microphone. Complete station at one dollar per watt. Hubert Ingalls, W1NQ, Nottingham, N. H.

WANTED: Eldico SSB-100 or Johnson Pacemaker, W4PRM, L. D. Chipman, 816 Melrose St., Winston-Salem, No. Carolina.

MEDICAL Hams! Trade Beck-Lee Model E electrocardiograph for a good Collins receiver. T. R. Jacobson, M.D., WØSLG, Hot Springs, S. Dak.

SALE: QSL metal file boxes with State and DX index. Initialed with call letters, $3.00 each. Gerold Kaminski, W8OQR, 2814 Albion St., Toledo, Ohio.

FOR Sale: BC-610D and speech amplifier BC-614D with coils for 80-40-20-10 and manual, all for $250. Will consider part of cost in trade. W4EBH, Winchester, Va.

SELL: SuperPro SP-4008X, $190 or best offer; Gonset 10X11 converter, $17.50; TBS50C, $55; VFO, $30 power supply for xmitter, $25 (1200 CT at 300 Ma.) push-pull amplifier c phono & mike input and mixer, 10 watts $20; 3650 VDC CT at 450 Ma. surplus xfrmer & cT primary, standard 15 watt multi-match mod. frmr, new, $6.50; BC459 7 Mc., VFO or xmittr, and meter and coax output, $16; WRL 3-el 10 meter beam, $16 new, VEC-DX beam rot. new, $20; tubes 6146, $400; 807, $1.25, $30 Mendelsohn flash unit, exc. condx, $10. Interested in hi-fi tape recorder. R. D. Connor. 65 Suffolk, Worcester, Mass.

FOR Sale: 32V2. $375. W2ADD

TECHNICAL Manuals TM11-273, 120 pages covering BC-312 receivers and BC-191 transmitters, $2.50. ID-60/APA-10 Panadaptor manuals, $2.75. Both postpaid in U.S.A. Electronicraft, Bronxville, N. Y.

SIX Meters S.S.B. transmitter, one kilowatt peak, in rack, complete, ready to operate: $450. Cash or will take receiver in partial trade. W4UCH, Sterling, Virginia.

FEW DM-35D dynamotors 12 v. input 625 v. at 225 Ma. output $12; matching 12 v. combination relay (antenna changeover and hi voltage) $1.50. S. A. Tucker, W2HLT, 51-10 Little Neck Parkway Little Neck 62, N. Y.

SELL: Pi-net PRL 807a amp., $12; push-to-talk grid modulator, $18; Shure 707A mike, $9; E-V push-to-talk stand, $9; need cash badly. Ramon Britt, W4GIM, 819 E. 5th, Lumberton, N. C.

SX-71 for sale. First offer of $150. Bought a Collins. W. M. Montgomery, 716 N. Freedom St., Ravenna, O. Will ship collect.

ADVENTURER with modulator in cabinet, complete with microphone and crystal, $40; ARC-5 with power supply, $15. Bob Lieberman, K2SHK, 118-01 Park Lane S., Kew Gardens 18, N. Y.

NOTICES! Get started: Heath AR-2, AT-1, antenna coupler, crystal, and key, $55; code course 0-18 WPM, $12. Top condition. F.o.b. Racine, Wisconsin. Poulson, K9CPT, 929 E. Colonial Dr.

FOR Sale: QST complete: 1926, -26, -27, -28, -29, -30, -31, -32, -35, -36, -39, -40. Some 1923: all except June, July, October 1924. Almost complete run 1933, -34, -37, -38. Some extras 1926, -28, -29, -40. Also Electronics complete 1934, -37, -38, -39, -40. Almost complete 1930, -31, -32, -33, -41, -42. No 1935. Will sell entire lot for best offer or in portions. All in good condition except 1924 QSTs (no covers). W3QMZ, 17 School Lane, Springfield, Pa.

FOR Sale: DX-100 xmittr box, unopened. Liquidating estate: $170. Tajbl, 1319 S. Cuyler, Berwyn, Ill.

SELL: Pair 829-Bs. in gud condx. Hardly used: $20. Al Walthers, 3531 E. Allerton, Cudahy, Wis.

WANTED: BC-779, with power supply. Quote best price in first letter. James Mose, Box 131, Sharpsburg, Md.

CANADIANS! 35 mm Diax f2.8 Xenar lens, coupled range-finder, meter tripod, new, with cases. Will swap for gud rcvr. VE3DUV, Wilton, Ont., Can.

VHF Transmitter and receiver SCR-522A and SCR-542A, $35. W7NLR, Roy Kenna, 713 East 5th, Tucson, Arizona.

WANTED: Used Citizens Band mobile 2-way radio, 10 or 12 watt r.f. power output or more. John J. Strouhal, Hungerford, Texas.

COLLINS Station 32V3 and 75A2 with RCA speaker, $795 complete. Alfred A. Bein, K2BWQ, 26 Lenox Ave., Clifton, N. J.

WANTED: 15 meter coil for HRO-50, in gud condx. State price W8ASL, Convoy, Ohio.

FOR Sale: Hallicrafters S-76 double conversion receiver, complete with matching speaker, like new throughout, $100. Wilford Lane, WØOHX, Kiowa, Kans.

FOR Sale: AT-1 with home-built modulator and antenna coupler with two switching relays. Very nice rig. $45. K8AKE, Lake Odessa, Mich.

TRADE: RCA color TV, new, full warranty, for 32V3, 75A4 or equivalent valued equipment. W6UTV, 1176 Lincoln, San Jose, Calif.

FOR Sale: 120-watt home-built c.w. only transmitter, bandswitching 80-40-20 meters, 6AG7 VFO, 6AG7 buffer, 4-65A final, 6AS7 vacuum tube keyer and power supplies, all in one metal cabinet; nice looking clean operation; also M.B. 3 signal monitor for break-in operation. Rig is excellent for NETS. You wouldn't go wrong. Best reasonable offer takes it. You pay freight. Seagars, W6TRF, 109 Elm Circle, Needles, Calif.

WANTED: Mobile 6 volt converter. Gonset Super Six or Morrow. W8SHG, G. R. Collins, 1221 Ridge Dr., South Charleston, W. Va.

SWAP: 5KW of S.S.B. for a 455Kc Panadaptor. Yes, a brand new Eimac 4-1000-A and A 2 inc. bar of copper to keep the meter on scale for a Panadaptor. Don Taylor, 5A2TP, 633D AC & W Sq., APO 231, N. Y.

HARVEY-WELLS TBS-50C Bandmaster Sr., transmitter with carbon mic; excellent condx. Bandmaster VFO, APS-50AC power supply; Johnson key Speed-X 114 -320 and 2 Amphenol 139-010, 139-020, all never used; Shure 101C carbon mic; Mobile antenna 80 m., crystal, control box and all cables for mobile rig. $165. J. S. Kamborian, Jr., W1USP, 133 Forest Ave., West Newton, Mass.

WANTED: Lampkin 205A modulation deviation meter. Cash or trade. W5AMK.

NC-300, new, never used. Factory sealed. Shipped prepaid in U.S.A. A sacrifice at $350. Lynn Finch, W2MSJ, 14 Myrtle, Oneonta, N. Y.

SWAP Zeiss Contax 11A camera with Sonnar F2 lens and flashgun ($300) for good receiver HRO 50A1 or 183-D. Contax camera guaranteed new. R. Long, 933 E. Broadway, So. Boston, Mass.

WANTED: Eldico SSB linear amplifier 500 or 1000. Please write W6QGD, 2751 Marty Way, Sacramento 18, Calif.

FOR Sale: DX-100, $185, in excellent condition, new final tubes; balun coils, $6; low pass filter, $5; AR-3, $24. Reason for sale going S.S.B. KØDOJ, Richard Evans, Britt, Iowa.

WANTED: Prop pitch motor in good condition. WØDST, 1420 Lincoln Road, Bettendorf, Iowa.

FOR Sale: Collins 310B modified with turret output for front of panel, band switching new condition, $185. Gerard Miller, W2AVV, 16 Hendrickson Ave., Hempstead, L. I., N. Y.

WANTED: 833-A's for experimental work. E. Kucharski, 39 Aqueduct St., Ossining, N. Y.

FOR Sale: Gonset Commander with coils for all bands, $75; Millen Exciter, #90800, $12; HRO5TA1 receiver and power supply, $150; RME VHF 152, $35. W9THB, Granite City, Ill.

SELL: Complete two-meter rig: Gonset VFO and reamp, deluxe Communicator, Two and linear power amplifier, spare tubes and E-V mike; value over $480. Sell for $278. NC-98 receiver with Central Electronics Q Multiplier; value $180, sell for $107. RME-100 speech clipper, $23. All guaranteed new or like new. Express C.O.D. or send money and will ship prepaid.. W9FFP, H. Roddick, 153 Robsart Place, Kenilworth, Ill.

CUSTOM Built: KW linear band-switching BW KW coil, Jennings vacuum, .4-1000 air flow socket . . . pie net, fully metered with plastic front meters; cabinet 28 x 21 x 15 complete with bias supply bottom rack photos available; 5 watts driving power Class AB1, a beautiful amplifier: $500, with complete power supply, $600. W1CPI, Greene, Wakefield, R. I.

FOR Sale: Complete 10 meter mobile 12V converted Link PBX 10-30 watt transmitter with Gonset Tri-Band and Delco converted receiver with built-in TNS designed for trunk mtg. with all cables, relays and control box for dash control, $100; SX-25 Hallic. receiver, no spkr, $65; 500 W 10 meter c.w. transmitter, less power supply, 813 final with tubes, $50; Johnson Viking II complete with VFO, all tubes factory wired. Used about 20 hours. Modified for added mike gain and better audio, like new, $250. Frank Lester, W2AMJ, 280 West Main St., Bergenfield, N. J.

WANTED: Circuitry and/or manual for megaphone amplifier Mod. Mi-2790 Mfg. RCA. John J. Towey, 1511 17th Ave., Seattle 22, Wash.

TO Get most dough, sell to Hario! We're buying: BC-224 and BC-348 receivers, ARC-3, ART-13, BC-788, R5/ARN-7. Cash or trade. Quick action. Top money. Hario Sales Co. Dept. E, 503 North Victory Blvd., Burbank, Calif.

522 Transmitter-Receiver, paneled and metered. 6J6 preamp. Separate power supplies, $40; QST 1927-1951 inclusive, plus 6 issues 1926, two missing, $25 F.o.b. San Anselmo, Calif. W6DXA, 209 San Francisco Blvd.

AT-1 Perf. with 2 xtals; Hallicrafters S-40, working condx but needs repairs; SCR-283 set brand new; trans. VFO controlled with voice tone, c.w. 2500-7900Kc. with coils; recvr. minus coils; dynamotor with filter base; 2 control boxes, 1 relay. Shock mounts, manual included. The works for $70 F.o.b. Anthony Danese, W3DGQ, 251E Girard Ave., Phila. 25, Pa.

FOR Sale or trade: AT-1, $30; AR-3, $25, G4ZU beam, $50; 522 transmitter rack mounted with power supply on 8" steel panel, 6 meter cascode xtal converter, Command sets. Want: Hunter Cyclemaster. Frank Baker, W8QJR, McComb, Ohio.

TMC GPR-90 receivers in stock. Write for details or trade prices. Penta tubes. Gonset and Elmac. Baker Supply Co., McComb, Ohio,

B&W 51SB Sideband Generator, new, still in sealed carton, $230; Battery Handy D.B. field strength meter, $15; RME MC55 converter, $35. Pair 4" 110V selsyns motors, $5. M. Adamson, WØYEB, 4060 So. Penn, Englewood, Colo.

400 Watt fone transmitter: standard relay rack mounted, push-pull output, Class B modulated, five power supplies, xtal oscillator and 2 VFO's, KW Barker & Williamson swinging link output coils, T-R relay, 10, 20, 40, 80 meters, remote control unit with time delay, push-to-talk, VFO frequency test, etc. Can be used any distance from xmitter. Write for full description. Hear it on the air Monday, Tuesday, Thursday, Friday at 07:30-0800 on 3835 Kc. Won't be available long for only $250 complete. W6FWA, H. B. Axtell, Rte. 3, Box 971, Porterville, Calif.

CENTRAL Electronics 10A sideband exciter with 75, 40, 20 coils; like new condx: $90. W3SF, 564 Austin Ave., Pittsburgh 16, Pa.

WE Will pay you $$$$/¢¢¢ for an AN/ARN-6 or any of its components, AS-313 Loop. Phone us collect at STanley 7-0406 on these items. We also pay fabulous prices for APR-9, ARC-1, ARN-7, ART-13 parts; BC-788-C, LP-21-AM, LM, or MO-18A, or MC-507 from these loops: I-152C, R-65/APN-9, test sets I-100, TS-117, -125, -47, -148, -488. Arrow Sales, Dept. QST, 7460 Varna Ave., North Hollywood, Calif.

FOR Sale: NC-98 and speaker in original carton, $105; Heath Q multiplier, $8; BC453 (Q5'er), $10. Jonathan Wachtel, 36-42 206th St., Bayside 61, L. I., N. Y.

OLD Cone type loudspeakers: Collector wants all makes and models manufactured before 1927. In reply write make, model, condition, location, price. Donal Eymard, 140-35 58th Rd., Flushing, L. I., N. Y.

SELL: Elmac AF-67. Excellent condition: $130. Also Heath DX-100 wired by professional engineer. All reasonable offers will be considered. Larry Pyle, WØAGE/2, 78 Southgate Rd., Murray Hill, N. J.

HRO w/pwr supply and bandspread coils, $75; SX32, $90; Gonset 3-30, $20; Gonset 10-11, $10; DB20, $20; Bliley CCO2A, $5; Eico sweep generator, $18; UTC S22 unused 250 watt modulation, $20; UTC S48 3000 VCT, ½ amp, $15; ART(ATC) w/tubes and manual "as is" rough, $50. Art Ford, W2HAE, 85 Franklin St., Northport, L. I., N. Y. Tel. NOrthport 3-0501J.

SELL: Hallicrafters S40B receiver, excellent condition. Price $65. W3VTL, 848 Medway Rd., Phila. 15, Pa.

FOR Sale: Harvey-Wells TBS50D Bandmaster Deluxe transmitter, never used, plus schematic, $110. Robert Hildebrand, 501 Washington Ave., Greenville, Ohio.

SELL: DX-35, VF1, QF-1, NC-98 w/spkr and Bud 100 Kc. freq. standard. Complete station for $220. Pair of 813's, $10. Jim Jones, WØVER, 1220 W. Fourth, Sedalia, Mo.

12 V. Viking Mobile, tubes, dynamotor, cost $247. Never used. $165 or best offer. Harold Greene, W1KO, West Hanover, Mass.

BARGAINS: With new guarantee: HT-9 $99.00; S-52 Receiver $55.00; SX-28 rack $99.00; S-77 Receiver $69.00; HT-18 VFO $39.00; Lysco 600 $69.00; Eldico TR75TV $30.00; Meissner EX VFO $25.00; NC-183D rack $259.00; Millen 90800 $14.95; Johnson Adventurer $34.50; Johnson VFO $24.95; Viking II $199.00; Ranger $179.00; RME-84 $65.00; Gonset Tri Band $24.50; Sonar SRT-120 $99.00; Globe Trotter $39.00; Scout 40A $59.00; Globe Champ 165 $160.00; Globe King 275 $225.00; Heath AR-2 $22.50; and many others. Free trial, Terms financed by Leo. WØGFQ. Write for catalog and best deals to World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

S40 Rcvr, recently overhauled and aligned, $60. Want late model Lettine 240. L. Blum, 396 E. Whittier St., Columbus 6, Ohio.

LEARN Code easy. Instructograph with 10 rolls of tape, AC motor; in excellent condition: $17 all. Roman S. Segiel, 1024 N. Damen Ave., Chicago 22, Ill.

FOR Sale: Hallicrafters S53A brand new in original carton, price: $70. Charles W. Ehrlers, 319 Union St., Jersey City 4, N. J.

LATE HRO-60 with coils and spkr; extras include 100-1000 Kc. xtal calibr., 21 Mc. Bandspread coil set, Central Electronics "Q" mult., exc. shape; $395; Gonset Communicator II, 2 mtrs; 6 volts & Gonset VFO, $150. Your pickup. W2TE, Treston, 1106 York Rd., Barclay Farm, Haddonfield, N. J. Phone HA. 9-9169.

SELL Or Trade: *Viking II unmodified, perfect,* $200 or trade for 20A. Complete 10 meter mobile, Stancor 203A, 425/6 volt. dyn., Master whip, VFO, cables, Gonset Tri-Band, Deluxe, Packard radio; TNS, push-to-talk mike, meter, $165 or trade for Communicator 2, 6 volt. Both units now in operation. Will demonstrate. W2KVJ, Ronald Poinsett, R.D. #1, Trenton, N. J.

HAVE the following magazines: Radio News and Radio Technician News, years 1942–1955; Radiocraft & Radio Electronics, years 1942–1955; QST, years 1943–1947. Most years complete. Will sell or trade. Richard D. Ford, 122 Darby St., Hartford 12, Conn.

SALE: New Viking Adventurer, wired, 50 watts c.w., key and 80M. xtal. Perfect. New Hallicrafters S-38D receiver. Both for $100. Dewey Nelson, Remington, Ind.

MOBILE 6-meter rig, complete, with transmitter, 6-V power supply and converter, $50; 2-meter 6-V transmitter/receiver, $20. W8PLO.

PHASEMASTER II is yours for best offer over $200; also Navy TBX transceiver (80 mtr.) new condx, with manual but no power supply. Make offer. K6EYB, 760 Via Marin, San Lorenzo, Calif.

IDEAL Mobile power source, Janette rotary, converts 12 VDC to 115 VAC, *60 cycles, 150 watts;* will ship, price $20. W4MO, 434 Cornell Place, Louisville, Ky.

POWER Supply: 500 W., partly wired; UTC parts, S-49 pwr xfrmr, 4200 VCT 300 Ma.; swing and filter chokes S-33 & 33, 5/25 and 20 hy. 300 Ma. fil. xfrmr S-57, 2.5V 10 amps. 10 x 13 chassis; 100 W. *bleeder;* 2 *μfd* oil cond. *Local pickup sale.* Make offer. Francis J. Maier, 231 Columbia Ave., Trenton, N. J. K2BSZ.

GUARANTEED, Reasonably priced new and used gear for sale: HRO50T/50T1 AA and AC coils, HRO60T cabinet, Precision E-200C signal generator, Gonset 100% K, Electro-Voice Mod. 1000 speech clipper; Thordarson 1250/*1000* VDC, *300* Ma., UTC 825/600 VDC, 300 Ma. Thordarson T15D79 Multi-Match driver transformers, assorted Triplett milliammeters 75T's. W8VJD, 203 W. Kaye Ave., Marquette, Mich.

LATE Model SX-71, speaker, S9'er, excellent condx, just reconditioned. Best offer. K. Johnston, c/o J. Cattier, Locust Valley, N. Y.

FOR Sale: Complete 120 watt phone/c.w. xmitter, bandswitching 80–40–20–15, in Bud cabinet; Heath VFO, Bud variable low-pass filter, antenna changeover relay, Balun coils, Electro-Voice Cardax 950 crystal mike, speech clipper, all for $155. Can see in operation, would prefer local buyer. Carl Zimmerman, K2GCB, 2701 Webb Ave., Bronx 68, N. Y. Tel. KIngsbridge 8-2964.

SELL: Globe Scout 40A, factory-wired, $50; Hallicrafters S-38C, $27. Warren Hendricks, K2GQT, 1526 Corlies Ave., Neptune, N. J.

SELL: DX 35, mtd. balun coils, window antenna, 5 Novice xtals, all operating; $75. Alvin Berger, 21 Pleasant St., Littleton, Mass.

COLLINS 32V-3, excellent condition, spare 4D32, instruction book. Will crate and prepay motor freight to any QTH in USA. $525 cash. This is the rig that ran up 1270 QSOs in the 1955 Sweepstakes, an unbeaten record. All inquiries answered. John D. Ryan, W7KVU, 18 Laird St., Ramsay Mont.

SELL Viking Kilowatt with Ranger exciter, as new. Used less than fifty hours. Complete and in perf. condx: $1000. F.o.b. Apex, N. C. C. S. Schaub, Box 218, W4LOZ.

LEECE-NEVILLE 6V-100A alternator, regulator and rectifier, $35; Carter 6V dynamotor 630v. 370 Ma., $10; TA-12C xmitter, 100 watt VFO, $25 with MP-28, 100 watt modulator, $15, both converted to 6v. input; 0–1 Ma., 0–8 VDC Simpson meters, $2 each or swap for antenna tuner, HV pwr. supply or what have you? All F.o.b. Midland, Texas. J. Herold, W5HIQ, 4310 Harlowe Dr.

FOR Sale: Viking Valiant kit, in original shipping carton, never opened, $350. W3YPL, Charles Kranias, 58 Chambersburg St., Gettysburg, Pa.

WANTED: BC-221, original calibration book, metal case; BC-779-B, or 794-B or 1004-C w/pw sup; *instruction book for* Super-Pro Mod. LRX. State condx, price. All letters answered. A. M. Wickland, 308 Monroe St., Kalamazoo, Mich.

HEATH DX-35, excellent condition, $55. Mohn, K2RPI, R.D. #1, Westwood, N. J.

FOR Sale: Collins KWS-1 transmitter, less than four months old and in excellent condition. Completely checked by Collins 30 days ago. $1600 cash; 75A1 receiver, no modifications. In excellent condition, $200. Cash. 30 ft. Kuehne tower, 3-el. Telrex 10-meter "Mini-Beam" AR22 rotor complete, 100 ft. RG8U coax, all for $70 cash. L. M. Newberry, 1703 Bunker Hill Dr., Irving, Texas.

SSB Elenco PA400 linear, $150; Collins 32V-3, $495; Gordon rotator with 10 and 20 meter beams, $275; Dymont #274 'scope, $50; Motorola P-69–18ARS mobile receiver, $25; 6-volt dynamotor power supply, $25. W1RMS, 198 Euclid Ave., Waterbury, Conn.

TELREX 20 meter beam for sale, five element, Mod. 506-A, unused, $140. R. E. Winkelman, 54 Boylston St., Cambridge 38, Mass.

SALE: Brand new DX-100 with assorted accessories, $200. S-85 receiver with external "S" Meter, $90. F.o.b. Daren Kettler, Chesaning, Mich.

SELL: NC300, matching speaker, 100 Kc xtal calibrator, brand new condx, $335; Factory wired Ranger, $159; Matchbox, $29; B&W 380 T-R switch, new, $15. W2NDP, 910 Smith St., Uniondale, L. I., N. Y. Phone IVanhoe 5-3190.

SELL: Meissner 150-B, 300 watts, EX-VFO, $225., Edward Theiss 210 23rd St. Drive S.E., Cedar Rapids, Iowa.

WANTED: Coils or forms for National SW-3. All letters answered. K4BNI.

SELL: Viking Valiant, $350; Hammarlund HQ-140XA with matching speaker, $220. Both in exc. condx. C. L. Gomel, W5BZW, 1125 Dakota SE, Albuquerque, New Mex.

WANTED: Late 75A4. Quote lowest price. I. Shepard, W8BNG, 18680 West 13 Mile Road, Birmingham, Mich.

WANTED: A Mobile receiver (Amateur Bands) with or without 12V. power supply. W8PNM.

VIKING Adventurer, like new, $35. M. Kunzman, 723 Hillside Ave., Plainfield, N. J.

SELL: Complete modern AM and CW Band-switching KW. Parallel 4-250As, pi-network, 810 modulators; 2500v @ 1 amp; final supply 1500v at 500 Ma. Mod. supply. HT-18 VFO. Complete in standard 77" rack. Reasonable offers considered. Will trade for Globe-King 500. Joe Shank, Jr., 2310 Washington Blvd., Huntington, W. Va.

CLEANING House: *High and low power transformers, chokes,* condensers, other components. Meters, cabinets, test equipment, tubes, dynamotors, misc. surplus equipment. Send stamped self-addressed envelope for complete list. C. E. Jeffries, Box 255, Enon, Ohio.

ELMAC AF56 transmitter, 160 thru 10 with PS-2V Elmac 110 volt power supply including microphone, $150. Elmac receiver with power supply for 6 volt, $90; Collins 32V3 transmitter, excellent condition $490. F.O.B. Toledo.

QSTS 1932 to 1956, 4 for $1. B&W Mod. 425 low pass filter, $10. W3FYW.

MULTIBAND Traps 80 thru 10. Weather sealed, 52 or 72 ohm feed, 1 KW. $8 pair, postpaid. Send stamp for literature. S. & W Electronics, 293 N. Evergreen, Kankakee, Ill.

FOR Sale: Globe King 500 with 500A modifications, like new, $450 Elmac PMR6A and PSR6 v., $110; perf. condx, Gonset Communicator 1 for 6 volts and 115 Ac., perf. condx, $125; 1.5 KVA Kohler 4 cylinder water-cooled 115 VAC power plant with automatic relay control, 2 12-V. batteries, and mounted on trailer, ready to go, just push the button, $350; National SOJ-3 Selecto-Ject for HRO or 183D receiver, $15. J. E. Reed, W4ZAV, 3012 Wilkinson Blvd., Gastonia, N. C. Phone UN 7-7323.

VIKING II, perf. condx., factory wired, $275; Johnson VFO factory wired, $50; low pass filter, $10; HQ150, used 10 hours, $270; matching spkr, $10; B&W #3975 balun coils mounted, $5; Astatic JT-30 mike, $6; Heath grid dip meter, $10; 2 meter transceiver, home-built, $125; Mallory Vibrapack VP6-325, $12; PE-103 $22. K6CZK, 1712 Austin Way, Santa Rosa, Calif.

COLLEGE undergraduate, general license, radio counsellor job this summer, Westchester County resident preferred. Furnace Woods Camp, Peekskill, N. Y.

WANTED: Collins 75A2 or 75A3. Also Viking Ranger. Would like Rx with 800 cycle filter, though not necessary. State condx, price. Bill Butler, 141 Ellsworth, Crystal Lake, Ill

CADILLAC 1938. Will trade for xmitter or rcvr. Jim Windeck, K9CQQ, 228 W. Marshall, Belvidere, Ill.

FOR Sale: Globe Champion. Details. Write W8DED, Holland, Mich.

JOHNSON Viking I, 4S32, factory TVI kit, $130; Johnson VFO, $30; Baluns, $5; JT-30 microphone, $6; Hallicrafters SX-71 w/spkr, $125; Heathkit AR-1 $22.50; Heathkit VF-1, $19.50; new PE-103A, $17.50; Bud CPO-128A oscillator, monitor, $10; BC-645-A transmitter, dynamotor, antennas, plugs, $17.50; Triplett 1295 modulation monitor, carrier shift indicator, $12.50; Wilcox CW-3 receiver, $12.50; *Sonar VFO-120* tubeless VFO, $7.50; General Electric YE-9 electronic switch, $20; ABD-2 IFF VHF transceiver, new, $3; set 300 crystals, FT-241-A, 54th harmonic, various channels 0–70, $17.50; FOB Indianapolis. Request free detailed listing. W9DPI, Howard O. Severeid, 2431 E. Riverside Dr., Indianapolis 23, Ind. Tel. WAlnut 4-2184.

SWAP or sell: Gonset 2-meter Communicator; complete 10/11 meter mobile including Subraco MT15X, Gonset converter, Mallory dual Vibrapack, etc. PP 813 complete CW rig, with Meissner signal shifter, Millen exciter, low-pass filter, enclosed rack, TVI suppressed, complete high gain speech and 25 watt modulator in 3½" rack mounting; set Rider service manuals; RCA Voltohmist and many other items. Want: tabletop all-band rig, Collins, Johnson, B & W or what have you? W2GCV, Percival, 5 Hillside Ave., Kearny, N. J. Tel. KEarny 2-8077.

FOR Sale: xtal filter, perf. condx. $15. K2PHC.

VIKING I and VFO, TVI suppressed: $135. New 14V. Dynamotor 425V at 163 Ma; filter and relay, $8. Scott Smithson, Box 914, Dumas, Texas.

SPARE Receiver for sale: HQ-129X or BC-1004 Super-Pro. Either one, $120. With slicer, $140. Also speech amplifier and 811's modulator, $15; new dynamotor, 6 volts to 425 volts at 375 Ma. $12. All F.o.b. Princeton, N. J. Morrison, 17 Random Rd., Princeton, N. J.

PERFORATED Aluminum sheet, .051, 5/64" OD holes, 1⅛" centers, $1.20 sq. ft., cut to size. Send for listing on Beams, *Aluminum Tubing, etc.* Radcliff's, Fostoria, Ohio.

START Your QSO Index File now! 200, $1.00; 1000, $4.50. Postpaid. Sample free. Hamproco, Box 183, Merriam, Kansas. Box 247, Cedar Rapids, Iowa

SELL: Eldico TR75TVI, 65 watts, six band. Coils for 80 and 40. Eleven Novice crystals for 80 and 40. $25 takes all. Bill Laskey, 412 N. Chicago, Rossville, Ill.

NINE Years: QST from 1947 to 1955. In excellent condx: $10, plus postage. Eimac 5/125B pentodes, used, two for $18. W3OJW, 6913 Churchland St., Pittsburgh 6, Pa.

COLLINS 310B-3 factory modified band sws PA control, TVI suppressed, $190 or best offer. Central Electronics B-Sideband Slicer, Q-Multiplier, factory wired, $70; Select-O-Ject, $10; Thordarson Splatter Choke T-20C60 $10; CHT choke T-15C47 400 Ma, 250 Ma. CHT bias transformer MU-LTI-Volt T-15R62 275V-500V 150 Ma. Cornell-Dubilier transmitting capacitors (1) TJH-50020 2*μfd* 5000 WV. G.E. 1 and 2 *μfd* 4000 WV. Mixe .02 3500 WV Sangamo type E porcelain micas. 115v. AC relays, DC and AC volt Ma. ant. RF. No reasonable offers refused. W4AIX, P. O. Box 178, Hendersonville, N. C.

CENTRAL "A" Slicer $49.95, "B" Slicer $74.95, Collins 32V2 $450.00, 32V3 $550.00; Eldico TR75TV $449.95, VFO-2 $19.95, VFO10/20A $38.95; Elmac A54 $99.95, A54H $110.00, PSR6 $19.95, PSR116 $19.95; Gonset Commander $94.95, Communicator II $179.95, Super-Six $34.95; Hallicrafters SX62 $225.00, S76 $139.95, S85 $89.95, S86 $89.95, SX96 $229.95; Hammarlund HQ129X $139.95, SP400X $229.95; Johnson VFO $39.95, KW $1295.00; Lettine 240 $59.95; Lysco 600 $79.95; Millen 90810-VHF $89.95; Morrow MBR-5 $194.95; National HRO-3 $99.95, HRO50T1 6 coils and speaker $350.00, NC183D $275.00, PE-103 $19.95; many *other used items* available. *Write for latest list.* Evans Radio, Box 312, Concord, N. H.

WANTED: Press Wireless FRR-3 diversity receiving equipment, parts or complete. Also APN-9, ART-13, TG-7 (mod. #15) teletype model #26, T-D #14 transmitter distributor. Sell 32V-2, Viking 1, NC-300, Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Richmond 2-0916.

FAMOUS VHF "Lunenburg" antennas, 6 meter 5 element, $14.95; 2 meter 6 element, $6.95. 6 meter horizontally polarized mobile *antenna.* Wholesale Supply Co., *Lunenburg, Mass.*

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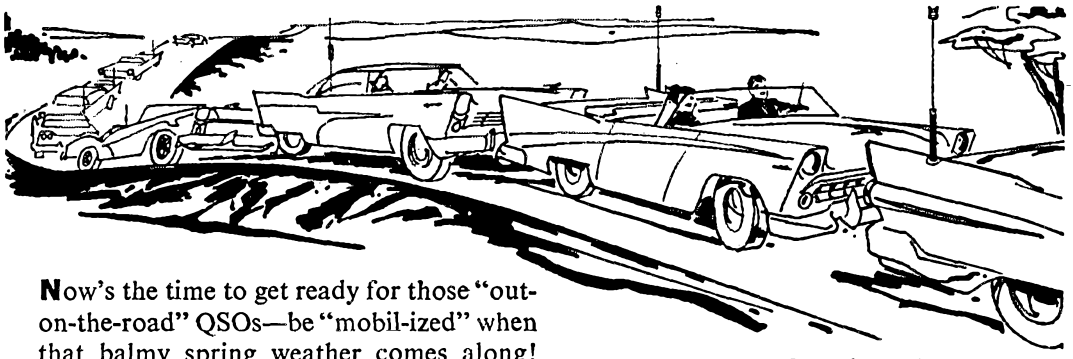

Now's the time to get ready for those "out-on-the-road" QSOs—be "mobil-ized" when that balmy spring weather comes along! Whether you're just getting started in mobile work or "sprucing up" your present road-rig, ALLIED has exactly what you want. We've got *everything* in stock for *immediate* shipment—from a complete deluxe mobile installation to a tube of anti-static powder! And, of course, when you deal with us at ALLIED, you get the *biggest* trade-in offers in Ham Radio and the Easiest Terms.

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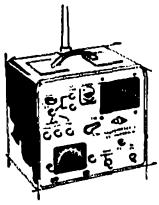

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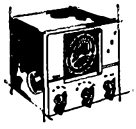

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DM-42A Dynamotor. 12–14 v. input. Output: 1030 v. DC @ 260 ma. With 6v. DC input, output is 515 v. DC @ 215 ma.

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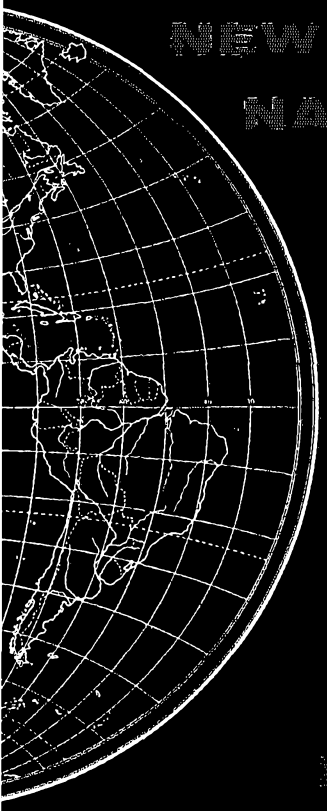

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Use this rugged portable 4 ways...as a ham receiver, a 3-way portable, a marine receiver, and as an SWL receiver. Use it in your shack, in your car, on your boat. Take it along on your vacation. It's truly the world's most versatile receiver!

National's exciting new NC-66 offers 115V. AC/DC or battery operation, 5-band coverage from 150 kc to 23 mc, electrical bandspread with logging scale, plus a fixed tuned CW oscillator! Housed in a handsome, sturdy metal cabinet with carrying handle, the traditional National quality is evident throughout.

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Provisions for external direction finder for marine use (RDF-66 Loop accessory).

Receives voice or code.

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Handsome two-tone metal cabinet, chrome trim.

12-5/16" wide x 9-11/16" high x 10" deep: weight: 16 lbs. less batteries.

BAND:		COVERAGE:			
	DF	150	—400	kc	
	BC	.50—	1.4	mc	
	1	1.40—	4.05	mc	
	2	4.0 —	11.4	mc	
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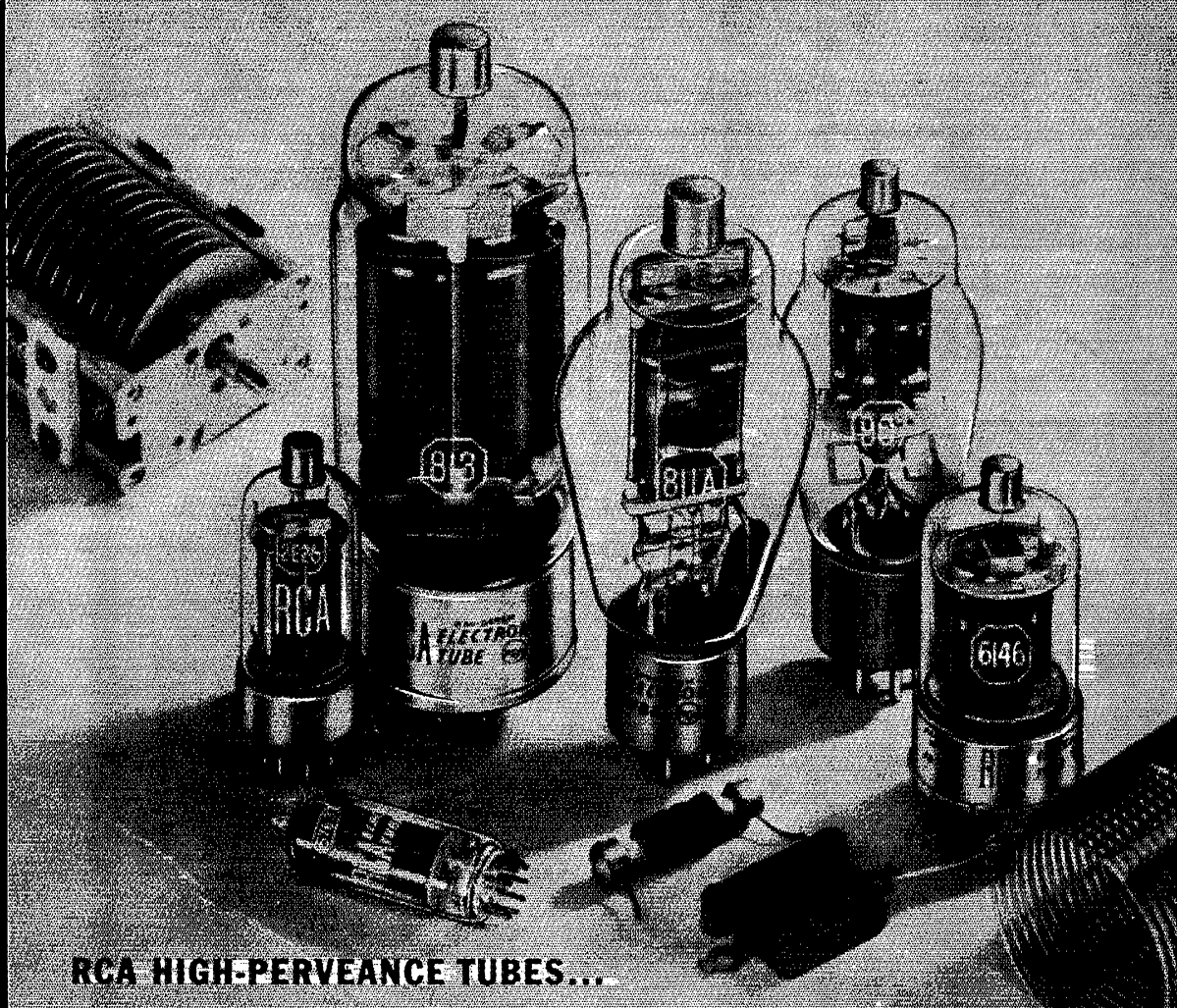
MALDEN 48, MASS.

tuned to tomorrow



RCA HIGH-PERVEANCE TUBES...

give more watts per transmitter dollar

Known for their ability to handle high power at relatively low plate voltage, RCA high-perveance tubes are the answer for radio amateurs looking for power types that will save substantially on transmitter construction costs.

Here's why RCA high-perveance designs contribute to overall economy:

High-perveance tubes—an original RCA development—enable you to use lower-voltage-rated tank-circuit components. These tubes eliminate the need for very high-voltage plate transformers and very-high-voltage-rated filter capacitors. They enable you to use more reasonable values of pi-network components. And they simplify your insulation problems.

The power tubes pictured here are typical of the many RCA high-perveance types available to provide power up to the legal limit. Ratings on these and other RCA high-perveance types are listed on the chart.

RCA high-perveance tubes are available at your RCA Tube Distributor. For technical data on any of these types, write RCA Commercial Engineering, Section D-37-M, Harrison, N. J.

See how little plate voltage it takes for the power you want

RF Amplifier Service—Max. Amateur Ratings, Class C					
RCA Tube No.	Type	DC Plate Input Watts		DC Plate Volts	
		CW	AM	CW	AM
2E26	Beam Power	40	27	600	500
4X150A	Beam Power	250	200	1250	1000
807	Beam Power	75	60	750	600
810	Triode	750	500	2500	2000
811-A	Triode	260	175	1500	1250
812-A	Triode	260	175	1500	1250
813	Beam Power	500	400	2250	2000
815	Twin Beam Power	75*	60*	500	400
829-B	Twin Beam Power	120*	90*	750	600
832-A	Twin Beam Power	50*	36*	750	600
5763	Beam Power	17	15	350	300
6146	Beam Power	90	67.5	750	600
8000	Triode	750	500	2500	2000
8005	Triode	300	240	1500	1250

*Total for Tube

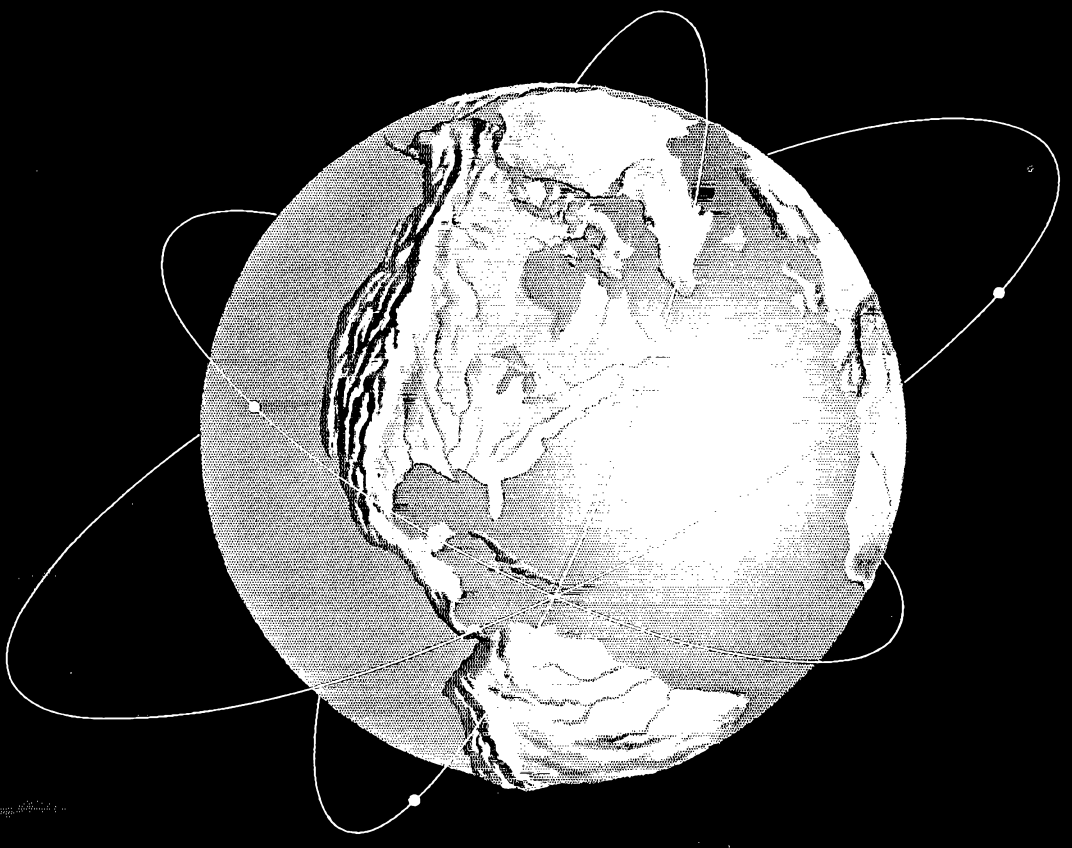
POWER TUBE AUTHORITY

New 256-page RCA Transmitting Tube Manual TT-4 covers 108 power types, and 13 rectifier types. Includes theory, data, installation, application, and useful circuits. See your RCA Tube Distributor. Or send $1.00 to RCA Commercial Engineering, Harrison, N. J.

TUBES FOR AMATEURS

RADIO CORPORATION OF AMERICA

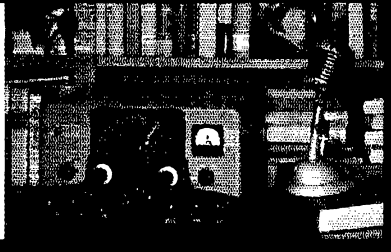
Tube Division • Harrison, N. J.



Johnson Amateur Equipment

. . . For Full Communication

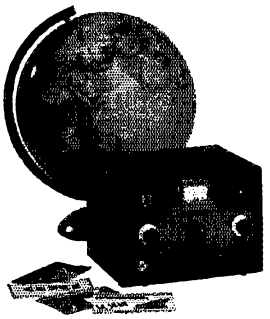
POWER!



Top performance isn't simply a matter of watts. Only carefully integrated equipment design can be relied on to develop effective power that punches your signal home every time. That's what we call "communication power" . . . and your Viking transmitter will deliver it in full measure!

Your best buy!

Johnson Amateur Equipment



VIKING "ADVENTURER" TRANSMITTER

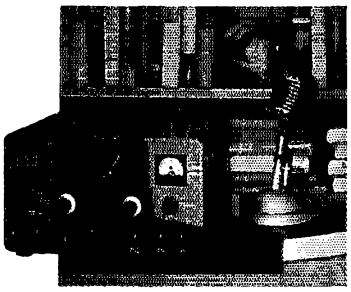
Here's a compact, completely self-contained 50 watt CW transmitter ideally suited to the novice! Used to earn the first novice WAC (Worked All Continents), the "Adventurer" is effectively TVI suppressed . . . puts 50 watts of power into a rugged 807 transmitting tube. Instant bandswitching 80 through 10 meters . . . operates by crystal or external VFO control. Wide range pi-network output—no antenna tuner needed. Break-in keying is clean and crisp. Designed for easy assembly—with tubes, less crystals and key.

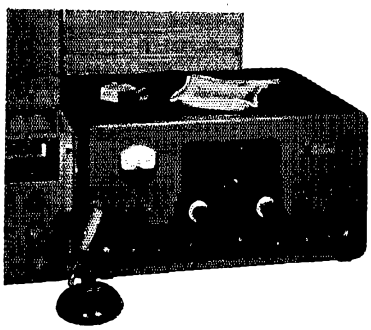
Cat. No. 240-181-1 Kit..... **Amateur Net $54.95**

VIKING "RANGER" TRANSMITTER

This popular 75 watt CW or 65 watt phone transmitter delivers a solid signal! As an RF and audio exciter, the "Ranger" will also drive any of the popular kilowatt level tubes. Completely self-contained . . . effectively TVI suppressed. Instant bandswitching 160 through 10 meters—operates by extremely stable, built-in VFO or crystal control. Final amplifier tube is a 6146. Easily assembled—with tubes, less crystals, key and microphone.

Cat. No. 240-161-1 Kit..... **Amateur Net $214.50**
Cat. No. 240-161-2 Wired and tested.. **Amateur Net $293.00**





VIKING "VALIANT" TRANSMITTER

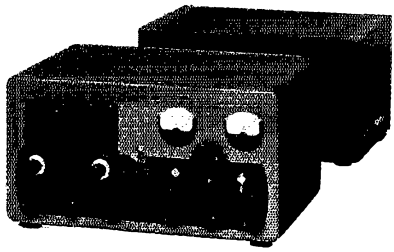
Here is power to slice through terrific QRM . . . a transmitter engineered for outstanding flexibility and performance! 275 watts input on CW and SSB*, 200 watts phone. Instant bandswitching 160 through 10 meters—operates by built-in VFO or crystal control. Pi-network tank circuit will match antenna loads from 50 to 600 ohms—final amplifier utilizes three 6146 tubes in parallel. TVI suppressed—timed sequence (break-in) keying—low level audio clipping—built-in low pass audio filter—self-contained power supplies. With tubes, less crystals, key and microphone.

Cat. No. 240-104-1 Kit..... **Amateur Net $349.50**
Cat. No. 240-104-2 Wired and tested.... **Amateur Net $439.50**

VIKING "FIVE HUNDRED" TRANSMITTER

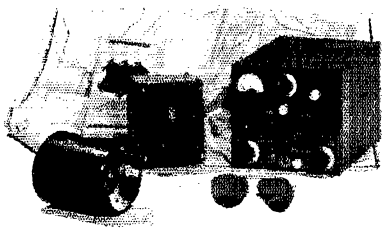
Over a half-kilowatt of *full* communication power! Rated 600 watts CW . . . 500 watts phone and SSB*—compact RF unit designed for desk-top operation—power supply/modulator unit may be placed in any convenient location. All exciter stages ganged to VFO tuning—also may be operated by crystal control. Instant bandswitching 80 through 10 meters—TVI suppressed—high gain push-to-talk audio system—low level audio clipping. Pi-network output will match a wide range of antenna impedances. With tubes, less crystals, key and microphone.

Cat. No. 240-500-1 Kit..... **Amateur Net $699.50**
Cat. No. 240-500-2 Wired and tested.. **Amateur Net $879.50**



*P.E.P. input with auxiliary SSB exciter

for mobile...



VIKING "MOBILE" TRANSMITTER

This power-packed mobile transmitter is rated at 60 watts PA input—powerful PP807 modulator is designed for extra audio punch! Instant bandswitching 75 through 10 meters. All stages ganged to a single tuning knob. Under-dash mounting. Specify 6 or 12 volts. Less tubes, crystals, microphone and power supply.

Cat. No. 240-141-1 Kit.....**Amateur Net $99.50**
Cat. No. 240-141-2 Wired and tested on special order only.

MOBILE VFO

Small size permits steering post mounting . . . rugged construction minimizes frequency shift. Temperature compensated and voltage regulated. Calibrated 75 through 10 meters. With tubes.

Cat. No. 240-152-1 Kit.....**Amateur Net $33.95**
Cat. No. 240-152-2 Wired and tested....**Amateur Net $49.95**

"WHIPLOAD-6"

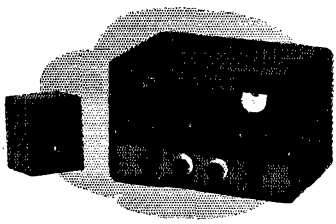
Provides high efficiency base loading for mobile whips—bandswitching 75 through 10 meters. Air-wound coil provides extremely high "Q". Fibre-glass housing. Mounts on standard mobile whip.

Cat. No. 250-26 Wired and tested.....**Amateur Net $19.50**

for VHF... VIKING "6N2" TRANSMITTER

This compact VHF transmitter is rated at 150 watts CW and 100 watts phone—bandswitching 6 and 2 meters! TVI suppressed—may be used with the Viking I, II, "Ranger", or similar power supply/modulator combinations. Crystal control or may be operated by external VFO with 8-9 mc. output. With tubes, less crystals, key and microphone.

Cat. No. 240-201-1 Kit.....**Amateur Net $119.50**
Cat. No. 240-201-2 Wired and tested..**Amateur Net $159.50**



TWO METER VFO

Replaces 8 mc. crystals in most two meter equipment, including types using overtone oscillators. Temperature compensated—excellent stability. Output range: 7.995 mc. to 8.235 mc. Edge-lighted lucite dial calibrated 144 to 148 mc. Requires 6.3 volts at .3 amp. and 250-325 volts at 10 ma. With tubes, power cable, and plug.

Cat. No. 240-132-1 Kit.....**Amateur Net $29.50**
Cat. No. 240-132-2 Wired and tested..**Amateur Net $46.50**

VIKING "PACEMAKER" TRANSMITTER

This exciting transmitter is the perfect companion unit to the Viking "Kilowatt." 90 watts input CW and SSB (P.E.P.) . . . 35 watts AM! Excellent stability—built-in temperature compensated VFO—separate crystal control provided for each band. Bandswitching 80, 40, 20, 15 and 10 meters—automatic voice controlled operation. Pi-network matches antenna loads from 50 to 600 ohms. More than enough power to drive a kilowatt amplifier. With tubes and crystals, less key and microphone.

Cat. No. 240-301-2
Wired and tested.....**Amateur Net $495.00**

POWER DIVIDER— Provides up to 35 watts continuous dissipation for proper output loading of the "Pacemaker" when used to drive the Viking "Kilowatt".

Cat. No. 250-34.....**Amateur Net $24.95**

VIKING "KILOWATT" AMPLIFIER

Imagine yourself at the controls of this exciting Viking "Kilowatt"! You'll marvel at the ease of selecting maximum legal input AM, CW or SSB with the flip of a single switch . . . you'll immediately sense the authority of its *full* kilowatt signal, placing the world at your fingertips. Continuous frequency coverage 3.5 to 30 megacycles, wide range antenna matching and complete TVI suppression. Compact pedestal contains the complete "Kilowatt". Excitation requirements: 30 watts RF and 10 watts audio for AM; 2-3 watts peak for SSB.

Cat. No. 240-1000 Wired and tested with tubes.....**Amateur Net $1595.00**
Cat. No. 251-101 Matching accessory desk.....**FOB Corry, Pa. $123.50**

HRO-60 and NC-300 receivers—courtesy National Company, Malden Mass.

Antennas, Beams and Rotators...

PRE-TUNED BEAMS—Rugged, semi-wide spaced with balun matching sections. Approximately 9.0 db gain over tuned dipole—more than 27 db front-to-back ratio with low SWR. Pattern is uni-directional, beam width is 55° With 3 elements, boom and balun.

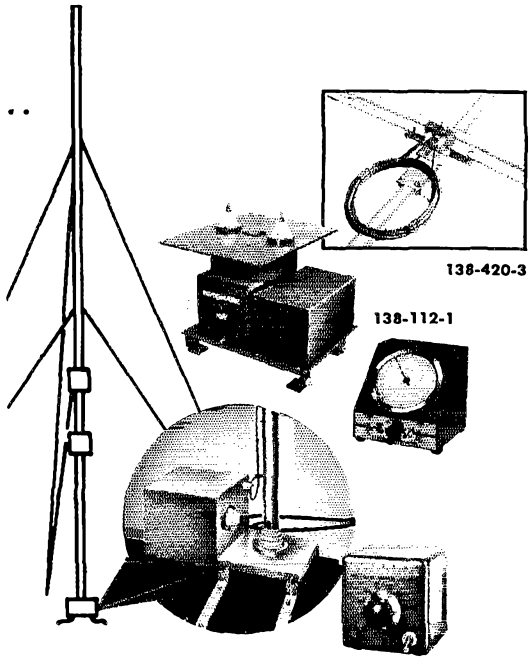
Cat. No. 138-420-3 20 Meters.....**Amateur Net $139.50**
Cat. No. 138-415-3 15 Meters.....**Amateur Net $110.00**
Cat. No. 138-410-3 10 Meters.....**Amateur Net $ 79.50**

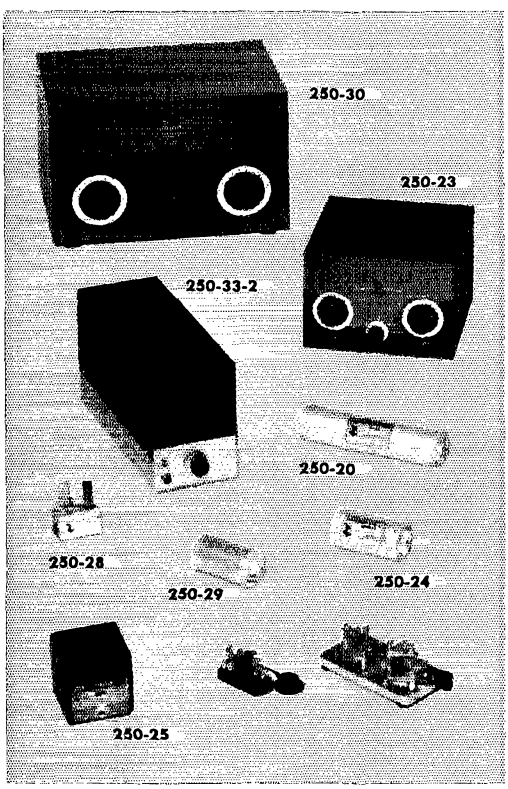
"ROTOMATIC" ROTATOR—Supports up to 175 lb. beams even under heavy icing or in high winds. Rotates 1¼ RPM—1200 to 1 gear reduction. Cast aluminum housing with 5/16" steel rotating table. (Tilts 90°.) Includes desk top control box with selsyn indicator.

Cat. No. 138-112-1 With slip rings for continuous rotation.
For open wire line.....**Amateur Net $354.00**
Cat. No. 138-112-51 With limit switches for 370° rotation.
For coaxial line.....**Amateur Net $354.00**

VIKING "MATCH-STICK"—Fully automatic, pre-tuned multi-band vertical antenna system. Bandswitching 80 through 10 meters. Remotely motor driven from operating position. Easily mounts on roof top or in limited space location. Low SWR (less than 2 to 1) all bands. Impedance: 52 ohms. With 35' mast, base, tuning network, relays, control box and 6 nylon guy ropes.

Cat. No. 137-102 Pre-tuned.....**Amateur Net $129.50**





The E. F. Johnson Co. reserves the right to change prices or specifications without notice and without incurring obligation.

Station Accessories...

VIKING"MATCH BOXES"—Self-contained, band switching 80 through 10 meters. Provides integrated antenna matching and switching. Tunes out large amounts of reactance. No load-tapping or plug-in coils necessary.

Cat. No. 250-23 275 watts, wired.....**Amateur Net $ 49.85**
Cat. No. 250-30 Kilowatt, wired.....**Amateur Net $124.50**

VIKING AUDIO AMPLIFIER — Self-contained 10-watt speech amplifier, complete with power supply and tubes. Speech clipping and filtering improves performance and effectiveness of your AM transmitter.

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—Handles more than 1000 watts RF. 75 db or more attenuation above 54 mc. Wired, pre-tuned.

Cat. No. 250-20 52 Ohms Impedance...**Amateur Net $13.50**
Cat. No. 250-35 72 Ohms Impedance...**Amateur Net $13.50**

SWR BRIDGE—Provides accurate measurement of SWR for effective use of low pass filter and antenna coupler.

Cat. No. 250-24 52 Ohms Impedance....**Amateur Net $9.75**

POWER REDUCER—Provides up to 20 watts continuous dissipation, permitting 100-150 watt transmitters such as Johnson Viking, Collins 32V to serve as exciters for the Viking "Kilowatt". Completely shielded.

Cat. No. 250-29.....**Amateur Net $13.95**

CRYSTAL CALIBRATOR—Provides accurate 100 kc check points to 55 mc. Requires 6.3 volts at .15 amps and 150-300 volts at 2 ma. With tube and crystal.

Cat. No. 250-28 Wired and tested.....**Amateur Net $17.25**

"SIGNAL SENTRY"—Monitors CW or phone signals up to 50 mc. Powered by receiver. With tubes.

Cat. No. 250-25 Wired and tested.....**Amateur Net $18.95**

KEYS AND PRACTICE SETS—See your distributor or write for descriptive literature on Johnson's complete key line.

E. F. Johnson Company
126 SECOND AVENUE S.W. • WASECA, MINNESOTA